

**Phantom** 

**INTERNATIONAL  
TOOLS**

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**CHECK OUR INNOVATIONS ON PAGE 6**

- Bij uitstek geschikt - Très approprié - Muy adecuado - Ideal geeignet  
 □ Beperkt geschikt - Approprié - Adecuado - Eingeschränkt geeignet

ISO ■	ISO □	NL	FR	ES	DE
<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 11</b> S800 N/mm <sup>2</sup>	<b>Ongelegeerd en gelegeerd staal ≤600 N/mm<sup>2</sup></b> 1.0037 (St37), 1.0038 (S235JR G2), 1.00402 (C22), 1.1178 (C30E)	<b>Aciers non-alliés ou faiblement alliés ≤600 N/mm<sup>2</sup></b> 1.0037 (A37), 1.0038 (E 24-2 Ne), 1.00402 (1C20), 1.1178 (1C30)	<b>Acero no aleado ≤600 N/mm<sup>2</sup></b> 1.0037 (S235JR), 1.0038 (S235JR G2), 1.0402 (F.112), 1.1178 (C30E)	<b>Unlegierter und legierter Stahl ≤600 N/mm<sup>2</sup></b> 1.0037 (St37), 1.0038 (S235JR G2), 1.00402 (C22), 1.1178 (C30E)
<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>Ongelegeerd en gelegeerd staal 600 - 850 N/mm<sup>2</sup></b> 1.0050 (St50-2), 1.0070 (St70-2), 1.0301 (C10), 1.0503 (C45), 1.1121 (Ck10), 1.1191 (C45E), 1.0718 (11SMnPb30), 1.0736 (11SMn37)	<b>Aciers non-alliés ou faiblement alliés 600 - 850 N/mm<sup>2</sup></b> 1.0050 (A50-2), 1.0070 (A70-2), 1.0301 (1C10), 1.0503 (1C45), 1.1121 (XC10), 1.1191 (2C45), 1.0718 (S250PB), 1.0736 (S300PB)	<b>Acero no aleado 600 - 850 N/mm<sup>2</sup></b> 1.0050 (Fe490-2), 1.0070 (Fe690-2), 1.0301 (F.1151), 1.0503 (F.114), 1.1121 (F.1510-C10K), 1.1191 (C45K), 1.0718 (F.2112-11SMnPb28), 1.0736 (F.2113-11SMn37)	<b>Unlegierter und legierter Stahl 600 - 850 N/mm<sup>2</sup></b> 1.0050 (St50-2), 1.0070 (St70-2), 1.0301 (C10), 1.0503 (C45), 1.1121 (Ck10), 1.1191 (C45E), 1.0718 (11SMnPb30), 1.0736 (11SMn37)
<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>Gelegeerd staal 850 - 1000 N/mm<sup>2</sup></b> 1.0727 (46S20), 1.0728 (60S20), 1.0757 (46SPb20), 1.2080 (X210Cr12), 1.2083 (X42Cr13), 1.2767 (X45NiCrMo4), 1.5131 (50MnSi4), 1.7003 (38Cr2), 1.7030 (28Cr4), 1.7043 (38Cr4)	<b>Aciers alliés 850 - 1000 N/mm<sup>2</sup></b> 1.0727 (45MF4), 1.0728 (60S20), 1.0757 (46SPb20), 1.2080 (Z200C12), 1.2083 (Z40C14), 1.2767 (Y35NCD16), 1.5131 (50MnSi4), 1.7003 (38Cr2), 1.7030 (28Cr4), 1.7043 (38Cr4)	<b>Acero aleado 850 - 1000 N/mm<sup>2</sup></b> 1.0727 (46S20), 1.0728 (60S20), 1.0757 (46SPb20), 1.2080 (F.5212-X210Cr12), 1.2083 (X42Cr13), 1.2767 (X45NiCrMo4), 1.5131 (50MnSi4), 1.7003 (38Cr2), 1.7030 (28Cr4), 1.7043 (38Cr4)	<b>Legierter Stahl 850 - 1000 N/mm<sup>2</sup></b> 1.0727 (46S20), 1.0728 (60S20), 1.0757 (46SPb20), 1.2080 (X210Cr12), 1.2083 (X42Cr13), 1.2767 (X45NiCrMo4), 1.5131 (50MnSi4), 1.7003 (38Cr2), 1.7030 (28Cr4), 1.7043 (38Cr4)
<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>Gelegeerd staal 1000 - 1400 N/mm<sup>2</sup></b> 1.5710 (36NiCr6), 1.7035 (41Cr40), 1.7225 (42CrMo4), 1.8519 (31CrMoV9), 1.8550 (34CrAlNi7), 1.5752 (15NiCr13), 1.7131 (16MnCr5), 1.7264 (20CrMo5)	<b>Aciers alliés 1000 - 1400 N/mm<sup>2</sup></b> 1.5710 (36NiCr6), 1.7035 (41Cr40), 1.7225 (42CrMo4), 1.8519 (31CrMoV9), 1.8550 (34CrAlNi7), 1.5752 (15NiCr13), 1.7131 (16MnCr5), 1.7264 (20CrMo5)	<b>Acero aleado 1000 - 1400 N/mm<sup>2</sup></b> 1.5710 (36NiCr6), 1.7035 (41Cr40), 1.7225 (42CrMo4), 1.8519 (31CrMoV9), 1.8550 (34CrAlNi7), 1.5752 (15NiCr13), 1.7131 (16MnCr5), 1.7264 (20CrMo5)	<b>Legierter Stahl 1000 - 1400 N/mm<sup>2</sup></b> 1.5710 (36NiCr6), 1.7035 (41Cr40), 1.7225 (42CrMo4), 1.8519 (31CrMoV9), 1.8550 (34CrAlNi7), 1.5752 (15NiCr13), 1.7131 (16MnCr5), 1.7264 (20CrMo5)
<b>H 15</b> HRC	<b>H 15</b> HRC	<b>Gehard en inzetgehard staal 50 - 60 HRC</b> 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)	<b>Aciers trempés et Aciers de cémentation alliés 50 - 60 HRC</b> 1.2344 (Z 40 CDV 5), 1.2767 (X45NiCrMo4), 1.2379 (D2), 1.2080 (Z200C12), 1.3343 (Z85WDCV)	<b>Acero templado 50 - 60 HRC</b> 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)	<b>Gehärteter und einsatzgehärteter Stahl, 50-60 HRC</b> 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)
<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>Roestvaststaal, INOX ≤850 N/mm<sup>2</sup></b> 1.4005 (X12CrS13), 1.4104 (X14CrMos17), 1.4105 (X6CrMoS17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)	<b>Aciers inoxydables ≤850 N/mm<sup>2</sup></b> 1.4005 (Z11CF13), 1.4104 (Z13CF17), 1.4105 (Z8CF17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)	<b>Acero inoxidable ≤850 N/mm<sup>2</sup></b> 1.4006 (F.3401-X10Cr13), 1.4104 (F.3117-X10Cr17), 1.4301 (F.3504-X5CrNi18-10)(304), 1.4305 (F.3508-X10CrNiS18-09)(303)	<b>Rostfreier Stahl, INOX ≤850 N/mm<sup>2</sup></b> 1.4005 (X12CrS13), 1.4104 (X14CrMos17), 1.4105 (X6CrMoS17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)
<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>Roestvaststaal, INOX &gt;850 N/mm<sup>2</sup></b> 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)	<b>Aciers inoxydables &gt;850 N/mm<sup>2</sup></b> 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)	<b>Acero inoxidable &gt;850 N/mm<sup>2</sup></b> 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (F.3535-X6CrNiMoTi17-12-2)(316Ti)	<b>Rostfreier Stahl, INOX &gt;850 N/mm<sup>2</sup></b> 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)
<b>K 31</b> GG	<b>K 31</b> GG	<b>Grijs gietijzer GG &lt;260 HB30</b> 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)	<b>Fontes &lt;260 HB30</b> 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)	<b>Fundición gris con grafito laminado GG &lt;260 HB30</b> 0.6015 (FG15), 0.6025 (FG25), 0.6040 (FG40)	<b>Grauguss GG &lt;260 HB30</b> 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)
<b>K 32</b> GGG GTS-GTW	<b>K 32</b> GGG GTS-GTW	<b>Smeedbaar en Nodulair gietijzer &lt;260 HB30</b> 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	<b>Fontes à graphites et malléables &lt;260 HB30</b> 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	<b>Fundición gris con grafito esferoidal &lt;260 HB30</b> 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	<b>Formbar und dehnbares Gusseisen &lt;260 HB30</b> 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)
<b>N 41</b> Alu	<b>N 41</b> Alu	<b>Aluminium en Aluminiumlegeringen</b> 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)	<b>Aluminium et Alliages d'Aluminium</b> 3.0255 (A59050C), 3.2315 (AlMgSi1), 3.3515 (AlMg1)	<b>Aluminio y aleaciones de Aluminio</b> 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)	<b>Aluminium und Aluminiumlegierungen</b> 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)
<b>N 42</b> Alu Si>10%	<b>N 42</b> Alu Si>10%	<b>Gietaluminium Si 10 - 24%</b> 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (G-AISi12), 3.2583 (G-AISi12Cu)	<b>Alliages d'Aluminium Si 10 - 24%</b> 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (G-AISi12), 3.2583 (G-AISi12Cu)	<b>Fundición de Aluminio aleada Si 10 - 24%</b> 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (L-2520,21), 3.2583 (L2530)	<b>Druckguss Si 10 - 24%</b> 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (G-AISi12), 3.2583 (G-AISi12Cu)
<b>N 43</b> Mg	<b>N 43</b> Mg	<b>Magnesiumlegeringen</b> 3.5200 (MgMn2), 3.5812 (G-MgAl8Zn1), 3.5612 (G-MgAl6Zn1)	<b>Alliages de Magnésium</b> 3.5200 (MgMn2), 3.5812 (AZ81hp), 3.5612 (AZ61)	<b>Aleaciones de Magnesio</b> 3.5200 (MgMn2), 3.5812 (AZ81hp), 3.5612 (AZ61)	<b>Magnesiumlegierungen</b> 3.5200 (MgMn2), 3.5812 (G-MgAl8Zn1), 3.5612 (G-MgAl6Zn1)
<b>N 51</b> Cu	<b>N 51</b> Cu	<b>Koper en Koperlegeringen</b> 2.0070 (SE-Cu), 2.1020 (CuSn6), 2.1096 (G-CuSn5ZnPB), 2.0380 (CuZn39Pb2), 2.0401 (CuZn39Pb3), 2.0250 (CuZn20), 2.0280 (CuZn33), 2.0332 (CuZn37Pb0,5)	<b>Cuivres et Alliages de cuivres</b> 2.0070 (SE-Cu), 2.1020 (CuSn6), 2.1096 (G-CuSn5ZnPB), 2.0380 (CuZn40), 2.0401 (CuZn39Pb3), 2.0250 (CuZn20), 2.0280 (CuZn33), 2.0332 (CuZn37Pb0,5)	<b>Cobre y aleaciones de cobre</b> 2.0070 (SE-Cu), 2.1020 (CuSn6), 2.1096 (G-CuSn5ZnPB), 2.0380 (CuZn39Pb2), 2.0401 (CuZn39Pb3), 2.0250 (CuZn20), 2.0280 (CuZn33), 2.0332 (CuZn37Pb0,5)	<b>Kupfer und Kupferlegeringen</b> 2.0070 (SE-Cu), 2.1020 (CuSn6), 2.1096 (G-CuSn5ZnPB), 2.0380 (CuZn39Pb2), 2.0401 (CuZn39Pb3), 2.0250 (CuZn20), 2.0280 (CuZn33), 2.0332 (CuZn37Pb0,5)
<b>N 52</b> CuAlFe	<b>N 52</b> CuAlFe	<b>Koper- en Aluminiumlegering</b> 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (CuBe2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18	<b>Cuivre et Alliages d'Aluminium</b> 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (CuBe1.9) AMPCO® 8, AMPCO® 8 15, AMPCO® 18	<b>Cobre y aleaciones de Aluminio</b> 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (CuBe2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18	<b>Kupfer- und Aluminiumlegierungen</b> 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (Cu-Be2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18
<b>N 61</b> PVC	<b>N 61</b> PVC	<b>Duroplastic en Thermoplastic</b> PMMA, PVC, PE, PP, PTFE	<b>Duroplastiques et Thermoplastiques</b> PMMA, PVC, PE, PP, PTFE	<b>Duroplásticos en Termoplásticos</b> PMMA, PVC, PE, PP, PTFE	<b>Duroplaste und Thermoplaste</b> PMMA, PVC, PE, PP, PTFE
<b>N 62</b> GFK/CFK	<b>N 62</b> GFK/CFK	<b>Versterkte kunststoffen</b> GFK, CFK	<b>Plastiques réenforcés</b> GFK, CFK	<b>Plásticos reforzados</b> GFK, CFK	<b>Verstärkte Kunststoffe</b> GFK, CFK
<b>S 71</b> Ni/Co	<b>S 71</b> Ni/Co	<b>Nikkel- en Cobaltlegeringen</b> Hastelloy, Inconel, Nimonic, Jetalloy	<b>Alliages de Nickel et de Cobalt</b> Hastelloy, Inconel, Nimonic, Jetalloy	<b>Aleaciones de Niquel y Cobalto</b> Hastelloy, Inconel, Nimonic, Jetalloy	<b>Nickel und Kobaltlegeringen</b> Hastelloy, Inconel, Nimonic, Jetalloy
<b>S 72</b> Ti	<b>S 72</b> Ti	<b>Titaniumlegeringen</b> 3.7024 (Ti99.5), 3.7114 (TiAl5Sn2.5), 3.7124 (TiCu2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)	<b>Alliages de Titane</b> 3.7024 (T35), 3.7114 (TiAl5Sn2.5), 3.7124 (T-U2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)	<b>Titanio aleado</b> 3.7024 (Ti99.5), 3.7114 (TiAl5Sn2.5), 3.7124 (TiCu2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)	<b>Titanlegierungen</b> 3.7024 (Ti99.5), 3.7114 (TiAl5Sn2.5), 3.7124 (TiCu2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)



**Phantom**

**INTERNATIONAL  
TOOLS**



# COMMITTED, DEDICATED SPECIALISTS WITH MORE THAN 70 YEARS OF EXPERIENCE

> SINCE 1952    > PASSIONATE PEOPLE    > 99,9% ERROR FREE

# Phantom

## RELIABLE, INNOVATIVE, SUPERIOR QUALITY

Phantom is the leading brand of cutting tools of the highest quality for use in metalworking. With no less than 20,000 general metalworking and modern precision-engineering tools to choose from, the extensive range contains machining tools of all types and sizes, including models. At Phantom, not only is the highest quality guaranteed, your options are also limitless. With precision and a long service life assured, we can safely say that, at Phantom, we can handle any cutting task.

## BETROUWBAAR, INNOVATIEF EN A-KWALITEIT

Phantom is het A-merk van absolute topkwaliteit voor verspanende gereedschappen ten behoeve van metaalbewerking. U heeft keuze uit maar liefst 20.000 gereedschappen voor algemene metaalbewerking en moderne precisietechniek.

Het assortiment is zeer compleet en bestaat uit verspanend gereedschap in alle soorten en maten, ook de meest bijzondere. Met Phantom heeft u topkwaliteit in handen en zijn uw mogelijkheden werkelijk onbegrensd. U bent verzekerd van precisie en hoge standtijden. Daardoor kunnen wij gerust stellen dat u met Phantom werkelijk ieder verspaningsvraagstuk aan kunt.



## UN PRODUIT D'EXCELLENTE QUALITÉ

Les produits de la marque Phantom sont des produits à haute valeur ajoutée technique pour l'usinage des métaux. Notre gamme comporte plus de 20.000 références qui vous permettront de réaliser quasiment toutes les opérations d'usinage avec des produits bénéficiant des dernières avancées technologiques.

Notre catalogue dispose d'un choix d'outils extrêmement large, de toutes les formes, de toutes les dimensions et pour toutes les applications. Vous avez donc accès à des produits d'excellente qualité qui vous offrent des possibilités sans limites. Pour cette raison, nous pouvons en toute sécurité vous assurer que vous serez en mesure, avec les produits Phantom, de maîtriser et de répondre à l'ensemble de vos opérations d'usinage, des plus simples aux plus complexes.

## INTERNATIONAL TOOLS

### EXTENSIVE AND COMPETITIVELY PRICED

With its extensive, highly competitive range, International Tools offers an attractive array of drills, taps and countersinks in standard sizes. For universal use, available from stock.



### UITGEBREID EN PRIJSCONCURREEREND

Met een uitgebreid en zeer prijsconcurrerend assortiment biedt International Tools u een aantrekkelijk aanbod boren, tappen en verzinkfrezen in gangbare maten. Universeel inzetbaar en ook nog eens uit voorraad leverbaar.

### UNE LARGE GAMME A PRIX COMPETITIF

Avec International Tools vous accédez à une large gamme de forets, tarauds et fraise à chanfreiner dans les dimensions les plus courantes pour une utilisation universelle, le tout disponible sur stock.

# THERE'S NO END TO WHAT YOU CAN DO.



## UNA PRESTIGIOSA MARCA DE PRIMERA CALIDAD

Phantom es una prestigiosa marca de herramientas de mecanizado para el procesamiento de metal de alta calidad. Puede elegir entre nada menos que 20.000 herramientas para el procesamiento general de metal y una moderna técnica de precisión.

El surtido es muy completo y consta de herramientas de mecanizado de todo tipo y tamaño. Con Phantom tiene garantizada la calidad y unas posibilidades de trabajo verdaderamente ilimitadas. Precisión y larga vida útil garantizadas. Las ilimitadas se miden en fábrica y se prueban con equipos de última tecnología. Esto nos permite asegurarle que con Phantom es posible mecanizar todo aquello que necesita.

## ZUVERLÄSSIG, INNOVATIV UND HÖCHSTER QUALITÄT

Phantom ist die A-Marke für zerspanende Werkzeuge, die für die Metallbearbeitung geeignet sind. Sie können von bis zu 20.000 Werkzeugen wählen für den allgemeinen Maschinenbau und moderne Feinmechanik.

Der Bereich ist sehr komplett und umfasst Bearbeitungswerkzeuge aller Formen und Größen, auch die besonderen. Phantom hat eine Top Qualität, mit grenzenlosen Möglichkeiten und Optionen. Hier ist Präzision und eine lange Lebensdauer gewährleistet. Sie sind Präzision gewährleistet und lange Lebensdauer. Daher können wir Ihnen versprechen, dass unsere Marke Phantom, für alle Ihre Probleme eine Lösung findet.

**ECO**

- › **LOWEST PRICE**  
LAAGSTE PRIJS  
PRIX TRÈS COMPÉTITIF  
PRECIO MÁS BAJO  
NIEDRIGSTER PREIS

**ECO PRO**

- › **INDUSTRIAL QUALITY**  
INDUSTRIE KWALITEIT  
QUALITÉ INDUSTRIELLE  
CALIDAD DE LA INDUSTRIA  
INDUSTRIEQUALITÄT

- › **Basic quality**  
Basis kwaliteit  
Qualité standard  
Calidad básica  
Grundlegende Qualität

- › **Favourably priced**  
Gunstige prijs  
Le meilleur rapport qualité prix  
Precio favorable  
Günstiger Preis

- › **Suitable for a wide range of materials**  
Geschikt voor vele materialen  
Adaptée à différents types de matières  
Adecuado para muchos materiales  
Geeignet für viele Materialien

- › **Suitable for a wide range of materials and stainless steel**  
Geschikt voor vele materialen en RVS  
Adaptée à différents types de matières ainsi que les inox  
Adecuado para muchos materiales y acero inoxidable  
Geeignet für viele Materialien und Edelstahl

- › **Professional use**  
Professioneel gebruik  
Usage professionnel  
Uso profesional  
Professioneller Einsatz

- › **Professional and industrial use**  
Professioneel en industrieel gebruik  
Usage professionnel et industriel  
Uso profesional e industrial  
Professioneller und industrieller Einsatz

## UNA AMPLIA GAMA A PRECIOS COMPETITIVOS

El amplio catálogo con precios competitivos de International Tools le ofrece una selección atractiva de brocas, machos y avellanadores de tamaños habituales. Para uso universal y disponibles en stock.

## BREIT & PREISBEWUSST

Mit seinem breiten und sehr preisbewussten Programm verfügt International Tools über ein attraktives Angebot universell einsetzbarer Bohrer, Gewindebohrer und Senkern in gängigen Maßen, die ab Lager lieferbar sind.



# Phantom

> 11.440 - 11.441 - 11.445 - 11.446

**Phantom**

Jobber Drills with 3 flat surfaces.



Spiraalboren met 3-vlaks schacht.  
Forets trois pans.  
Brocas con 3 chaflanes.  
Spiralbohren mit drei platten Flächen.

> 21.145 - 21.250 - 21.405

**Phantom**

Hand taps DIN 352 in Metric, Metric Fine and BSP (gas).



Handtappen volgens DIN 352 in Metrisch, Metrisch Fijn en BSP (Gas).  
Tarauds à main DIN 352 en métrique, métrique fin et BSP (pas gaz).  
Machos mano DIN 352 en Métrica, Métrica Fina y BSP (gas).  
Handgewindebohrer nach DIN 352 in Metrisch, Metrisch Fein und BSP (Gas).

> 22.230 - 22.231 - 23.320 - 23.321 - 23.621

**Phantom**

UNI HSS-E Machine taps Metric and Metric Fine, TiN for longer tool life.



UNI HSS-E machinetappen in Metrisch en Metrisch Fijn, TiN, voor langere standtijd.  
Tarauds machine UNI HSS-E en métrique et métrique fin, TiN, pour une plus longue durée de vie.  
Machos Máquina UNI HSS-E Métrica y Métrica Fina, TiN para una vida útil más larga.  
UNI HSS-E Maschinengewindebohrer für Metrisch und Metrisch Fein Gewinde, TiN, für längere Standzeiten.

> 25.097 - 25.297

**Phantom**

UNI HSS-E Machine taps BSP (gas) for through and blind holes.



UNI HSS-E machinetappen BSP (Gasdraad) voor blinde en doorlopende gaten.  
Tarauds machine UNI HSS-E BSP (pas gaz) pour trous traversants et trous borgnes.  
Machos Máquina UNI HSS-E BSP (gas) para agujeros pasantes y ciegos.  
UNI HSS-E Maschinengewindebohrer BSP (Gasgewinde) für Sack- und Durchgangslöcher.

## INTERNATIONAL TOOLS

ECO PRO

> 11.813

**INTERNATIONAL TOOLS**

ECO PRO HSS Drill, long version, industrial quality.



ECO PRO HSS spiraalboor, lang, industrie kwaliteit.  
Foret ECO PRO HSS, version longue taillé meulé, affûtage en croix, adaptée aux utilisations industrielles.  
Broca HSS ECO PRO, versión larga, calidad industrial.  
ECO PRO HSS-Spiralbohrer, lang, Industriequalität.

ECO

> 11.423

**INTERNATIONAL TOOLS**

ECO HSS Countersinks for the lowest price.



ECO HSS spiraalboor, kruisaanslijping, laagste prijs.  
Foret ECO HSS, Affûtage en croix, prix très compétitif.  
Broca ECO HSS, afilado en cruz, precio muy competitivo.  
ECO HSS-Spiralbohrer, Kreuzanschliff niedrigster Preis.

# NEW PHANTOM PRODUCTS IN 2023

> 34.302 - 34.318 - 34.314 - 34.316 - 34.330 - 34.331

## Phantom

**UNI HP2 Vari SC End-Mills and HP2 Vari SC End-Mills for trochoidal milling in 1,5xD, 2xD, 3xD and 5xD.**



HP2 UNI VHM vari-frezen en HP2 trochoïdaal vari-frezen in 1,5xD, 2xD, 3xD en 5xD.  
Fraises Vari UNI HP2 Carbure et Fraises Vari HP2 pour l'usinage trochoïdal en 1,5xD, 2xD, 3xD et 5xD.  
Fresas Vari UNI HP2 Metal Duro et Fresas Vari HP2 para mecanizado trocoïdal en 1,5xD, 2xD, 3xD, 5xD.  
HP2 UNI VHM-Vario-Fräser und HP2 Trochoidal-Vario-Fräser mit 1,5xD, 2xD, 3xD und 5xD.

> 42.553 - 42.567 **Phantom**

**Range expansion Vari countersinks: without coating, long version, triangle shaft, with 3 flat surfaces.**



Uitbreiding Vari verzinkboren: ongecoat, TiAlN, lang, met drie platte vlakken.  
Développement de notre gamme de Fraises à chanfreiner Vari: non revêtu, TiAlN, version longue, avec 3 dents.  
Expansión de los avellanadores Vari: sin recubrimiento, versión larga, mango de 3 labios.  
Expansion Vari-Senker: unbeschichtet, TiAlN, lang, mit drei Spann Flächen.

> 49.152 **Phantom**

**Phantom SC Locksmith set.**

HM slotenmakers set - lock smith.  
Lock smith set.  
Phantom Coffret spécial serrurier Carbure.  
Phantom Juego especial cerrajero MD.  
HM-Schlosser-Set Lock smith.



> 82.817 - 82.942 **Phantom**

**Range expansión ER Collets: Ultra precise, for taps, steel sealed, rubber sealed, Coolant Jet.**



Uitbreiding ER spantangen: ultra precisie, voor tappen, rubber afgedicht, staal afgedicht, coolant jet.  
Développement de notre gamme de pinces ER: ultra précis, pour tarauds, acier scellé, joint d'étanchéité en caoutchouc, Coolant Jet.  
Expansión del programa de pinzas ER: Ultra preciso, para machos, sellado por acero, sellado de goma, Coolant Jet.  
ER Spanzangen Ultra präzision, Gewindebohrzangen Abgedichtet, Metallisch dichtend, mit Kühlmittelborungen.

# NEW INTERNATIONAL TOOLS PRODUCTS IN 2023

**ECO PRO**

> 41.410 - 41.488 **INTERNATIONAL TOOLS**

**Carbide burrs ECO PRO, tooth pitch 6-UNI, for standard use.**

ECO PRO HM stiftfrezen, tandvorm 6-UNI, voor standaard gebruik.  
Fraises limes Carbure ECO PRO, denture 6-UNI, adaptées aux utilisations standards.  
Fresas rotativas MD ECO PRO, dentado 6-UNI, para uso estándar.  
ECO PRO TC Frässtifte, Zahnform 6-UNI, für Standardanwendungen.



# SINCE 1952



Active in the market of machining and clamping tools since 1952. Constantly looking for practical and innovative solutions in the field of drilling, tapping, milling, galvanizing, clearing, sawing, turning and tensioning. On [phantom.eu](http://phantom.eu) and [vanommen.nl](http://vanommen.nl) you will find more than 25,000 quality products and practical advice to get the maximum return from your tools.

## The 7 most important advantages of using [phantom.eu](http://phantom.eu) for your customer

- 1 Your own environment for even faster finding and ordering
- 2 24/7 full access to product information and practical expertise & advice
- 3 Always an overview of your current price and available stock
- 4 Ordered until 7pm, shipped the same day
- 5 Customisable shipping & delivery methods
- 6 Direct order information and 'Track & Trace' code
- 7 Trusted invoicing and payment through your dealer

## ONZE GESCHIEDENIS

Sinds 1952 actief in de markt van verspaning en spangereedschappen. Voortdurend op zoek naar praktische en vernieuwende oplossingen op gebied van boren, tappen, frezen, verzinken, ruimen, zagen, draaien en spannen. Op [phantom.eu](http://phantom.eu) en [vanommen.nl](http://vanommen.nl) vindt u meer dan 25.000 kwaliteitsproducten en praktisch advies om het maximale rendement uit uw gereedschap te halen.

## NOTRE HISTOIRE

Actif depuis des années sur le marché des outils coupants pour le métal ainsi que l'usinage, nous sommes constamment à la recherche de solutions pratiques et innovantes dans le domaine du perçage, taraudage, fraisage, chanfreinage, alésage, sciage, tournage et serrage. Sur [phantom.eu](http://phantom.eu) et [vanommen.nl](http://vanommen.nl), vous trouverez plus de 25.000 produits de qualité et des conseils pratiques pour tirer le rendement maximal de nos outils coupants.

## NUESTRA HISTORIA

Estamos activos en el mercado de herramientas de corte de metal y sujeción desde 1952. Estamos constantemente buscando soluciones prácticas e innovadoras en el sector del taladrado, roscado, fresado, avellanado, escariado, serrado, torneado y sujeción. En [phantom.eu](http://phantom.eu) y [vanommen.nl](http://vanommen.nl), encontrará más de 25.000 productos de calidad y consejos prácticos para obtener el máximo rendimiento de sus herramientas.

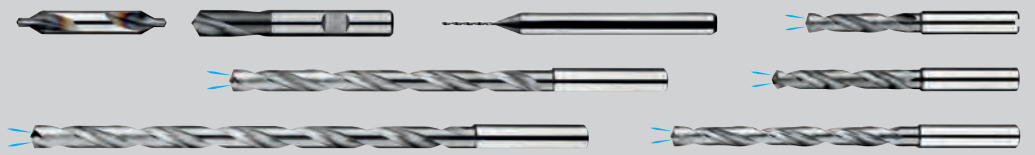
## WOFÜR WIR STEHEN

Seit 1952 auf dem Markt für Zerspanungs- und Spannwerkzeuge tätig. Ständig auf der Suche nach praktischen und innovativen Lösungen in den Bereichen Bohren, Gewindegewinde, Fräsen, Senken, Reiben, Sägen, Drehen und Spannen. Auf [phantom.eu](http://phantom.eu) und [vanommen.nl](http://vanommen.nl) finden Sie mehr als 25.000 Qualitätsprodukte und praktische Tipps, um das Beste aus Ihren Werkzeugen herauszuholen.





NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



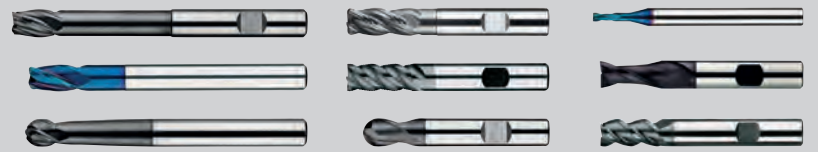
NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



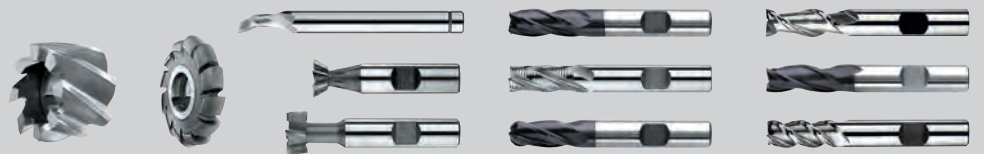
NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



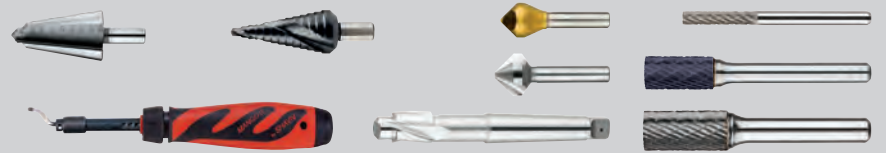
NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



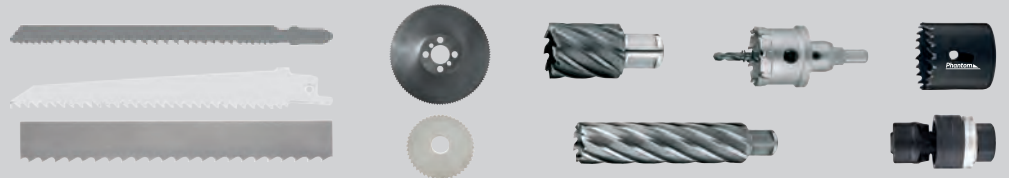
NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



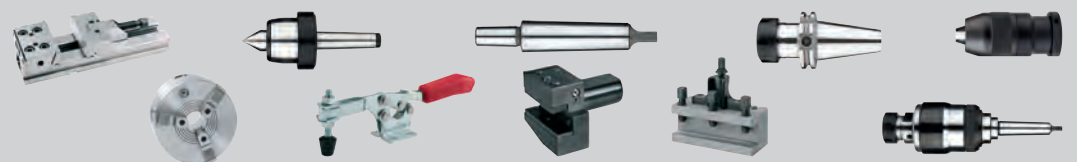
NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



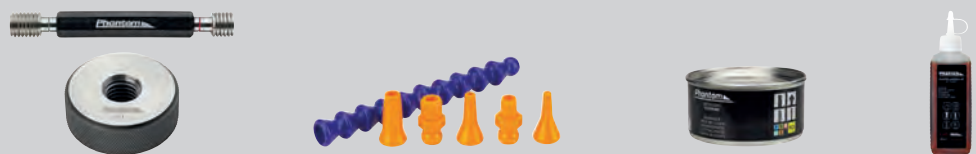
NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
<b>HSS</b>	HSS	HSS	HSS	HSS
<b>HSS-E</b>	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalto)	HSS-E (5% Cobalt)
<b>HSS-E PM</b>	PM HSS-E	Acier rapide fritté de haute qualité	Acero rápido pulvi-metalúrgico con	PM HSS-E
<b>HM-TIP</b>	Hardmetaal Tip	Plaquette carbure brasée	Plaquitas de metal duro soldadas	mit HM-Schneiden
<b>HM</b>	Hardmetaal	Carbure monobloc	Metal duro integral	Hartmetall
<b>CV</b>	Hoog gelegeerd Chrom Vanadium staal	Acier hautement allié au Chrome Vanadium	Acero de alta aleación de Cromo Vanadio	Hochlegiert Chrom-Vanadium-Stahl
<b>OX.</b>	Stoomontlaten	Vaporisé	Vaporizado	Dampfangelassen
<b>TiN</b>	TiN gecoat	Revêtement TiN	Recubrimiento TiN	TiN Beschichtung
<b>TiAIN</b>	TiAIN gecoat	Revêtement TiAIN	Recubrimiento TiAIN	TiAIN Beschichtung
<b>AlCrN</b>	AlCrN-X gecoat	Revêtement AlCrN-X	Recubrimiento AlCrN-X	AlCrN-X Beschichtung
<b>DIN 338</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
<b>ECO</b>	ECO, basis kwaliteit	ECO, qualité standard	ECO, calidad básica	ECO, grundlegende Qualität
<b>ECO PRO</b>	ECO PRO, industrie kwaliteit	ECO PRO, qualité industrielle	ECO PRO, calidad de la industria	ECO PRO, Industriequalität
<b>3xD</b>	Max. boordiepte	Profondeur max. de perçage	Profundidad máx. de perforación	Max. Bohrtiefe
<b>N</b>	Type N, standaard spiraaluitvoering	Type N, hélice standard	Tipo N, Versión helicoidal estándar	Type N, standard Spiralwinkel
<b>&gt;N</b>	Spiraalhoek sterker dan standaard	Hélice plus rapide que standard	Ángulo de hélice más rápido que estándar	Spiralwinkel sterker wie Standard
<b>H</b>	Type H, flauwe spiraalhoek	Type H, hélice lente	Tipo H, Ángulo de hélice lento	Type H, flache Spiralwinkel
<b>W</b>	Type W, sterke spiraalhoek	Type W, hélice rapide	Tipo W, Ángulo de hélice rápido	Type W, sterke Spiralwinkeln
<b>TS</b>	Type TS, Tiefloch-spiraal	Type TS, goujure large	Tipo TS, Hélice para perforación profunda	Type TS, Tiefloch Spiral
	Cilindrische schacht	Queue cylindrique	Mango cilíndrico	Zylinderschaft
	Afgedraaide schacht	Queue réduite	Mango rebajado	Abgedrehtem Zylinderschaft
	Schacht zeskant	Queue hexagonale	Mango hexagonal	Sechskantschaft
	Bitopname (1/4")	Queue hexagonale 1/4" (6,35 mm)	Mango hexagonal 1/4" (6,35 mm)	Bitaufnahme (1/4")
<b>DIN 228-B</b>	Morse Konus Opname	Cône morse	Mango cónico	Morsekegel
	Coniciteit	Conicité	Conicidad	Konizität
	Standaard boorpunt	Affûtage standard	Afilado normal	Standard Bohrerspitze
	Kruisaanslijping	Affûtage en croix	Afilado en Cruz	Kreuzanschliff
	S-aanslijping	Affûtage en S	Afilado en S	S-Anschliff

	NL	FR	ES	DE
	Viervlaks-aanslijping	Affûtage 4 pentes	Afilado 4 facetas	Vierflachs-Anschliff
	Met verdunde punt	Ame amincie	Con alma delgada	Ausgedündete Spitze
	Aanslijping 3-lippenboor	Affûtage à 3 lèvres	Afilado con 3 labios	Aufbohrer-anschliff
	HM-Snijkmanten	A plaquettes carbure brasées	Punta Metal Duro	HM-Schneiden
	Lage snijkrachten, sneller boren	Faible force de coupe et perçage plus rapide	Baja fuerza de corte, taladro más rápido	Geringe Schnittkräfte, schnelleres Bohren
	NAS 907	NAS 907	NAS 907	NAS 907
	Fijnpassing	Ajustement fin	Ajuste fino	Senkung fein
	Middelpassing	Ajustement moyen	Ajuste medio	Senkung mittel
	Koelkanaal	A trous d'huile	Canal de refrigeración	Mit Kühlkanal
	Tophoek	Angle au sommet	Ángulo de la punta	Spitzenwinkel
	Form B (met centreerpunt)	Forme B (avec pointe de centrage)	Forma B (con punta de centrado)	Form B (mit Zentrierspitze)
	Met Lewis centreerpunt	Avec pointe de centrage Lewis	Con punta de centrado Lewis	mit Lewis Zentrierspitze
	Hoek 90°	Angle 90°	Ángulo 90°	Winkel 90°
	Hoek 180°	Angle 180°	Ángulo 180°	Winkel 180°
	Uitvoering centreergat	Angle de lamage	Versión ángulo avellanado	Ausführung Zentrierloch
	Centreerboor met kraag	Foret à centrer à bourelet de renfort	Broca de centrar con valona	Zentrierbohrer mit Kragen
	Centreerboor met radius	Foret à centrer à rayon	Broca de centrar con radio	Zentrierbohrer mit Radius
	Centreerboor met dubbele hoek	Foret à centrer à centre protégé	Broca de centrar con chafan	Zentrierbohrer mit Schutzsenkung
	Centreerhoek	Point de centrage	Ángulo de centrar	Zentrierspitze
<b>INOX</b>	T.b.v. roestvaststaal	Pour Inox	Para acero inoxidable	Für Rostfreier Stahl
<b>ALU</b>	T.b.v. aluminium	Pour aluminium	Para aluminio	Für Aluminium
<b>HP2 UNI</b>	HP2 Universeel	Haute Performance Universel	Alta Rendimiento Universal	HP2 Universal
	Ook voor hardhout	Aussi pour bois dur	También para madera dura	Auch für Hartholz
	Linkssnijdend	Coupe à gauche	Corte a izquierda	Linksschneidend
	SDS-PLUS	SDS-PLUS	SDS-PLUS	SDS-PLUS
	SDS-MAX	SDS-MAX	SDS-MAX	SDS-MAX
<b>Z=2</b>	2 Snijkmanten	À 2 lèvres	Con 2 facetas	2 Schneiden
<b>Z=4</b>	4 Snijkmanten	À 4 lèvres	Con 4 facetas	4 Schneiden
	Volgens PGM-keurmerk	Conformément à la directive PGM	Según la directiva PGM	Gemäß PGM-vorschriften

NL VHM Boren  
FR Forets Carbure Monobloc  
ES Brocas Metal Duro  
DE VHM Bohrer

**P K** Bij uitstek geschikt  
Très approprié  
**H N** Muy adecuado  
**M S** Ideal geeignet

**P K** Bepoort geschikt  
Approprié  
**H N** Adecuado  
**M S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

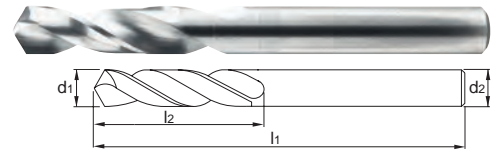
> 11.200	<b>Phantom</b>	DIN 6539	3xD		<b>P M K N S</b>			P. 2
> 11.204	<b>Phantom</b>	DIN 6539	3xD		<b>P M K N S</b>			P. 2
> 11.240	<b>Phantom</b>	DIN 6539	3xD			<b>K N</b>		P. 3
> 11.245	<b>Phantom</b>	DIN 6537-L	5xD		<b>P</b>	<b>K</b>		P. 3
> 11.250	<b>Phantom</b>	DIN 6537-K	3xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 4
> 11.251	<b>Phantom</b>	DIN 6537-K	3xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 4
> 11.253	<b>Phantom</b>	DIN 6537-K	3xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 5
> 11.254	<b>Phantom</b>	DIN 6537-K	3xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 5
> 11.259	<b>Phantom</b>	DIN 6537-K	3xD	ALU		<b>N</b>		P. 6
> 11.262	<b>Phantom</b>	DIN 6537-K	3xD	INOX	<b>P M</b>	<b>S</b>		P. 6
> 11.270	<b>Phantom</b>	DIN 6537-L	5xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 7
> 11.271	<b>Phantom</b>	DIN 6537-L	5xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 8
> 11.273	<b>Phantom</b>	DIN 6537-L	5xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 8
> 11.274	<b>Phantom</b>	DIN 6537-L	5xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 9
> 11.279	<b>Phantom</b>	DIN 6537-L	5xD	ALU		<b>N</b>		P. 9
> 11.282	<b>Phantom</b>	DIN 6537-L	5xD	INOX	<b>P M</b>	<b>S</b>		P. 10
> 11.286	<b>Phantom</b>		5xD			<b>H</b>		P. 11
> 11.295	<b>Phantom</b>		8xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 11
> 11.296	<b>Phantom</b>		8xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 11
> 11.305	<b>Phantom</b>		10xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 12
> 11.310	<b>Phantom</b>		15xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 12
> 11.330	<b>Phantom</b>		5xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 13
> 11.335	<b>Phantom</b>		8xD	UNI	<b>P M K N S</b>	<b>H</b>		P. 13
> 11.360	<b>Phantom</b>				<b>P M K N S</b>	<b>H</b>		P. 14
> 11.650	<b>Phantom</b>	DIN 338	8xD		<b>P M K N S</b>			P. 15
> 11.654	<b>Phantom</b>	DIN 338	8xD		<b>P M K N S</b>			P. 15
> 13.814	<b>Phantom</b>				<b>P M</b>			P. 15
> 15.144	<b>Phantom</b>	DIN 333-A			<b>P M</b>			P. 16
> 15.624	<b>Phantom</b>	DIN 6535-HB			<b>P M K N S</b>	<b>H</b>		P. 16
> 15.724	<b>Phantom</b>	DIN 6535-HB			<b>P M K N S</b>	<b>H</b>		P. 16
> 15.764	<b>Phantom</b>	DIN 6535-HB			<b>P M K N S</b>	<b>H</b>		P. 17





> 11.200 Phantom

NL VHM Spiraalboor  
FR Foret Carbure  
ES Broca MD  
DE VHM Spiralbohrer



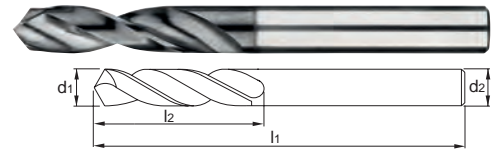
MG HM DIN 6539 3xD N h6 118° h7

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	N 62	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	GFK/CFK	Ni/Co	Ti
70-80 D	50-80 D	50-70 D	25-80 B	20-25 D	20-25 C	72-90 D	70-80 D	160-200 G	120-150 F	120-180 F	120-180 E	30-40 C	60-80 C	12-15 B	15-20 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.200.0100	1	1	26	6	11.200.0440	4.4	4.4	58	24	11.200.0780	7.8	7.8	79	37
11.200.0110	1.1	1.1	28	7	11.200.0450	4.5	4.5	58	24	11.200.0790	7.9	7.9	79	37
11.200.0120	1.2	1.2	30	8	11.200.0460	4.6	4.6	58	24	11.200.0800	8	8	79	37
11.200.0130	1.3	1.3	30	8	11.200.0470	4.7	4.7	58	24	11.200.0810	8.1	8.1	79	37
11.200.0140	1.4	1.4	32	9	11.200.0480	4.8	4.8	62	26	11.200.0820	8.2	8.2	79	37
11.200.0150	1.5	1.5	32	9	11.200.0490	4.9	4.9	62	26	11.200.0830	8.3	8.3	79	37
11.200.0160	1.6	1.6	34	10	11.200.0500	5	5	62	26	11.200.0840	8.4	8.4	79	37
11.200.0170	1.7	1.7	34	10	11.200.0510	5.1	5.1	62	26	11.200.0850	8.5	8.5	79	37
11.200.0180	1.8	1.8	36	11	11.200.0520	5.2	5.2	62	26	11.200.0860	8.6	8.6	84	40
11.200.0190	1.9	1.9	36	11	11.200.0530	5.3	5.3	62	26	11.200.0870	8.7	8.7	84	40
11.200.0200	2	2	38	12	11.200.0540	5.4	5.4	66	28	11.200.0880	8.8	8.8	84	40
11.200.0210	2.1	2.1	38	12	11.200.0550	5.5	5.5	66	28	11.200.0890	8.9	8.9	84	40
11.200.0220	2.2	2.2	40	13	11.200.0560	5.6	5.6	66	28	11.200.0900	9	9	84	40
11.200.0230	2.3	2.3	40	13	11.200.0570	5.7	5.7	66	28	11.200.0910	9.1	9.1	84	40
11.200.0240	2.4	2.4	43	14	11.200.0580	5.8	5.8	66	28	11.200.0920	9.2	9.2	84	40
11.200.0250	2.5	2.5	43	14	11.200.0590	5.9	5.9	66	28	11.200.0930	9.3	9.3	84	40
11.200.0260	2.6	2.6	43	14	11.200.0600	6	6	66	28	11.200.0940	9.4	9.4	84	40
11.200.0270	2.7	2.7	46	16	11.200.0610	6.1	6.1	70	31	11.200.0950	9.5	9.5	84	40
11.200.0280	2.8	2.8	46	16	11.200.0620	6.2	6.2	70	31	11.200.0960	9.6	9.6	89	43
11.200.0290	2.9	2.9	46	16	11.200.0630	6.3	6.3	70	31	11.200.0970	9.7	9.7	89	43
11.200.0300	3	3	46	16	11.200.0640	6.4	6.4	70	31	11.200.0980	9.8	9.8	89	43
11.200.0310	3.1	3.1	49	18	11.200.0650	6.5	6.5	70	31	11.200.0990	9.9	9.9	89	43
11.200.0320	3.2	3.2	49	18	11.200.0660	6.6	6.6	70	31	11.200.1000	10	10	89	43
11.200.0330	3.3	3.3	49	18	11.200.0670	6.7	6.7	70	31	11.200.1020	10.2	10.2	89	43
11.200.0340	3.4	3.4	52	20	11.200.0680	6.8	6.8	74	34	11.200.1050	10.5	10.5	89	43
11.200.0350	3.5	3.5	52	20	11.200.0690	6.9	6.9	74	34	11.200.1100	11	11	95	47
11.200.0360	3.6	3.6	52	20	11.200.0700	7	7	74	34	11.200.1150	11.5	11.5	95	47
11.200.0370	3.7	3.7	52	20	11.200.0710	7.1	7.1	74	34	11.200.1200	12	12	102	51
11.200.0380	3.8	3.8	55	22	11.200.0720	7.2	7.2	74	34	11.200.1300	13	13	102	51
11.200.0390	3.9	3.9	55	22	11.200.0730	7.3	7.3	74	34	11.200.1400	14	14	107	54
11.200.0400	4	4	55	22	11.200.0740	7.4	7.4	74	34	11.200.1500	15	15	111	56
11.200.0410	4.1	4.1	55	22	11.200.0750	7.5	7.5	74	34	11.200.1600	16	16	115	58
11.200.0420	4.2	4.2	55	22	11.200.0760	7.6	7.6	79	37					
11.200.0430	4.3	4.3	58	24	11.200.0770	7.7	7.7	79	37					

> 11.204 Phantom

NL VHM Spiraalboor TiAIN  
FR Foret Carbure TiAIN  
ES Broca MD TiAIN  
DE VHM Spiralbohrer TiAIN



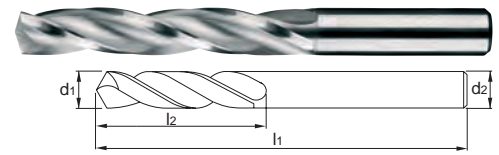
MG HM TiAIN DIN 6539 3xD N h6 118° h7

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 43	N 51	N 61	N 62	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Mg	Cu	PVC	GFK/CFK	Ni/Co	Ti
100-110 D	65-105 D	72-95 D	32-95 B	27-32 D	28-32 C	72-90 D	75-95 D	120-180 F	120-180 E	30-40 C	80-95 C	12-15 B	17-24 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.204.0100	1	1	26	6	11.204.0510	5.1	5.1	62	26	11.204.0900	9	9	84	40
11.204.0150	1.5	1.5	32	9	11.204.0520	5.2	5.2	62	26	11.204.0950	9.5	9.5	84	40
11.204.0200	2	2	38	12	11.204.0550	5.5	5.5	66	28	11.204.1000	10	10	89	43
11.204.0250	2.5	2.5	43	14	11.204.0600	6	6	66	28	11.204.1020	10.2	10.2	89	43
11.204.0300	3	3	46	16	11.204.0610	6.1	6.1	70	31	11.204.1050	10.5	10.5	89	43
11.204.0350	3.5	3.5	52	20	11.204.0650	6.5	6.5	70	31	11.204.1100	11	11	95	47
11.204.0400	4	4	55	22	11.204.0700	7	7	74	34	11.204.1150	11.5	11.5	95	47
11.204.0420	4.2	4.2	55	22	11.204.0750	7.5	7.5	74	34	11.204.1200	12	12	102	51
11.204.0450	4.5	4.5	58	24	11.204.0800	8	8	79	37	11.204.1250	12.5	12.5	102	51
11.204.0500	5	5	62	26	11.204.0850	8.5	8.5	79	37	11.204.1300	13	13	102	51



> 11.240 Phantom



NL VHM Spiraalboor 3xD 3 snijkanten  
 FR Foret Carbure 3xD 3 taillants  
 ES Broca MD 3xD 3 labios  
 DE VHM Spiralbohrer 3xD 3 Schneiden

MG HM DIN 6539 3xD N h6 150°

P 13 K 31 K 32 N 41 N 42 N 43 N 51

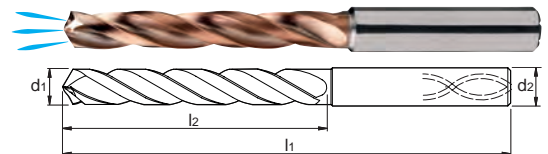
50-70 C 80-100 F 70-80 F 180-200 G 120-150 F 160-180 F 120-180 E

Ref.	d1	d2	l1	l2	z
11.240.0300	3	3	46	16	3
11.240.0310	3.1	3.1	49	18	3
11.240.0320	3.2	3.2	49	18	3
11.240.0330	3.3	3.3	49	18	3
11.240.0340	3.4	3.4	52	20	3
11.240.0350	3.5	3.5	52	20	3
11.240.0360	3.6	3.6	52	20	3
11.240.0370	3.7	3.7	52	20	3
11.240.0380	3.8	3.8	55	22	3
11.240.0390	3.9	3.9	55	22	3
11.240.0400	4	4	55	22	3
11.240.0410	4.1	4.1	55	22	3
11.240.0420	4.2	4.2	55	22	3
11.240.0430	4.3	4.3	58	24	3
11.240.0440	4.4	4.4	58	24	3
11.240.0450	4.5	4.5	58	24	3
11.240.0460	4.6	4.6	58	24	3
11.240.0470	4.7	4.7	58	24	3
11.240.0480	4.8	4.8	62	26	3
11.240.0490	4.9	4.9	62	26	3
11.240.0500	5	5	62	26	3
11.240.0510	5.1	5.1	62	26	3
11.240.0520	5.2	5.2	62	26	3
11.240.0530	5.3	5.3	62	26	3
11.240.0540	5.4	5.4	66	28	3
11.240.0550	5.5	5.5	66	28	3
11.240.0560	5.6	5.6	66	28	3
11.240.0570	5.7	5.7	66	28	3

Ref.	d1	d2	l1	l2	z
11.240.0580	5.8	5.8	66	28	3
11.240.0590	5.9	5.9	66	28	3
11.240.0600	6	6	66	28	3
11.240.0610	6.1	6.1	70	31	3
11.240.0620	6.2	6.2	70	31	3
11.240.0630	6.3	6.3	70	31	3
11.240.0640	6.4	6.4	70	31	3
11.240.0650	6.5	6.5	70	31	3
11.240.0660	6.6	6.6	70	31	3
11.240.0670	6.7	6.7	70	31	3
11.240.0680	6.8	6.8	74	34	3
11.240.0690	6.9	6.9	74	34	3
11.240.0700	7	7	74	34	3
11.240.0710	7.1	7.1	74	34	3
11.240.0720	7.2	7.2	74	34	3
11.240.0730	7.3	7.3	74	34	3
11.240.0740	7.4	7.4	74	34	3
11.240.0750	7.5	7.5	74	34	3
11.240.0760	7.6	7.6	79	37	3
11.240.0770	7.7	7.7	79	37	3
11.240.0780	7.8	7.8	79	37	3
11.240.0790	7.9	7.9	79	37	3
11.240.0800	8	8	79	37	3
11.240.0810	8.1	8.1	79	37	3
11.240.0820	8.2	8.2	79	37	3
11.240.0830	8.3	8.3	79	37	3
11.240.0840	8.4	8.4	79	37	3
11.240.0850	8.5	8.5	79	37	3

Ref.	d1	d2	l1	l2	z
11.240.0860	8.6	8.6	84	40	3
11.240.0870	8.7	8.7	84	40	3
11.240.0880	8.8	8.8	84	40	3
11.240.0890	8.9	8.9	84	40	3
11.240.0900	9	9	84	40	3
11.240.0910	9.1	9.1	84	40	3
11.240.0920	9.2	9.2	84	40	3
11.240.0930	9.3	9.3	84	40	3
11.240.0950	9.5	9.5	84	40	3
11.240.0960	9.6	9.6	89	43	3
11.240.0970	9.7	9.7	89	43	3
11.240.0980	9.8	9.8	89	43	3
11.240.0990	9.9	9.9	89	43	3
11.240.1000	10	10	89	43	3
11.240.1020	10.2	10.2	89	43	3
11.240.1050	10.5	10.5	89	43	3
11.240.1100	11	11	95	47	3
11.240.1150	11.5	11.5	95	47	3
11.240.1200	12	12	102	51	3
11.240.1250	12.5	12.5	102	51	3
11.240.1300	13	13	102	51	3
11.240.1350	13.5	13.5	107	54	3
11.240.1400	14	14	107	54	3
11.240.1450	14.5	14.5	111	56	3
11.240.1500	15	15	111	56	3
11.240.1550	15.5	15.5	115	58	3
11.240.1600	16	16	115	58	3

> 11.245 Phantom



NL VHM Spiraalboor 5xD High-Feed, met koelkanaal, AlCrN-X, 3 snijkanten  
 FR Foret Carbure 5xD High-Feed, à trou d'huile, AlCrN-X, 3 taillants  
 ES Broca MD 5xD High-Feed, con canal de refrigeración, AlCrN-X, 3 labios  
 DE VHM Spiralbohrer 5xD High-Feed, mit Innenkühlung, AlCrN-X, 3 Schneiden

MG HM AlCrN-X DIN 6537-L 5xD h6 DIN 6535-HA 140° m7 HF

P 11 P 12 P 13 P 14 H 15 K 31 K 32

120-130 K 90-140 K 90-110 K 70-85 J 35-55 D 80-110 K 100-120 L

Ref.	d1	d2	l1	l2	z
11.245.0500	5	6	82	35	3
11.245.0510	5.1	6	82	35	3
11.245.0520	5.2	6	82	35	3
11.245.0530	5.3	6	82	35	3
11.245.0550	5.5	6	82	35	3
11.245.0580	5.8	6	82	35	3
11.245.0600	6	6	82	35	3
11.245.0650	6.5	8	91	43	3

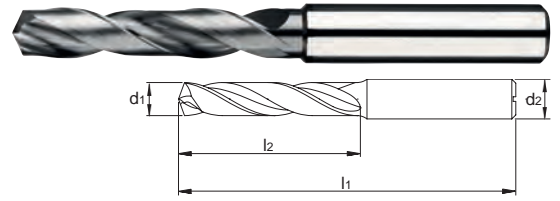
Ref.	d1	d2	l1	l2	z
11.245.0680	6.8	8	91	43	3
11.245.0700	7	8	91	43	3
11.245.0740	7.4	8	91	43	3
11.245.0800	8	8	91	43	3
11.245.0850	8.5	10	103	49	3
11.245.0900	9	10	103	49	3
11.245.1000	10	10	103	49	3
11.245.1020	10.2	12	118	56	3

Ref.	d1	d2	l1	l2	z
11.245.1050	10.5	12	118	56	3
11.245.1100	11	12	118	56	3
11.245.1200	12	12	118	56	3
11.245.1300	13	14	124	60	3
11.245.1400	14	14	124	60	3
11.245.1500	15	16	133	63	3
11.245.1600	16	16	133	63	3



> 11.250 Phantom

NL UNI VHM Spiraalboor 3xD TiAlN  
 FR Foret Carbure UNI 3xD TiAlN  
 ES Broca MD UNI 3xD TiAlN  
 DE UNI VHM Spiralbohrer 3xD TiAlN



MG HM TiAlN DIN 6537-K 3xD h6 DIN 6535-HA 140° m7 UNI

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² P 14 ≤1400 N/mm² H 15 HRC M 21 INOX ≤850N/mm² M 22 INOX >850N/mm² K 31 GG K 32 GGG GTS-GTW N 51 Cu S 71 Ni/Co

120-130 G 65-145 F 55-110 F 45-100 C 25-45 C 50-55 C 35-45 C 155-210 H 125-155 G 60-180 G 22-25 D

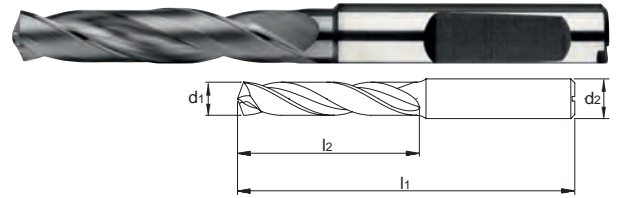
Ref.	d1	d2	l1	l2
11.250.0100	1	3	45	7
11.250.0110	1.1	3	45	7
11.250.0120	1.2	3	45	7
11.250.0130	1.3	3	45	7
11.250.0140	1.4	3	45	7
11.250.0150	1.5	3	55	14
11.250.0160	1.6	3	55	14
11.250.0170	1.7	3	55	14
11.250.0180	1.8	3	55	14
11.250.0190	1.9	3	55	14
11.250.0200	2	4	55	20
11.250.0210	2.1	4	55	20
11.250.0220	2.2	4	55	20
11.250.0230	2.3	4	55	20
11.250.0240	2.4	4	55	20
11.250.0250	2.5	4	55	20
11.250.0260	2.6	4	55	20
11.250.0270	2.7	4	55	20
11.250.0280	2.8	4	55	20
11.250.0290	2.9	4	55	20
11.250.0300	3	6	62	20
11.250.0310	3.1	6	62	20
11.250.0320	3.2	6	62	20
11.250.0330	3.3	6	62	20
11.250.0340	3.4	6	62	20
11.250.0350	3.5	6	62	20
11.250.0360	3.6	6	62	20
11.250.0370	3.7	6	62	20

Ref.	d1	d2	l1	l2
11.250.0380	3.8	6	66	24
11.250.0390	3.9	6	66	24
11.250.0400	4	6	66	24
11.250.0410	4.1	6	66	24
11.250.0420	4.2	6	66	24
11.250.0430	4.3	6	66	24
11.250.0440	4.4	6	66	24
11.250.0450	4.5	6	66	24
11.250.0460	4.6	6	66	24
11.250.0470	4.7	6	66	24
11.250.0480	4.8	6	66	28
11.250.0490	4.9	6	66	28
11.250.0500	5	6	66	28
11.250.0510	5.1	6	66	28
11.250.0520	5.2	6	66	28
11.250.0530	5.3	6	66	28
11.250.0540	5.4	6	66	28
11.250.0550	5.5	6	66	28
11.250.0560	5.6	6	66	28
11.250.0570	5.7	6	66	28
11.250.0580	5.8	6	66	28
11.250.0590	5.9	6	66	28
11.250.0600	6	6	66	28
11.250.0610	6.1	8	79	34
11.250.0620	6.2	8	79	34
11.250.0630	6.3	8	79	34
11.250.0640	6.4	8	79	34
11.250.0650	6.5	8	79	34

Ref.	d1	d2	l1	l2
11.250.0660	6.6	8	79	34
11.250.0670	6.7	8	79	34
11.250.0680	6.8	8	79	34
11.250.0690	6.9	8	79	34
11.250.0700	7	8	79	34
11.250.0720	7.2	8	79	41
11.250.0750	7.5	8	79	41
11.250.0800	8	8	79	41
11.250.0850	8.5	10	89	47
11.250.0860	8.6	10	89	47
11.250.0880	8.8	10	89	47
11.250.0900	9	10	89	47
11.250.0950	9.5	10	89	47
11.250.1000	10	10	89	47
11.250.1020	10.2	12	102	55
11.250.1030	10.3	12	102	55
11.250.1050	10.5	12	102	55
11.250.1100	11	12	102	55
11.250.1150	11.5	12	102	55
11.250.1200	12	12	102	55
11.250.1250	12.5	14	107	60
11.250.1300	13	14	107	60
11.250.1350	13.5	14	107	60
11.250.1400	14	14	107	60
11.250.1450	14.5	16	115	65
11.250.1500	15	16	115	65
11.250.1550	15.5	16	115	65
11.250.1600	16	16	115	65

> 11.251 Phantom

NL UNI VHM Spiraalboor 3xD TiAlN  
 FR Foret Carbure UNI 3xD TiAlN  
 ES Broca MD UNI 3xD TiAlN  
 DE UNI VHM Spiralbohrer 3xD TiAlN



MG HM TiAlN DIN 6537-K 3xD h6 DIN 6535-HE 140° m7 UNI

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² P 14 ≤1400 N/mm² H 15 HRC M 21 INOX ≤850N/mm² M 22 INOX >850N/mm² K 31 GG K 32 GGG GTS-GTW N 51 Cu S 71 Ni/Co

120-130 G 65-145 F 55-110 F 45-100 C 25-45 C 50-55 C 35-45 C 155-210 H 125-155 G 60-180 G 22-25 D

Ref.	d1	d2	l1	l2
11.251.0300	3	6	62	20
11.251.0330	3.3	6	62	20
11.251.0350	3.5	6	62	20
11.251.0380	3.8	6	66	24
11.251.0400	4	6	66	24
11.251.0420	4.2	6	66	24
11.251.0450	4.5	6	66	24
11.251.0480	4.8	6	66	28
11.251.0500	5	6	66	28
11.251.0550	5.5	6	66	28
11.251.0580	5.8	6	66	28

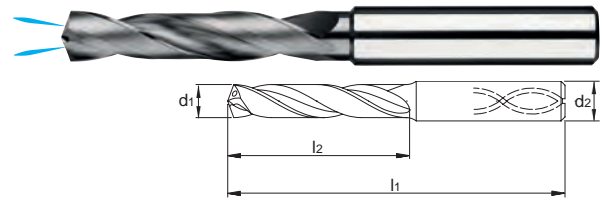
Ref.	d1	d2	l1	l2
11.251.0600	6	6	66	28
11.251.0650	6.5	8	79	34
11.251.0680	6.8	8	79	34
11.251.0700	7	8	79	34
11.251.0750	7.5	8	79	41
11.251.0800	8	8	79	41
11.251.0850	8.5	10	89	47
11.251.0880	8.8	10	89	47
11.251.0900	9	10	89	47
11.251.0950	9.5	10	89	47
11.251.1000	10	10	89	47

Ref.	d1	d2	l1	l2
11.251.1020	10.2	12	102	55
11.251.1050	10.5	12	102	55
11.251.1100	11	12	102	55
11.251.1150	11.5	12	102	55
11.251.1200	12	12	102	55
11.251.1250	12.5	14	107	60
11.251.1300	13	14	107	60
11.251.1400	14	14	107	60
11.251.1500	15	16	115	65
11.251.1600	16	16	115	65



> **11.253 Phantom**

NL UNI VHM Spiraalboor 3xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 3xD à trou d'huile, TiAIN  
 ES Broca MD UNI 3xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 3xD mit Innenkühlung, TiAIN

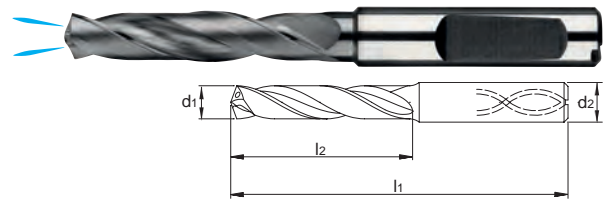


<b>MG HM</b>	<b>TiAIN</b>	<b>DIN 6537-K</b>	<b>3xD</b>	<b>h6</b>	<b>DIN 6535-HA</b>				<b>UNI</b>	
<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤550 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>S 71</b> Ni/Co
130-145 G	80-170 F	65-145 F	60-105 C	35-55 C	55-60 C	35-45 C	160-210 I	130-140 H	80-220 G	30-35 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.253.0100	1	3	45	7	11.253.0520	5.2	6	66	28	11.253.0940	9.4	10	89	47
11.253.0110	1.1	3	45	7	11.253.0530	5.3	6	66	28	11.253.0950	9.5	10	89	47
11.253.0120	1.2	3	45	7	11.253.0540	5.4	6	66	28	11.253.0960	9.6	10	89	47
11.253.0130	1.3	3	45	7	11.253.0550	5.5	6	66	28	11.253.0970	9.7	10	89	47
11.253.0140	1.4	3	45	7	11.253.0560	5.6	6	66	28	11.253.0980	9.8	10	89	47
11.253.0150	1.5	3	55	14	11.253.0570	5.7	6	66	28	11.253.0990	9.9	10	89	47
11.253.0160	1.6	3	55	14	11.253.0580	5.8	6	66	28	11.253.1000	10	10	89	47
11.253.0170	1.7	3	55	14	11.253.0590	5.9	6	66	28	11.253.1020	10.2	12	102	55
11.253.0180	1.8	3	55	14	11.253.0600	6	6	66	28	11.253.1030	10.3	12	102	55
11.253.0190	1.9	3	55	14	11.253.0610	6.1	8	79	34	11.253.1050	10.5	12	102	55
11.253.0200	2	4	55	20	11.253.0620	6.2	8	79	34	11.253.1080	10.8	12	102	55
11.253.0210	2.1	4	55	20	11.253.0630	6.3	8	79	34	11.253.1100	11	12	102	55
11.253.0220	2.2	4	55	20	11.253.0640	6.4	8	79	34	11.253.1150	11.5	12	102	55
11.253.0230	2.3	4	55	20	11.253.0650	6.5	8	79	34	11.253.1180	11.8	12	102	55
11.253.0240	2.4	4	55	20	11.253.0660	6.6	8	79	34	11.253.1200	12	12	102	55
11.253.0250	2.5	4	55	20	11.253.0670	6.7	8	79	34	11.253.1230	12.3	14	107	60
11.253.0260	2.6	4	55	20	11.253.0680	6.8	8	79	34	11.253.1250	12.5	14	107	60
11.253.0270	2.7	4	55	20	11.253.0690	6.9	8	79	34	11.253.1280	12.8	14	107	60
11.253.0280	2.8	4	55	20	11.253.0700	7	8	79	34	11.253.1300	13	14	107	60
11.253.0290	2.9	4	55	20	11.253.0710	7.1	8	79	41	11.253.1350	13.5	14	107	60
11.253.0300	3	6	62	20	11.253.0720	7.2	8	79	41	11.253.1380	13.8	14	107	60
11.253.0310	3.1	6	62	20	11.253.0730	7.3	8	79	41	11.253.1400	14	14	107	60
11.253.0320	3.2	6	62	20	11.253.0740	7.4	8	79	41	11.253.1450	14.5	16	115	65
11.253.0330	3.3	6	62	20	11.253.0750	7.5	8	79	41	11.253.1480	14.8	16	115	65
11.253.0340	3.4	6	62	20	11.253.0760	7.6	8	79	41	11.253.1500	15	16	115	65
11.253.0350	3.5	6	62	20	11.253.0770	7.7	8	79	41	11.253.1550	15.5	16	115	65
11.253.0360	3.6	6	62	20	11.253.0780	7.8	8	79	41	11.253.1580	15.8	16	115	65
11.253.0370	3.7	6	62	20	11.253.0790	7.9	8	79	41	11.253.1600	16	16	115	65
11.253.0380	3.8	6	66	24	11.253.0800	8	8	79	41	11.253.1650	16.5	18	123	73
11.253.0390	3.9	6	66	24	11.253.0810	8.1	10	89	47	11.253.1680	16.8	18	123	73
11.253.0400	4	6	66	24	11.253.0820	8.2	10	89	47	11.253.1700	17	18	123	73
11.253.0410	4.1	6	66	24	11.253.0830	8.3	10	89	47	11.253.1750	17.5	18	123	73
11.253.0420	4.2	6	66	24	11.253.0840	8.4	10	89	47	11.253.1780	17.8	18	123	73
11.253.0430	4.3	6	66	24	11.253.0850	8.5	10	89	47	11.253.1800	18	18	123	73
11.253.0440	4.4	6	66	24	11.253.0860	8.6	10	89	47	11.253.1850	18.5	20	131	79
11.253.0450	4.5	6	66	24	11.253.0870	8.7	10	89	47	11.253.1880	18.8	20	131	79
11.253.0460	4.6	6	66	24	11.253.0880	8.8	10	89	47	11.253.1900	19	20	131	79
11.253.0470	4.7	6	66	24	11.253.0890	8.9	10	89	47	11.253.1950	19.5	20	131	79
11.253.0480	4.8	6	66	28	11.253.0900	9	10	89	47	11.253.1980	19.8	20	131	79
11.253.0490	4.9	6	66	28	11.253.0910	9.1	10	89	47	11.253.2000	20	20	131	79
11.253.0500	5	6	66	28	11.253.0920	9.2	10	89	47					
11.253.0510	5.1	6	66	28	11.253.0930	9.3	10	89	47					

> **11.254 Phantom**

NL UNI VHM Spiraalboor 3xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 3xD à trou d'huile, TiAIN  
 ES Broca MD UNI 3xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 3xD mit Innenkühlung, TiAIN



<b>MG HM</b>	<b>TiAIN</b>	<b>DIN 6537-K</b>	<b>3xD</b>	<b>h6</b>	<b>DIN 6535-HE</b>				<b>UNI</b>	
<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤550 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>S 71</b> Ni/Co
130-145 G	80-170 F	65-145 F	60-105 C	35-55 C	55-60 C	35-45 C	160-210 I	130-140 H	80-220 G	30-35 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.254.0300	3	6	62	20	11.254.0370	3.7	6	62	20	11.254.0440	4.4	6	66	24
11.254.0310	3.1	6	62	20	11.254.0380	3.8	6	66	24	11.254.0450	4.5	6	66	24
11.254.0320	3.2	6	62	20	11.254.0390	3.9	6	66	24	11.254.0460	4.6	6	66	24
11.254.0330	3.3	6	62	20	11.254.0400	4	6	66	24	11.254.0470	4.7	6	66	24
11.254.0340	3.4	6	62	20	11.254.0410	4.1	6	66	24	11.254.0480	4.8	6	66	28
11.254.0350	3.5	6	62	20	11.254.0420	4.2	6	66	24	11.254.0490	4.9	6	66	28
11.254.0360	3.6	6	62	20	11.254.0430	4.3	6	66	24	11.254.0500	5	6	66	28

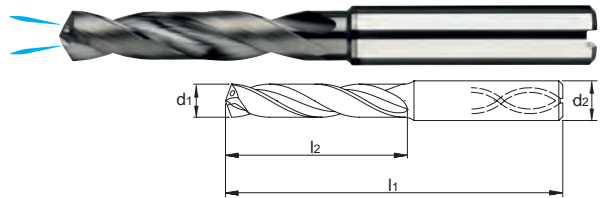


> 11.254 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.254.0510	5.1	6	66	28	11.254.0700	7	8	79	34	11.254.1100	11	12	102	55
11.254.0520	5.2	6	66	28	11.254.0750	7.5	8	79	41	11.254.1150	11.5	12	102	55
11.254.0530	5.3	6	66	28	11.254.0780	7.8	8	79	41	11.254.1180	11.8	12	102	55
11.254.0540	5.4	6	66	28	11.254.0800	8	8	79	41	11.254.1200	12	12	102	55
11.254.0550	5.5	6	66	28	11.254.0850	8.5	10	89	47	11.254.1220	12.2	14	107	60
11.254.0560	5.6	6	66	28	11.254.0860	8.6	10	89	47	11.254.1250	12.5	14	107	60
11.254.0570	5.7	6	66	28	11.254.0880	8.8	10	89	47	11.254.1300	13	14	107	60
11.254.0580	5.8	6	66	28	11.254.0900	9	10	89	47	11.254.1400	14	14	107	60
11.254.0590	5.9	6	66	28	11.254.0920	9.2	10	89	47	11.254.1500	15	16	115	65
11.254.0600	6	6	66	28	11.254.0950	9.5	10	89	47	11.254.1550	15.5	16	115	65
11.254.0620	6.2	8	79	34	11.254.0980	9.8	10	89	47	11.254.1600	16	16	115	65
11.254.0630	6.3	8	79	34	11.254.1000	10	10	89	47	11.254.1700	17	18	123	73
11.254.0650	6.5	8	79	34	11.254.1010	10.1	12	102	55	11.254.1800	18	18	123	73
11.254.0670	6.7	8	79	34	11.254.1020	10.2	12	102	55	11.254.1900	19	20	131	79
11.254.0680	6.8	8	79	34	11.254.1030	10.3	12	102	55	11.254.2000	20	20	131	79
11.254.0690	6.9	8	79	34	11.254.1050	10.5	12	102	55					

> 11.259 Phantom

NL VHM Spiraalboor 3xD met koelkanaal, DLC, Aluminium  
 FR Foret Carbure 3xD à trou d'huile, DLC, Aluminium  
 ES Broca MD 3xD con canal de refrigeración, DLC, Aluminio  
 DE VHM Spiralbohrer 3xD mit Innenkühlung, DLC, Aluminium



MG HM | DLC | DIN 6537-K | 3xD | DIN 6535-HA | | | | ALU

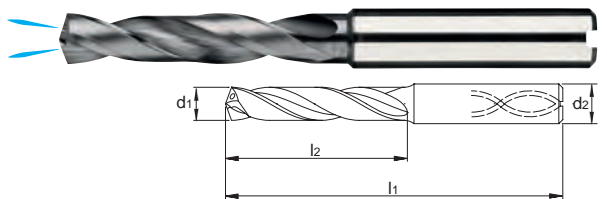
N 41 | N 42 | N 43 | N 51  
 Alu | Alu Si>10% | Mg | Cu

250-310 I | 220-260 I | 200-280 H | 80-310 G

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.259.0300	3	6	62	20	11.259.0620	6.2	8	79	34	11.259.1080	10.8	12	102	55
11.259.0320	3.2	6	62	20	11.259.0650	6.5	8	79	34	11.259.1100	11	12	102	55
11.259.0330	3.3	6	62	20	11.259.0660	6.6	8	79	34	11.259.1120	11.2	12	102	55
11.259.0350	3.5	6	62	20	11.259.0680	6.8	8	79	34	11.259.1150	11.5	12	102	55
11.259.0400	4	6	66	24	11.259.0700	7	8	79	34	11.259.1180	11.8	12	102	55
11.259.0410	4.1	6	66	24	11.259.0750	7.5	8	79	41	11.259.1200	12	12	102	55
11.259.0420	4.2	6	66	24	11.259.0780	7.8	8	79	41	11.259.1250	12.5	14	107	60
11.259.0450	4.5	6	66	24	11.259.0800	8	8	79	41	11.259.1300	13	14	107	60
11.259.0490	4.9	6	66	28	11.259.0820	8.2	10	89	47	11.259.1350	13.5	14	107	60
11.259.0500	5	6	66	28	11.259.0850	8.5	10	89	47	11.259.1380	13.8	14	107	60
11.259.0510	5.1	6	66	28	11.259.0880	8.8	10	89	47	11.259.1400	14	14	107	60
11.259.0520	5.2	6	66	28	11.259.0900	9	10	89	47	11.259.1450	14.5	16	115	65
11.259.0540	5.4	6	66	28	11.259.0950	9.5	10	89	47	11.259.1480	14.8	16	115	65
11.259.0550	5.5	6	66	28	11.259.0980	9.8	10	89	47	11.259.1500	15	16	115	65
11.259.0580	5.8	6	66	28	11.259.1000	10	10	89	47	11.259.1600	16	16	115	65
11.259.0600	6	6	66	28	11.259.1020	10.2	12	102	55	11.259.1800	18	18	123	73
11.259.0610	6.1	8	79	34	11.259.1050	10.5	12	102	55	11.259.2000	20	20	131	79

> 11.262 Phantom

NL VHM Spiraalboor 3xD met koelkanaal, TiAlN, roestvaststaal  
 FR Foret Carbure 3xD à trou d'huile, TiAlN, Inox  
 ES Broca MD 3xD con canal de refrigeración, TiAlN, acero inoxidable  
 DE VHM Spiralbohrer 3xD mit Innenkühlung, TiAlN, rostfreien Stahl



MG HM | TiAlN | DIN 6537-K | 3xD | h6 | DIN 6535-HA | | | | INOX

P 11 | P 12 | P 13 | P 14 | M 21 | M 22 | S 72  
 ≤800 N/mm² | ≤850 N/mm² | ≤1000 N/mm² | ≤1400 N/mm² | INOX ≤850 N/mm² | INOX >850 N/mm² | Ti

130-145 G | 80-125 F | 65-145 F | 60-105 C | 72-80 C | 60-80 C | 30-35 B

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.262.0300	3	6	62	20	11.262.0400	4	6	66	24	11.262.0500	5	6	66	28
11.262.0310	3.1	6	62	20	11.262.0410	4.1	6	66	24	11.262.0510	5.1	6	66	28
11.262.0320	3.2	6	62	20	11.262.0420	4.2	6	66	24	11.262.0520	5.2	6	66	28
11.262.0330	3.3	6	62	20	11.262.0430	4.3	6	66	24	11.262.0530	5.3	6	66	28
11.262.0340	3.4	6	62	20	11.262.0440	4.4	6	66	24	11.262.0540	5.4	6	66	28
11.262.0350	3.5	6	62	20	11.262.0450	4.5	6	66	24	11.262.0550	5.5	6	66	28
11.262.0360	3.6	6	62	20	11.262.0460	4.6	6	66	24	11.262.0560	5.6	6	66	28
11.262.0370	3.7	6	62	20	11.262.0470	4.7	6	66	24	11.262.0570	5.7	6	66	28
11.262.0380	3.8	6	66	24	11.262.0480	4.8	6	66	28	11.262.0580	5.8	6	66	28
11.262.0390	3.9	6	66	24	11.262.0490	4.9	6	66	28	11.262.0590	5.9	6	66	28

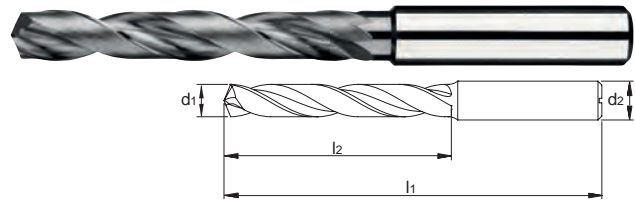


> **11.262 Phantom**

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.262.0600	6	6	66	28	11.262.0900	9	10	89	47	11.262.1350	13.5	14	107	60
11.262.0610	6.1	8	79	34	11.262.0920	9.2	10	89	47	11.262.1400	14	14	107	60
11.262.0620	6.2	8	79	34	11.262.0950	9.5	10	89	47	11.262.1450	14.5	16	115	65
11.262.0630	6.3	8	79	34	11.262.0980	9.8	10	89	47	11.262.1500	15	16	115	65
11.262.0650	6.5	8	79	34	11.262.1000	10	10	89	47	11.262.1550	15.5	16	115	65
11.262.0670	6.7	8	79	34	11.262.1020	10.2	12	102	55	11.262.1600	16	16	115	65
11.262.0680	6.8	8	79	34	11.262.1050	10.5	12	102	55	11.262.1650	16.5	18	123	73
11.262.0690	6.9	8	79	34	11.262.1080	10.8	12	102	55	11.262.1700	17	18	123	73
11.262.0700	7	8	79	41	11.262.1100	11	12	102	55	11.262.1750	17.5	18	123	73
11.262.0750	7.5	8	79	41	11.262.1120	11.2	12	102	55	11.262.1800	18	18	123	73
11.262.0780	7.8	8	79	41	11.262.1150	11.5	12	102	55	11.262.1850	18.5	20	131	79
11.262.0800	8	8	79	41	11.262.1180	11.8	12	102	55	11.262.1900	19	20	131	79
11.262.0850	8.5	10	89	47	11.262.1200	12	12	102	55	11.262.1950	19.5	20	131	79
11.262.0860	8.6	10	89	47	11.262.1250	12.5	14	107	60	11.262.2000	20	20	131	79
11.262.0880	8.8	10	89	47	11.262.1300	13	14	107	60					

> **11.270 Phantom**

NL UNI VHM Spiraalboor 5xD TiAIN  
 FR Foret Carbure UNI 5xD TiAIN  
 ES Broca MD UNI 5xD TiAIN  
 DE UNI VHM Spiralbohrer 5xD TiAIN



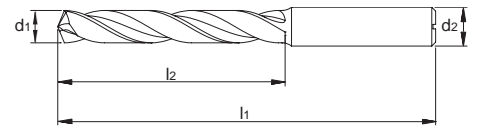
<b>MG HM</b>	<b>TiAIN</b>	<b>DIN 6537-L</b>	<b>5xD</b>	<b>h6</b>	<b>DIN 6535-HA</b>		<b>140°</b>	<b>m7</b>	<b>UNI</b>	
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>S 71</b> Ni/Co
120-130 G	65-145 F	55-110 F	45-100 C	25-45 C	50-55 C	35-45 C	155-210 H	125-155 G	60-180 G	22-25 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.270.0100	1	3	55	8	11.270.0480	4.8	6	82	44	11.270.0860	8.6	10	103	61
11.270.0110	1.1	3	55	12	11.270.0490	4.9	6	82	44	11.270.0870	8.7	10	103	61
11.270.0120	1.2	3	55	12	11.270.0500	5	6	82	44	11.270.0880	8.8	10	103	61
11.270.0130	1.3	3	55	12	11.270.0510	5.1	6	82	44	11.270.0890	8.9	10	103	61
11.270.0140	1.4	3	55	12	11.270.0520	5.2	6	82	44	11.270.0900	9	10	103	61
11.270.0150	1.5	3	55	16	11.270.0530	5.3	6	82	44	11.270.0910	9.1	10	103	61
11.270.0160	1.6	3	55	16	11.270.0540	5.4	6	82	44	11.270.0920	9.2	10	103	61
11.270.0170	1.7	3	55	16	11.270.0550	5.5	6	82	44	11.270.0930	9.3	10	103	61
11.270.0180	1.8	3	55	16	11.270.0560	5.6	6	82	44	11.270.0940	9.4	10	103	61
11.270.0190	1.9	3	55	16	11.270.0570	5.7	6	82	44	11.270.0950	9.5	10	103	61
11.270.0200	2	4	57	21	11.270.0580	5.8	6	82	44	11.270.0960	9.6	10	103	61
11.270.0210	2.1	4	57	21	11.270.0590	5.9	6	82	44	11.270.0970	9.7	10	103	61
11.270.0220	2.2	4	57	21	11.270.0600	6	6	82	44	11.270.0980	9.8	10	103	61
11.270.0230	2.3	4	57	21	11.270.0610	6.1	8	91	53	11.270.0990	9.9	10	103	61
11.270.0240	2.4	4	57	21	11.270.0620	6.2	8	91	53	11.270.1000	10	10	103	61
11.270.0250	2.5	4	57	21	11.270.0630	6.3	8	91	53	11.270.1020	10.2	12	118	71
11.270.0260	2.6	4	57	21	11.270.0640	6.4	8	91	53	11.270.1030	10.3	12	118	71
11.270.0270	2.7	4	57	21	11.270.0650	6.5	8	91	53	11.270.1050	10.5	12	118	71
11.270.0280	2.8	4	57	21	11.270.0660	6.6	8	91	53	11.270.1080	10.8	12	118	71
11.270.0290	2.9	4	57	21	11.270.0670	6.7	8	91	53	11.270.1100	11	12	118	71
11.270.0300	3	6	66	28	11.270.0680	6.8	8	91	53	11.270.1150	11.5	12	118	71
11.270.0310	3.1	6	66	28	11.270.0690	6.9	8	91	53	11.270.1180	11.8	12	118	71
11.270.0320	3.2	6	66	28	11.270.0700	7	8	91	53	11.270.1200	12	12	118	71
11.270.0330	3.3	6	66	28	11.270.0710	7.1	8	91	53	11.270.1230	12.3	14	124	77
11.270.0340	3.4	6	66	28	11.270.0720	7.2	8	91	53	11.270.1250	12.5	14	124	77
11.270.0350	3.5	6	66	28	11.270.0730	7.3	8	91	53	11.270.1280	12.8	14	124	77
11.270.0360	3.6	6	66	28	11.270.0740	7.4	8	91	53	11.270.1300	13	14	124	77
11.270.0370	3.7	6	66	28	11.270.0750	7.5	8	91	53	11.270.1350	13.5	14	124	77
11.270.0380	3.8	6	74	36	11.270.0760	7.6	8	91	53	11.270.1380	13.8	14	124	77
11.270.0390	3.9	6	74	36	11.270.0770	7.7	8	91	53	11.270.1400	14	14	124	77
11.270.0400	4	6	74	36	11.270.0780	7.8	8	91	53	11.270.1450	14.5	16	133	83
11.270.0410	4.1	6	74	36	11.270.0790	7.9	8	91	53	11.270.1480	14.8	16	133	83
11.270.0420	4.2	6	74	36	11.270.0800	8	8	91	53	11.270.1500	15	16	133	83
11.270.0430	4.3	6	74	36	11.270.0810	8.1	10	103	61	11.270.1550	15.5	16	133	83
11.270.0440	4.4	6	74	36	11.270.0820	8.2	10	103	61	11.270.1580	15.8	16	133	83
11.270.0450	4.5	6	74	36	11.270.0830	8.3	10	103	61	11.270.1600	16	16	133	83
11.270.0460	4.6	6	74	36	11.270.0840	8.4	10	103	61					
11.270.0470	4.7	6	74	36	11.270.0850	8.5	10	103	61					



**> 11.271 Phantom**

NL UNI VHM Spiraalboor 5xD TiAIN  
 FR Foret Carbure UNI 5xD TiAIN  
 ES Broca MD UNI 5xD TiAIN  
 DE UNI VHM Spiralbohrer 5xD TiAIN

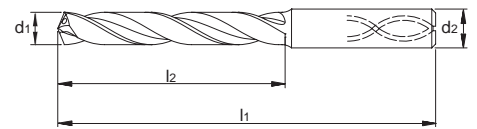


MG HM	TiAIN	DIN 6537-L	5xD	h6	DIN 6535-HE		140°		UNI	
P 11 ≤600 N/mm²	P 12 ≤850 N/mm²	P 13 ≤1000 N/mm²	P 14 ≤1400 N/mm²	H 15 HRC	M 21 INOX ≤850N/mm²	M 22 INOX >850N/mm²	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	S 71 Ni/Co
120-130 G	65-145 F	55-110 F	45-100 C	25-45 C	50-55 C	35-45 C	155-210 H	125-155 G	60-180 G	22-25 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.271.0300	3	6	66	28	11.271.0600	6	6	82	44	11.271.1000	10	10	103	61
11.271.0330	3.3	6	66	28	11.271.0650	6.5	8	91	53	11.271.1020	10.2	12	118	61
11.271.0350	3.5	6	66	28	11.271.0680	6.8	8	91	53	11.271.1050	10.5	12	118	71
11.271.0380	3.8	6	74	36	11.271.0700	7	8	91	53	11.271.1100	11	12	118	71
11.271.0400	4	6	74	36	11.271.0750	7.5	8	91	53	11.271.1150	11.5	12	118	71
11.271.0420	4.2	6	74	36	11.271.0780	7.8	8	91	53	11.271.1200	12	12	118	71
11.271.0450	4.5	6	74	36	11.271.0800	8	8	91	53	11.271.1250	12.5	14	124	77
11.271.0480	4.8	6	82	44	11.271.0850	8.5	10	103	61	11.271.1300	13	14	124	77
11.271.0500	5	6	82	44	11.271.0880	8.8	10	103	61	11.271.1400	14	14	124	77
11.271.0550	5.5	6	82	44	11.271.0900	9	10	103	61	11.271.1500	15	16	133	83
11.271.0580	5.8	6	82	44	11.271.0950	9.5	10	103	61	11.271.1600	16	16	133	83

**> 11.273 Phantom**

NL UNI VHM Spiraalboor 5xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 5xD à trou d'huile, TiAIN  
 ES Broca MD UNI 5xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 5xD mit Innenkühlung, TiAIN



MG HM	TiAIN	DIN 6537-L	5xD	h6	DIN 6535-HA			140°		UNI
P 11 ≤600 N/mm²	P 12 ≤850 N/mm²	P 13 ≤1000 N/mm²	P 14 ≤1400 N/mm²	H 15 HRC	M 21 INOX ≤850N/mm²	M 22 INOX >850N/mm²	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	S 71 Ni/Co
130-145 G	80-170 F	65-145 F	60-105 C	35-55 C	55-60 C	35-45 C	160-210 I	130-140 H	80-220 G	30-35 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.273.0100	1	3	55	8	11.273.0460	4.6	6	74	36	11.273.0810	8.1	10	103	61
11.273.0110	1.1	3	55	12	11.273.0465	4.65	6	74	36	11.273.0820	8.2	10	103	61
11.273.0120	1.2	3	55	12	11.273.0470	4.7	6	74	36	11.273.0830	8.3	10	103	61
11.273.0130	1.3	3	55	12	11.273.0480	4.8	6	82	44	11.273.0840	8.4	10	103	61
11.273.0140	1.4	3	55	12	11.273.0490	4.9	6	82	44	11.273.0850	8.5	10	103	61
11.273.0150	1.5	3	55	16	11.273.0500	5	6	82	44	11.273.0860	8.6	10	103	61
11.273.0160	1.6	3	55	16	11.273.0510	5.1	6	82	44	11.273.0870	8.7	10	103	61
11.273.0170	1.7	3	55	16	11.273.0520	5.2	6	82	44	11.273.0880	8.8	10	103	61
11.273.0180	1.8	3	55	16	11.273.0530	5.3	6	82	44	11.273.0890	8.9	10	103	61
11.273.0190	1.9	3	55	16	11.273.0540	5.4	6	82	44	11.273.0900	9	10	103	61
11.273.0200	2	4	57	21	11.273.0550	5.5	6	82	44	11.273.0910	9.1	10	103	61
11.273.0210	2.1	4	57	21	11.273.0555	5.55	6	82	44	11.273.0920	9.2	10	103	61
11.273.0220	2.2	4	57	21	11.273.0560	5.6	6	82	44	11.273.0930	9.3	10	103	61
11.273.0230	2.3	4	57	21	11.273.0570	5.7	6	82	44	11.273.0940	9.4	10	103	61
11.273.0240	2.4	4	57	21	11.273.0580	5.8	6	82	44	11.273.0950	9.5	10	103	61
11.273.0250	2.5	4	57	21	11.273.0590	5.9	6	82	44	11.273.0955	9.55	10	103	61
11.273.0260	2.6	4	57	21	11.273.0600	6	6	82	44	11.273.0960	9.6	10	103	61
11.273.0270	2.7	4	57	21	11.273.0610	6.1	8	91	53	11.273.0970	9.7	10	103	61
11.273.0280	2.8	4	57	21	11.273.0620	6.2	8	91	53	11.273.0980	9.8	10	103	61
11.273.0290	2.9	4	57	21	11.273.0630	6.3	8	91	53	11.273.0990	9.9	10	103	61
11.273.0300	3	6	66	28	11.273.0640	6.4	8	91	53	11.273.1000	10	10	103	61
11.273.0310	3.1	6	66	28	11.273.0650	6.5	8	91	53	11.273.1010	10.1	12	118	71
11.273.0320	3.2	6	66	28	11.273.0660	6.6	8	91	53	11.273.1020	10.2	12	118	71
11.273.0325	3.25	6	66	28	11.273.0670	6.7	8	91	53	11.273.1030	10.3	12	118	71
11.273.0330	3.3	6	66	28	11.273.0680	6.8	8	91	53	11.273.1040	10.4	12	118	71
11.273.0340	3.4	6	66	28	11.273.0690	6.9	8	91	53	11.273.1050	10.5	12	118	71
11.273.0350	3.5	6	66	28	11.273.0700	7	8	91	53	11.273.1060	10.6	12	118	71
11.273.0360	3.6	6	66	28	11.273.0710	7.1	8	91	53	11.273.1070	10.7	12	118	71
11.273.0365	3.65	6	66	28	11.273.0720	7.2	8	91	53	11.273.1080	10.8	12	118	71
11.273.0370	3.7	6	66	28	11.273.0730	7.3	8	91	53	11.273.1090	10.9	12	118	71
11.273.0380	3.8	6	74	36	11.273.0740	7.4	8	91	53	11.273.1100	11	12	118	71
11.273.0390	3.9	6	74	36	11.273.0750	7.5	8	91	53	11.273.1110	11.1	12	118	71
11.273.0400	4	6	74	36	11.273.0755	7.55	8	91	53	11.273.1120	11.2	12	118	71
11.273.0410	4.1	6	74	36	11.273.0760	7.6	8	91	53	11.273.1130	11.3	12	118	71
11.273.0420	4.2	6	74	36	11.273.0770	7.7	8	91	53	11.273.1140	11.4	12	118	71
11.273.0430	4.3	6	74	36	11.273.0780	7.8	8	91	53	11.273.1150	11.5	12	118	71
11.273.0440	4.4	6	74	36	11.273.0790	7.9	8	91	53	11.273.1155	11.55	12	118	71
11.273.0450	4.5	6	74	36	11.273.0800	8	8	91	53	11.273.1160	11.6	12	118	71

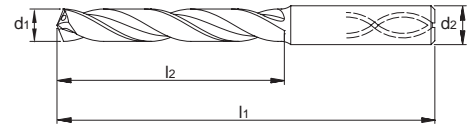


> 11.273 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.273.1170	11.7	12	118	71	11.273.1290	12.9	14	124	77	11.273.1680	16.8	18	143	93
11.273.1180	11.8	12	118	71	11.273.1300	13	14	124	77	11.273.1700	17	18	143	93
11.273.1190	11.9	12	118	71	11.273.1350	13.5	14	124	77	11.273.1750	17.5	18	143	93
11.273.1200	12	12	118	71	11.273.1380	13.8	14	124	77	11.273.1780	17.8	18	143	93
11.273.1210	12.1	14	124	77	11.273.1400	14	14	124	77	11.273.1800	18	18	143	93
11.273.1220	12.2	14	124	77	11.273.1450	14.5	16	133	83	11.273.1850	18.5	20	153	101
11.273.1225	12.25	14	124	77	11.273.1480	14.8	16	133	83	11.273.1880	18.8	20	153	101
11.273.1230	12.3	14	124	77	11.273.1500	15	16	133	83	11.273.1900	19	20	153	101
11.273.1240	12.4	14	124	77	11.273.1510	15.1	16	133	83	11.273.1950	19.5	20	153	101
11.273.1250	12.5	14	124	77	11.273.1550	15.5	16	133	83	11.273.1980	19.8	20	153	101
11.273.1260	12.6	14	124	77	11.273.1580	15.8	16	133	83	11.273.2000	20	20	153	101
11.273.1270	12.7	14	124	77	11.273.1600	16	16	133	83					
11.273.1280	12.8	14	124	77	11.273.1650	16.5	18	143	93					

> 11.274 Phantom

NL UNI VHM Spiraalboor 5xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 5xD à trou d'huile, TiAIN  
 ES Broca MD UNI 5xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 5xD mit Innenkühlung, TiAIN



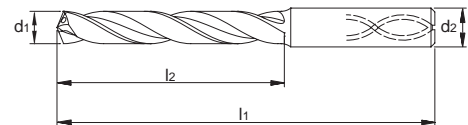
MG HM TiAIN DIN 6537-L 5xD h6 DIN 6535-HE 140° m7 UNI

P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	H 15 HRC	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	S 71 Ni/Co
130-145 G	80-170 F	65-145 F	60-105 C	35-55 C	55-60 C	35-45 C	160-210 I	130-140 H	80-220 G	30-35 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.274.0300	3	6	66	28	11.274.0490	4.9	6	82	44	11.274.0860	8.6	10	103	61
11.274.0310	3.1	6	66	28	11.274.0500	5	6	82	44	11.274.0900	9	10	103	61
11.274.0320	3.2	6	66	28	11.274.0510	5.1	6	82	44	11.274.0950	9.5	10	103	61
11.274.0330	3.3	6	66	28	11.274.0520	5.2	6	82	44	11.274.1000	10	10	103	61
11.274.0340	3.4	6	66	28	11.274.0530	5.3	6	82	44	11.274.1010	10.1	12	118	71
11.274.0350	3.5	6	66	28	11.274.0540	5.4	5	82	44	11.274.1020	10.2	12	118	71
11.274.0360	3.6	6	66	28	11.274.0550	5.5	6	82	44	11.274.1030	10.3	12	118	71
11.274.0370	3.7	6	66	28	11.274.0560	5.6	6	82	44	11.274.1050	10.5	12	118	71
11.274.0380	3.8	6	74	36	11.274.0570	5.7	6	82	44	11.274.1100	11	12	118	71
11.274.0390	3.9	6	74	36	11.274.0580	5.8	6	82	44	11.274.1150	11.5	12	118	71
11.274.0400	4	6	74	36	11.274.0590	5.9	6	82	44	11.274.1200	12	12	118	71
11.274.0410	4.1	6	74	36	11.274.0600	6	6	82	44	11.274.1250	12.5	14	124	77
11.274.0420	4.2	6	74	36	11.274.0650	6.5	8	91	53	11.274.1300	13	14	124	77
11.274.0430	4.3	6	74	36	11.274.0680	6.8	8	91	53	11.274.1350	13.5	14	124	77
11.274.0440	4.4	6	74	36	11.274.0690	6.9	8	91	53	11.274.1400	14	14	124	77
11.274.0450	4.5	6	74	36	11.274.0700	7	8	91	53	11.274.1500	15	16	133	83
11.274.0460	4.6	6	74	36	11.274.0750	7.5	8	91	53	11.274.1600	16	16	133	83
11.274.0470	4.7	6	74	36	11.274.0800	8	8	91	53	11.274.1800	18	18	143	93
11.274.0480	4.8	6	82	44	11.274.0850	8.5	10	103	61	11.274.2000	20	20	153	101

> 11.279 Phantom

NL VHM Spiraalboor 5xD met koelkanaal, DLC, Aluminium  
 FR Foret Carbure 5xD à trou d'huile, DLC, Aluminium  
 ES Broca MD 5xD con canal de refrigeración, DLC, Aluminio  
 DE VHM Spiralbohrer 5xD mit Innenkühlung, DLC, Aluminium



MG HM DLC DIN 6537-L 5xD DIN 6535-HA 118° m7 ALU

N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu
250-310 I	220-260 I	200-280 H	80-310 G

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.279.0300	3	6	66	28	11.279.0410	4.1	6	74	36	11.279.0520	5.2	6	82	44
11.279.0310	3.1	6	66	28	11.279.0420	4.2	6	74	36	11.279.0530	5.3	6	82	44
11.279.0320	3.2	6	66	28	11.279.0430	4.3	6	74	36	11.279.0540	5.4	6	82	44
11.279.0330	3.3	6	66	28	11.279.0440	4.4	6	74	36	11.279.0550	5.5	6	82	44
11.279.0340	3.4	6	66	28	11.279.0450	4.5	6	74	36	11.279.0560	5.6	6	82	44
11.279.0350	3.5	6	66	28	11.279.0460	4.6	6	74	36	11.279.0570	5.7	6	82	44
11.279.0360	3.6	6	66	28	11.279.0470	4.7	6	74	36	11.279.0580	5.8	6	82	44
11.279.0370	3.7	6	66	28	11.279.0480	4.8	6	82	44	11.279.0590	5.9	6	82	44
11.279.0380	3.8	6	74	36	11.279.0490	4.9	6	82	44	11.279.0600	6	6	82	44
11.279.0390	3.9	6	74	36	11.279.0500	5	6	82	44	11.279.0610	6.1	8	91	53
11.279.0400	4	6	74	36	11.279.0510	5.1	6	82	44	11.279.0620	6.2	8	91	53

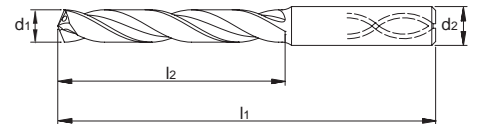


> 11.279 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.279.0630	6.3	8	91	53	11.279.0830	8.3	10	103	61	11.279.1050	10.5	12	118	71
11.279.0640	6.4	8	91	53	11.279.0840	8.4	10	103	61	11.279.1080	10.8	12	118	71
11.279.0650	6.5	8	91	53	11.279.0850	8.5	10	103	61	11.279.1090	10.9	12	118	71
11.279.0660	6.6	8	91	53	11.279.0860	8.6	10	103	61	11.279.1100	11	12	118	71
11.279.0670	6.7	8	91	53	11.279.0870	8.7	10	103	61	11.279.1120	11.2	12	118	71
11.279.0680	6.8	8	91	53	11.279.0880	8.8	10	103	61	11.279.1150	11.5	12	118	71
11.279.0690	6.9	8	91	53	11.279.0890	8.9	10	103	61	11.279.1180	11.8	12	118	71
11.279.0700	7	8	91	53	11.279.0900	9	10	103	61	11.279.1200	12	12	118	71
11.279.0710	7.1	8	91	53	11.279.0910	9.1	10	103	61	11.279.1250	12.5	14	124	77
11.279.0720	7.2	8	91	53	11.279.0920	9.2	10	103	61	11.279.1300	13	14	124	77
11.279.0730	7.3	8	91	53	11.279.0930	9.3	10	103	61	11.279.1350	13.5	14	124	77
11.279.0740	7.4	8	91	53	11.279.0940	9.4	10	103	61	11.279.1380	13.8	14	124	77
11.279.0750	7.5	8	91	53	11.279.0950	9.5	10	103	61	11.279.1400	14	14	124	77
11.279.0760	7.6	8	91	53	11.279.0960	9.6	10	103	61	11.279.1450	14.5	16	133	83
11.279.0770	7.7	8	91	53	11.279.0970	9.7	10	103	61	11.279.1480	14.8	16	133	83
11.279.0780	7.8	8	91	53	11.279.0980	9.8	10	103	61	11.279.1500	15	16	133	83
11.279.0790	7.9	8	91	53	11.279.0990	9.9	10	103	61	11.279.1600	16	16	133	83
11.279.0800	8	8	91	53	11.279.1000	10	10	103	61	11.279.1800	18	18	143	93
11.279.0810	8.1	10	103	61	11.279.1020	10.2	12	118	71	11.279.2000	20	20	153	101
11.279.0820	8.2	10	103	61	11.279.1030	10.3	12	118	71					

> 11.282 Phantom

NL VHM Spiraalboor 5xD met koelkanaal, TiAlN, roestvaststaal  
 FR Foret Carbure 5xD à trou d'huile, TiAlN, Inox  
 ES Broca MD 5xD con canal de refrigeración, TiAlN, acero inoxidable  
 DE VHM Spiralbohrer 5xD mit Innenkühlung, TiAlN, rostfreien Stahl



MG HM, TIAlN, DIN 6537-L, 5xD, h6, DIN 6535-HA, 140°, m7, INOX

P 11 (≤800 N/mm²), P 12 (≤850 N/mm²), P 13 (≤1000 N/mm²), P 14 (≤1400 N/mm²), M 21 (INOX ≤850 N/mm²), M 22 (INOX >850 N/mm²), S 72 (Ti)

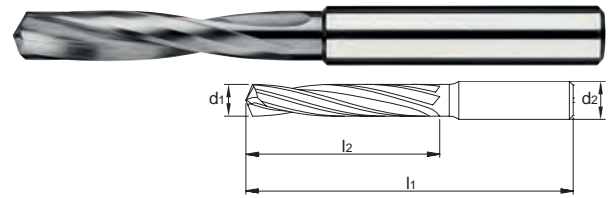
130-145 G, 80-125 F, 65-145 F, 60-105 C, 72-80 C, 60-80 C, 30-35 B

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.282.0200	2	4	57	21	11.282.0550	5.5	6	82	44	11.282.0900	9	10	103	61
11.282.0210	2.1	4	57	21	11.282.0560	5.6	6	82	44	11.282.0910	9.1	10	103	61
11.282.0220	2.2	4	57	21	11.282.0570	5.7	6	82	44	11.282.0920	9.2	10	103	61
11.282.0230	2.3	4	57	21	11.282.0580	5.8	6	82	44	11.282.0930	9.3	10	103	61
11.282.0240	2.4	4	57	21	11.282.0590	5.9	6	82	44	11.282.0940	9.4	10	103	61
11.282.0250	2.5	4	57	21	11.282.0600	6	6	82	44	11.282.0950	9.5	10	103	61
11.282.0260	2.6	4	57	21	11.282.0610	6.1	8	91	53	11.282.0960	9.6	10	103	61
11.282.0270	2.7	4	57	21	11.282.0620	6.2	8	91	53	11.282.0970	9.7	10	103	61
11.282.0280	2.8	4	57	21	11.282.0630	6.3	8	91	53	11.282.0980	9.8	10	103	61
11.282.0290	2.9	4	57	21	11.282.0640	6.4	8	91	53	11.282.0990	9.9	10	103	61
11.282.0300	3	6	66	28	11.282.0650	6.5	8	91	53	11.282.1000	10	10	103	61
11.282.0310	3.1	6	66	28	11.282.0660	6.6	8	91	53	11.282.1020	10.2	12	118	71
11.282.0320	3.2	6	66	28	11.282.0670	6.7	8	91	53	11.282.1050	10.5	12	118	71
11.282.0330	3.3	6	66	28	11.282.0680	6.8	8	91	53	11.282.1080	10.8	12	118	71
11.282.0340	3.4	6	66	28	11.282.0690	6.9	8	91	53	11.282.1100	11	12	118	71
11.282.0350	3.5	6	66	28	11.282.0700	7	8	91	53	11.282.1120	11.2	12	118	71
11.282.0360	3.6	6	66	28	11.282.0710	7.1	8	91	53	11.282.1150	11.5	12	118	71
11.282.0370	3.7	6	66	28	11.282.0720	7.2	8	91	53	11.282.1180	11.8	12	118	71
11.282.0380	3.8	6	74	36	11.282.0730	7.3	8	91	53	11.282.1200	12	12	118	71
11.282.0390	3.9	6	74	36	11.282.0740	7.4	8	91	53	11.282.1250	12.5	14	124	77
11.282.0400	4	6	74	36	11.282.0750	7.5	8	91	53	11.282.1300	13	14	124	77
11.282.0410	4.1	6	74	36	11.282.0760	7.6	8	91	53	11.282.1350	13.5	14	124	77
11.282.0420	4.2	6	74	36	11.282.0770	7.7	8	91	53	11.282.1400	14	14	124	77
11.282.0430	4.3	6	74	36	11.282.0780	7.8	8	91	53	11.282.1450	14.5	16	133	83
11.282.0440	4.4	6	74	36	11.282.0790	7.9	8	91	53	11.282.1500	15	16	133	83
11.282.0450	4.5	6	74	36	11.282.0800	8	8	91	53	11.282.1550	15.5	16	133	83
11.282.0460	4.6	6	74	36	11.282.0810	8.1	10	103	61	11.282.1600	16	16	133	83
11.282.0470	4.7	6	74	36	11.282.0820	8.2	10	103	61	11.282.1650	16.5	18	143	93
11.282.0480	4.8	6	82	44	11.282.0830	8.3	10	103	61	11.282.1700	17	18	143	93
11.282.0490	4.9	6	82	44	11.282.0840	8.4	10	103	61	11.282.1750	17.5	18	143	93
11.282.0500	5	6	82	44	11.282.0850	8.5	10	103	61	11.282.1800	18	18	143	93
11.282.0510	5.1	6	82	44	11.282.0860	8.6	10	103	61	11.282.1850	18.5	20	153	101
11.282.0520	5.2	6	82	44	11.282.0870	8.7	10	103	61	11.282.1900	19	20	153	101
11.282.0530	5.3	6	82	44	11.282.0880	8.8	10	103	61	11.282.1950	19.5	20	153	101
11.282.0540	5.4	6	82	44	11.282.0890	8.9	10	103	61	11.282.2000	20	20	153	101



> **11.286 Phantom**

NL VHM Spiraalboor 5xD TiAIN, gehard staal, 45-70 HRC  
 FR Foret Carbure 5xD TiAIN, acier trempé, 45-70 HRC  
 ES Broca MD 5xD TiAIN, aceros duros, 45-70 HRC  
 DE VHM Spiralbohrer 5xD TiAIN, harte Stähle, 45-70 HRC



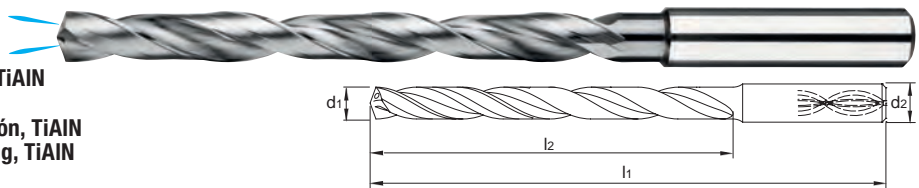
MG HM TiAIN NORM 5xD h6 DIN 6535-HA 140° h7

**H 15**  
HRC  
10-22  
A

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.286.0300	3	3	46	16	11.286.0600	6	6	75	35	11.286.0900	9	10	105	57
11.286.0350	3.5	4	50	20	11.286.0650	6.5	8	80	40	11.286.0950	9.5	10	105	57
11.286.0400	4	4	52	22	11.286.0700	7	8	85	45	11.286.1000	10	10	111	63
11.286.0450	4.5	6	68	28	11.286.0750	7.5	8	85	45	11.286.1200	12	12	119	71
11.286.0500	5	6	72	32	11.286.0800	8	8	98	50					
11.286.0550	5.5	6	75	35	11.286.0850	8.5	10	98	50					

> **11.295 Phantom**

NL UNI VHM Spiraalboor 8xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 8xD à trou d'huile, TiAIN  
 ES Broca MD UNI 8xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 8xD mit Innenkühlung, TiAIN



MG HM TiAIN NORM 8xD h6 DIN 6535-HA 140° m7 UNI

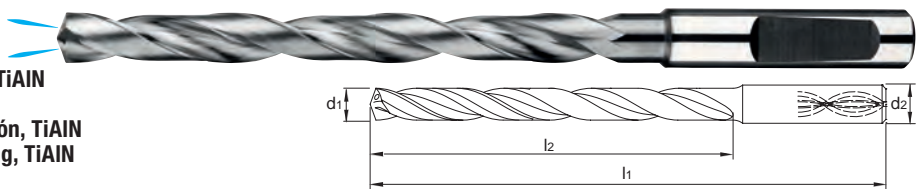
P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 51 S 71  
 ≤800 N/mm² ≤850 N/mm² ≤1000 N/mm² ≤1400 N/mm² INOX ≤850N/mm² INOX >850N/mm² GG GGG GTS-GTW Cu Ni/Co

130-145 F 80-170 F 65-145 F 60-105 B 55-60 B 35-45 C 155-210 H 130-160 G 80-220 F 30-35 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.295.0300	3	6	72	34	11.295.0700	7	8	114	76	11.295.1200	12	12	162	114
11.295.0330	3.3	6	72	34	11.295.0750	7.5	8	114	76	11.295.1250	12.5	14	178	133
11.295.0350	3.5	6	72	34	11.295.0800	8	8	114	76	11.295.1300	13	14	178	133
11.295.0400	4	6	81	43	11.295.0850	8.5	10	142	95	11.295.1350	13.5	14	178	133
11.295.0420	4.2	6	81	43	11.295.0900	9	10	142	95	11.295.1400	14	14	178	133
11.295.0450	4.5	6	81	43	11.295.0950	9.5	10	142	95	11.295.1500	15	16	203	152
11.295.0500	5	6	95	57	11.295.1000	10	10	142	95	11.295.1600	16	16	203	152
11.295.0550	5.5	6	95	57	11.295.1020	10.2	12	162	114	11.295.1800	18	18	222	171
11.295.0600	6	6	95	57	11.295.1050	10.5	12	162	114	11.295.2000	20	20	243	190
11.295.0650	6.5	8	114	76	11.295.1100	11	12	162	114					
11.295.0680	6.8	8	114	76	11.295.1150	11.5	12	162	114					

> **11.296 Phantom**

NL UNI VHM Spiraalboor 8xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 8xD à trou d'huile, TiAIN  
 ES Broca MD UNI 8xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 8xD mit Innenkühlung, TiAIN



MG HM TiAIN NORM 8xD h6 DIN 6535-HE 140° m7 UNI

P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 51 S 71  
 ≤800 N/mm² ≤850 N/mm² ≤1000 N/mm² ≤1400 N/mm² INOX ≤850N/mm² INOX >850N/mm² GG GGG GTS-GTW Cu Ni/Co

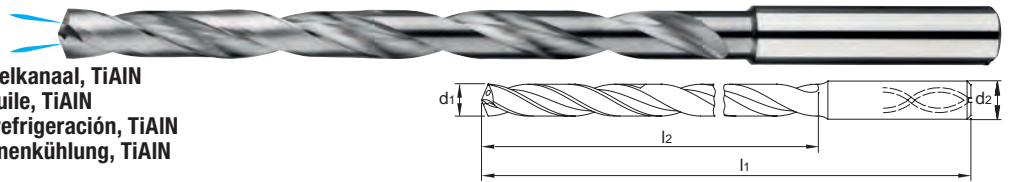
130-145 F 80-170 F 65-145 F 60-105 B 55-60 B 35-45 C 155-210 H 130-160 G 80-220 F 30-35 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.296.0400	4	6	81	43	11.296.0800	8	8	114	76	11.296.1250	12.5	14	178	133
11.296.0420	4.2	6	81	43	11.296.0850	8.5	10	142	95	11.296.1300	13	14	178	133
11.296.0450	4.5	6	81	43	11.296.0900	9	10	142	95	11.296.1350	13.5	14	178	133
11.296.0500	5	6	95	57	11.296.0950	9.5	10	142	95	11.296.1400	14	14	178	133
11.296.0550	5.5	6	95	57	11.296.1000	10	10	142	95	11.296.1500	15	16	203	152
11.296.0600	6	6	95	57	11.296.1020	10.2	12	162	114	11.296.1600	16	16	203	152
11.296.0650	6.5	8	114	76	11.296.1050	10.5	12	162	114	11.296.1800	18	18	222	171
11.296.0680	6.8	8	114	76	11.296.1100	11	12	162	114	11.296.2000	20	20	243	190
11.296.0700	7	8	114	76	11.296.1150	11.5	12	162	114					
11.296.0750	7.5	8	114	76	11.296.1200	12	12	162	114					



## > 11.305 Phantom

NL UNI VHM Spiraalboor 10xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 10xD à trou d'huile, TiAIN  
 ES Broca MD UNI 10xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 10xD mit Innenkühlung, TiAIN



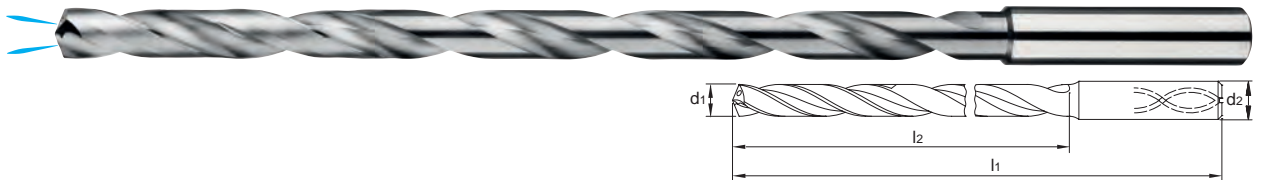
Ref.	d1	d2	l1	l2
11.305.0300	3	6	80	40
11.305.0330	3.3	6	87	47
11.305.0350	3.5	6	87	47
11.305.0400	4	6	93	53
11.305.0420	4.2	6	100	60
11.305.0450	4.5	6	100	60
11.305.0500	5	6	106	66
11.305.0550	5.5	6	113	73
11.305.0600	6	6	119	79

Ref.	d1	d2	l1	l2
11.305.0650	6.5	8	126	86
11.305.0680	6.8	8	132	92
11.305.0700	7	8	132	92
11.305.0750	7.5	8	139	99
11.305.0800	8	8	145	105
11.305.0850	8.5	10	156	112
11.305.0900	9	10	162	118
11.305.0950	9.5	10	170	123
11.305.1000	10	10	176	132

Ref.	d1	d2	l1	l2
11.305.1050	10.5	12	188	139
11.305.1100	11	12	194	145
11.305.1150	11.5	12	201	152
11.305.1200	12	12	207	158
11.305.1250	12.5	14	214	165
11.305.1300	13	14	220	171
11.305.1350	13.5	14	227	178
11.305.1400	14	14	233	184

## > 11.310 Phantom

NL UNI VHM Spiraalboor 15xD met koelkanaal, TiAIN  
 FR Foret Carbure UNI 15xD à trou d'huile, TiAIN  
 ES Broca MD UNI 15xD con canal de refrigeración, TiAIN  
 DE UNI VHM Spiralbohrer 15xD mit Innenkühlung, TiAIN



Ref.	d1	d2	l1	l2
11.310.0300	3	6	95	55
11.310.0350	3.5	6	104	64
11.310.0400	4	6	113	73
11.310.0450	4.5	6	122	82
11.310.0500	5	6	131	91
11.310.0550	5.5	6	140	100
11.310.0600	6	6	149	109
11.310.0650	6.5	8	158	118

Ref.	d1	d2	l1	l2
11.310.0700	7	8	167	127
11.310.0750	7.5	8	176	136
11.310.0800	8	8	185	145
11.310.0850	8.5	10	198	154
11.310.0900	9	10	207	163
11.310.0950	9.5	10	217	173
11.310.1000	10	10	226	182
11.310.1050	10.5	12	240	191

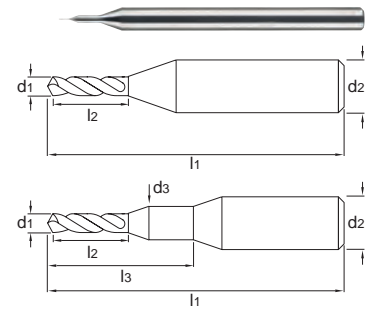
Ref.	d1	d2	l1	l2
11.310.1100	11	12	249	200
11.310.1150	11.5	12	258	209
11.310.1200	12	12	267	218
11.310.1250	12.5	14	276	227
11.310.1300	13	14	285	236
11.310.1350	13.5	14	294	245
11.310.1400	14	14	303	254





> **11.330 Phantom**

NL UNI VHM Microboor 5xD  
 FR Micro-foret Carbure UNI 5xD  
 ES Micro-Broca MD UNI 5xD  
 DE UNI VHM Kleinstbohrer 5xD



MG HM NORM 5xD h5 130° UNI

P 11 P 12 P 13 M 21 M 22 K 31 K 32 N 41 N 42 N 51 N 61 N 62 S 71 S 72

55-65 S 40-50 S 30-40 R 20-30 Q 15-25 Q 55-75 S 40-60 S 80-100 U 60-100 U 80-100 T 30-40 Q 55-60 S 12-15 P 25-40 P

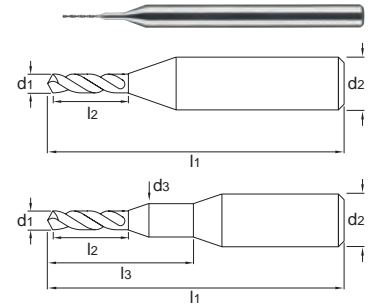
Ref.	d1	d2	d3	l1	l2	l3
11.330.0100	0.1	3	1	39	0.5	5
11.330.0150	0.15	3	1	39	0.8	5
11.330.0200	0.2	3	1	39	1	5
11.330.0250	0.25	3	1	39	1.25	5
11.330.0300	0.3	3	1	39	1.5	5
11.330.0350	0.35	3	1	39	1.75	5
11.330.0400	0.4	3	1	39	2	5
11.330.0450	0.45	3	1	39	2.25	5
11.330.0500	0.5	3	1.5	39	2.5	10
11.330.0550	0.55	3	1.5	39	3	10
11.330.0600	0.6	3	1.5	39	3	10
11.330.0650	0.65	3	1.5	39	3.5	10
11.330.0700	0.7	3	1.5	39	3.5	10

Ref.	d1	d2	d3	l1	l2	l3
11.330.0750	0.75	3	1.5	39	4	10
11.330.0800	0.8	3	1.5	39	4	10
11.330.0850	0.85	3	1.5	39	4.5	10
11.330.0900	0.9	3	1.5	39	4.5	10
11.330.1000	1	3	2	39	5	10
11.330.1100	1.1	3	2	39	5.5	10
11.330.1200	1.2	3	2	39	6	10
11.330.1300	1.3	3	2	39	6.5	10
11.330.1400	1.4	3	2	39	7	10
11.330.1500	1.5	3		39	7.5	
11.330.1600	1.6	3		39	8	
11.330.1700	1.7	3		39	8.5	
11.330.1800	1.8	3		39	9	

Ref.	d1	d2	d3	l1	l2	l3
11.330.1900	1.9	3		39	9.5	
11.330.2000	2	3		39	10	
11.330.2100	2.1	3		39	10.5	
11.330.2200	2.2	3		39	11	
11.330.2300	2.3	3		39	11.5	
11.330.2400	2.4	3		39	12	
11.330.2500	2.5	3		39	12.5	
11.330.2600	2.6	3		39	13	
11.330.2700	2.7	3		39	13.5	
11.330.2800	2.8	3		39	14	
11.330.2900	2.9	3		39	14.5	
11.330.3000	3	3		39	15	

> **11.335 Phantom**

NL UNI VHM Microboor 8xD  
 FR Micro-foret Carbure UNI 8xD  
 ES Micro-Broca MD UNI 8xD  
 DE UNI VHM Kleinstbohrer 8xD



MG HM NORM 8xD h5 130° UNI

P 11 P 12 P 13 M 21 M 22 K 31 K 32 N 41 N 42 N 51 N 61 N 62 S 71 S 72

55-65 S 40-50 S 30-40 R 20-30 Q 15-25 Q 55-75 S 40-60 S 80-100 U 60-100 U 80-100 T 30-40 Q 55-60 S 12-15 P 25-40 P

Ref.	d1	d2	d3	l1	l2	l3
11.335.0100	0.1	3	1	39	0.8	5
11.335.0150	0.15	3	1	39	1.3	5
11.335.0200	0.2	3	1	39	1.6	7
11.335.0250	0.25	3	1	39	2	7
11.335.0300	0.3	3	1	39	2.4	7
11.335.0350	0.35	3	1	39	2.8	7
11.335.0400	0.4	3	1	39	3.2	7
11.335.0450	0.45	3	1	39	3.6	7
11.335.0500	0.5	3	1.5	39	4	15
11.335.0550	0.55	3	1.5	39	4.8	15

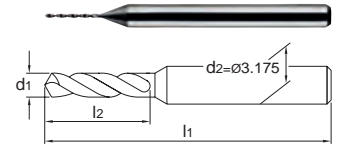
Ref.	d1	d2	d3	l1	l2	l3
11.335.0600	0.6	3	1.5	39	4.8	15
11.335.0650	0.65	3	1.5	39	5.6	15
11.335.0700	0.7	3	1.5	39	5.6	15
11.335.0750	0.75	3	1.5	39	6.4	15
11.335.0800	0.8	3	1.5	39	6.4	15
11.335.0850	0.85	3	1.5	39	7.2	15
11.335.0900	0.9	3	1.5	39	7.2	15
11.335.1000	1	3	2	39	8	15
11.335.1100	1.1	3	2	39	8.8	15
11.335.1200	1.2	3	2	39	9.6	15

Ref.	d1	d2	d3	l1	l2	l3
11.335.1300	1.3	3	2	39	10.4	15
11.335.1400	1.4	3	2	39	11.2	15
11.335.1500	1.5	3		39	12	
11.335.1600	1.6	3		39	12.8	
11.335.1700	1.7	3		39	13.6	
11.335.1800	1.8	3		39	14.4	
11.335.1900	1.9	3		39	15.2	
11.335.2000	2	3		39	16	



# > 11.360 Phantom

NL VHM Microboor  
FR Micro-foret Carbure  
ES Micro-Broca MD  
DE VHM Kleinstbohrer



<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC	<b>N 62</b> GFK/CFK	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
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45-50 E	25-50 D	25-45 D	20-40 B	10-20 B	20-25 C	20-25 B	64-80 E	50-60 E	120-150 F	60-100 F	120-150 E	40-77 D	30-36 C	55-60 D	12-15 B	25-45 D
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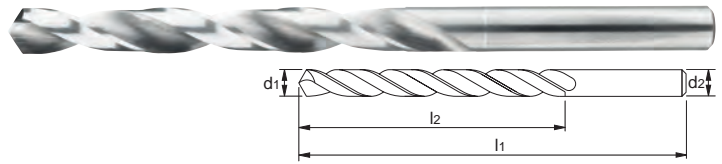
Ref.	d1	d2	l1	l2
11.360.0030	0.3	3.175	38	5.5
11.360.0040	0.4	3.175	38	5.5
11.360.0050	0.5	3.175	38	5.5
11.360.0060	0.6	3.175	38	7
11.360.0070	0.7	3.175	38	8.5
11.360.0080	0.8	3.175	38	10.5

Ref.	d1	d2	l1	l2
11.360.0090	0.9	3.175	38	10.5
11.360.0100	1	3.175	38	10.5
11.360.0110	1.1	3.175	38	10.5
11.360.0120	1.2	3.175	38	10.5
11.360.0130	1.3	3.175	38	10.5
11.360.0140	1.4	3.175	38	10.5

Ref.	d1	d2	l1	l2
11.360.0150	1.5	3.175	38	10.5
11.360.0160	1.6	3.175	38	10.5
11.360.0170	1.7	3.175	38	10.5
11.360.0180	1.8	3.175	38	10.5
11.360.0190	1.9	3.175	38	10.5
11.360.0200	2	3.175	38	10.5



> **11.650 Phantom**



NL VHM Spiraalboor  
FR Foret Carbure  
ES Broca MD  
DE VHM Spiralbohrer

MG HM DIN 338 8xD N h6 118° h7

P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 41 N 42 N 43 N 51 N 61 N 62 S 71 S 72

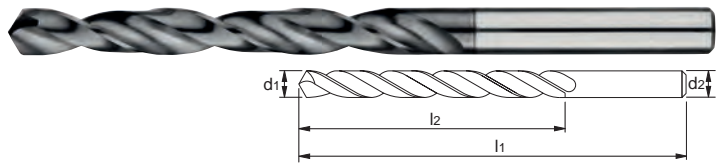
70-80 D 50-80 D 65-70 D 25-80 B 20-25 D 20-25 C 72-90 D 70-80 D 160-200 G 120-150 F 120-180 E 120-180 E 30-40 C 60-80 C 12-15 B 15-20 C

Ref.	d1	d2	l1	l2
11.650.0100	1	1	34	12
11.650.0110	1.1	1.1	36	14
11.650.0120	1.2	1.2	38	16
11.650.0130	1.3	1.3	38	16
11.650.0140	1.4	1.4	40	18
11.650.0150	1.5	1.5	40	18
11.650.0160	1.6	1.6	43	20
11.650.0170	1.7	1.7	43	20
11.650.0180	1.8	1.8	46	22
11.650.0190	1.9	1.9	46	22
11.650.0200	2	2	49	24
11.650.0210	2.1	2.1	49	24
11.650.0220	2.2	2.2	53	27
11.650.0230	2.3	2.3	53	27
11.650.0240	2.4	2.4	57	30
11.650.0250	2.5	2.5	57	30
11.650.0260	2.6	2.6	57	30
11.650.0270	2.7	2.7	61	33
11.650.0280	2.8	2.8	61	33

Ref.	d1	d2	l1	l2
11.650.0290	2.9	2.9	61	33
11.650.0300	3	3	61	33
11.650.0310	3.1	3.1	65	36
11.650.0320	3.2	3.2	65	36
11.650.0330	3.3	3.3	65	36
11.650.0340	3.4	3.4	70	39
11.650.0350	3.5	3.5	70	39
11.650.0360	3.6	3.6	70	39
11.650.0370	3.7	3.7	70	39
11.650.0380	3.8	3.8	75	43
11.650.0390	3.9	3.9	75	43
11.650.0400	4	4	75	43
11.650.0410	4.1	4.1	75	43
11.650.0420	4.2	4.2	75	43
11.650.0430	4.3	4.3	80	47
11.650.0440	4.4	4.4	80	47
11.650.0450	4.5	4.5	80	47
11.650.0460	4.6	4.6	80	47
11.650.0470	4.7	4.7	80	47

Ref.	d1	d2	l1	l2
11.650.0480	4.8	4.8	86	52
11.650.0490	4.9	4.9	86	52
11.650.0500	5	5	86	52
11.650.0550	5.5	5.5	93	57
11.650.0600	6	6	93	57
11.650.0650	6.5	6.5	101	63
11.650.0680	6.8	6.8	109	69
11.650.0700	7	7	109	69
11.650.0750	7.5	7.5	109	69
11.650.0800	8	8	117	75
11.650.0850	8.5	8.5	117	75
11.650.0900	9	9	125	81
11.650.0950	9.5	9.5	125	81
11.650.1000	10	10	133	87
11.650.1020	10.2	10.2	133	87
11.650.1050	10.5	10.5	133	87
11.650.1100	11	11	142	94
11.650.1150	11.5	11.5	142	94
11.650.1200	12	12	151	101

> **11.654 Phantom**



NL VHM Spiraalboor TiAlN  
FR Foret Carbure TiAlN  
ES Broca MD TiAlN  
DE VHM Spiralbohrer TiAlN

MG HM TiAlN DIN 338 8xD N h6 118° h7

P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 43 N 51 N 61 N 62 S 71 S 72

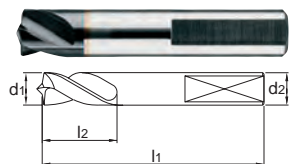
100-110 D 65-105 D 82-95 D 32-95 B 27-32 D 28-32 C 72-90 D 75-95 D 120-180 E 120-180 E 30-40 C 80-95 C 12-15 B 17-24 C

Ref.	d1	d2	l1	l2
11.654.0100	1	1	34	12
11.654.0150	1.5	1.5	40	18
11.654.0200	2	2	49	24
11.654.0250	2.5	2.5	57	30
11.654.0300	3	3	61	33
11.654.0330	3.3	3.3	65	36
11.654.0350	3.5	3.5	70	39

Ref.	d1	d2	l1	l2
11.654.0400	4	4	75	43
11.654.0420	4.2	4.2	75	43
11.654.0450	4.5	4.5	80	47
11.654.0500	5	5	86	52
11.654.0550	5.5	5.5	93	57
11.654.0600	6	6	93	57
11.654.0650	6.5	6.5	101	63

Ref.	d1	d2	l1	l2
11.654.0700	7	7	109	69
11.654.0750	7.5	7.5	109	69
11.654.0800	8	8	117	75
11.654.0850	8.5	8.5	117	75
11.654.0900	9	9	125	81
11.654.0950	9.5	9.5	125	81
11.654.1000	10	10	133	87

> **13.814 Phantom**



NL VHM Puntlasboor TiAlN, 3 snijkanten  
FR Foret à dépointer Carbure TiAlN, 3 taillants  
ES Broca para puntos de soldadura MD TiAlN, 3 labios  
DE VHM Bohrer zum Bohren von Punktschweißstellen TiAlN, 3 Schneiden

VHM SC TiAlN h6

P 11 P 12 P 13 P 14 M 21 M 22

75-85 60-70 55-65 30-40 20-35 18-30

Ref.	d1	d2	l1	l2
13.814.0645	6	6	45	15

Ref.	d1	d2	l1	l2
13.814.0845	8	8	45	15

Ref.	d1	d2	l1	l2
13.814.1045	10	10	45	15



## > 15.144 Phantom

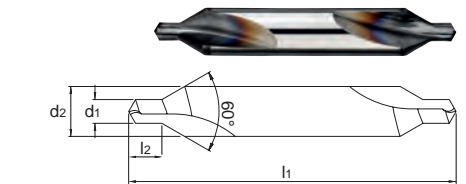
NL VHM Centerboor TiAIN, 60°  
FR Foret à centrer Carbure TiAIN, 60°  
ES Broca de centrar MD TiAIN, 60°  
DE VHM Zentrierbohrer TiAIN, 60°



100-110 D	65-105 D	82-95 D	32-95 B	10-20 C	20-45 B
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Ref.	d1	d2	l1	l2
15.144.1031	1	3.15	31.5	1,3-1,7
15.144.1231	1.25	3.15	31.5	1,6-2,0
15.144.1640	1.6	4	35.5	2,0-2,6

Ref.	d1	d2	l1	l2
15.144.2050	2	5	40	2,5-3,1
15.144.2563	2.5	6.3	45	3,1-3,8
15.144.3180	3.15	8	50	3,9-4,6



## > 15.624 Phantom

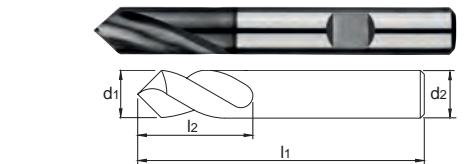
NL VHM NC-Centreerboor TiAIN, 90°  
FR Foret à pointer NC Carbure TiAIN, 90°  
ES Broca de puntear NC MD TiAIN, 90°  
DE VHM NC Anbohrer TiAIN, 90°



70-80 F	34-70 F	25-35 B	10-28 A	14-22 E	15-20 E	72-90 D	70-80 D	90-140 G	80-100 F	120-180 E	120-150 G	8-10 B	15-20 E
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Ref.	d1	d2	l1	l2
15.624.0200	2	2	40	8
15.624.0300	3	3	45	10
15.624.0400	4	4	50	12
15.624.0500	5	5	50	13

Ref.	d1	d2	l1	l2
15.624.0600	6	6	50	13
15.624.0800	8	8	60	23
15.624.1000	10	10	70	24
15.624.1200	12	12	70	24



## > 15.724 Phantom

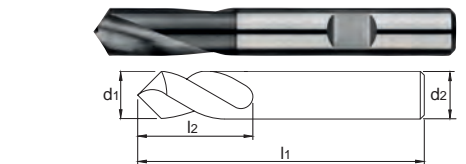
NL VHM NC-Centreerboor TiAIN, 120°  
FR Foret à pointer NC Carbure TiAIN, 120°  
ES Broca de puntear NC MD TiAIN, 120°  
DE VHM NC Anbohrer TiAIN, 120°



70-80 F	34-70 F	25-35 B	10-28 A	14-22 E	15-20 E	72-90 D	70-80 D	90-140 G	80-100 F	120-180 E	120-150 G	8-10 B	15-20 E
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Ref.	d1	d2	l1	l2
15.724.0200	2	2	32	8
15.724.0300	3	3	32	8
15.724.0400	4	4	40	10
15.724.0500	5	5	50	13

Ref.	d1	d2	l1	l2
15.724.0600	6	6	50	13
15.724.0800	8	8	60	23
15.724.1000	10	10	70	24
15.724.1200	12	12	70	24



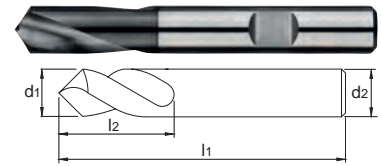
Ref.	d1	d2	l1	l2
15.724.1600	16	16	75	29
15.724.2000	20	20	100	35





> **15.764 Phantom**

NL VHM NC-Centreerboor TiAlN, 142°  
 FR Foret à pointer NC Carbure TiAlN, 142°  
 ES Broca de puntear NC MD TiAlN, 142°  
 DE VHM NC Anbohrer TiAlN, 142°



MG HM TiAlN 142° h6 DIN 6535-HB

P 12 P 13 P 14 H 15 M 21 M 22 K 31 K 32 N 42 N 43 N 51 N 61 S 71 S 72

70-80 F 34-70 F 25-35 B 10-28 A 14-22 E 15-20 E 72-90 D 70-80 D 90-140 G 80-100 F 120-180 E 120-150 G 8-10 B 15-20 E

Ref.	d1	d2	l1	l2
15.764.0300	3	3	45	10
15.764.0400	4	4	50	12
15.764.0500	5	5	50	15

Ref.	d1	d2	l1	l2
15.764.0600	6	6	50	18
15.764.0800	8	8	60	18
15.764.1000	10	10	70	23

Ref.	d1	d2	l1	l2
15.764.1200	12	12	70	24
15.764.1600	16	16	80	26



NL Voedingswaardentabel  
FR Tableau des avances  
ES Tabla de avances  
DE Vorschubtabelle

**P 11** = ISO  
500 N/mm<sup>2</sup>  
25-35 Vc = 25-35  
E FRC = E

FRC																		
	A	B	C	D	E	F	G	H	I	J	K	L	P	Q	R	S	T	U
d1(mm)	f (mm/n)																	
0,1																		
0,3	0,002	0,003	0,003	0,004	0,010	0,010	0,010	0,010	0,010				0,0022	0,0025	0,003	0,004	0,006	0,007
0,5	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019				0,0040	0,0045	0,005	0,007	0,010	0,013
0,8	0,005	0,007	0,008	0,009	0,012	0,014	0,016	0,018	0,023				0,0100	0,0110	0,013	0,017	0,026	0,030
1	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025				0,0135	0,0150	0,018	0,023	0,036	0,045
1,5	0,012	0,014	0,016	0,018	0,020	0,023	0,025	0,032	0,040				0,0200	0,0240	0,028	0,035	0,056	0,070
2	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125				0,0250	0,030	0,035	0,044	0,070	0,085
3	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160				0,0400	0,0450	0,055	0,069	0,10	0,130
4	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200									
5	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,250	0,250	0,300						
6	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,300	0,300	0,360						
8	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	0,400	0,400	0,480						
10	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	0,500	0,500	0,600						
12	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	0,540	0,600	0,720						
14	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	0,700	0,840						
16	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,640	0,720	0,840						
18	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630									
20	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630									

NL Toerentabel  
FR Tableau des vitesses de rotation  
ES Tabla de número de revoluciones  
DE Drehzahltable

$$n = \frac{Vc \times 1000}{3,14 \times d1} \quad Vc = \frac{n \times 3,14 \times d1}{1000}$$

Vc (m/min)																		
	5	8	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120
d1 (mm)	n = rpm																	
1	1592	2546	3183	3820	4775	6366	7958	9549	11141	12732	15915	19099	22282	25465	28648	31831	35014	38197
1,5	1061	1698	2122	2546	3183	4244	5305	6366	7427	8588	10610	12732	14854	16977	19099	21221	23343	25465
2	796	1273	1592	1910	2387	3183	3937	4775	5570	6366	7958	9549	11141	12732	14324	15915	17507	19099
2,5	637	1019	1273	1528	1910	2546	3183	3820	4456	5093	6366	7639	8913	10186	11459	12732	14006	15279
3	531	849	1061	1273	1592	2122	2653	3183	2714	4244	5305	6366	7427	8488	9549	10610	11671	12732
3,5	455	728	909	1091	1364	1819	2274	2728	3183	3638	4547	5457	6366	7276	8185	9095	10004	10913
4	398	637	796	955	1194	1592	1989	2387	2785	3183	3979	4775	5570	6366	7162	7958	8754	9549
4,5	354	566	707	849	1061	1415	1768	2122	2476	2829	3537	4244	4951	5659	6366	7074	7781	8488
5	318	509	637	764	955	1273	1592	1910	2228	2546	3183	3820	4456	5093	5730	6366	7003	7639
5,5	289	463	579	694	868	1157	1447	1739	2026	2315	2894	3472	4051	4630	5209	5787	6366	6945
6	265	424	531	637	796	1061	1326	1592	1857	2122	2653	3183	3714	4244	4775	5305	5836	6366
7	227	364	455	546	682	909	1137	1364	1592	1819	2274	2728	3183	3638	4093	4547	5002	5457
8	199	318	398	477	597	796	995	1194	1393	1592	1989	2387	2785	3183	3581	3979	4377	4775
9	177	283	354	424	531	707	884	1061	1238	1415	1768	2122	2476	2829	3183	3537	3890	4244
10	159	255	318	382	477	637	796	955	1114	1273	1592	1910	2228	2546	2865	3183	3501	3820
11	145	321	289	347	434	579	723	868	1013	1157	1447	1736	2026	2315	2604	2894	3183	3472
12	133	212	265	318	398	531	663	796	928	1061	1326	1592	1857	2122	2387	2653	2918	3183
13	122	196	245	294	367	490	612	735	857	979	1224	1469	1714	1959	2204	2449	2693	2938
14	114	182	227	273	341	455	568	682	796	909	1137	1364	1592	1819	2046	2274	2501	2728
15	106	170	212	255	318	424	531	637	743	849	1061	1273	1485	1698	1910	2122	2334	2546
16	99	159	199	239	298	398	497	597	696	796	995	1194	1393	1592	1790	1989	2188	2387
18	88	141	177	212	265	354	442	531	619	707	884	1061	1238	1415	1592	1768	1945	2122
20	80	127	159	191	239	318	398	477	557	637	796	955	1114	1273	1432	1592	1751	1910

**FRC**  
NL: Voedingscode  
FR: Codification vitesse d'avance  
ES: Codificación de velocidad de avance  
DE: Vorschubgeschwindigkeit Codierung

**f (mm/n)**  
NL: Voeding per omwenteling (mm/n)  
FR: Avance par tour (mm/tr)  
ES: Avance por revolucion (mm/r)  
DE: Vorschub pro Umdrehung (mm/U)

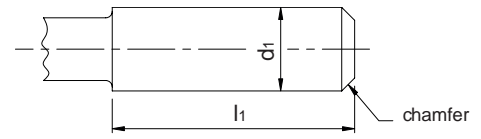
**Vc**  
NL: Snijsnelheid (m/min)  
FR: Vitesse de coupe (m/min)  
ES: Velocidad de corte (m/min)  
DE: Schnittgeschwindigkeit (m/min)

**n=rpm**  
NL: Spiltoerental (omw/min)  
FR: Vitesse de broche (tr/min)  
ES: Velocidad del husillo (rpm)  
DE: Spindeldrehzahl (U/min)



**DIN 6535 HA**

NL Cilindrische schacht  
 FR Queue cylindrique  
 ES Mango cilíndrico  
 DE Zylinderschaft



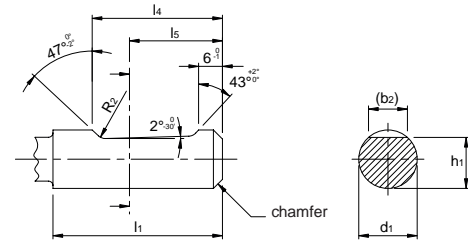
Dimensions in mm	
$d_1$	$l_1$ +2
h6	0
3	28
4	28
5	28
6	36
8	36

Dimensions in mm	
$d_1$	$l_1$ +2
h6	0
10	40
12	45
16	48
20	50
25	56

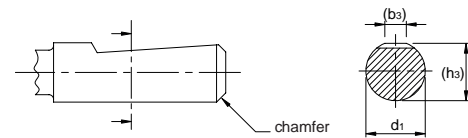
Dimensions in mm	
$d_1$	$l_1$ +2
h6	0
32	60
40	70
50	80
63	90

**DIN 6535 HE**

NL Cilindrische schacht "Whistle-Notch"  
 FR Queue cylindrique "Whistle-Notch"  
 ES Mango cilíndrico "Whistle-Notch"  
 DE Zylinderschaft "Whistle-Notch"



$d_1 = 6 \text{ to } 20 \text{ mm}$								
$d_1$	$(b_2)$	$(b_3)$	$h_2$	$(h_3)$	$l_1$ +2 0	$l_4$ 0 -1	$l_5$ nom. size	$r_2$ min.
h6	≈	-	h11	-	0	-1	nom. size	min.
6	4.3	-	5.1	-	36	25	18	1.2
8	5.5	-	6.9	-	36	25	18	1.2
10	7.1	-	8.5	-	40	28	20	1.2
12	8.2	-	10.4	-	45	33	22.5	1.2
14	8.1	-	12.7	-	45	33	22.5	1.2
16	10.1	-	14.2	-	48	36	24	1.6
18	10.8	-	16.2	-	48	36	24	1.6
20	11.4	-	18.2	-	50	38	25	1.6



$d_1 = 25 \text{ to } 32 \text{ mm}$								
$d_1$	$(b_2)$	$(b_3)$	$h_2$	$(h_3)$	$l_1$ +2 0	$l_4$ 0 -1	$l_5$ nom. size	$r_2$ min.
h6	≈	-	h11	-	0	-1	nom. size	min.
25	13.6	9.3	23.0	24.1	56	44	32	1.6
32	15.5	9.9	30.0	31.2	60	48	35	1.6





NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



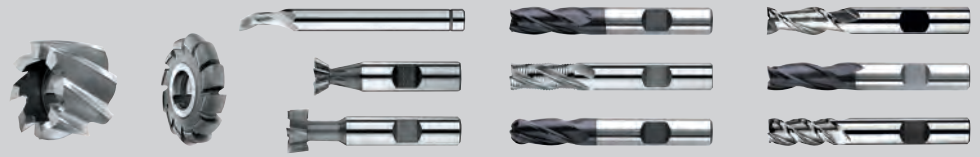
NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



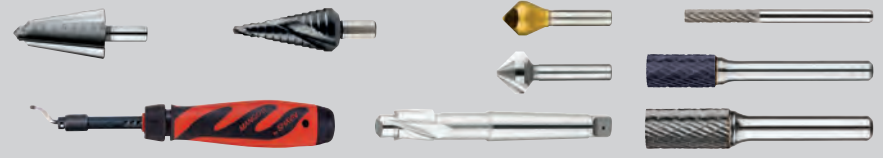
NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



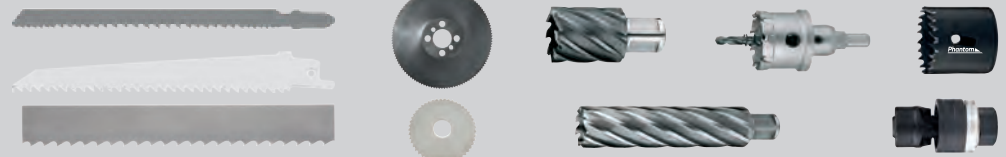
NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



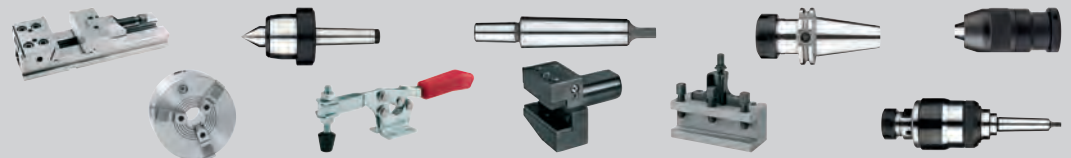
NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



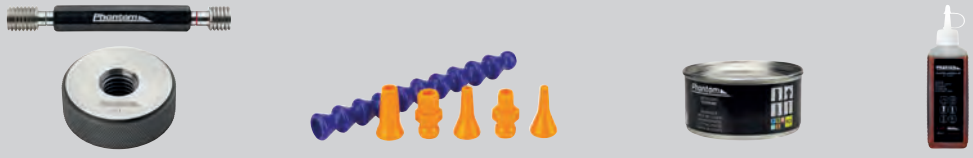
NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge











NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig



## ICONEN    ICONES    ICONOS    PIKTOGRAMME

	NL	FR	ES	DE
<b>VHM SC</b>	Volhardmetaal	Carbure Monobloc	Metal Duro integral	Vollhartmetall
<b>MG HM</b>	Micro-Grain volhardmetaal	Carbure Micrograin	Metal Duro Micro-Grano	Micro-Grain Vollhartmetall
<b>TiAIN</b>	TiAN gecoat	Revêtement TiAIN	Recubrimiento TiAIN	TiAIN Beschichtung
<b>AlCrN-X</b>	AlCrN-X gecoat	Revêtement AlCrN-X	Recubrimiento AlCrN-X	AlCrN-X Beschichtung
<b>DLC</b>	DLC gecoat	Revêtement DLC	Recubrimiento DLC	DLC Beschichtung
<b>DIN 6537-K</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
<b>3xD</b>	Max. boordiepte	Profondeur max. de perçage	Profundidad máx. de perforacion	Max. Bohrtiefe
<b>N</b>	Type N, standaard spiraaluitvoering	Type N, hélice standard	Tipo N, Versión helicoidal estándar	Type N, standard Spiralwinkel
<b>h6</b>	Cilindrische schacht h6	Queue cylindrique h6	Mango cilíndrico h6	Zylinderschaft h6
<b>DIN 6535-HA</b>	Cilindrische schacht	Queue cylindrique	Mango cilíndrico	Zylinderschaft
<b>DIN 6535-HB</b>	Cilindrische schacht met Weldon vlak	Queue cylindrique avec méplat type Weldon	Mango cilíndrico con plano de arrastre tipo Weldon	Zylinderschaft mit Mitnahmefläche Typ Weldon
<b>DIN 6535-HE</b>	Cilindrische schacht met Whistle-Notch	Queue cylindrique avec Whistle-Notch	Mango cilíndrico con Whistle-Notch	Zylinderschaft mit Whistle-Notch
	Meervlaks-kruis-aanslijping	Affûtage multi-pentes	Afilado multi-facetado	Mehrfachs-Kreuzanschliff

	NL	FR	ES	DE
	Phantom VHM-aanslijping	Affûtage Carbure Phantom	Afilado metal duro Phantom	Phantom VHM-Anschliff
	Boor met 3 snijkanten	Foret à 3 lèvres	Broca con 3 facetas	Bohrer mit 3 Schneiden
	Koelkanaal	A trous d'huile	Canal de refrigeración	Mit Kühlkanal
	Tophoek	Angle au sommet	Ángulo de la punta	Spitzenwinkel
	Boortolerantie	Tolérance du perçage	Tolerancia de taladrar	Bohrtoleranz
<b>INOX</b>	T.b.v. roestvaststaal	Pour Inox	Para acero inoxidable	Für Rostfreier Stahl
<b>ALU</b>	T.b.v. aluminium	Pour aluminium	Para aluminio	Für Aluminium
<b>UNI</b>	Universeel	Universel	Universal	Universal
<b>HF</b>	Hoge voeding	Grande Avance	Alto avance	Hohe Ernährung
	Uitvoering centreergat	Angle de lamage	Versión ángulo avellanado	Ausführung Zentrierloch
	Centreerhoek	Point de centrage	Ángulo de centrar	Zentrierspitze
	NC-Centreerboor 142°	Foret à pointer NC 142°	Broca de puntear NC 142°	NC Anbohr 142°
<b>-0,000 +0,005</b>	Tolerantie 0,005 mm	Tolérance 0,005 mm	Tolerancia 0,005 mm	Toleranz 0,005 mm

NL HSS en HSS-E Boren  
FR Forets HSS et HSS-E  
ES Brocas HSS y HSS-E  
DE HSS Bohrer und HSS-E Bohrer

**P** **K** Bij uitstek geschikt  
Très approprié  
**H** **N** Muy adecuado  
**M** **S** Ideal geeignet

**P** **K** Bepoort geschikt  
Approprié  
**H** **N** Adecuado  
**M** **S** Eingeschränkt geeignet

P = pagina  
P = page  
P = página  
P = Seite

> 11.100	INTERNATIONAL TOOLS	HSS	DIN 1897	ECO	P		K				P. 7
> 11.110	INTERNATIONAL TOOLS	HSS	DIN 1897	ECO	P	M	K	N			P. 7
> 11.130	Phantom	HSS	DIN 1897		P	M	K	N			P. 7
> 11.145	Phantom	HSS	NORM		P	M	K	N			P. 8
> 11.150	INTERNATIONAL TOOLS	+6.6 (	DIN 1897	ECO PRO	P	M	K	N			P. 8
> 11.160	Phantom	+6.6 (	DIN 1897		P	M	K	N			P. 9
> 11.161	Phantom	+6.6 (	DIN 1897		P	M	K	N			P. 9
> 11.167	Phantom	+6.6 (	DIN 1897	INOX	P	M	K	N	S		P. 10
> 11.168	Phantom	+6.6 (	DIN 1897	HP2 UNI	P	M	K	N			P. 10
> 11.174	Phantom	+6.6 (	DIN 1897		P	M	K				P. 11
> 11.340	Phantom	HSS-E PM	DIN 1899 A		P	M	K	N			P. 11
> 11.400	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P		K				P. 12
> 11.410	INTERNATIONAL TOOLS	HSS	Ø10	ECO	P		K				P. 12
> 11.413	INTERNATIONAL TOOLS	HSS	Ø13	ECO	P		K				P. 13
> 11.415	INTERNATIONAL TOOLS	+6.6 (	Ø13	ECO PRO	P	M	K	N			P. 13
> 11.416	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P		K	N			P. 13
> 11.420	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P		K	N			P. 14
> 11.423	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P		K	N			NEW P. 15
> 11.426	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P		K	N			P. 15
> 11.430	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P		K	N			P. 16
> 11.431	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P	M	K	N			P. 17
> 11.440	Phantom	HSS			P	M	K	N			NEW P. 17
> 11.441	Phantom	HSS			P	M	K	N			NEW P. 18
> 11.443	Phantom	HSS			P	M	K	N			NEW P. 18
> 11.445	Phantom	+6.6 (			P	M	K	N			NEW P. 19
> 11.446	Phantom	+6.6 (			P	M	K	N			NEW P. 19
> 11.450	Phantom	HSS	DIN 338		P	M	K	N			P. 20
> 11.451	Phantom	HSS	DIN 338		P	M	K	N			P. 21
> 11.461	Phantom	HSS	DIN 338		P	M	K	N			P. 22
> 11.490	INTERNATIONAL TOOLS	+6.6 (	DIN 338	ECO PRO	P	M	K	N			P. 22
> 11.500	Phantom	+6.6 (	DIN 338		P	M	K	N			P. 23
> 11.501	Phantom	+6.6 (	DIN 338		P	M	K	N			P. 24
> 11.506	Phantom	+6.6 (	DIN 338		P	M	K	N			NEW P. 24
> 11.510	Phantom	HSS-E 8%	DIN 338		P	M	K	N	S		P. 25



> 11.568	<b>Phantom</b>	+6.6 (	DIN 338	HP2 UNI	P M K N		P. 25
> 11.600	<b>Phantom</b>	HM-TIP	DIN 338		P M K N S H		P. 26
> 11.700	<b>Phantom</b>	HSS	DIN 338	H	N		P. 27
> 11.710	<b>Phantom</b>	HSS	DIN 338	ALU	N		P. 27
> 11.760	<b>Phantom</b>	+6.6 (	DIN 338	INOX	P M S		P. 28
> 11.764	<b>Phantom</b>	+6.6 (	DIN 338	INOX	P M S		P. 29
> 11.770	<b>Phantom</b>	+6.6 (	DIN 338	TS	P M K N		P. 30
> 11.774	<b>Phantom</b>	+6.6 (	DIN 338	TS	P M K N		P. 30
> 11.810	INTERNATIONAL TOOLS	HSS	DIN 340	ECO	P K		P. 31
> 11.813	INTERNATIONAL TOOLS	HSS	DIN 340	ECO PRO	P K N		<b>NEW</b> P. 31
> 11.815	<b>Phantom</b>	HSS	DIN 340		P M K N		P. 32
> 11.820	<b>Phantom</b>	+6.6 (	DIN 340	INOX	P M S		P. 32
> 11.840	<b>Phantom</b>	HM-TIP	DIN 340		P M K N S H		P. 33
> 11.850	<b>Phantom</b>	HSS	DIN 340	TS	P N		P. 33
> 11.860	<b>Phantom</b>	HSS	DIN 340	TS	P K N		P. 33
> 11.870	<b>Phantom</b>	+6.6 (	DIN 340	TS	P M K N		P. 34
> 11.874	<b>Phantom</b>	+6.6 (	DIN 340	TS	P M K N		P. 34
> 11.890	<b>Phantom</b>	HSS			P M K N		P. 35
> 11.900	<b>Phantom</b>	HSS	DIN 1869		P K N		P. 35
> 11.920	<b>Phantom</b>	HSS	DIN 1869	TS	P K N		P. 36
> 11.940	<b>Phantom</b>	+6.6 (	DIN 1869	TS	P M K N		<b>NEW</b> P. 36
> 12.150	<b>Phantom</b>	HSS-E 8%		DIN 228-B	P		P. 37
> 12.400	INTERNATIONAL TOOLS	HSS	DIN 345	DIN 228-B	P K		P. 37
> 12.420	INTERNATIONAL TOOLS	HSS		DIN 228-B	P K		P. 38
> 12.440	<b>Phantom</b>	HSS	DIN 345	DIN 228-B	P M K N		P. 38
> 12.480	<b>Phantom</b>	HSS	DIN 346	DIN 228-B	P M K N		P. 39
> 12.500	<b>Phantom</b>	+6.6 (	DIN 345	DIN 228-B	P M K N		P. 39
> 12.520	<b>Phantom</b>	+6.6 (	DIN 345	DIN 228-B	P M K N		P. 40
> 12.600	<b>Phantom</b>	HM-TIP	DIN 345	DIN 228-B	P M K N S H		P. 40
> 12.800	<b>Phantom</b>	HSS	DIN 341	DIN 228-B	P M K N		P. 40
> 12.840	<b>Phantom</b>	HSS		DIN 228-B	P M K N		P. 41
> 12.860	<b>Phantom</b>	HSS		DIN 228-B	P M K N		P. 41
> 12.900	<b>Phantom</b>	HSS	DIN 1870	DIN 228-B	P M K N		P. 42
> 12.910	<b>Phantom</b>	HSS	DIN 1870	DIN 228-B	P M K N		P. 42
> 12.920	<b>Phantom</b>	+6.6 (	DIN 1870	DIN 228-B	P M N		P. 43
> 13.200	<b>Phantom</b>	HSS	DIN 1898 A	1:50	P		P. 43





































> 13.300	<b>Phantom</b>	HSS	DIN 344		<b>P</b> <b>M</b> <b>N</b>		P. 43
> 13.320	<b>Phantom</b>	HSS	DIN 343		<b>P</b> <b>M</b> <b>N</b>		P. 44
> 13.350	<b>Phantom</b>	HSS	DIN 222		<b>P</b> <b>M</b> <b>N</b>		P. 45
> 84.410	<b>Phantom</b>		DIN 217				P. 45
> 13.603	<b>Phantom</b>	CV			<b>B</b>		P. 46
> 13.606	<b>Phantom</b>	CV			90°		P. 46
> 13.610	<b>Phantom</b>	CV			1/4"		P. 46
> 13.615	<b>Phantom</b>				1/4"		P. 46
> 13.640	<b>Phantom</b>	CV					P. 47
> 13.650	<b>Phantom</b>	CV					P. 47
> 13.680	<b>Phantom</b>	HM			PU		P. 47
> 13.700	<b>Phantom</b>	HM	DIN 8039		PU		P. 48
> 13.710	<b>Phantom</b>	HM			PU		P. 48
> 13.720	<b>Phantom</b>	HM			PU		P. 48
> 13.730	<b>Phantom</b>	HM			PU		P. 49
> 13.740	<b>Phantom</b>	HM	Z=2		SS plus		P. 49
> 13.744	<b>Phantom</b>	HM	Z=4		SS plus		P. 49
> 13.750	<b>Phantom</b>	HM			SS plus		P. 50
> 13.765	<b>Phantom</b>	HM			SS plus		P. 50
> 13.766	<b>Phantom</b>	HM					P. 50
> 13.770	<b>Phantom</b>				SS plus		P. 51
> 13.775	<b>Phantom</b>				SS plus		P. 51
> 13.790	<b>Phantom</b>	HM			1/4"		P. 52
> 13.800	<b>Phantom</b>		+6 6 (				P. 52
> 13.801	<b>Phantom</b>		+6 6 (				P. 52
> 15.095	<b>INTERNATIONAL TOOLS</b>	HSS	DIN 333-A		60° <b>P</b> <b>K</b> <b>N</b>		P. 53
> 15.096	<b>INTERNATIONAL TOOLS</b>	HSS	DIN 333-A		60° <b>P</b> <b>K</b> <b>N</b>		P. 53
> 15.100	<b>Phantom</b>	HSS	DIN 333-A		60° <b>P</b> <b>K</b> <b>N</b>		P. 53
> 15.120	<b>Phantom</b>		+6 6 (	DIN 333-A	60° <b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 54
> 15.124	<b>Phantom</b>		+6 6 (	DIN 333-A	60° <b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 54
> 15.150	<b>Phantom</b>		+6 6 (	NORM	60° <b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 54
> 15.200	<b>Phantom</b>	HSS	DIN 333-W		60° <b>P</b> <b>K</b> <b>N</b>		P. 55
> 15.250	<b>Phantom</b>	HSS	DIN 333-R		60° <b>P</b> <b>K</b> <b>N</b>		P. 55
> 15.380	<b>Phantom</b>	HSS	DIN 333-B		60°/120° <b>P</b> <b>K</b> <b>N</b>		P. 56





> 15.500	<b>Phantom</b>	HSS	NORM	90°	P	K	N		P. 56	
> 15.600	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 56
> 15.604	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 57
> 15.606	<b>Phantom</b>	HSS-E 8%		90°	P	M	K	N		P. 57
> 15.611	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 57
> 15.640	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 58
> 15.644	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 58
> 15.650	<b>Phantom</b>	+6.6 (	DIN 228-B	90°	P	M	K	N		P. 58
> 15.700	<b>Phantom</b>	+6.6 (		120°	P	M	K	N		P. 59
> 15.704	<b>Phantom</b>	+6.6 (		120°	P	M	K	N		P. 59
> 15.740	<b>Phantom</b>	+6.6 (		120°	P	M	K	N		P. 59
> 15.744	<b>Phantom</b>	+6.6 (		120°	P	M	K	N		P. 60
> 15.751	<b>Phantom</b>	+6.6 (		142°	P	M	K	N		P. 60
> 15.820	<b>Phantom</b>	+6.6 (	DIN 332-2	60°	P	M	K	N		P. 60
> 15.840	<b>Phantom</b>	+6.6 (	DIN 332-2	60°	P	M	K	N		P. 61
> 15.880	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 61
> 16.100	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 62
> 16.104	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 62
> 16.120	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 62
> 16.124	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 63
> 16.200	<b>Phantom</b>	HSS		90°	P	M	K	N		P. 63
> 16.220	<b>Phantom</b>	HSS	DIN 8374	90°	P	M	K	N		P. 63
> 16.250	<b>Phantom</b>	HSS	DIN 8378	90°	P	M	K	N		P. 63
> 16.300	<b>Phantom</b>	HSS	DIN 8375	90°	P	M	K	N		P. 64
> 16.350	<b>Phantom</b>	HSS	DIN 8379	90°	P	M	K	N		P. 64
> 16.500	<b>Phantom</b>	+6.6 (		180°	P	M	K	N		P. 64
> 16.504	<b>Phantom</b>	+6.6 (		180°	P	M	K	N		P. 64
> 16.600	<b>Phantom</b>	HSS	DIN 8376	180°	P	M	K	N		P. 65
> 16.700	<b>Phantom</b>	HSS	DIN 8377	180°	P	M	K	N		P. 65
> 16.730	<b>Phantom</b>	HSS		180°	P	M	K	N		P. 65
> 19.100	<b>Phantom</b>								P. 66	
> 19.105	<b>Phantom</b>								P. 66	
> 19.113	<b>Phantom</b>	HSS	DIN 1897		P	M	K	N		P. 66

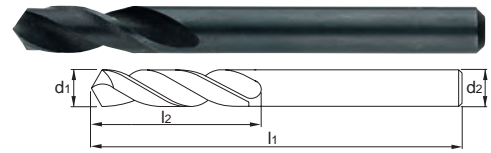
> 19.116	<b>Phantom</b>	+6.6 (	DIN 1897	P M K N		 P. 67
> 19.120	INTERNATIONAL TOOLS	HSS	DIN 338	ECO P K N		  P. 68
> 19.124	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO P K N		  P. 68
> 19.127	INTERNATIONAL TOOLS	HSS	DIN 338	ECO P K N		 <b>NEW</b> P. 68
> 19.130	INTERNATIONAL TOOLS	HSS	DIN 338	ECO P K N		  P. 69
> 19.134	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO P K N		 P. 69
> 19.136	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO P M K N		 P. 70
> 19.137	<b>Phantom</b>	HSS		P M K N		 <b>NEW</b> P. 70
> 19.138	<b>Phantom</b>	HSS	 	P M K N		 <b>NEW</b> P. 71
> 19.139	<b>Phantom</b>	HSS	  	P M K N		 <b>NEW</b> P. 71
> 19.140	<b>Phantom</b>	+6.6 (		P M K N		 <b>NEW</b> P. 71
> 19.141	<b>Phantom</b>	+6.6 (	 	P M K N		 <b>NEW</b> P. 72
> 19.144	INTERNATIONAL TOOLS	HSS	DIN 338	ECO P K		 P. 72
> 19.145	<b>Phantom</b>	HSS	DIN 338	P M K N		 P. 72
> 19.146	<b>Phantom</b>	HSS	DIN 338	P M K N		 P. 73
> 19.147	<b>Phantom</b>	HSS	DIN 338	 P M K N		 P. 73
> 19.149	INTERNATIONAL TOOLS	+6.6 (	DIN 338	ECO PRO P M K N		 P. 74
> 19.150	<b>Phantom</b>	+6.6 (	DIN 338	P M K N		 P. 74
> 19.152	<b>Phantom</b>	+6.6 (	DIN 338	 P M K N		 <b>NEW</b> P. 75
> 19.154	<b>Phantom</b>	HSS-E 8%	DIN 338	P M K N S		 <b>NEW</b> P. 75



> 19.156	<b>Phantom</b>	+6.6 (	DIN 338	HP2 UNI	P M K N			P. 76
> 19.160	<b>Phantom</b>	HM-TIP	DIN 338		P M K N S H			P. 76
> 19.171	<b>Phantom</b>	HSS	DIN 338	ALU	N			P. 76
> 19.176	<b>Phantom</b>	+6.6 (	DIN 338	INOX	P M S			P. 77
> 19.370	<b>Phantom</b>	HM	DIN 8039	PU				P. 77
> 19.372	<b>Phantom</b>	HM		PU				P. 78
> 19.374	<b>Phantom</b>	HM	Z=2	SOS plus				P. 78
> 19.377	<b>Phantom</b>			SOS plus				P. 78
> 19.540	<b>Phantom</b>	HSS	DIN 333-A	60°	P K N			P. 79
> 19.910	<b>Phantom</b>	HSS	DIN 338	60°	P M K N			P. 80
> 19.914	<b>Phantom</b>	HSS	DIN 338	60°	P M K N			P. 80
> 19.951	<b>Phantom</b>	HSS		60°	P K N			P. 80
> 19.956	<b>Phantom</b>	+6.6 (		90°	P M K N			P. 81
> 19.957	<b>Phantom</b>	+6.6 (		120°	P M K N			P. 81

**> 11.100 INTERNATIONAL TOOLS**

NL ECO HSS Spiraalboor gewalst  
FR Foret HSS ECO laminé  
ES Broca HSS ECO laminada  
DE ECO HSS Spiralbohrer Gewalzt



HSS DIN 1897 N ECO

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW

20-25 D 20-25 E 15-20 D 15-20 E 25-30 E

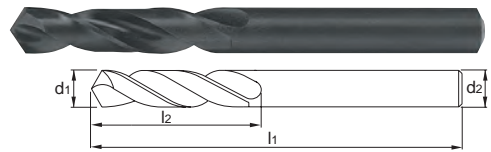
Ref.	d1	d2	l1	l2
11.100.0320	3.2	3.2	49	18
11.100.0330	3.3	3.3	49	18

Ref.	d1	d2	l1	l2
11.100.0400	4	4	55	22
11.100.0420	4.2	4.2	55	22

Ref.	d1	d2	l1	l2
11.100.0500	5	5	62	26
11.100.0600	6	6	66	28

**> 11.110 INTERNATIONAL TOOLS**

NL ECO HSS Spiraalboor  
FR Foret HSS ECO  
ES Broca HSS ECO  
DE ECO HSS Spiralbohrer



HSS DIN 1897 N ECO

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> M 21 INOX ≤850 N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW N 42 Alu Si>10% N 51 Cu N 61 PVC

25-27 F 22-30 F 15-20 E 8-12 D 15-20 E 25-30 E 45-50 G 25-40 D 22-28 D

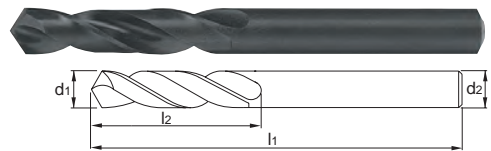
Ref.	d1	d2	l1	l2
11.110.0100	1	1	26	6
11.110.0150	1.5	1.5	32	9
11.110.0200	2	2	38	12
11.110.0250	2.5	2.5	43	14
11.110.0300	3	3	46	16
11.110.0320	3.2	3.2	49	18
11.110.0330	3.3	3.3	49	18
11.110.0350	3.5	3.5	52	20
11.110.0400	4	4	55	22
11.110.0410	4.1	4.1	55	22
11.110.0420	4.2	4.2	55	22

Ref.	d1	d2	l1	l2
11.110.0450	4.5	4.5	58	24
11.110.0490	4.9	4.9	62	26
11.110.0500	5	5	62	26
11.110.0510	5.1	5.1	62	26
11.110.0520	5.2	5.2	62	26
11.110.0550	5.5	5.5	66	28
11.110.0580	5.8	5.8	66	28
11.110.0600	6	6	66	28
11.110.0650	6.5	6.5	70	31
11.110.0700	7	7	74	34
11.110.0750	7.5	7.5	74	34

Ref.	d1	d2	l1	l2
11.110.0800	8	8	79	37
11.110.0850	8.5	8.5	79	37
11.110.0900	9	9	84	40
11.110.0950	9.5	9.5	84	40
11.110.1000	10	10	89	43
11.110.1050	10.5	10.5	89	43
11.110.1100	11	11	95	47
11.110.1150	11.5	11.5	95	47
11.110.1200	12	12	102	51
11.110.1250	12.5	12.5	102	51
11.110.1300	13	13	102	51

**> 11.130 Phantom**

NL HSS Spiraalboor  
FR Foret HSS  
ES Broca HSS  
DE HSS Spiralbohrer



HSS OX. DIN 1897 N

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> M 21 INOX ≤850 N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW N 42 Alu Si>10% N 51 Cu N 61 PVC

25-27 F 22-30 F 15-20 E 8-12 D 15-20 E 25-30 E 45-50 G 25-40 D 22-28 D

Ref.	d1	d2	l1	l2
11.130.0100	1	1	26	6
11.130.0110	1.1	1.1	28	7
11.130.0120	1.2	1.2	30	8
11.130.0130	1.3	1.3	30	8
11.130.0140	1.4	1.4	32	9
11.130.0150	1.5	1.5	32	9
11.130.0160	1.6	1.6	34	10
11.130.0170	1.7	1.7	34	10
11.130.0180	1.8	1.8	36	11
11.130.0190	1.9	1.9	36	11
11.130.0200	2	2	38	12
11.130.0210	2.1	2.1	38	12
11.130.0220	2.2	2.2	40	13
11.130.0230	2.3	2.3	40	13
11.130.0240	2.4	2.4	43	14
11.130.0250	2.5	2.5	43	14
11.130.0260	2.6	2.6	43	14
11.130.0270	2.7	2.7	46	16
11.130.0280	2.8	2.8	46	16

Ref.	d1	d2	l1	l2
11.130.0290	2.9	2.9	46	16
11.130.0300	3	3	46	16
11.130.0310	3.1	3.1	49	18
11.130.0320	3.2	3.2	49	18
11.130.0330	3.3	3.3	49	18
11.130.0340	3.4	3.4	52	20
11.130.0350	3.5	3.5	52	20
11.130.0360	3.6	3.6	52	20
11.130.0370	3.7	3.7	52	20
11.130.0380	3.8	3.8	55	22
11.130.0390	3.9	3.9	55	22
11.130.0400	4	4	55	22
11.130.0410	4.1	4.1	55	22
11.130.0420	4.2	4.2	55	22
11.130.0430	4.3	4.3	58	24
11.130.0440	4.4	4.4	58	24
11.130.0450	4.5	4.5	58	24
11.130.0460	4.6	4.6	58	24
11.130.0470	4.7	4.7	58	24

Ref.	d1	d2	l1	l2
11.130.0480	4.8	4.8	62	26
11.130.0490	4.9	4.9	62	26
11.130.0500	5	5	62	26
11.130.0510	5.1	5.1	62	26
11.130.0520	5.2	5.2	62	26
11.130.0530	5.3	5.3	62	26
11.130.0540	5.4	5.4	66	28
11.130.0550	5.5	5.5	66	28
11.130.0560	5.6	5.6	66	28
11.130.0570	5.7	5.7	66	28
11.130.0580	5.8	5.8	66	28
11.130.0590	5.9	5.9	66	28
11.130.0600	6	6	66	28
11.130.0610	6.1	6.1	70	31
11.130.0620	6.2	6.2	70	31
11.130.0630	6.3	6.3	70	31
11.130.0640	6.4	6.4	70	31
11.130.0650	6.5	6.5	70	31
11.130.0660	6.6	6.6	70	31

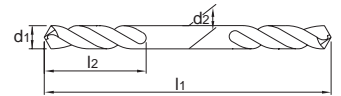


## > 11.130 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.130.0670	6.7	6.7	70	31	11.130.0980	9.8	9.8	89	43	11.130.1500	15	15	111	56
11.130.0680	6.8	6.8	74	34	11.130.1000	10	10	89	43	11.130.1550	15.5	15.5	115	58
11.130.0690	6.9	6.9	74	34	11.130.1050	10.5	10.5	89	43	11.130.1600	16	16	115	58
11.130.0700	7	7	74	34	11.130.1100	11	11	95	47	11.130.1650	16.5	16.5	119	60
11.130.0750	7.5	7.5	74	34	11.130.1150	11.5	11.5	95	47	11.130.1700	17	17	119	60
11.130.0780	7.8	7.8	79	37	11.130.1200	12	12	102	51	11.130.1750	17.5	17.5	123	62
11.130.0800	8	8	79	37	11.130.1250	12.5	12.5	102	51	11.130.1800	18	18	123	62
11.130.0850	8.5	8.5	79	37	11.130.1300	13	13	102	51	11.130.1850	18.5	18.5	127	64
11.130.0880	8.8	8.8	84	40	11.130.1350	13.5	13.5	107	54	11.130.1900	19	19	127	64
11.130.0900	9	9	84	40	11.130.1400	14	14	107	54	11.130.1950	19.5	19.5	131	66
11.130.0950	9.5	9.5	84	40	11.130.1450	14.5	14.5	111	56	11.130.2000	20	20	131	66

## > 11.145 Phantom

NL HSS Spiraalboor dubbelzijdig  
FR Foret HSS double-pointe  
ES Broca HSS de doble punta  
DE HSS Spiralbohrer Doppelseitig

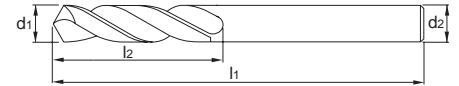


HSS	NORM	N	2,5	135°				
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si<10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.145.0200	2	2	38	7.5	11.145.0350	3.5	3.5	52	12.5	11.145.0490	4.9	4.9	62	16
11.145.0210	2.1	2.1	38	7.5	11.145.0400	4	4	55	14	11.145.0500	5	5	62	17
11.145.0250	2.5	2.5	43	9.5	11.145.0410	4.1	4.1	55	14	11.145.0510	5.1	5.1	62	17
11.145.0300	3	3	46	10.6	11.145.0420	4.2	4.2	55	14	11.145.0520	5.2	5.2	62	17
11.145.0320	3.2	3.2	49	11.2	11.145.0450	4.5	4.5	58	15.5	11.145.0550	5.5	5.5	66	19
11.145.0330	3.3	3.3	49	11.2	11.145.0480	4.8	4.8	62	17	11.145.0600	6	6	66	19

## > 11.150 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Spiraalboor  
FR Foret HSS-E ECO PRO  
ES Broca HSS-E ECO PRO  
DE ECO PRO HSS-E Spiralbohrer



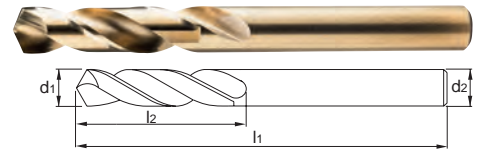
+6 (	DIN 1897	N	>3	135°	ECO PRO				
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	N 52 CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.150.0100	1	1	26	6	11.150.0400	4	4	55	22	11.150.0700	7	7	74	34
11.150.0150	1.5	1.5	32	9	11.150.0410	4.1	4.1	55	22	11.150.0750	7.5	7.5	74	34
11.150.0200	2	2	38	12	11.150.0420	4.2	4.2	55	22	11.150.0800	8	8	79	37
11.150.0220	2.2	2.2	40	13	11.150.0450	4.5	4.5	58	24	11.150.0850	8.5	8.5	79	37
11.150.0250	2.5	2.5	43	14	11.150.0470	4.7	4.7	58	24	11.150.0900	9	9	84	40
11.150.0300	3	3	46	16	11.150.0480	4.8	4.8	62	26	11.150.0950	9.5	9.5	84	40
11.150.0310	3.1	3.1	49	18	11.150.0490	4.9	4.9	62	26	11.150.1000	10	10	89	43
11.150.0320	3.2	3.2	49	18	11.150.0500	5	5	62	26	11.150.1050	10.5	10.5	89	43
11.150.0330	3.3	3.3	49	18	11.150.0520	5.2	5.2	62	26	11.150.1100	11	11	95	47
11.150.0340	3.4	3.4	52	20	11.150.0550	5.5	5.5	66	28	11.150.1150	11.5	11.5	95	47
11.150.0350	3.5	3.5	52	20	11.150.0600	6	6	66	28	11.150.1200	12	12	102	51
11.150.0370	3.7	3.7	52	20	11.150.0650	6.5	6.5	70	31	11.150.1250	12.5	12.5	102	51
11.150.0380	3.8	3.8	55	22	11.150.0680	6.8	6.8	74	34	11.150.1300	13	13	102	51



> **11.160 Phantom**

NL HSS-E Spiraalboor  
FR Foret HSS-E  
ES Broca HSS-E  
DE HSS-E Spiralbohrer



+6 6 ( DIN 1897 N 135°

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

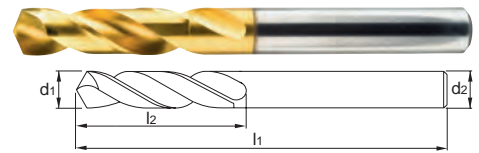
Ref.	d1	d2	l1	l2
11.160.0100	1	1	26	6
11.160.0150	1.5	1.5	32	9
11.160.0200	2	2	38	12
11.160.0210	2.1	2.1	38	12
11.160.0220	2.2	2.2	40	13
11.160.0230	2.3	2.3	40	13
11.160.0240	2.4	2.4	43	14
11.160.0250	2.5	2.5	43	14
11.160.0260	2.6	2.6	43	14
11.160.0270	2.7	2.7	46	16
11.160.0280	2.8	2.8	46	16
11.160.0290	2.9	2.9	46	16
11.160.0300	3	3	46	16
11.160.0310	3.1	3.1	49	18
11.160.0320	3.2	3.2	49	18
11.160.0330	3.3	3.3	49	18
11.160.0340	3.4	3.4	52	20
11.160.0350	3.5	3.5	52	20
11.160.0360	3.6	3.6	52	20
11.160.0370	3.7	3.7	52	20

Ref.	d1	d2	l1	l2
11.160.0380	3.8	3.8	55	22
11.160.0390	3.9	3.9	55	22
11.160.0400	4	4	55	22
11.160.0410	4.1	4.1	55	22
11.160.0420	4.2	4.2	55	22
11.160.0430	4.3	4.3	58	24
11.160.0440	4.4	4.4	58	24
11.160.0450	4.5	4.5	58	24
11.160.0460	4.6	4.6	58	24
11.160.0470	4.7	4.7	58	24
11.160.0480	4.8	4.8	62	26
11.160.0490	4.9	4.9	62	26
11.160.0500	5	5	62	26
11.160.0510	5.1	5.1	62	26
11.160.0520	5.2	5.2	62	26
11.160.0530	5.3	5.3	62	26
11.160.0540	5.4	5.4	66	28
11.160.0550	5.5	5.5	66	28
11.160.0560	5.6	5.6	66	28
11.160.0570	5.7	5.7	66	28

Ref.	d1	d2	l1	l2
11.160.0580	5.8	5.8	66	28
11.160.0590	5.9	5.9	66	28
11.160.0600	6	6	66	28
11.160.0620	6.2	6.2	70	31
11.160.0640	6.4	6.4	70	31
11.160.0650	6.5	6.5	70	31
11.160.0680	6.8	6.8	74	34
11.160.0700	7	7	74	34
11.160.0750	7.5	7.5	74	34
11.160.0800	8	8	79	37
11.160.0850	8.5	8.5	79	37
11.160.0900	9	9	84	40
11.160.0950	9.5	9.5	84	40
11.160.1000	10	10	89	43
11.160.1050	10.5	10.5	89	43
11.160.1100	11	11	95	47
11.160.1150	11.5	11.5	95	47
11.160.1200	12	12	102	51
11.160.1250	12.5	12.5	102	51
11.160.1300	13	13	102	51

> **11.161 Phantom**

NL HSS-E Spiraalboor TiN  
FR Foret HSS-E TiN  
ES Broca HSS-E TiN  
DE HSS-E Spiralbohrer TiN



+6 6 ( TiN DIN 1897 N 135°

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
32-40 E	35-40 E	25-32 E	12-20 D	15-20 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	d1	d2	l1	l2
11.161.0100	1	1	26	6
11.161.0110	1.1	1.1	28	7
11.161.0120	1.2	1.2	30	8
11.161.0130	1.3	1.3	30	8
11.161.0140	1.4	1.4	32	9
11.161.0150	1.5	1.5	32	9
11.161.0160	1.6	1.6	34	10
11.161.0170	1.7	1.7	34	10
11.161.0180	1.8	1.8	36	11
11.161.0190	1.9	1.9	36	11
11.161.0200	2	2	38	12
11.161.0210	2.1	2.1	38	12
11.161.0220	2.2	2.2	40	13
11.161.0230	2.3	2.3	40	13
11.161.0240	2.4	2.4	43	14
11.161.0250	2.5	2.5	43	14
11.161.0260	2.6	2.6	43	14
11.161.0270	2.7	2.7	46	16
11.161.0280	2.8	2.8	46	16
11.161.0290	2.9	2.9	46	16
11.161.0300	3	3	46	16
11.161.0310	3.1	3.1	49	18

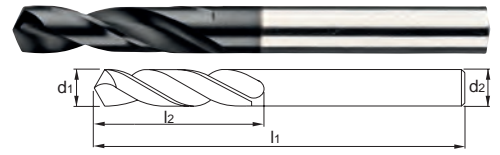
Ref.	d1	d2	l1	l2
11.161.0320	3.2	3.2	49	18
11.161.0330	3.3	3.3	49	18
11.161.0340	3.4	3.4	52	20
11.161.0350	3.5	3.5	52	20
11.161.0360	3.6	3.6	52	20
11.161.0370	3.7	3.7	52	20
11.161.0380	3.8	3.8	55	22
11.161.0390	3.9	3.9	55	22
11.161.0400	4	4	55	22
11.161.0410	4.1	4.1	55	22
11.161.0420	4.2	4.2	55	22
11.161.0430	4.3	4.3	58	24
11.161.0440	4.4	4.4	58	24
11.161.0450	4.5	4.5	58	24
11.161.0460	4.6	4.6	58	24
11.161.0470	4.7	4.7	58	24
11.161.0480	4.8	4.8	62	26
11.161.0490	4.9	4.9	62	26
11.161.0500	5	5	62	26
11.161.0510	5.1	5.1	62	26
11.161.0520	5.2	5.2	62	26
11.161.0530	5.3	5.3	62	26

Ref.	d1	d2	l1	l2
11.161.0550	5.5	5.5	66	28
11.161.0570	5.7	5.7	66	28
11.161.0580	5.8	5.8	66	28
11.161.0600	6	6	66	28
11.161.0620	6.2	6.2	70	31
11.161.0650	6.5	6.5	70	31
11.161.0680	6.8	6.8	74	34
11.161.0700	7	7	74	34
11.161.0750	7.5	7.5	74	34
11.161.0800	8	8	79	37
11.161.0850	8.5	8.5	79	37
11.161.0900	9	9	84	40
11.161.0950	9.5	9.5	84	40
11.161.1000	10	10	89	43
11.161.1050	10.5	10.5	89	43
11.161.1100	11	11	95	47
11.161.1150	11.5	11.5	95	47
11.161.1200	12	12	102	51
11.161.1250	12.5	12.5	102	51
11.161.1300	13	13	102	51



> 11.167 Phantom

NL HSS-E Spiraalboor TiAlN, roestvaststaal  
 FR Foret HSS-E TiAlN, Inox  
 ES Broca HSS-E TiAlN, acero inoxidable  
 DE HSS-E Spiralbohrer TiAlN, rostfreien Stahl



+6 ( TiAlN DIN 1897 >N 130° INOX

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 52	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	INOX >850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	CuAlFe	Ni/Co	Ti
42-48 F	36-48 F	30-42 E	16-24 D	18-22 E	17-20 D	40-45 G	35-40 G	15-20 E	5-8 B	8-12 C

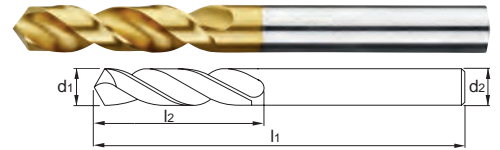
Ref.	d1	d2	l1	l2
11.167.0100	1	1	26	6
11.167.0150	1.5	1.5	32	9
11.167.0200	2	2	38	12
11.167.0220	2.2	2.2	40	13
11.167.0250	2.5	2.5	43	14
11.167.0280	2.8	2.8	46	16
11.167.0300	3	3	46	16
11.167.0310	3.1	3.1	49	18
11.167.0320	3.2	3.2	49	18
11.167.0330	3.3	3.3	49	18
11.167.0340	3.4	3.4	52	20
11.167.0350	3.5	3.5	52	20
11.167.0360	3.6	3.6	52	20
11.167.0370	3.7	3.7	52	20
11.167.0380	3.8	3.8	55	22
11.167.0390	3.9	3.9	55	22
11.167.0400	4	4	55	22
11.167.0410	4.1	4.1	55	22

Ref.	d1	d2	l1	l2
11.167.0420	4.2	4.2	55	22
11.167.0430	4.3	4.3	58	24
11.167.0440	4.4	4.4	58	24
11.167.0450	4.5	4.5	58	24
11.167.0460	4.6	4.6	58	24
11.167.0470	4.7	4.7	58	24
11.167.0480	4.8	4.8	62	26
11.167.0490	4.9	4.9	62	26
11.167.0500	5	5	62	26
11.167.0510	5.1	5.1	62	26
11.167.0520	5.2	5.2	62	26
11.167.0530	5.3	5.3	62	26
11.167.0540	5.4	5.4	66	28
11.167.0550	5.5	5.5	66	28
11.167.0560	5.6	5.6	66	28
11.167.0570	5.7	5.7	66	28
11.167.0580	5.8	5.8	66	28
11.167.0590	5.9	5.9	66	28

Ref.	d1	d2	l1	l2
11.167.0600	6	6	66	28
11.167.0650	6.5	6.5	70	31
11.167.0680	6.8	6.8	74	34
11.167.0700	7	7	74	34
11.167.0750	7.5	7.5	74	34
11.167.0800	8	8	79	37
11.167.0850	8.5	8.5	79	37
11.167.0900	9	9	84	40
11.167.0950	9.5	9.5	84	40
11.167.1000	10	10	89	43
11.167.1020	10.2	10.2	89	43
11.167.1050	10.5	10.5	89	43
11.167.1100	11	11	95	47
11.167.1150	11.5	11.5	95	47
11.167.1200	12	12	102	51
11.167.1250	12.5	12.5	102	51
11.167.1300	13	13	102	51

> 11.168 Phantom

NL HP2 UNI HSS-E Spiraalboor TiN  
 FR Foret HSS-E HP2 UNI TiN  
 ES Broca HSS-E HP2 UNI TiN  
 DE HP2 UNI HSS-E Spiralbohrer TiN



+6 ( TiN DIN 1897 >N 118° HP2 UNI

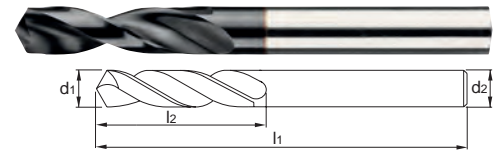
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 52	N 61
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	INOX >850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	CuAlFe	PVC
38-42 F	20-44 E	20-40 E	16-22 C	15-20 D	12-18 C	40-45 F	35-40 F	50-70 E	40-60 F	60-80 F	40-44 E	15-20 D	24-28 D

Ref.	d1	d2	l1	l2
11.168.0100	1	1	26	6
11.168.0110	1.1	1.1	28	7
11.168.0120	1.2	1.2	30	8
11.168.0130	1.3	1.3	30	8
11.168.0140	1.4	1.4	32	9
11.168.0150	1.5	1.5	32	9
11.168.0160	1.6	1.6	34	10
11.168.0170	1.7	1.7	34	10
11.168.0180	1.8	1.8	36	11
11.168.0190	1.9	1.9	36	11
11.168.0200	2	2	38	12
11.168.0210	2.1	2.1	38	12
11.168.0220	2.2	2.2	40	13
11.168.0230	2.3	2.3	40	13
11.168.0240	2.4	2.4	43	14
11.168.0250	2.5	2.5	43	14
11.168.0260	2.6	2.6	43	14
11.168.0270	2.7	2.7	46	16
11.168.0280	2.8	2.8	46	16
11.168.0290	2.9	2.9	46	16
11.168.0300	3	3	46	16
11.168.0310	3.1	3.1	49	18
11.168.0320	3.2	3.2	49	18
11.168.0330	3.3	3.3	49	18
11.168.0340	3.4	3.4	52	20
11.168.0350	3.5	3.5	52	20
11.168.0360	3.6	3.6	52	20
11.168.0370	3.7	3.7	52	20
11.168.0380	3.8	3.8	55	22
11.168.0390	3.9	3.9	55	22
11.168.0400	4	4	55	22
11.168.0410	4.1	4.1	55	22
11.168.0420	4.2	4.2	55	22
11.168.0430	4.3	4.3	58	24

Ref.	d1	d2	l1	l2
11.168.0440	4.4	4.4	58	24
11.168.0450	4.5	4.5	58	24
11.168.0460	4.6	4.6	58	24
11.168.0470	4.7	4.7	58	24
11.168.0480	4.8	4.8	62	26
11.168.0490	4.9	4.9	62	26
11.168.0500	5	5	62	26
11.168.0510	5.1	5.1	62	26
11.168.0520	5.2	5.2	62	26
11.168.0530	5.3	5.3	62	26
11.168.0540	5.4	5.4	66	28
11.168.0550	5.5	5.5	66	28
11.168.0560	5.6	5.6	66	28
11.168.0570	5.7	5.7	66	28
11.168.0580	5.8	5.8	66	28
11.168.0590	5.9	5.9	66	28
11.168.0600	6	6	66	28
11.168.0610	6.1	6.1	70	31
11.168.0620	6.2	6.2	70	31
11.168.0630	6.3	6.3	70	31
11.168.0640	6.4	6.4	70	31
11.168.0650	6.5	6.5	70	31
11.168.0660	6.6	6.6	70	31
11.168.0670	6.7	6.7	70	31
11.168.0680	6.8	6.8	74	34
11.168.0690	6.9	6.9	74	34
11.168.0700	7	7	74	34
11.168.0710	7.1	7.1	74	34
11.168.0720	7.2	7.2	74	34
11.168.0730	7.3	7.3	74	34
11.168.0740	7.4	7.4	74	34
11.168.0750	7.5	7.5	74	34
11.168.0760	7.6	7.6	79	37
11.168.0770	7.7	7.7	79	37

Ref.	d1	d2	l1	l2
11.168.0780	7.8	7.8	79	37
11.168.0790	7.9	7.9	79	37
11.168.0800	8	8	79	37
11.168.0810	8.1	8.1	79	37
11.168.0820	8.2	8.2	79	37
11.168.0830	8.3	8.3	79	37
11.168.0840	8.4	8.4	79	37
11.168.0850	8.5	8.5	79	37
11.168.0860	8.6	8.6	84	40
11.168.0870	8.7	8.7	84	40
11.168.0880	8.8	8.8	84	40
11.168.0890	8.9	8.9	84	40
11.168.0900	9	9	84	40
11.168.0910	9.1	9.1	84	40
11.168.0920	9.2	9.2	84	40
11.168.0930	9.3	9.3	84	40
11.168.0940	9.4	9.4	84	40
11.168.0950	9.5	9.5	84	40
11.168.0960	9.6	9.6	89	43
11.168.0970	9.7	9.7	89	43
11.168.0980	9.8	9.8	89	43
11.168.0990	9.9	9.9	89	43
11.168.1000	10	10	89	43
11.168.1010	10	10.1	89	43
11.168.1020	10.2	10.2	89	43
11.168.1030	10.3	10.3	89	43
11.168.1050	10.5	10.5	89	43
11.168.1100	11	11	95	47
11.168.1150	11.5	11.5	95	47
11.168.1200	12	12	102	51
11.168.1250	12.5	12.5	102	51
11.168.1300	13	13	102	51
11.168.1350	13.5	13.5	107	54
11.168.1400	14	14	107	54

> **11.174 Phantom**



NL HSS-E Spiraalboor TiAlN, (productieboor)  
FR Foret HSS-E TiAlN, (foret à haut rendement)  
ES Broca HSS-E TiAlN, (broca de gran rendimiento)  
DE HSS-E Spiralbohrer TiAlN, (Produktionsbohrer)

+6 6 ( TiAlN DIN 1897 >N

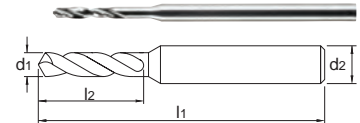
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
42-48 F	36-48 F	20-40 E	20-24 D	13-17 D	12-14 C	40-45 F	35-40 F	40-44 E	15-20 D	25-30 E

Ref.	d1	d2	l1	l2
11.174.0100	1	1	26	6
11.174.0110	1.1	1.1	28	7
11.174.0120	1.2	1.2	30	8
11.174.0130	1.3	1.3	30	8
11.174.0140	1.4	1.4	32	9
11.174.0150	1.5	1.5	32	9
11.174.0160	1.6	1.6	34	10
11.174.0170	1.7	1.7	34	10
11.174.0180	1.8	1.8	36	11
11.174.0190	1.9	1.9	36	11
11.174.0200	2	2	38	12
11.174.0210	2.1	2.1	38	12
11.174.0220	2.2	2.2	40	13
11.174.0230	2.3	2.3	40	13
11.174.0240	2.4	2.4	43	14
11.174.0250	2.5	2.5	43	14
11.174.0260	2.6	2.6	43	14
11.174.0270	2.7	2.7	46	16
11.174.0280	2.8	2.8	46	16
11.174.0290	2.9	2.9	46	16
11.174.0300	3	3	46	16
11.174.0310	3.1	3.1	49	18
11.174.0320	3.2	3.2	49	18
11.174.0330	3.3	3.3	49	18
11.174.0340	3.4	3.4	52	20
11.174.0350	3.5	3.5	52	20
11.174.0360	3.6	3.6	52	20
11.174.0370	3.7	3.7	52	20
11.174.0380	3.8	3.8	55	22
11.174.0390	3.9	3.9	55	22
11.174.0400	4	4	55	22
11.174.0410	4.1	4.1	55	22
11.174.0420	4.2	4.2	55	22
11.174.0430	4.3	4.3	58	24
11.174.0440	4.4	4.4	58	24
11.174.0450	4.5	4.5	58	24
11.174.0460	4.6	4.6	58	24
11.174.0470	4.7	4.7	58	24

Ref.	d1	d2	l1	l2
11.174.0480	4.8	4.8	62	26
11.174.0490	4.9	4.9	62	26
11.174.0500	5	5	62	26
11.174.0510	5.1	5.1	62	26
11.174.0520	5.2	5.2	62	26
11.174.0530	5.3	5.3	62	26
11.174.0540	5.4	5.4	66	28
11.174.0550	5.5	5.5	66	28
11.174.0560	5.6	5.6	66	28
11.174.0570	5.7	5.7	66	28
11.174.0580	5.8	5.8	66	28
11.174.0590	5.9	5.9	66	28
11.174.0600	6	6	66	28
11.174.0610	6.1	6.1	70	31
11.174.0620	6.2	6.2	70	31
11.174.0630	6.3	6.3	70	31
11.174.0640	6.4	6.4	70	31
11.174.0650	6.5	6.5	70	31
11.174.0660	6.6	6.6	70	31
11.174.0670	6.7	6.7	70	31
11.174.0680	6.8	6.8	74	34
11.174.0690	6.9	6.9	74	34
11.174.0700	7	7	74	34
11.174.0710	7.1	7.1	74	34
11.174.0720	7.2	7.2	74	34
11.174.0730	7.3	7.3	74	34
11.174.0740	7.4	7.4	74	34
11.174.0750	7.5	7.5	74	34
11.174.0760	7.6	7.6	79	37
11.174.0770	7.7	7.7	79	37
11.174.0780	7.8	7.8	79	37
11.174.0790	7.9	7.9	79	37
11.174.0800	8	8	79	37
11.174.0810	8.1	8.1	79	37
11.174.0820	8.2	8.2	79	37
11.174.0830	8.3	8.3	79	37
11.174.0840	8.4	8.4	79	37
11.174.0850	8.5	8.5	79	37

Ref.	d1	d2	l1	l2
11.174.0860	8.6	8.6	84	40
11.174.0870	8.7	8.7	84	40
11.174.0880	8.8	8.8	84	40
11.174.0890	8.9	8.9	84	40
11.174.0900	9	9	84	40
11.174.0910	9.1	9.1	84	40
11.174.0920	9.2	9.2	84	40
11.174.0930	9.3	9.3	84	40
11.174.0940	9.4	9.4	84	40
11.174.0950	9.5	9.5	84	40
11.174.0960	9.6	9.6	89	43
11.174.0970	9.7	9.7	89	43
11.174.0980	9.8	9.8	89	43
11.174.0990	9.9	9.9	89	43
11.174.1000	10	10	89	43
11.174.1020	10.2	10.2	89	43
11.174.1050	10.5	10.5	89	43
11.174.1100	11	11	95	47
11.174.1150	11.5	11.5	95	47
11.174.1200	12	12	102	51
11.174.1250	12.5	12.5	102	51
11.174.1300	13	13	102	51
11.174.1350	13.5	13.5	107	54
11.174.1400	14	14	107	54
11.174.1450	14.5	14.5	111	56
11.174.1500	15	15	111	56
11.174.1550	15.5	15.5	115	58
11.174.1600	16	16	115	58
11.174.1650	16.5	16.5	119	60
11.174.1700	17	17	119	60
11.174.1750	17.5	17.5	123	62
11.174.1800	18	18	123	62
11.174.1850	18.5	18.5	127	64
11.174.1900	19	19	127	64
11.174.1950	19.5	19.5	131	66
11.174.2000	20	20	131	66

> **11.340 Phantom**



NL HSS-E PM Microboor  
FR Micro-foret HSS-E PM  
ES Micro-Broca HSS-E PM  
DE HSS-E PM Kleinstbohrer

HSS-E PM DIN 1899 A

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
18-21 E	16-18 E	14-16 E	12-14 D	14-18 D	10-15 C	22-26 F	18-22 F	22-42 E	13-18 C

Ref.	d1	d2	l1	l2
11.340.0020	0.2	1	25	1.5
11.340.0025	0.25	1	25	1.9
11.340.0030	0.3	1	25	1.9
11.340.0035	0.35	1	25	2.4
11.340.0040	0.4	1	25	3
11.340.0045	0.45	1	25	3
11.340.0050	0.5	1	25	3.4
11.340.0055	0.55	1	25	3.9
11.340.0060	0.6	1	25	3.9

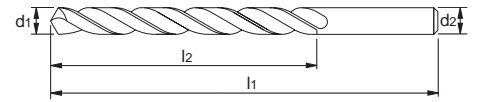
Ref.	d1	d2	l1	l2
11.340.0065	0.65	1	25	4.2
11.340.0070	0.7	1	25	4.8
11.340.0075	0.75	1	25	4.8
11.340.0080	0.8	1.5	25	5.3
11.340.0085	0.85	1.5	25	5.3
11.340.0090	0.9	1.5	25	6
11.340.0095	0.95	1.5	25	6
11.340.0100	1	1.5	25	6.8
11.340.0105	1.05	1.5	25	6.8

Ref.	d1	d2	l1	l2
11.340.0110	1.1	1.5	25	7.6
11.340.0115	1.15	1.5	25	7.6
11.340.0120	1.2	1.5	25	8.5
11.340.0125	1.25	1.5	25	8.5
11.340.0130	1.3	1.5	25	8.5
11.340.0135	1.35	1.5	25	9.5
11.340.0140	1.4	1.5	25	9.5
11.340.0145	1.45	1.5	25	9.5
11.340.0150	1.5	2	30	9.5



## > 11.400 INTERNATIONAL TOOLS

NL ECO HSS Spiraalboor gewalst  
FR Foret HSS ECO laminé  
ES Broca HSS ECO laminada  
DE ECO HSS Spiralbohrer Gewalzt



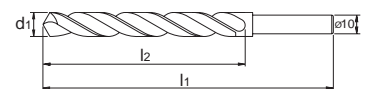
Ref.	d1	d2	l1	l2
11.400.0100	1	1	34	12
11.400.0110	1.1	1.1	36	14
11.400.0120	1.2	1.2	38	16
11.400.0130	1.3	1.3	38	16
11.400.0140	1.4	1.4	40	18
11.400.0150	1.5	1.5	40	18
11.400.0160	1.6	1.6	43	20
11.400.0170	1.7	1.7	43	20
11.400.0180	1.8	1.8	46	22
11.400.0190	1.9	1.9	46	22
11.400.0200	2	2	49	24
11.400.0210	2.1	2.1	49	24
11.400.0220	2.2	2.2	53	27
11.400.0230	2.3	2.3	53	27
11.400.0240	2.4	2.4	57	30
11.400.0250	2.5	2.5	57	30
11.400.0260	2.6	2.6	57	30
11.400.0270	2.7	2.7	61	33
11.400.0280	2.8	2.8	61	33
11.400.0290	2.9	2.9	61	33
11.400.0300	3	3	61	33
11.400.0310	3.1	3.1	65	36
11.400.0320	3.2	3.2	65	36
11.400.0330	3.3	3.3	65	36
11.400.0340	3.4	3.4	70	39
11.400.0350	3.5	3.5	70	39
11.400.0360	3.6	3.6	70	39
11.400.0370	3.7	3.7	70	39
11.400.0380	3.8	3.8	75	43
11.400.0390	3.9	3.9	75	43
11.400.0400	4	4	75	43
11.400.0410	4.1	4.1	75	43
11.400.0420	4.2	4.2	75	43
11.400.0430	4.3	4.3	80	47
11.400.0440	4.4	4.4	80	47
11.400.0450	4.5	4.5	80	47
11.400.0460	4.6	4.6	80	47
11.400.0470	4.7	4.7	80	47
11.400.0480	4.8	4.8	86	52
11.400.0490	4.9	4.9	86	52
11.400.0500	5	5	86	52
11.400.0510	5.1	5.1	86	52
11.400.0520	5.2	5.2	86	52
11.400.0530	5.3	5.3	86	52
11.400.0540	5.4	5.4	93	57

Ref.	d1	d2	l1	l2
11.400.0550	5.5	5.5	93	57
11.400.0560	5.6	5.6	93	57
11.400.0570	5.7	5.7	93	57
11.400.0580	5.8	5.8	93	57
11.400.0590	5.9	5.9	93	57
11.400.0600	6	6	93	57
11.400.0610	6.1	6.1	101	63
11.400.0620	6.2	6.2	101	63
11.400.0630	6.3	6.3	101	63
11.400.0640	6.4	6.4	101	63
11.400.0650	6.5	6.5	101	63
11.400.0660	6.6	6.6	101	63
11.400.0670	6.7	6.7	101	63
11.400.0680	6.8	6.8	109	69
11.400.0690	6.9	6.9	109	69
11.400.0700	7	7	109	69
11.400.0710	7.1	7.1	109	69
11.400.0720	7.2	7.2	109	69
11.400.0730	7.3	7.3	109	69
11.400.0740	7.4	7.4	109	69
11.400.0750	7.5	7.5	109	69
11.400.0760	7.6	7.6	117	75
11.400.0770	7.7	7.7	117	75
11.400.0780	7.8	7.8	117	75
11.400.0790	7.9	7.9	117	75
11.400.0800	8	8	117	75
11.400.0810	8.1	8.1	117	75
11.400.0820	8.2	8.2	117	75
11.400.0830	8.3	8.3	117	75
11.400.0840	8.4	8.4	117	75
11.400.0850	8.5	8.5	117	75
11.400.0860	8.6	8.6	125	81
11.400.0870	8.7	8.7	125	81
11.400.0880	8.8	8.8	125	81
11.400.0890	8.9	8.9	125	81
11.400.0900	9	9	125	81
11.400.0910	9.1	9.1	125	81
11.400.0920	9.2	9.2	125	81
11.400.0930	9.3	9.3	125	81
11.400.0940	9.4	9.4	125	81
11.400.0950	9.5	9.5	125	81
11.400.0960	9.6	9.6	133	87
11.400.0970	9.7	9.7	133	87
11.400.0980	9.8	9.8	133	87
11.400.0990	9.9	9.9	133	87

Ref.	d1	d2	l1	l2
11.400.1000	10	10	133	87
11.400.1010	10.1	10.1	133	87
11.400.1020	10.2	10.2	133	87
11.400.1030	10.3	10.3	133	87
11.400.1040	10.4	10.4	133	87
11.400.1050	10.5	10.5	133	87
11.400.1060	10.6	10.6	133	87
11.400.1070	10.7	10.7	142	94
11.400.1080	10.8	10.8	142	94
11.400.1090	10.9	10.9	142	94
11.400.1100	11	11	142	94
11.400.1110	11.1	11.1	142	94
11.400.1120	11.2	11.2	142	94
11.400.1130	11.3	11.3	142	94
11.400.1140	11.4	11.4	142	94
11.400.1150	11.5	11.5	142	94
11.400.1160	11.6	11.6	142	94
11.400.1170	11.7	11.7	142	94
11.400.1180	11.8	11.8	142	94
11.400.1190	11.9	11.9	151	101
11.400.1200	12	12	151	101
11.400.1210	12.1	12.1	151	101
11.400.1220	12.2	12.2	151	101
11.400.1230	12.3	12.3	151	101
11.400.1240	12.4	12.4	151	101
11.400.1250	12.5	12.5	151	101
11.400.1260	12.6	12.6	151	101
11.400.1270	12.7	12.7	151	101
11.400.1280	12.8	12.8	151	101
11.400.1290	12.9	12.9	151	101
11.400.1300	13	13	151	101
11.400.1350	13.5	13.5	160	108
11.400.1400	14	14	160	108
11.400.1450	14.5	14.5	169	114
11.400.1500	15	15	169	114
11.400.1550	15.5	15.5	178	120
11.400.1600	16	16	178	120
11.400.1650	16.5	16.5	184	125
11.400.1700	17	17	184	125
11.400.1750	17.5	17.5	191	130
11.400.1800	18	18	191	130
11.400.1850	18.5	18.5	198	135
11.400.1900	19	19	198	135
11.400.1950	19.5	19.5	205	140
11.400.2000	20	20	205	140

## > 11.410 INTERNATIONAL TOOLS

NL ECO HSS Spiraalboor gewalst, schacht 10 mm  
FR Foret HSS ECO laminé, queue 10 mm  
ES Broca HSS ECO laminada, mango 10 mm  
DE ECO HSS Spiralbohrer Gewalzt, Schaft 10 mm



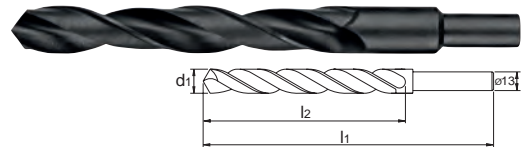
Ref.	d1	l1	l2
11.410.1050	10.5	133	87
11.410.1100	11	142	94
11.410.1150	11.5	142	94
11.410.1200	12	151	101

Ref.	d1	l1	l2
11.410.1250	12.5	151	101
11.410.1300	13	151	101
11.410.1350	13.5	160	108
11.410.1400	14	160	108

Ref.	d1	l1	l2
11.410.1450	14.5	169	114
11.410.1500	15	169	114
11.410.1550	15.5	178	120
11.410.1600	16	178	120

> 11.413 INTERNATIONAL TOOLS

NL ECO HSS Spiraalboor gewalst, schacht 13 mm  
 FR Foret HSS ECO laminé, queue 13 mm  
 ES Broca HSS ECO laminada, mango 13 mm  
 DE ECO HSS Spiralbohrer Gewalzt, Schaft 13 mm



HSS N Ø13 118° ECO

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² K 31 GG K 32 GGG GTS-GTW

20-25 E 20-25 E 15-20 D 15-20 E 25-30 E

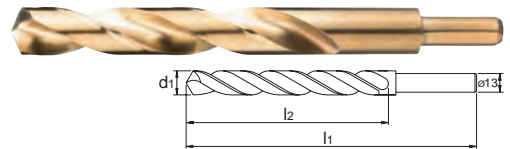
Ref.	d1	l1	l2
11.413.1350	13,5	160	108
11.413.1400	14	160	108
11.413.1450	14,5	169	114
11.413.1500	15	169	114
11.413.1550	15,5	178	120
11.413.1600	16	178	120
11.413.1650	16,5	184	125
11.413.1700	17	184	125

Ref.	d1	l1	l2
11.413.1750	17,5	191	130
11.413.1800	18	191	130
11.413.1850	18,5	198	135
11.413.1900	19	198	135
11.413.1950	19,5	205	140
11.413.2000	20	205	140
11.413.2100	21	208	145
11.413.2200	22	208	150

Ref.	d1	l1	l2
11.413.2300	23	213	155
11.413.2400	24	222	160
11.413.2500	25	222	160
11.413.2600	26	227	165
11.413.2700	27	232	170
11.413.2800	28	232	170
11.413.2900	29	237	175
11.413.3000	30	237	175

> 11.415 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Spiraalboor schacht 13 mm  
 FR Foret HSS-E ECO PRO queue 13 mm  
 ES Broca HSS-E ECO PRO mango 13 mm  
 DE ECO PRO HSS-E Spiralbohrer Schaft 13 mm



+6.6 ( N 135° ECO PRO

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² M 21 INOX ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW N 51 Cu N 52 CuAlFe

28-35 E 30-36 E 20-27 E 14-18 D 30-35 F 24-30 F 30-40 E 8-15 C

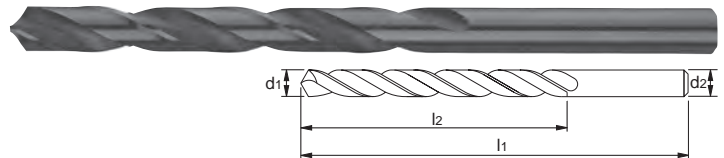
Ref.	d1	l1	l2
11.415.1350	13,5	160	108
11.415.1400	14	160	108
11.415.1450	14,5	169	114
11.415.1500	15	169	114
11.415.1550	15,5	178	120
11.415.1600	16	178	120
11.415.1650	16,5	184	125

Ref.	d1	l1	l2
11.415.1700	17	184	125
11.415.1750	17,5	191	130
11.415.1800	18	191	130
11.415.1850	18,5	198	135
11.415.1900	19	198	135
11.415.1950	19,5	205	140
11.415.2000	20	205	140

Ref.	d1	l1	l2
11.415.2100	21	208	145
11.415.2200	22	208	150
11.415.2300	23	213	155
11.415.2400	24	222	160
11.415.2500	25	222	160

> 11.416 INTERNATIONAL TOOLS

NL ECO HSS Spiraalboor  
 FR Foret HSS ECO  
 ES Broca HSS ECO  
 DE ECO HSS Spiralbohrer



HSS DIN 338 N 118° ECO

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu N 61 PVC

25-27 F 22-30 F 15-20 E 15-20 E 25-30 E 45-50 E 35-40 G 25-40 D 22-28 D

Ref.	d1	d2	l1	l2
11.416.0100	1	1	34	12
11.416.0110	1.1	1.1	36	14
11.416.0120	1.2	1.2	38	16
11.416.0130	1.3	1.3	38	16
11.416.0140	1.4	1.4	40	18
11.416.0150	1.5	1.5	40	18
11.416.0160	1.6	1.6	43	20
11.416.0170	1.7	1.7	43	20
11.416.0180	1.8	1.8	46	22
11.416.0190	1.9	1.9	46	22
11.416.0200	2	2	49	24
11.416.0210	2.1	2.1	49	24
11.416.0220	2.2	2.2	53	27
11.416.0230	2.3	2.3	53	27
11.416.0240	2.4	2.4	57	30
11.416.0250	2.5	2.5	57	30
11.416.0260	2.6	2.6	57	30

Ref.	d1	d2	l1	l2
11.416.0270	2.7	2.7	61	33
11.416.0280	2.8	2.8	61	33
11.416.0290	2.9	2.9	61	33
11.416.0300	3	3	61	33
11.416.0310	3.1	3.1	65	36
11.416.0320	3.2	3.2	65	36
11.416.0330	3.3	3.3	65	36
11.416.0340	3.4	3.4	70	39
11.416.0350	3.5	3.5	70	39
11.416.0360	3.6	3.6	70	39
11.416.0370	3.7	3.7	70	39
11.416.0380	3.8	3.8	75	43
11.416.0390	3.9	3.9	75	43
11.416.0400	4	4	75	43
11.416.0410	4.1	4.1	75	43
11.416.0420	4.2	4.2	75	43
11.416.0430	4.3	4.3	80	47

Ref.	d1	d2	l1	l2
11.416.0440	4.4	4.4	80	47
11.416.0450	4.5	4.5	80	47
11.416.0460	4.6	4.6	80	47
11.416.0470	4.7	4.7	80	47
11.416.0480	4.8	4.8	86	52
11.416.0490	4.9	4.9	86	52
11.416.0500	5	5	86	52
11.416.0510	5.1	5.1	86	52
11.416.0520	5.2	5.2	86	52
11.416.0530	5.3	5.3	86	52
11.416.0540	5.4	5.4	93	57
11.416.0550	5.5	5.5	93	57
11.416.0560	5.6	5.6	93	57
11.416.0570	5.7	5.7	93	57
11.416.0580	5.8	5.8	93	57
11.416.0590	5.9	5.9	93	57
11.416.0600	6	6	93	57



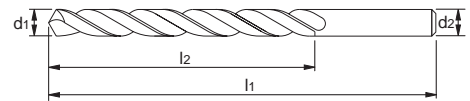


> 11.416 INTERNATIONAL TOOLS

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.416.0610	6.1	6.1	101	63	11.416.0850	8.5	8.5	117	75	11.416.1090	10.9	10.9	142	94
11.416.0620	6.2	6.2	101	63	11.416.0860	8.6	8.6	125	81	11.416.1100	11	11	142	94
11.416.0630	6.3	6.3	101	63	11.416.0870	8.7	8.7	125	81	11.416.1110	11.1	11.1	142	94
11.416.0640	6.4	6.4	101	63	11.416.0880	8.8	8.8	125	81	11.416.1120	11.2	11.2	142	94
11.416.0650	6.5	6.5	101	63	11.416.0890	8.9	8.9	125	81	11.416.1130	11.3	11.3	142	94
11.416.0660	6.6	6.6	101	63	11.416.0900	9	9	125	81	11.416.1140	11.4	11.4	142	94
11.416.0670	6.7	6.7	101	63	11.416.0910	9.1	9.1	125	81	11.416.1150	11.5	11.5	142	94
11.416.0680	6.8	6.8	109	69	11.416.0920	9.2	9.2	125	81	11.416.1160	11.6	11.6	142	94
11.416.0690	6.9	6.9	109	69	11.416.0930	9.3	9.3	125	81	11.416.1170	11.7	11.7	142	94
11.416.0700	7	7	109	69	11.416.0940	9.4	9.4	125	81	11.416.1180	11.8	11.8	142	94
11.416.0710	7.1	7.1	109	69	11.416.0950	9.5	9.5	125	81	11.416.1190	11.9	11.9	151	101
11.416.0720	7.2	7.2	109	69	11.416.0960	9.6	9.6	133	87	11.416.1200	12	12	151	101
11.416.0730	7.3	7.3	109	69	11.416.0970	9.7	9.7	133	87	11.416.1210	12.1	12.1	151	101
11.416.0740	7.4	7.4	109	69	11.416.0980	9.8	9.8	133	87	11.416.1220	12.2	12.2	151	101
11.416.0750	7.5	7.5	109	69	11.416.0990	9.9	9.9	133	87	11.416.1230	12.3	12.3	151	101
11.416.0760	7.6	7.6	117	75	11.416.1000	10	10	133	87	11.416.1240	12.4	12.4	151	101
11.416.0770	7.7	7.7	117	75	11.416.1010	10.1	10.1	133	87	11.416.1250	12.5	12.5	151	101
11.416.0780	7.8	7.8	117	75	11.416.1020	10.2	10.2	133	87	11.416.1260	12.6	12.6	151	101
11.416.0790	7.9	7.9	117	75	11.416.1030	10.3	10.3	133	87	11.416.1270	12.7	12.7	151	101
11.416.0800	8	8	117	75	11.416.1040	10.4	10.4	133	87	11.416.1280	12.8	12.8	151	101
11.416.0810	8.1	8.1	117	75	11.416.1050	10.5	10.5	133	87	11.416.1290	12.9	12.9	151	101
11.416.0820	8.2	8.2	117	75	11.416.1060	10.6	10.6	133	87	11.416.1300	13	13	151	101
11.416.0830	8.3	8.3	117	75	11.416.1070	10.7	10.7	142	94					
11.416.0840	8.4	8.4	117	75	11.416.1080	10.8	10.8	142	94					

> 11.420 INTERNATIONAL TOOLS

NL ECO PRO HSS Spiraalboor  
 FR Foret HSS ECO PRO  
 ES Broca HSS ECO PRO  
 DE ECO PRO HSS Spiralbohrer



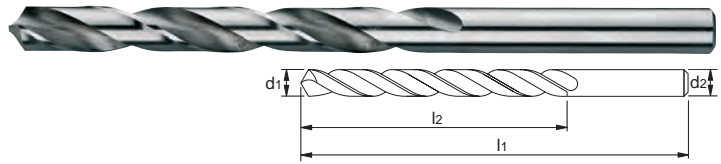
**HSS** **DIN 338** **N** **118°** **ECO PRO**

<b>P 11</b> S600 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si-10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	45-50 E	35-40 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.420.0100	1	1	34	12	11.420.0510	5.1	5.1	86	52	11.420.0920	9.2	9.2	125	81
11.420.0110	1.1	1.1	36	14	11.420.0520	5.2	5.2	86	52	11.420.0930	9.3	9.3	125	81
11.420.0120	1.2	1.2	38	16	11.420.0530	5.3	5.3	86	52	11.420.0940	9.4	9.4	125	81
11.420.0130	1.3	1.3	38	16	11.420.0540	5.4	5.4	93	57	11.420.0950	9.5	9.5	125	81
11.420.0140	1.4	1.4	40	18	11.420.0550	5.5	5.5	93	57	11.420.0960	9.6	9.6	133	87
11.420.0150	1.5	1.5	40	18	11.420.0560	5.6	5.6	93	57	11.420.0970	9.7	9.7	133	87
11.420.0160	1.6	1.6	43	20	11.420.0570	5.7	5.7	93	57	11.420.0980	9.8	9.8	133	87
11.420.0170	1.7	1.7	43	20	11.420.0580	5.8	5.8	93	57	11.420.0990	9.9	9.9	133	87
11.420.0180	1.8	1.8	46	22	11.420.0590	5.9	5.9	93	57	11.420.1000	10	10	133	87
11.420.0190	1.9	1.9	46	22	11.420.0600	6	6	93	57	11.420.1010	10.1	10.1	133	87
11.420.0200	2	2	49	24	11.420.0610	6.1	6.1	101	63	11.420.1020	10.2	10.2	133	87
11.420.0210	2.1	2.1	49	24	11.420.0620	6.2	6.2	101	63	11.420.1030	10.3	10.3	133	87
11.420.0220	2.2	2.2	53	27	11.420.0630	6.3	6.3	101	63	11.420.1040	10.4	10.4	133	87
11.420.0230	2.3	2.3	53	27	11.420.0640	6.4	6.4	101	63	11.420.1050	10.5	10.5	133	87
11.420.0240	2.4	2.4	57	30	11.420.0650	6.5	6.5	101	63	11.420.1060	10.6	10.6	133	87
11.420.0250	2.5	2.5	57	30	11.420.0660	6.6	6.6	101	63	11.420.1070	10.7	10.7	142	94
11.420.0260	2.6	2.6	57	30	11.420.0670	6.7	6.7	101	63	11.420.1080	10.8	10.8	142	94
11.420.0270	2.7	2.7	61	33	11.420.0680	6.8	6.8	109	69	11.420.1090	10.9	10.9	142	94
11.420.0280	2.8	2.8	61	33	11.420.0690	6.9	6.9	109	69	11.420.1100	11	11	142	94
11.420.0290	2.9	2.9	61	33	11.420.0700	7	7	109	69	11.420.1110	11.1	11.1	142	94
11.420.0300	3	3	61	33	11.420.0710	7.1	7.1	109	69	11.420.1120	11.2	11.2	142	94
11.420.0310	3.1	3.1	65	36	11.420.0720	7.2	7.2	109	69	11.420.1130	11.3	11.3	142	94
11.420.0320	3.2	3.2	65	36	11.420.0730	7.3	7.3	109	69	11.420.1140	11.4	11.4	142	94
11.420.0330	3.3	3.3	65	36	11.420.0740	7.4	7.4	109	69	11.420.1150	11.5	11.5	142	94
11.420.0340	3.4	3.4	70	39	11.420.0750	7.5	7.5	109	69	11.420.1160	11.6	11.6	142	94
11.420.0350	3.5	3.5	70	39	11.420.0760	7.6	7.6	117	75	11.420.1170	11.7	11.7	142	94
11.420.0360	3.6	3.6	70	39	11.420.0770	7.7	7.7	117	75	11.420.1180	11.8	11.8	142	94
11.420.0370	3.7	3.7	70	39	11.420.0780	7.8	7.8	117	75	11.420.1190	11.9	11.9	151	101
11.420.0380	3.8	3.8	75	43	11.420.0790	7.9	7.9	117	75	11.420.1200	12	12	151	101
11.420.0390	3.9	3.9	75	43	11.420.0800	8	8	117	75	11.420.1210	12.1	12.1	151	101
11.420.0400	4	4	75	43	11.420.0810	8.1	8.1	117	75	11.420.1220	12.2	12.2	151	101
11.420.0410	4.1	4.1	75	43	11.420.0820	8.2	8.2	117	75	11.420.1230	12.3	12.3	151	101
11.420.0420	4.2	4.2	75	43	11.420.0830	8.3	8.3	117	75	11.420.1240	12.4	12.4	151	101
11.420.0430	4.3	4.3	80	47	11.420.0840	8.4	8.4	117	75	11.420.1250	12.5	12.5	151	101
11.420.0440	4.4	4.4	80	47	11.420.0850	8.5	8.5	117	75	11.420.1260	12.6	12.6	151	101
11.420.0450	4.5	4.5	80	47	11.420.0860	8.6	8.6	125	81	11.420.1270	12.7	12.7	151	101
11.420.0460	4.6	4.6	80	47	11.420.0870	8.7	8.7	125	81	11.420.1280	12.8	12.8	151	101
11.420.0470	4.7	4.7	80	47	11.420.0880	8.8	8.8	125	81	11.420.1290	12.9	12.9	151	101
11.420.0480	4.8	4.8	86	52	11.420.0890	8.9	8.9	125	81	11.420.1300	13	13	151	101
11.420.0490	4.9	4.9	86	52	11.420.0900	9	9	125	81					
11.420.0500	5	5	86	52	11.420.0910	9.1	9.1	125	81					

**> 11.423 INTERNATIONAL TOOLS**

NL ECO HSS Spiraalboor  
FR Foret HSS ECO  
ES Broca HSS ECO  
DE ECO HSS Spiralbohrer



**NIEUW / NOUVEAU / NUEVO / NEU**

**HSS** **DIN 338** **N** **ECO**

**P 11** **P 12** **P 13** **K 31** **K 32** **N 42** **N 51** **N 61**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Si>10% Cu PVC

25-27 F 22-30 F 15-20 E 15-20 E 25-30 E 35-40 G 25-40 D 22-28 D

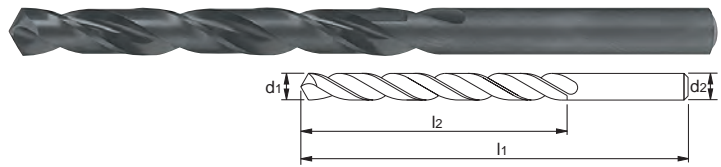
Ref.	d1	d2	l1	l2
11.423.0100	1	1	34	12
11.423.0150	1.5	1.5	40	18
11.423.0200	2	2	49	24
11.423.0250	2.5	2.5	57	30
11.423.0300	3	3	61	33
11.423.0310	3.1	3.1	65	36
11.423.0320	3.2	3.2	65	36
11.423.0330	3.3	3.3	65	36
11.423.0350	3.5	3.5	70	39
11.423.0380	3.8	3.8	75	43
11.423.0400	4	4	75	43
11.423.0410	4.1	4.1	75	43
11.423.0420	4.2	4.2	75	43
11.423.0450	4.5	4.5	80	47

Ref.	d1	d2	l1	l2
11.423.0480	4.8	4.8	86	52
11.423.0490	4.9	4.9	86	52
11.423.0500	5	5	86	52
11.423.0510	5.1	5.1	86	52
11.423.0520	5.2	5.2	86	52
11.423.0550	5.5	5.5	93	57
11.423.0570	5.7	5.7	93	57
11.423.0580	5.8	5.8	93	57
11.423.0600	6	6	93	57
11.423.0620	6.2	6.2	101	63
11.423.0650	6.5	6.5	101	63
11.423.0680	6.8	6.8	109	69
11.423.0700	7	7	109	69
11.423.0750	7.5	7.5	109	69

Ref.	d1	d2	l1	l2
11.423.0800	8	8	117	75
11.423.0850	8.5	8.5	117	75
11.423.0900	9	9	125	81
11.423.0950	9.5	9.5	125	81
11.423.1000	10	10	133	87
11.423.1020	10.2	10.2	133	87
11.423.1050	10.5	10.5	133	87
11.423.1100	11	11	142	94
11.423.1150	11.5	11.5	142	94
11.423.1200	12	12	151	101
11.423.1250	12.5	12.5	151	101
11.423.1300	13	13	151	101

**> 11.426 INTERNATIONAL TOOLS**

NL ECO HSS Spiraalboor  
FR Foret HSS ECO  
ES Broca HSS ECO  
DE ECO HSS Spiralbohrer



**HSS** **DIN 338** **N** **ECO**

**P 11** **P 12** **P 13** **K 31** **K 32** **N 42** **N 51** **N 61**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Si>10% Cu PVC

25-27 F 22-30 F 15-20 E 15-20 E 25-30 E 35-40 G 25-40 D 22-28 D

Ref.	d1	d2	l1	l2
11.426.0100	1	1	34	12
11.426.0110	1.1	1.1	36	14
11.426.0120	1.2	1.2	38	16
11.426.0130	1.3	1.3	38	16
11.426.0140	1.4	1.4	40	18
11.426.0150	1.5	1.5	40	18
11.426.0160	1.6	1.6	43	20
11.426.0170	1.7	1.7	43	20
11.426.0180	1.8	1.8	46	22
11.426.0190	1.9	1.9	46	22
11.426.0200	2	2	49	24
11.426.0210	2.1	2.1	49	24
11.426.0220	2.2	2.2	53	27
11.426.0230	2.3	2.3	53	27
11.426.0240	2.4	2.4	57	30
11.426.0250	2.5	2.5	57	30
11.426.0260	2.6	2.6	57	30
11.426.0270	2.7	2.7	61	33
11.426.0280	2.8	2.8	61	33
11.426.0290	2.9	2.9	61	33
11.426.0300	3	3	61	33
11.426.0310	3.1	3.1	65	36
11.426.0320	3.2	3.2	65	36
11.426.0330	3.3	3.3	65	36
11.426.0340	3.4	3.4	70	39
11.426.0350	3.5	3.5	70	39
11.426.0360	3.6	3.6	70	39
11.426.0370	3.7	3.7	70	39
11.426.0380	3.8	3.8	75	43
11.426.0390	3.9	3.9	75	43
11.426.0400	4	4	75	43
11.426.0410	4.1	4.1	75	43
11.426.0420	4.2	4.2	75	43
11.426.0430	4.3	4.3	80	47
11.426.0440	4.4	4.4	80	47
11.426.0450	4.5	4.5	80	47
11.426.0460	4.6	4.6	80	47

Ref.	d1	d2	l1	l2
11.426.0470	4.7	4.7	80	47
11.426.0480	4.8	4.8	86	52
11.426.0490	4.9	4.9	86	52
11.426.0500	5	5	86	52
11.426.0510	5.1	5.1	86	52
11.426.0520	5.2	5.2	86	52
11.426.0530	5.3	5.3	86	52
11.426.0540	5.4	5.4	93	57
11.426.0550	5.5	5.5	93	57
11.426.0560	5.6	5.6	93	57
11.426.0570	5.7	5.7	93	57
11.426.0580	5.8	5.8	93	57
11.426.0590	5.9	5.9	93	57
11.426.0600	6	6	93	57
11.426.0610	6.1	6.1	101	63
11.426.0620	6.2	6.2	101	63
11.426.0630	6.3	6.3	101	63
11.426.0640	6.4	6.4	101	63
11.426.0650	6.5	6.5	101	63
11.426.0660	6.6	6.6	101	63
11.426.0670	6.7	6.7	101	63
11.426.0680	6.8	6.8	109	69
11.426.0690	6.9	6.9	109	69
11.426.0700	7	7	109	69
11.426.0710	7.1	7.1	109	69
11.426.0720	7.2	7.2	109	69
11.426.0730	7.3	7.3	109	69
11.426.0740	7.4	7.4	109	69
11.426.0750	7.5	7.5	109	69
11.426.0760	7.6	7.6	117	75
11.426.0770	7.7	7.7	117	75
11.426.0780	7.8	7.8	117	75
11.426.0790	7.9	7.9	117	75
11.426.0800	8	8	117	75
11.426.0810	8.1	8.1	117	75
11.426.0820	8.2	8.2	117	75
11.426.0830	8.3	8.3	117	75

Ref.	d1	d2	l1	l2
11.426.0840	8.4	8.4	117	75
11.426.0850	8.5	8.5	117	75
11.426.0860	8.6	8.6	125	81
11.426.0870	8.7	8.7	125	81
11.426.0880	8.8	8.8	125	81
11.426.0890	8.9	8.9	125	81
11.426.0900	9	9	125	81
11.426.0910	9.1	9.1	125	81
11.426.0920	9.2	9.2	125	81
11.426.0930	9.3	9.3	125	81
11.426.0940	9.4	9.4	125	81
11.426.0950	9.5	9.5	125	81
11.426.0960	9.6	9.6	133	87
11.426.0970	9.7	9.7	133	87
11.426.0980	9.8	9.8	133	87
11.426.0990	9.9	9.9	133	87
11.426.1000	10	10	133	87
11.426.1010	10.1	10.1	133	87
11.426.1020	10.2	10.2	133	87
11.426.1040	10.4	10.4	133	87
11.426.1050	10.5	10.5	133	87
11.426.1060	10.6	10.6	133	87
11.426.1070	10.7	10.7	142	94
11.426.1080	10.8	10.8	142	94
11.426.1090	10.9	10.9	142	94
11.426.1100	11	11	142	94
11.426.1110	11.1	11.1	142	94
11.426.1120	11.2	11.2	142	94
11.426.1130	11.3	11.3	142	94
11.426.1140	11.4	11.4	142	94
11.426.1150	11.5	11.5	142	94
11.426.1160	11.6	11.6	142	94
11.426.1170	11.7	11.7	142	94
11.426.1180	11.8	11.8	142	94
11.426.1190	11.9	11.9	151	101
11.426.1200	12	12	151	101
11.426.1210	12.1	12.1	151	101



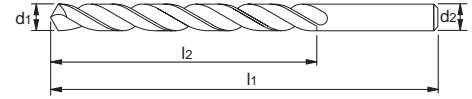
**> 11.426 INTERNATIONAL TOOLS**

Ref.	d1	d2	l1	l2
11.426.1220	12.2	12.2	151	101
11.426.1230	12.3	12.3	151	101
11.426.1240	12.4	12.4	151	101

Ref.	d1	d2	l1	l2
11.426.1250	12.5	12.5	151	101
11.426.1260	12.6	12.6	151	101
11.426.1270	12.7	12.7	151	101

Ref.	d1	d2	l1	l2
11.426.1280	12.8	12.8	151	101
11.426.1290	12.9	12.9	151	101
11.426.1300	13	13	151	101

**> 11.430 INTERNATIONAL TOOLS**



NL ECO PRO HSS Spiraalboor Kruisaanslijping  
 FR Foret HSS ECO PRO Affûtage en croix  
 ES Broca HSS ECO PRO Afilado en cruz  
 DE ECO PRO HSS Spiralbohrer Kreuzanschliff

**HSS**   **DIN 338**   **N**   **>3**   **118°**   **ECO PRO**

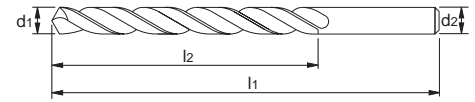
<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	35-40 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2
11.430.0100	1	1	34	12
11.430.0110	1.1	1.1	36	14
11.430.0120	1.2	1.2	38	16
11.430.0130	1.3	1.3	38	16
11.430.0140	1.4	1.4	40	18
11.430.0150	1.5	1.5	40	18
11.430.0160	1.6	1.6	43	20
11.430.0170	1.7	1.7	43	20
11.430.0180	1.8	1.8	46	22
11.430.0190	1.9	1.9	46	22
11.430.0200	2	2	49	24
11.430.0210	2.1	2.1	49	24
11.430.0220	2.2	2.2	53	27
11.430.0230	2.3	2.3	53	27
11.430.0240	2.4	2.4	57	30
11.430.0250	2.5	2.5	57	30
11.430.0260	2.6	2.6	57	30
11.430.0270	2.7	2.7	61	33
11.430.0280	2.8	2.8	61	33
11.430.0290	2.9	2.9	61	33
11.430.0300	3	3	61	33
11.430.0310	3.1	3.1	65	36
11.430.0320	3.2	3.2	65	36
11.430.0330	3.3	3.3	65	36
11.430.0340	3.4	3.4	70	39
11.430.0350	3.5	3.5	70	39
11.430.0360	3.6	3.6	70	39
11.430.0370	3.7	3.7	70	39
11.430.0380	3.8	3.8	75	43
11.430.0390	3.9	3.9	75	43
11.430.0400	4	4	75	43
11.430.0410	4.1	4.1	75	43
11.430.0420	4.2	4.2	75	43
11.430.0430	4.3	4.3	80	47
11.430.0440	4.4	4.4	80	47
11.430.0450	4.5	4.5	80	47
11.430.0460	4.6	4.6	80	47
11.430.0470	4.7	4.7	80	47
11.430.0480	4.8	4.8	86	52
11.430.0490	4.9	4.9	86	52
11.430.0500	5	5	86	52

Ref.	d1	d2	l1	l2
11.430.0510	5.1	5.1	86	52
11.430.0520	5.2	5.2	86	52
11.430.0530	5.3	5.3	86	52
11.430.0540	5.4	5.4	93	57
11.430.0550	5.5	5.5	93	57
11.430.0560	5.6	5.6	93	57
11.430.0570	5.7	5.7	93	57
11.430.0580	5.8	5.8	93	57
11.430.0590	5.9	5.9	93	57
11.430.0600	6	6	93	57
11.430.0610	6.1	6.1	101	63
11.430.0620	6.2	6.2	101	63
11.430.0630	6.3	6.3	101	63
11.430.0640	6.4	6.4	101	63
11.430.0650	6.5	6.5	101	63
11.430.0660	6.6	6.6	101	63
11.430.0670	6.7	6.7	101	63
11.430.0680	6.8	6.8	109	69
11.430.0690	6.9	6.9	109	69
11.430.0700	7	7	109	69
11.430.0710	7.1	7.1	109	69
11.430.0720	7.2	7.2	109	69
11.430.0730	7.3	7.3	109	69
11.430.0740	7.4	7.4	109	69
11.430.0750	7.5	7.5	109	69
11.430.0760	7.6	7.6	117	75
11.430.0770	7.7	7.7	117	75
11.430.0780	7.8	7.8	117	75
11.430.0790	7.9	7.9	117	75
11.430.0800	8	8	117	75
11.430.0810	8.1	8.1	117	75
11.430.0820	8.2	8.2	117	75
11.430.0830	8.3	8.3	117	75
11.430.0840	8.4	8.4	117	75
11.430.0850	8.5	8.5	117	75
11.430.0860	8.6	8.6	125	81
11.430.0870	8.7	8.7	125	81
11.430.0880	8.8	8.8	125	81
11.430.0890	8.9	8.9	125	81
11.430.0900	9	9	125	81
11.430.0910	9.1	9.1	125	81

Ref.	d1	d2	l1	l2
11.430.0920	9.2	9.2	125	81
11.430.0930	9.3	9.3	125	81
11.430.0940	9.4	9.4	125	81
11.430.0950	9.5	9.5	125	81
11.430.0960	9.6	9.6	133	87
11.430.0970	9.7	9.7	133	87
11.430.0980	9.8	9.8	133	87
11.430.0990	9.9	9.9	133	87
11.430.1000	10	10	133	87
11.430.1010	10.1	10.1	133	87
11.430.1020	10.2	10.2	133	87
11.430.1030	10.3	10.3	133	87
11.430.1040	10.4	10.4	133	87
11.430.1050	10.5	10.5	133	87
11.430.1060	10.6	10.6	133	87
11.430.1070	10.7	10.7	142	94
11.430.1080	10.8	10.8	142	94
11.430.1090	10.9	10.9	142	94
11.430.1100	11	11	142	94
11.430.1120	11.2	11.2	142	94
11.430.1150	11.5	11.5	142	94
11.430.1180	11.8	11.8	142	94
11.430.1200	12	12	151	101
11.430.1220	12.2	12.2	151	101
11.430.1250	12.5	12.5	151	101
11.430.1280	12.8	12.8	151	101
11.430.1300	13	13	151	101
11.430.1350	13.5	13.5	160	108
11.430.1400	14	14	160	108
11.430.1450	14.5	14.5	169	114
11.430.1500	15	15	169	114
11.430.1550	15.5	15.5	178	120
11.430.1600	16	16	178	120
11.430.1650	16.5	16.5	184	125
11.430.1700	17	17	184	125
11.430.1750	17.5	17.5	191	130
11.430.1800	18	18	191	130
11.430.1850	18.5	18.5	198	135
11.430.1900	19	19	198	135
11.430.1950	19.5	19.5	205	140
11.430.2000	20	20	205	140

> **11.431** **INTERNATIONAL TOOLS**



NL ECO PRO HSS Spiraalboor TiN-tip  
FR Foret HSS ECO PRO avec revêtement TiN sur la partie utile  
ES Broca HSS ECO PRO con punta TiN  
DE ECO PRO HSS Spiralbohrer TiN-Tip

**HSS** **TiN** **DIN 338** **N** **>3** **118°** **ECO PRO**

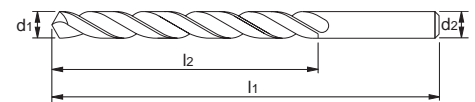
<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si<10%	<b>N 51</b> Cu	<b>N 61</b> PVC
27-30 F	25-28 F	17-22 E	10-14 D	20-33 E	20-28 E	50-80 E	45-70 G	40-65 D	25-36 D

Ref.	d1	d2	l1	l2
11.431.0100	1	1	34	12
11.431.0110	1.1	1.1	36	14
11.431.0120	1.2	1.2	38	16
11.431.0130	1.3	1.3	38	16
11.431.0140	1.4	1.4	40	18
11.431.0150	1.5	1.5	40	18
11.431.0160	1.6	1.6	43	20
11.431.0170	1.7	1.7	43	20
11.431.0180	1.8	1.8	46	22
11.431.0190	1.9	1.9	46	22
11.431.0200	2	2	49	24
11.431.0210	2.1	2.1	49	24
11.431.0220	2.2	2.2	53	27
11.431.0230	2.3	2.3	53	27
11.431.0240	2.4	2.4	57	30
11.431.0250	2.5	2.5	57	30
11.431.0260	2.6	2.6	57	30
11.431.0270	2.7	2.7	61	33
11.431.0280	2.8	2.8	61	33
11.431.0290	2.9	2.9	61	33
11.431.0300	3	3	61	33
11.431.0310	3.1	3.1	65	36
11.431.0320	3.2	3.2	65	36
11.431.0330	3.3	3.3	65	36
11.431.0340	3.4	3.4	70	39
11.431.0350	3.5	3.5	70	39
11.431.0360	3.6	3.6	70	39
11.431.0370	3.7	3.7	70	39
11.431.0380	3.8	3.8	75	43
11.431.0390	3.9	3.9	75	43
11.431.0400	4	4	75	43
11.431.0410	4.1	4.1	75	43
11.431.0420	4.2	4.2	75	43
11.431.0430	4.3	4.3	80	47
11.431.0440	4.4	4.4	80	47
11.431.0450	4.5	4.5	80	47
11.431.0460	4.6	4.6	80	47

Ref.	d1	d2	l1	l2
11.431.0470	4.7	4.7	80	47
11.431.0480	4.8	4.8	86	52
11.431.0490	4.9	4.9	86	52
11.431.0500	5	5	86	52
11.431.0510	5.1	5.1	86	52
11.431.0520	5.2	5.2	86	52
11.431.0530	5.3	5.3	86	52
11.431.0540	5.4	5.4	93	57
11.431.0550	5.5	5.5	93	57
11.431.0560	5.6	5.6	93	57
11.431.0570	5.7	5.7	93	57
11.431.0580	5.8	5.8	93	57
11.431.0590	5.9	5.9	93	57
11.431.0600	6	6	93	57
11.431.0610	6.1	6.1	101	63
11.431.0620	6.2	6.2	101	63
11.431.0630	6.3	6.3	101	63
11.431.0640	6.4	6.4	101	63
11.431.0650	6.5	6.5	101	63
11.431.0660	6.6	6.6	101	63
11.431.0670	6.7	6.7	101	63
11.431.0680	6.8	6.8	109	69
11.431.0690	6.9	6.9	109	69
11.431.0700	7	7	109	69
11.431.0710	7.1	7.1	109	69
11.431.0720	7.2	7.2	109	69
11.431.0730	7.3	7.3	109	69
11.431.0740	7.4	7.4	109	69
11.431.0750	7.5	7.5	109	69
11.431.0760	7.6	7.6	117	75
11.431.0770	7.7	7.7	117	75
11.431.0780	7.8	7.8	117	75
11.431.0790	7.9	7.9	117	75
11.431.0800	8	8	117	75
11.431.0810	8.1	8.1	117	75
11.431.0820	8.2	8.2	117	75
11.431.0830	8.3	8.3	117	75

Ref.	d1	d2	l1	l2
11.431.0840	8.4	8.4	117	75
11.431.0850	8.5	8.5	117	75
11.431.0860	8.6	8.6	125	81
11.431.0870	8.7	8.7	125	81
11.431.0880	8.8	8.8	125	81
11.431.0890	8.9	8.9	125	81
11.431.0900	9	9	125	81
11.431.0910	9.1	9.1	125	81
11.431.0920	9.2	9.2	125	81
11.431.0930	9.3	9.3	125	81
11.431.0940	9.4	9.4	125	81
11.431.0950	9.5	9.5	125	81
11.431.0960	9.6	9.6	133	87
11.431.0970	9.7	9.7	133	87
11.431.0980	9.8	9.8	133	87
11.431.0990	9.9	9.9	133	87
11.431.1000	10	10	133	87
11.431.1010	10.1	10.1	133	87
11.431.1020	10.2	10.2	133	87
11.431.1030	10.3	10.3	133	87
11.431.1040	10.4	10.4	133	87
11.431.1050	10.5	10.5	133	87
11.431.1060	10.6	10.6	133	87
11.431.1070	10.7	10.7	142	94
11.431.1080	10.8	10.8	142	94
11.431.1090	10.9	10.9	142	94
11.431.1100	11	11	142	94
11.431.1120	11.2	11.2	142	94
11.431.1150	11.5	11.5	142	94
11.431.1180	11.8	11.8	142	94
11.431.1200	12	12	151	101
11.431.1220	12.2	12.2	151	101
11.431.1250	12.5	12.5	151	101
11.431.1280	12.8	12.8	151	101
11.431.1300	13	13	151	101

> **11.440** **Phantom**



NL HSS Spiraalboor met 3-vlaks schacht  
FR Foret HSS à 3 pans  
ES Broca HSS con 3 chaflanes  
DE HSS Spiralbohrer mit drei platten Flächen

**HSS** **OX.** **DIN 338** **N** **1** **118°**

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si<10%	<b>N 51</b> Cu	<b>N 61</b> PVC
27-30 F	25-28 F	17-22 E	10-14 D	20-33 E	20-28 E	50-80 E	45-70 G	40-65 D	25-36 D

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	d1	d2	l1	l2
11.440.0400	4	4	75	43
11.440.0420	4.2	4.2	75	43
11.440.0450	4.5	4.5	80	47
11.440.0500	5	5	86	52
11.440.0550	5.5	5.5	93	57
11.440.0600	6	6	93	57
11.440.0650	6.5	6.5	101	63
11.440.0680	6.8	6.8	109	69

Ref.	d1	d2	l1	l2
11.440.0700	7	7	109	69
11.440.0750	7.5	7.5	109	69
11.440.0800	8	8	117	75
11.440.0850	8.5	8.5	117	75
11.440.0900	9	9	125	81
11.440.0950	9.5	9.5	125	81
11.440.1000	10	10	133	87
11.440.1020	10.2	10.2	133	87

Ref.	d1	d2	l1	l2
11.440.1050	10.5	10.5	133	87
11.440.1100	11	11	142	94
11.440.1150	11.5	11.5	142	94
11.440.1200	12	12	151	101
11.440.1250	12.5	12.5	151	101
11.440.1300	13	13	151	101



## > 11.441 Phantom

NL HSS Spiraalboor TiN-tip, met 3-vlaks schacht, (handgebruik)  
 FR Foret HSS avec revêtement TiN sur la partie utile, à 3 pans, (usage à la main)  
 ES Broca HSS con punta TiN, con 3 chaflanes, (uso manual)  
 DE HSS Spiralbohrer TiN-Tip, mit drei platten Flächen, (handgebrauch)

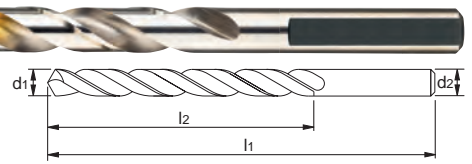


P 11 S600 N/mm <sup>2</sup>	P 12 S850 N/mm <sup>2</sup>	P 13 S1000 N/mm <sup>2</sup>	M 21 INOX S850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
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27-30 F	25-28 F	17-22 E	10-14 D	20-33 E	20-28 E	50-80 E	45-70 G	40-65 D	25-36 D
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Ref.	d1	d2	l1	l2
11.441.0400	4	4	75	43
11.441.0420	4.2	4.2	75	43
11.441.0450	4.5	4.5	80	47
11.441.0500	5	5	86	52
11.441.0550	5.5	5.5	93	57
11.441.0600	6	6	93	57
11.441.0650	6.5	6.5	101	63
11.441.0680	6.8	6.8	109	69

Ref.	d1	d2	l1	l2
11.441.0700	7	7	109	69
11.441.0750	7.5	7.5	109	69
11.441.0800	8	8	117	75
11.441.0850	8.5	8.5	117	75
11.441.0900	9	9	125	81
11.441.0950	9.5	9.5	125	81
11.441.1000	10	10	133	87
11.441.1020	10.2	10.2	133	87



NIEUW NOUVEAU NUEVO NEU

## > 11.443 Phantom

NL HSS Spiraalboor, Step-point met 3-vlaks schacht  
 FR Foret, Step-point HSS à 3 pans  
 ES Broca, Step-point HSS con 3 chaflanes  
 DE HSS Spiralbohrer, Step-point mit drei platten Flächen

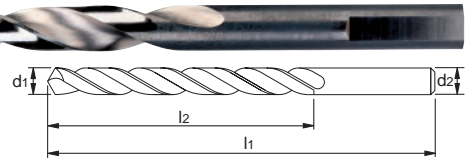


P 11 S600 N/mm <sup>2</sup>	P 12 S850 N/mm <sup>2</sup>	P 13 S1000 N/mm <sup>2</sup>	M 21 INOX S850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
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25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D
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Ref.	d1	d2	l1	l2
11.443.0100	1	1	34	12
11.443.0150	1,5	1,5	40	18
11.443.0200	2	2	49	24
11.443.0250	2,5	2,5	57	30
11.443.0300	3	3	61	33
11.443.0320	3,2	3,2	65	36
11.443.0330	3,3	3,3	65	36
11.443.0350	3,5	3,5	70	39
11.443.0400	4	4	75	43
11.443.0410	4,1	4,1	75	43
11.443.0420	4,2	4,2	75	43
11.443.0450	4,5	4,5	80	47

Ref.	d1	d2	l1	l2
11.443.0490	4,9	4,9	86	52
11.443.0500	5	5	86	52
11.443.0510	5,1	5,1	86	52
11.443.0520	5,2	5,2	86	52
11.443.0550	5,5	5,5	93	57
11.443.0600	6	6	93	57
11.443.0650	6,5	6,5	101	63
11.443.0680	6,8	6,8	109	69
11.443.0700	7	7	109	69
11.443.0750	7,5	7,5	109	69
11.443.0800	8	8	117	75
11.443.0850	8,5	8,5	117	75

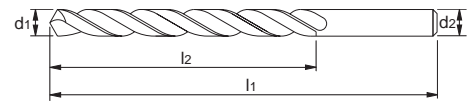


NIEUW NOUVEAU NUEVO NEU



► **11.445 Phantom**

NL HSS-E Spiraalboor met 3-vlaks schacht  
 FR Foret HSS-E à 3 pans  
 ES Broca HSS-E con 3 chaflanes  
 DE HSS-E Spiralbohrer mit drei platten Flächen



**NIEUW NOUVEAU NUEVO NEU**

+6 6 ( DIN 338 N 

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

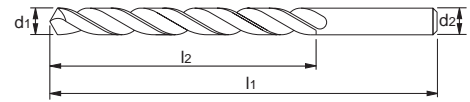
Ref.	d1	d2	l1	l2
11.445.0400	4	4	75	43
11.445.0420	4.2	4.2	75	43
11.445.0450	4.5	4.5	80	47
11.445.0500	5	5	86	52
11.445.0550	5.5	5.5	93	57
11.445.0600	6	6	93	57
11.445.0650	6.5	6.5	101	63
11.445.0680	6.8	6.8	109	69

Ref.	d1	d2	l1	l2
11.445.0700	7	7	109	69
11.445.0750	7.5	7.5	109	69
11.445.0800	8	8	117	75
11.445.0850	8.5	8.5	117	75
11.445.0900	9	9	125	81
11.445.0950	9.5	9.5	125	81
11.445.1000	10	10	133	87
11.445.1020	10.2	10.2	133	87

Ref.	d1	d2	l1	l2
11.445.1050	10.5	10.5	133	87
11.445.1100	11	11	142	94
11.445.1150	11.5	11.5	142	94
11.445.1200	12	12	151	101
11.445.1250	12.5	12.5	151	101
11.445.1300	13	13	151	101

► **11.446 Phantom**

NL HSS-E Spiraalboor TiN-tip, met 3-vlaks schacht, (handgebruik)  
 FR Foret HSS-E avec revêtement TiN sur la partie utile, à 3 pans, (usage à la main)  
 ES Broca HSS-E con punta TiN, con 3 chaflanes, (uso manual)  
 DE HSS-E Spiralbohrer TiN-Tip, mit drei platten Flächen, (handgebrauch)



**NIEUW NOUVEAU NUEVO NEU**

+6 6 ( **TiN** DIN 338 >N   

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
32-40 E	35-40 E	25-32 E	12-20 D	15-20 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	d1	d2	l1	l2
11.446.0400	4	4	75	43
11.446.0420	4.2	4.2	75	43
11.446.0450	4.5	4.5	80	47
11.446.0500	5	5	86	52
11.446.0550	5.5	5.5	93	57
11.446.0600	6	6	93	57
11.446.0650	6.5	6.5	101	63
11.446.0680	6.8	6.8	109	69

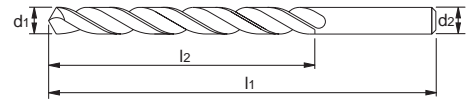
Ref.	d1	d2	l1	l2
11.446.0700	7	7	109	69
11.446.0750	7.5	7.5	109	69
11.446.0800	8	8	117	75
11.446.0850	8.5	8.5	117	75
11.446.0900	9	9	125	81
11.446.0950	9.5	9.5	125	81
11.446.1000	10	10	133	87
11.446.1020	10.2	10.2	133	87

Ref.	d1	d2	l1	l2
11.446.1050	10.5	10.5	133	87
11.446.1100	11	11	142	94
11.446.1150	11.5	11.5	142	94
11.446.1200	12	12	151	101
11.446.1250	12.5	12.5	151	101
11.446.1300	13	13	151	101



> 11.450 Phantom

NL HSS Spiraalboor  
 FR Foret HSS  
 ES Broca HSS  
 DE HSS Spiralbohrer



**HSS** **OX.** **DIN 338** **N**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 42** **N 51** **N 61**

5800 N/mm<sup>2</sup> 5850 N/mm<sup>2</sup> 51000 N/mm<sup>2</sup> INOX s850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Si<10% Cu PVC

25-27 F 22-30 F 15-20 E 8-12 D 15-20 E 25-30 E 45-50 G 25-40 D 22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.450.0020	0.2	0.2	19	2.5	11.450.0375	3.75	3.75	70	39	11.450.0875	8.75	8.75	125	81
11.450.0025	0.25	0.25	19	3	11.450.0380	3.8	3.8	75	43	11.450.0880	8.8	8.8	125	81
11.450.0030	0.3	0.3	19	3	11.450.0385	3.85	3.85	75	43	11.450.0890	8.9	8.9	125	81
11.450.0035	0.35	0.35	19	4	11.450.0390	3.9	3.9	75	43	11.450.0900	9	9	125	81
11.450.0040	0.4	0.4	20	5	11.450.0395	3.95	3.95	75	43	11.450.0910	9.1	9.1	125	81
11.450.0045	0.45	0.45	20	5	11.450.0400	4	4	75	43	11.450.0920	9.2	9.2	125	81
11.450.0050	0.5	0.5	22	6	11.450.0405	4.05	4.05	75	43	11.450.0925	9.25	9.25	125	81
11.450.0055	0.55	0.55	24	7	11.450.0410	4.1	4.1	75	43	11.450.0930	9.3	9.3	125	81
11.450.0060	0.6	0.6	24	7	11.450.0415	4.15	4.15	75	43	11.450.0940	9.4	9.4	125	81
11.450.0065	0.65	0.65	26	8	11.450.0420	4.2	4.2	75	43	11.450.0950	9.5	9.5	125	81
11.450.0070	0.7	0.7	28	9	11.450.0425	4.25	4.25	75	43	11.450.0960	9.6	9.6	133	87
11.450.0075	0.75	0.75	28	9	11.450.0430	4.3	4.3	80	47	11.450.0970	9.7	9.7	133	87
11.450.0080	0.8	0.8	30	10	11.450.0435	4.35	4.35	80	47	11.450.0975	9.75	9.75	133	87
11.450.0085	0.85	0.85	30	10	11.450.0440	4.4	4.4	80	47	11.450.0980	9.8	9.8	133	87
11.450.0090	0.9	0.9	32	11	11.450.0445	4.45	4.45	80	47	11.450.0990	9.9	9.9	133	87
11.450.0095	0.95	0.95	32	11	11.450.0450	4.5	4.5	80	47	11.450.1000	10	10	133	87
11.450.0100	1	1	34	12	11.450.0455	4.55	4.55	80	47	11.450.1010	10.1	10.1	133	87
11.450.0105	1.05	1.05	34	12	11.450.0460	4.6	4.6	80	47	11.450.1020	10.2	10.2	133	87
11.450.0110	1.1	1.1	36	14	11.450.0465	4.65	4.65	80	47	11.450.1025	10.25	10.25	133	87
11.450.0115	1.15	1.15	36	14	11.450.0470	4.7	4.7	80	47	11.450.1030	10.3	10.3	133	87
11.450.0120	1.2	1.2	38	16	11.450.0475	4.75	4.75	80	47	11.450.1040	10.4	10.4	133	87
11.450.0125	1.25	1.25	38	16	11.450.0480	4.8	4.8	86	52	11.450.1050	10.5	10.5	133	87
11.450.0130	1.3	1.3	38	16	11.450.0485	4.85	4.85	86	52	11.450.1060	10.6	10.6	133	87
11.450.0135	1.35	1.35	40	18	11.450.0490	4.9	4.9	86	52	11.450.1070	10.7	10.7	142	94
11.450.0140	1.4	1.4	40	18	11.450.0495	4.95	4.95	86	52	11.450.1075	10.75	10.75	142	94
11.450.0145	1.45	1.45	40	18	11.450.0500	5	5	86	52	11.450.1080	10.8	10.8	142	94
11.450.0150	1.5	1.5	40	18	11.450.0510	5.1	5.1	86	52	11.450.1090	10.9	10.9	142	94
11.450.0155	1.55	1.55	43	20	11.450.0520	5.2	5.2	86	52	11.450.1100	11	11	142	94
11.450.0160	1.6	1.6	43	20	11.450.0525	5.25	5.25	86	52	11.450.1110	11.1	11.1	142	94
11.450.0165	1.65	1.65	43	20	11.450.0530	5.3	5.3	86	52	11.450.1120	11.2	11.2	142	94
11.450.0170	1.7	1.7	43	20	11.450.0540	5.4	5.4	93	57	11.450.1125	11.25	11.25	142	94
11.450.0175	1.75	1.75	46	22	11.450.0550	5.5	5.5	93	57	11.450.1130	11.3	11.3	142	94
11.450.0180	1.8	1.8	46	22	11.450.0560	5.6	5.6	93	57	11.450.1140	11.4	11.4	142	94
11.450.0185	1.85	1.85	46	22	11.450.0570	5.7	5.7	93	57	11.450.1150	11.5	11.5	142	94
11.450.0190	1.9	1.9	46	22	11.450.0575	5.75	5.75	93	57	11.450.1160	11.6	11.6	142	94
11.450.0195	1.95	1.95	49	24	11.450.0580	5.8	5.8	93	57	11.450.1170	11.7	11.7	142	94
11.450.0200	2	2	49	24	11.450.0590	5.9	5.9	93	57	11.450.1175	11.75	11.75	142	94
11.450.0205	2.05	2.05	49	24	11.450.0600	6	6	93	57	11.450.1180	11.8	11.8	142	94
11.450.0210	2.1	2.1	49	24	11.450.0610	6.1	6.1	101	63	11.450.1190	11.9	11.9	151	101
11.450.0215	2.15	2.15	53	27	11.450.0620	6.2	6.2	101	63	11.450.1200	12	12	151	101
11.450.0220	2.2	2.2	53	27	11.450.0625	6.25	6.25	101	63	11.450.1210	12.1	12.1	151	101
11.450.0225	2.25	2.25	53	27	11.450.0630	6.3	6.3	101	63	11.450.1220	12.2	12.2	151	101
11.450.0230	2.3	2.3	53	27	11.450.0635	6.35	6.35	101	63	11.450.1225	12.25	12.25	151	101
11.450.0235	2.35	2.35	53	27	11.450.0640	6.4	6.4	101	63	11.450.1230	12.3	12.3	151	101
11.450.0240	2.4	2.4	57	30	11.450.0650	6.5	6.5	101	63	11.450.1240	12.4	12.4	151	101
11.450.0245	2.45	2.45	57	30	11.450.0660	6.6	6.6	101	63	11.450.1250	12.5	12.5	151	101
11.450.0250	2.5	2.5	57	30	11.450.0670	6.7	6.7	101	63	11.450.1260	12.6	12.6	151	101
11.450.0255	2.55	2.55	57	30	11.450.0675	6.75	6.75	109	69	11.450.1270	12.7	12.7	151	101
11.450.0260	2.6	2.6	57	30	11.450.0680	6.8	6.8	109	69	11.450.1275	12.75	12.75	151	101
11.450.0265	2.65	2.65	57	30	11.450.0690	6.9	6.9	109	69	11.450.1280	12.8	12.8	151	101
11.450.0270	2.7	2.7	61	33	11.450.0700	7	7	109	69	11.450.1290	12.9	12.9	151	101
11.450.0275	2.75	2.75	61	33	11.450.0710	7.1	7.1	109	69	11.450.1300	13	13	151	101
11.450.0280	2.8	2.8	61	33	11.450.0720	7.2	7.2	109	69	11.450.1310	13.1	13.1	151	101
11.450.0285	2.85	2.85	61	33	11.450.0725	7.25	7.25	109	69	11.450.1320	13.2	13.2	151	101
11.450.0290	2.9	2.9	61	33	11.450.0730	7.3	7.3	109	69	11.450.1325	13.25	13.25	160	108
11.450.0295	2.95	2.95	61	33	11.450.0740	7.4	7.4	109	69	11.450.1330	13.3	13.3	160	108
11.450.0300	3	3	61	33	11.450.0750	7.5	7.5	109	69	11.450.1340	13.4	13.4	160	108
11.450.0305	3.05	3.05	65	36	11.450.0760	7.6	7.6	117	75	11.450.1350	13.5	13.5	160	108
11.450.0310	3.1	3.1	65	36	11.450.0770	7.7	7.7	117	75	11.450.1360	13.6	13.6	160	108
11.450.0315	3.15	3.15	65	36	11.450.0775	7.75	7.75	117	75	11.450.1370	13.7	13.7	160	108
11.450.0320	3.2	3.2	65	36	11.450.0780	7.8	7.8	117	75	11.450.1375	13.75	13.75	160	108
11.450.0325	3.25	3.25	65	36	11.450.0790	7.9	7.9	117	75	11.450.1380	13.8	13.8	160	108
11.450.0330	3.3	3.3	65	36	11.450.0800	8	8	117	75	11.450.1390	13.9	13.9	160	108
11.450.0335	3.35	3.35	65	36	11.450.0810	8.1	8.1	117	75	11.450.1400	14	14	160	108
11.450.0340	3.4	3.4	70	39	11.450.0820	8.2	8.2	117	75	11.450.1425	14.25	14.25	169	114
11.450.0345	3.45	3.45	70	39	11.450.0825	8.25	8.25	117	75	11.450.1450	14.5	14.5	169	114
11.450.0350	3.5	3.5	70	39	11.450.0830	8.3	8.3	117	75	11.450.1475	14.75	14.75	169	114
11.450.0355	3.55	3.55	70	39	11.450.0840	8.4	8.4	117	75	11.450.1500	15	15	169	114
11.450.0360	3.6	3.6	70	39	11.450.0850	8.5	8.5	117	75	11.450.1525	15.25	15.25	178	120
11.450.0365	3.65	3.65	70	39	11.450.0860	8.6	8.6	125	81	11.450.1550	15.5	15.5	178	120
11.450.0370	3.7	3.7	70	39	11.450.0870	8.7	8.7	125	81	11.450.1575	15.75	15.75	178	120

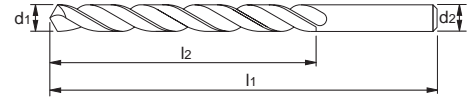
► **11.450 Phantom**

Ref.	d1	d2	l1	l2
11.450.1580	15.8	15.8	178	120
11.450.1600	16	16	178	120
11.450.1650	16.5	16.5	184	125
11.450.1700	17	17	184	125

Ref.	d1	d2	l1	l2
11.450.1750	17.5	17.5	191	130
11.450.1800	18	18	191	130
11.450.1850	18.5	18.5	198	135
11.450.1900	19	19	198	135

Ref.	d1	d2	l1	l2
11.450.1950	19.5	19.5	205	140
11.450.2000	20	20	205	140

► **11.451 Phantom**



NL HSS Spiraalboor TiN-tip  
FR Foret HSS avec revêtement TiN sur la partie utile  
ES Broca HSS con punta TiN  
DE HSS Spiralbohrer TiN-Tip

**HSS** **TiN** **DIN 338** **N** **118°**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 42** **N 51** **N 61**

5600 N/mm<sup>2</sup> 5850 N/mm<sup>2</sup> 51000 N/mm<sup>2</sup> INOX 5850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu PVC

27-30 F 25-28 F 17-22 E 10-14 D 20-33 E 20-28 E 50-80 E 45-70 G 40-65 D 25-36 D

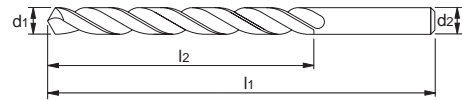
Ref.	d1	d2	l1	l2
11.451.0100	1	1	34	12
11.451.0110	1.1	1.1	36	14
11.451.0120	1.2	1.2	38	16
11.451.0130	1.3	1.3	38	16
11.451.0140	1.4	1.4	40	18
11.451.0150	1.5	1.5	40	18
11.451.0160	1.6	1.6	43	20
11.451.0170	1.7	1.7	43	20
11.451.0180	1.8	1.8	46	22
11.451.0190	1.9	1.9	46	22
11.451.0200	2	2	49	24
11.451.0210	2.1	2.1	49	24
11.451.0220	2.2	2.2	53	27
11.451.0230	2.3	2.3	53	27
11.451.0240	2.4	2.4	57	30
11.451.0250	2.5	2.5	57	30
11.451.0260	2.6	2.6	57	30
11.451.0270	2.7	2.7	61	33
11.451.0280	2.8	2.8	61	33
11.451.0290	2.9	2.9	61	33
11.451.0300	3	3	61	33
11.451.0310	3.1	3.1	65	36
11.451.0320	3.2	3.2	65	36
11.451.0330	3.3	3.3	65	36
11.451.0340	3.4	3.4	70	39
11.451.0350	3.5	3.5	70	39
11.451.0360	3.6	3.6	70	39
11.451.0370	3.7	3.7	70	39
11.451.0380	3.8	3.8	75	43
11.451.0390	3.9	3.9	75	43
11.451.0400	4	4	75	43
11.451.0410	4.1	4.1	75	43
11.451.0420	4.2	4.2	75	43
11.451.0430	4.3	4.3	80	47
11.451.0440	4.4	4.4	80	47
11.451.0450	4.5	4.5	80	47
11.451.0460	4.6	4.6	80	47
11.451.0470	4.7	4.7	80	47
11.451.0480	4.8	4.8	86	52
11.451.0490	4.9	4.9	86	52
11.451.0500	5	5	86	52

Ref.	d1	d2	l1	l2
11.451.0510	5.1	5.1	86	52
11.451.0520	5.2	5.2	86	52
11.451.0530	5.3	5.3	86	52
11.451.0540	5.4	5.4	93	57
11.451.0550	5.5	5.5	93	57
11.451.0560	5.6	5.6	93	57
11.451.0570	5.7	5.7	93	57
11.451.0580	5.8	5.8	93	57
11.451.0590	5.9	5.9	93	57
11.451.0600	6	6	93	57
11.451.0610	6.1	6.1	101	63
11.451.0620	6.2	6.2	101	63
11.451.0630	6.3	6.3	101	63
11.451.0640	6.4	6.4	101	63
11.451.0650	6.5	6.5	101	63
11.451.0660	6.6	6.6	101	63
11.451.0670	6.7	6.7	101	63
11.451.0680	6.8	6.8	109	69
11.451.0690	6.9	6.9	109	69
11.451.0700	7	7	109	69
11.451.0710	7.1	7.1	109	69
11.451.0720	7.2	7.2	109	69
11.451.0730	7.3	7.3	109	69
11.451.0740	7.4	7.4	109	69
11.451.0750	7.5	7.5	109	69
11.451.0760	7.6	7.6	117	75
11.451.0770	7.7	7.7	117	75
11.451.0780	7.8	7.8	117	75
11.451.0790	7.9	7.9	117	75
11.451.0800	8	8	117	75
11.451.0810	8.1	8.1	117	75
11.451.0820	8.2	8.2	117	75
11.451.0830	8.3	8.3	117	75
11.451.0840	8.4	8.4	117	75
11.451.0850	8.5	8.5	117	75
11.451.0860	8.6	8.6	125	81
11.451.0870	8.7	8.7	125	81
11.451.0880	8.8	8.8	125	81
11.451.0890	8.9	8.9	125	81
11.451.0900	9	9	125	81
11.451.0910	9.1	9.1	125	81

Ref.	d1	d2	l1	l2
11.451.0920	9.2	9.2	125	81
11.451.0930	9.3	9.3	125	81
11.451.0940	9.4	9.4	125	81
11.451.0950	9.5	9.5	125	81
11.451.0960	9.6	9.6	133	87
11.451.0970	9.7	9.7	133	87
11.451.0980	9.8	9.8	133	87
11.451.0990	9.9	9.9	133	87
11.451.1000	10	10	133	87
11.451.1010	10.1	10.1	133	87
11.451.1020	10.2	10.2	133	87
11.451.1030	10.3	10.3	133	87
11.451.1040	10.4	10.4	133	87
11.451.1050	10.5	10.5	133	87
11.451.1060	10.6	10.6	133	87
11.451.1070	10.7	10.7	142	94
11.451.1080	10.8	10.8	142	94
11.451.1090	10.9	10.9	142	94
11.451.1100	11	11	142	94
11.451.1110	11.1	11.1	142	94
11.451.1120	11.2	11.2	142	94
11.451.1130	11.3	11.3	142	94
11.451.1140	11.4	11.4	142	94
11.451.1150	11.5	11.5	142	94
11.451.1160	11.6	11.6	142	94
11.451.1170	11.7	11.7	142	94
11.451.1180	11.8	11.8	142	94
11.451.1190	11.9	11.9	151	101
11.451.1200	12	12	151	101
11.451.1210	12.1	12.1	151	101
11.451.1220	12.2	12.2	151	101
11.451.1230	12.3	12.3	151	101
11.451.1240	12.4	12.4	151	101
11.451.1250	12.5	12.5	151	101
11.451.1260	12.6	12.6	151	101
11.451.1270	12.7	12.7	151	101
11.451.1280	12.8	12.8	151	101
11.451.1290	12.9	12.9	151	101
11.451.1300	13	13	151	101



**> 11.461 Phantom**



NL HSS Spiraalboor TiN-tip, (handgebruik)  
 FR Foret HSS avec revêtement TiN sur la partie utile, (usage à la main)  
 ES Broca HSS con punta TiN, (uso manual)  
 DE HSS Spiralbohrer TiN-Tip, (handgebrauch)

**HSS** **TiN** **DIN 338** **>N** **1,6** **118°**

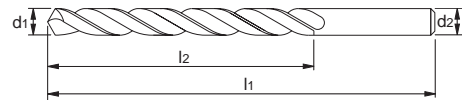
<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
27-30 F	25-28 F	17-22 E	10-14 D	20-33 E	20-28 E	50-80 E	45-70 G	40-65 D	25-36 D

Ref.	d1	d2	l1	l2
11.461.0100	1	1	34	12
11.461.0110	1.1	1.1	36	14
11.461.0120	1.2	1.2	38	16
11.461.0130	1.3	1.3	38	16
11.461.0140	1.4	1.4	40	18
11.461.0150	1.5	1.5	40	18
11.461.0160	1.6	1.6	43	20
11.461.0170	1.7	1.7	43	20
11.461.0180	1.8	1.8	46	22
11.461.0190	1.9	1.9	46	22
11.461.0200	2	2	49	24
11.461.0210	2.1	2.1	49	24
11.461.0220	2.2	2.2	53	27
11.461.0230	2.3	2.3	53	27
11.461.0240	2.4	2.4	57	30
11.461.0250	2.5	2.5	57	30
11.461.0260	2.6	2.6	57	30
11.461.0270	2.7	2.7	61	33
11.461.0280	2.8	2.8	61	33
11.461.0290	2.9	2.9	61	33
11.461.0300	3	3	61	33
11.461.0310	3.1	3.1	65	36
11.461.0320	3.2	3.2	65	36
11.461.0330	3.3	3.3	65	36
11.461.0340	3.4	3.4	70	39
11.461.0350	3.5	3.5	70	39
11.461.0360	3.6	3.6	70	39
11.461.0370	3.7	3.7	70	39
11.461.0380	3.8	3.8	75	43
11.461.0390	3.9	3.9	75	43
11.461.0400	4	4	75	43
11.461.0410	4.1	4.1	75	43
11.461.0420	4.2	4.2	75	43
11.461.0430	4.3	4.3	80	47
11.461.0440	4.4	4.4	80	47
11.461.0450	4.5	4.5	80	47
11.461.0460	4.6	4.6	80	47
11.461.0470	4.7	4.7	80	47
11.461.0480	4.8	4.8	86	52
11.461.0490	4.9	4.9	86	52
11.461.0500	5	5	86	52

Ref.	d1	d2	l1	l2
11.461.0510	5.1	5.1	86	52
11.461.0520	5.2	5.2	86	52
11.461.0530	5.3	5.3	86	52
11.461.0540	5.4	5.4	93	57
11.461.0550	5.5	5.5	93	57
11.461.0560	5.6	5.6	93	57
11.461.0570	5.7	5.7	93	57
11.461.0580	5.8	5.8	93	57
11.461.0590	5.9	5.9	93	57
11.461.0600	6	6	93	57
11.461.0610	6.1	6.1	101	63
11.461.0620	6.2	6.2	101	63
11.461.0630	6.3	6.3	101	63
11.461.0640	6.4	6.4	101	63
11.461.0650	6.5	6.5	101	63
11.461.0660	6.6	6.6	101	63
11.461.0670	6.7	6.7	101	63
11.461.0680	6.8	6.8	109	69
11.461.0690	6.9	6.9	109	69
11.461.0700	7	7	109	69
11.461.0710	7.1	7.1	109	69
11.461.0720	7.2	7.2	109	69
11.461.0730	7.3	7.3	109	69
11.461.0740	7.4	7.4	109	69
11.461.0750	7.5	7.5	109	69
11.461.0760	7.6	7.6	117	75
11.461.0770	7.7	7.7	117	75
11.461.0780	7.8	7.8	117	75
11.461.0790	7.9	7.9	117	75
11.461.0800	8	8	117	75
11.461.0810	8.1	8.1	117	75
11.461.0820	8.2	8.2	117	75
11.461.0830	8.3	8.3	117	75
11.461.0840	8.4	8.4	117	75
11.461.0850	8.5	8.5	117	75
11.461.0860	8.6	8.6	125	81
11.461.0870	8.7	8.7	125	81
11.461.0880	8.8	8.8	125	81
11.461.0890	8.9	8.9	125	81
11.461.0900	9	9	125	81
11.461.0910	9.1	9.1	125	81

Ref.	d1	d2	l1	l2
11.461.0920	9.2	9.2	125	81
11.461.0930	9.3	9.3	125	81
11.461.0940	9.4	9.4	125	81
11.461.0950	9.5	9.5	125	81
11.461.0960	9.6	9.6	133	87
11.461.0970	9.7	9.7	133	87
11.461.0980	9.8	9.8	133	87
11.461.0990	9.9	9.9	133	87
11.461.1000	10	10	133	87
11.461.1010	10.1	10.1	133	87
11.461.1020	10.2	10.2	133	87
11.461.1030	10.3	10.3	133	87
11.461.1040	10.4	10.4	133	87
11.461.1050	10.5	10.5	133	87
11.461.1060	10.6	10.6	133	87
11.461.1070	10.7	10.7	142	94
11.461.1080	10.8	10.8	142	94
11.461.1090	10.9	10.9	142	94
11.461.1100	11	11	142	94
11.461.1110	11.1	11.1	142	94
11.461.1120	11.2	11.2	142	94
11.461.1130	11.3	11.3	142	94
11.461.1140	11.4	11.4	142	94
11.461.1150	11.5	11.5	142	94
11.461.1160	11.6	11.6	142	94
11.461.1170	11.7	11.7	142	94
11.461.1180	11.8	11.8	142	94
11.461.1190	11.9	11.9	151	101
11.461.1200	12	12	151	101
11.461.1210	12.1	12.1	151	101
11.461.1220	12.2	12.2	151	101
11.461.1230	12.3	12.3	151	101
11.461.1240	12.4	12.4	151	101
11.461.1250	12.5	12.5	151	101
11.461.1260	12.6	12.6	151	101
11.461.1270	12.7	12.7	151	101
11.461.1280	12.8	12.8	151	101
11.461.1290	12.9	12.9	151	101
11.461.1300	13	13	151	101

**> 11.490 INTERNATIONAL TOOLS**



NL ECO PRO HSS-E Spiraalboor  
 FR Foret HSS-E ECO PRO  
 ES Broca HSS-E ECO PRO  
 DE ECO PRO HSS-E Spiralbohrer

**+6** **DIN 338** **N** **>3** **135°** **ECO PRO**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
28-35 E	30-36 E	20-27 E	14-18 D	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	d1	d2	l1	l2
11.490.0100	1	1	34	12
11.490.0110	1.1	1.1	36	14
11.490.0120	1.2	1.2	38	16
11.490.0130	1.3	1.3	38	16
11.490.0140	1.4	1.4	40	18
11.490.0150	1.5	1.5	40	18
11.490.0160	1.6	1.6	43	20
11.490.0170	1.7	1.7	43	20
11.490.0180	1.8	1.8	46	22
11.490.0190	1.9	1.9	46	22

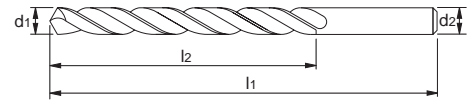
Ref.	d1	d2	l1	l2
11.490.0200	2	2	49	24
11.490.0210	2.1	2.1	49	24
11.490.0220	2.2	2.2	53	27
11.490.0230	2.3	2.3	53	27
11.490.0240	2.4	2.4	57	30
11.490.0250	2.5	2.5	57	30
11.490.0260	2.6	2.6	57	30
11.490.0270	2.7	2.7	61	33
11.490.0280	2.8	2.8	61	33
11.490.0290	2.9	2.9	61	33

Ref.	d1	d2	l1	l2
11.490.0300	3	3	61	33
11.490.0310	3.1	3.1	65	36
11.490.0320	3.2	3.2	65	36
11.490.0330	3.3	3.3	65	36
11.490.0340	3.4	3.4	70	39
11.490.0350	3.5	3.5	70	39
11.490.0360	3.6	3.6	70	39
11.490.0370	3.7	3.7	70	39
11.490.0380	3.8	3.8	75	43
11.490.0390	3.9	3.9	75	43

> **11.490** **INTERNATIONAL TOOLS**

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.490.0400	4	4	75	43	11.490.0630	6.3	6.3	101	63	11.490.0860	8.6	8.6	125	81
11.490.0410	4.1	4.1	75	43	11.490.0640	6.4	6.4	101	63	11.490.0870	8.7	8.7	125	81
11.490.0420	4.2	4.2	75	43	11.490.0650	6.5	6.5	101	63	11.490.0880	8.8	8.8	125	81
11.490.0430	4.3	4.3	80	47	11.490.0660	6.6	6.6	101	63	11.490.0890	8.9	8.9	125	81
11.490.0440	4.4	4.4	80	47	11.490.0670	6.7	6.7	101	63	11.490.0900	9	9	125	81
11.490.0450	4.5	4.5	80	47	11.490.0680	6.8	6.8	109	69	11.490.0910	9.1	9.1	125	81
11.490.0460	4.6	4.6	80	47	11.490.0690	6.9	6.9	109	69	11.490.0920	9.2	9.2	125	81
11.490.0470	4.7	4.7	80	47	11.490.0700	7	7	109	69	11.490.0930	9.3	9.3	125	81
11.490.0480	4.8	4.8	86	52	11.490.0710	7.1	7.1	109	69	11.490.0940	9.4	9.4	125	81
11.490.0490	4.9	4.9	86	52	11.490.0720	7.2	7.2	109	69	11.490.0950	9.5	9.5	125	81
11.490.0500	5	5	86	52	11.490.0730	7.3	7.3	109	69	11.490.0960	9.6	9.6	133	87
11.490.0510	5.1	5.1	86	52	11.490.0740	7.4	7.4	109	69	11.490.0970	9.7	9.7	133	87
11.490.0520	5.2	5.2	86	52	11.490.0750	7.5	7.5	109	69	11.490.0980	9.8	9.8	133	87
11.490.0530	5.3	5.3	86	52	11.490.0760	7.6	7.6	117	75	11.490.0990	9.9	9.9	133	87
11.490.0540	5.4	5.4	93	57	11.490.0770	7.7	7.7	117	75	11.490.1000	10	10	133	87
11.490.0550	5.5	5.5	93	57	11.490.0780	7.8	7.8	117	75	11.490.1020	10.2	10.2	133	87
11.490.0560	5.6	5.6	93	57	11.490.0790	7.9	7.9	117	75	11.490.1050	10.5	10.5	133	87
11.490.0570	5.7	5.7	93	57	11.490.0800	8	8	117	75	11.490.1100	11	11	142	94
11.490.0580	5.8	5.8	93	57	11.490.0810	8.1	8.1	117	75	11.490.1150	11.5	11.5	142	94
11.490.0590	5.9	5.9	93	57	11.490.0820	8.2	8.2	117	75	11.490.1200	12	12	151	101
11.490.0600	6	6	93	57	11.490.0830	8.3	8.3	117	75	11.490.1250	12.5	12.5	151	101
11.490.0610	6.1	6.1	101	63	11.490.0840	8.4	8.4	117	75	11.490.1300	13	13	151	101
11.490.0620	6.2	6.2	101	63	11.490.0850	8.5	8.5	117	75					

> **11.500** **Phantom**



NL HSS-E Spiraalboor  
FR Foret HSS-E  
ES Broca HSS-E  
DE HSS-E Spiralbohrer

+6 6 ( DIN 338 N 2 135°

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.500.0020	0.2	0.2	19	2.5	11.500.0330	3.3	3.3	65	36	11.500.0670	6.7	6.7	101	63
11.500.0025	0.25	0.25	19	3	11.500.0340	3.4	3.4	70	39	11.500.0675	6.75	6.75	109	69
11.500.0030	0.3	0.3	19	3	11.500.0350	3.5	3.5	70	39	11.500.0680	6.8	6.8	109	69
11.500.0040	0.4	0.4	20	5	11.500.0360	3.6	3.6	70	39	11.500.0690	6.9	6.9	109	69
11.500.0045	0.45	0.45	20	5	11.500.0370	3.7	3.7	70	39	11.500.0700	7	7	109	69
11.500.0050	0.5	0.5	22	6	11.500.0375	3.75	3.75	70	39	11.500.0710	7.1	7.1	109	69
11.500.0060	0.6	0.6	24	7	11.500.0380	3.8	3.8	75	43	11.500.0720	7.2	7.2	109	69
11.500.0065	0.65	0.65	26	8	11.500.0390	3.9	3.9	75	43	11.500.0725	7.25	7.25	109	69
11.500.0070	0.7	0.7	28	9	11.500.0400	4	4	75	43	11.500.0730	7.3	7.3	109	69
11.500.0075	0.75	0.75	28	9	11.500.0410	4.1	4.1	75	43	11.500.0740	7.4	7.4	109	69
11.500.0080	0.8	0.8	30	10	11.500.0420	4.2	4.2	75	43	11.500.0750	7.5	7.5	109	69
11.500.0090	0.9	0.9	32	11	11.500.0425	4.25	4.25	75	43	11.500.0760	7.6	7.6	117	75
11.500.0095	0.95	0.95	32	11	11.500.0430	4.3	4.3	80	47	11.500.0770	7.7	7.7	117	75
11.500.0100	1	1	34	12	11.500.0440	4.4	4.4	80	47	11.500.0775	7.75	7.75	117	75
11.500.0110	1.1	1.1	36	14	11.500.0450	4.5	4.5	80	47	11.500.0780	7.8	7.8	117	75
11.500.0120	1.2	1.2	38	16	11.500.0460	4.6	4.6	80	47	11.500.0790	7.9	7.9	117	75
11.500.0125	1.25	1.25	38	16	11.500.0465	4.65	4.65	80	47	11.500.0800	8	8	117	75
11.500.0130	1.3	1.3	38	16	11.500.0470	4.7	4.7	80	47	11.500.0810	8.1	8.1	117	75
11.500.0140	1.4	1.4	40	18	11.500.0475	4.75	4.75	80	47	11.500.0820	8.2	8.2	117	75
11.500.0150	1.5	1.5	40	18	11.500.0480	4.8	4.8	86	52	11.500.0825	8.25	8.25	117	75
11.500.0160	1.6	1.6	43	20	11.500.0490	4.9	4.9	86	52	11.500.0830	8.3	8.3	117	75
11.500.0170	1.7	1.7	43	20	11.500.0500	5	5	86	52	11.500.0840	8.4	8.4	117	75
11.500.0175	1.75	1.75	46	22	11.500.0510	5.1	5.1	86	52	11.500.0850	8.5	8.5	117	75
11.500.0180	1.8	1.8	46	22	11.500.0520	5.2	5.2	86	52	11.500.0860	8.6	8.6	125	81
11.500.0190	1.9	1.9	46	22	11.500.0525	5.25	5.25	86	52	11.500.0870	8.7	8.7	125	81
11.500.0200	2	2	49	24	11.500.0530	5.3	5.3	86	52	11.500.0875	8.75	8.75	125	81
11.500.0205	2.05	2.05	49	24	11.500.0540	5.4	5.4	93	57	11.500.0880	8.8	8.8	125	81
11.500.0210	2.1	2.1	49	24	11.500.0550	5.5	5.5	93	57	11.500.0890	8.9	8.9	125	81
11.500.0220	2.2	2.2	53	27	11.500.0560	5.6	5.6	93	57	11.500.0900	9	9	125	81
11.500.0225	2.25	2.25	53	27	11.500.0570	5.7	5.7	93	57	11.500.0910	9.1	9.1	125	81
11.500.0230	2.3	2.3	53	27	11.500.0575	5.75	5.75	93	57	11.500.0920	9.2	9.2	125	81
11.500.0240	2.4	2.4	57	30	11.500.0580	5.8	5.8	93	57	11.500.0925	9.25	9.25	125	81
11.500.0250	2.5	2.5	57	30	11.500.0590	5.9	5.9	93	57	11.500.0930	9.3	9.3	125	81
11.500.0260	2.6	2.6	57	30	11.500.0600	6	6	93	57	11.500.0940	9.4	9.4	125	81
11.500.0270	2.7	2.7	61	33	11.500.0610	6.1	6.1	101	63	11.500.0950	9.5	9.5	125	81
11.500.0275	2.75	2.75	61	33	11.500.0620	6.2	6.2	101	63	11.500.0960	9.6	9.6	133	87
11.500.0280	2.8	2.8	61	33	11.500.0625	6.25	6.25	101	63	11.500.0970	9.7	9.7	133	87
11.500.0290	2.9	2.9	61	33	11.500.0630	6.3	6.3	101	63	11.500.0975	9.75	9.75	133	87
11.500.0300	3	3	61	33	11.500.0635	6.35	6.35	101	63	11.500.0980	9.8	9.8	133	87
11.500.0310	3.1	3.1	65	36	11.500.0640	6.4	6.4	101	63	11.500.0990	9.9	9.9	133	87
11.500.0320	3.2	3.2	65	36	11.500.0650	6.5	6.5	101	63	11.500.1000	10	10	133	87
11.500.0325	3.25	3.25	65	36	11.500.0660	6.6	6.6	101	63	11.500.1010	10.1	10.1	133	87



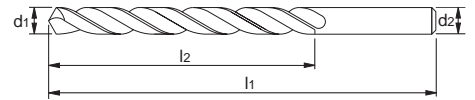


> 11.500 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.500.1020	10.2	10.2	133	87	11.500.1150	11.5	11.5	142	94	11.500.1400	14	14	160	108
11.500.1025	10.25	10.25	133	87	11.500.1175	11.75	11.75	142	94	11.500.1450	14.5	14.5	169	114
11.500.1030	10.3	10.3	133	87	11.500.1180	11.8	11.8	142	94	11.500.1500	15	15	169	114
11.500.1050	10.5	10.5	133	87	11.500.1200	12	12	151	101	11.500.1550	15.5	15.5	178	120
11.500.1080	10.8	10.8	142	94	11.500.1220	12.2	12.2	151	101	11.500.1600	16	16	178	120
11.500.1100	11	11	142	94	11.500.1250	12.5	12.5	151	101	11.500.1750	17.5	17.5	191	130
11.500.1110	11.1	11.1	142	94	11.500.1300	13	13	151	101	11.500.1800	18	18	191	130
11.500.1120	11.2	11.2	142	94	11.500.1350	13.5	13.5	160	108					

> 11.501 Phantom

NL HSS-E Spiraalboor TiN  
 FR Foret HSS-E TiN  
 ES Broca HSS-E TiN  
 DE HSS-E Spiralbohrer TiN



+6 ( TiN DIN 338 N 135°

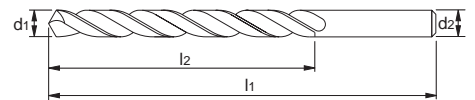
P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 51 N 52  
 s600 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> INOX s850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Cu CuAlFe

32-40 E 35-40 E 25-32 E 12-20 D 15-20 D 10-15 C 30-35 F 24-30 F 30-40 E 8-15 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.501.0100	1	1	34	12	11.501.0500	5	5	86	52	11.501.0950	9.5	9.5	125	81
11.501.0150	1.5	1.5	40	18	11.501.0520	5.2	5.2	86	52	11.501.1000	10	10	133	87
11.501.0200	2	2	49	24	11.501.0550	5.5	5.5	93	57	11.501.1020	10.2	10.2	133	87
11.501.0250	2.5	2.5	57	30	11.501.0600	6	6	93	57	11.501.1050	10.5	10.5	133	87
11.501.0300	3	3	61	33	11.501.0650	6.5	6.5	101	63	11.501.1100	11	11	142	94
11.501.0320	3.2	3.2	65	36	11.501.0680	6.8	6.8	109	69	11.501.1150	11.5	11.5	142	94
11.501.0330	3.3	3.3	65	36	11.501.0700	7	7	109	69	11.501.1200	12	12	151	101
11.501.0350	3.5	3.5	70	39	11.501.0750	7.5	7.5	109	69	11.501.1250	12.5	12.5	151	101
11.501.0400	4	4	75	43	11.501.0800	8	8	117	75	11.501.1300	13	13	151	101
11.501.0420	4.2	4.2	75	43	11.501.0850	8.5	8.5	117	75	11.501.1350	13.5	13.5	160	108
11.501.0450	4.5	4.5	80	47	11.501.0900	9	9	125	81	11.501.1400	14	14	160	108

> 11.506 Phantom

NL HSS-E Spiraalboor TiN-tip, (handgebruik)  
 FR Foret HSS-E avec revêtement TiN sur la partie utile, (usage à la main)  
 ES Broca HSS-E avec revêtement TiN sur la partie utile, (usage à la main)  
 DE HSS-E Spiralbohrer TiN-Tip, (handgebrauch)



+6 ( TiN DIN 338 >N 1,6 118°

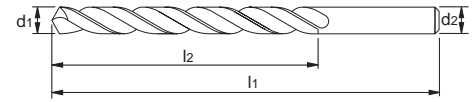
P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 51 N 52  
 s600 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> INOX s850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Cu CuAlFe

32-40 E 35-40 E 25-32 E 12-20 D 15-20 D 10-15 C 30-35 F 24-30 F 30-40 E 8-15 C

NIEUW NOUVEAU NUEVO NEU

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.506.0100	1	1	34	12	11.506.0450	4.5	4.5	80	47	11.506.0900	9	9	125	81
11.506.0150	1.5	1.5	40	18	11.506.0500	5	5	86	52	11.506.0950	9.5	9.5	125	81
11.506.0200	2	2	49	24	11.506.0550	5.5	5.5	93	57	11.506.1000	10	10	133	87
11.506.0250	2.5	2.5	57	30	11.506.0600	6	6	93	57	11.506.1020	10.2	10.2	133	87
11.506.0300	3	3	61	33	11.506.0650	6.5	6.5	101	63	11.506.1050	10.5	10.5	133	87
11.506.0320	3.2	3.2	65	36	11.506.0680	6.8	6.8	109	69	11.506.1100	11	11	142	94
11.506.0330	3.3	3.3	65	36	11.506.0700	7	7	109	69	11.506.1150	11.5	11.5	142	94
11.506.0350	3.5	3.5	70	39	11.506.0750	7.5	7.5	109	69	11.506.1200	12	12	151	101
11.506.0400	4	4	75	43	11.506.0800	8	8	117	75	11.506.1250	12.5	12.5	151	101
11.506.0420	4.2	4.2	75	43	11.506.0850	8.5	8.5	117	75	11.506.1300	13	13	151	101

> 11.510 Phantom



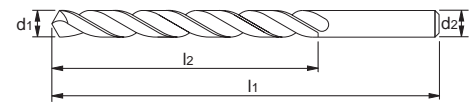
NL HSS-E 8% Spiraalboor Aero  
FR Foret HSS-E 8% Aéro  
ES Broca HSS-E 8% Aero  
DE HSS-E 8% Spiralbohrer Aero

HSS-E 8% NAS 907 P3 DIN 338 N 135°

Material and application codes: P 11, P 12, P 13, P 14, M 21, M 22, K 31, K 32, N 41, N 42, N 43, N 51, N 52, N 61, S 71, S 72. Includes material types like INOX, GG, Alu, Mg, Cu, CuAlFe, PVC, Ni/Co, Ti.

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.510.0100	1	1	34	12	11.510.0450	4.5	4.5	80	47	11.510.0800	8	8	117	75
11.510.0110	1.1	1.1	36	14	11.510.0460	4.6	4.6	80	47	11.510.0810	8.1	8.1	117	75
11.510.0120	1.2	1.2	38	16	11.510.0470	4.7	4.7	80	47	11.510.0820	8.2	8.2	117	75
11.510.0130	1.3	1.3	38	16	11.510.0480	4.8	4.8	86	52	11.510.0830	8.3	8.3	117	75
11.510.0140	1.4	1.4	40	18	11.510.0490	4.9	4.9	86	52	11.510.0840	8.4	8.4	117	75
11.510.0150	1.5	1.5	40	18	11.510.0500	5	5	86	52	11.510.0850	8.5	8.5	117	75
11.510.0160	1.6	1.6	43	20	11.510.0510	5.1	5.1	86	52	11.510.0860	8.6	8.6	125	81
11.510.0170	1.7	1.7	43	20	11.510.0520	5.2	5.2	86	52	11.510.0870	8.7	8.7	125	81
11.510.0180	1.8	1.8	46	22	11.510.0530	5.3	5.3	86	52	11.510.0880	8.8	8.8	125	81
11.510.0190	1.9	1.9	46	22	11.510.0540	5.4	5.4	93	57	11.510.0890	8.9	8.9	125	81
11.510.0200	2	2	49	24	11.510.0550	5.5	5.5	93	57	11.510.0900	9	9	125	81
11.510.0210	2.1	2.1	49	24	11.510.0560	5.6	5.6	93	57	11.510.0910	9.1	9.1	125	81
11.510.0220	2.2	2.2	53	27	11.510.0570	5.7	5.7	93	57	11.510.0920	9.2	9.2	125	81
11.510.0230	2.3	2.3	53	27	11.510.0580	5.8	5.8	93	57	11.510.0930	9.3	9.3	125	81
11.510.0240	2.4	2.4	57	30	11.510.0590	5.9	5.9	93	57	11.510.0940	9.4	9.4	125	81
11.510.0250	2.5	2.5	57	30	11.510.0600	6	6	93	57	11.510.0950	9.5	9.5	125	81
11.510.0260	2.6	2.6	57	30	11.510.0610	6.1	6.1	101	63	11.510.0960	9.6	9.6	133	87
11.510.0270	2.7	2.7	61	33	11.510.0620	6.2	6.2	101	63	11.510.0970	9.7	9.7	133	87
11.510.0280	2.8	2.8	61	33	11.510.0630	6.3	6.3	101	63	11.510.0980	9.8	9.8	133	87
11.510.0290	2.9	2.9	61	33	11.510.0640	6.4	6.4	101	63	11.510.0990	9.9	9.9	133	87
11.510.0300	3	3	61	33	11.510.0650	6.5	6.5	101	63	11.510.1000	10	10	133	87
11.510.0310	3.1	3.1	65	36	11.510.0660	6.6	6.6	101	63	11.510.1020	10.2	10.2	133	87
11.510.0320	3.2	3.2	65	36	11.510.0670	6.7	6.7	101	63	11.510.1050	10.5	10.5	133	87
11.510.0330	3.3	3.3	65	36	11.510.0680	6.8	6.8	109	69	11.510.1100	11	11	142	94
11.510.0340	3.4	3.4	70	39	11.510.0690	6.9	6.9	109	69	11.510.1150	11.5	11.5	142	94
11.510.0350	3.5	3.5	70	39	11.510.0700	7	7	109	69	11.510.1200	12	12	151	101
11.510.0360	3.6	3.6	70	39	11.510.0710	7.1	7.1	109	69	11.510.1250	12.5	12.5	151	101
11.510.0370	3.7	3.7	70	39	11.510.0720	7.2	7.2	109	69	11.510.1300	13	13	151	101
11.510.0380	3.8	3.8	75	43	11.510.0730	7.3	7.3	109	69	11.510.1350	13.5	13.5	160	108
11.510.0390	3.9	3.9	75	43	11.510.0740	7.4	7.4	109	69	11.510.1400	14	14	160	108
11.510.0400	4	4	75	43	11.510.0750	7.5	7.5	109	69	11.510.1450	14.5	14.5	169	114
11.510.0410	4.1	4.1	75	43	11.510.0760	7.6	7.6	117	75	11.510.1500	15	15	169	114
11.510.0420	4.2	4.2	75	43	11.510.0770	7.7	7.7	117	75	11.510.1600	16	16	178	120
11.510.0430	4.3	4.3	80	47	11.510.0780	7.8	7.8	117	75					
11.510.0440	4.4	4.4	80	47	11.510.0790	7.9	7.9	117	75					

> 11.568 Phantom



NL HP2 UNI HSS-E Spiraalboor TiN  
FR Foret HSS-E HP2 UNI TiN  
ES Broca HSS-E HP2 UNI TiN  
DE HP2 UNI HSS-E Spiralbohrer TiN

+6 L TiN DIN 338 >N 118° HP2 UNI

Material and application codes: P 11, P 12, P 13, P 14, M 21, M 22, K 31, K 32, N 41, N 42, N 43, N 51, N 52, N 61. Includes material types like INOX, GG, Alu, Mg, Cu, CuAlFe, PVC.

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.568.0100	1	1	34	12	11.568.0260	2.6	2.6	57	30	11.568.0420	4.2	4.2	75	43
11.568.0110	1.1	1.1	36	14	11.568.0270	2.7	2.7	61	33	11.568.0430	4.3	4.3	80	47
11.568.0120	1.2	1.2	38	16	11.568.0280	2.8	2.8	61	33	11.568.0440	4.4	4.4	80	47
11.568.0130	1.3	1.3	38	16	11.568.0290	2.9	2.9	61	33	11.568.0450	4.5	4.5	80	47
11.568.0140	1.4	1.4	40	18	11.568.0300	3	3	61	33	11.568.0460	4.6	4.6	80	47
11.568.0150	1.5	1.5	40	18	11.568.0310	3.1	3.1	65	36	11.568.0470	4.7	4.7	80	47
11.568.0160	1.6	1.6	43	20	11.568.0320	3.2	3.2	65	36	11.568.0480	4.8	4.8	86	52
11.568.0170	1.7	1.7	43	20	11.568.0330	3.3	3.3	65	36	11.568.0490	4.9	4.9	86	52
11.568.0180	1.8	1.8	46	22	11.568.0340	3.4	3.4	70	39	11.568.0500	5	5	86	52
11.568.0190	1.9	1.9	46	22	11.568.0350	3.5	3.5	70	39	11.568.0510	5.1	5.1	86	52
11.568.0200	2	2	49	24	11.568.0360	3.6	3.6	70	39	11.568.0520	5.2	5.2	86	52
11.568.0210	2.1	2.1	49	24	11.568.0370	3.7	3.7	70	39	11.568.0530	5.3	5.3	86	52
11.568.0220	2.2	2.2	53	27	11.568.0380	3.8	3.8	75	43	11.568.0540	5.4	5.4	93	57
11.568.0230	2.3	2.3	53	27	11.568.0390	3.9	3.9	75	43	11.568.0550	5.5	5.5	93	57
11.568.0240	2.4	2.4	57	30	11.568.0400	4	4	75	43	11.568.0560	5.6	5.6	93	57
11.568.0250	2.5	2.5	57	30	11.568.0410	4.1	4.1	75	43	11.568.0570	5.7	5.7	93	57



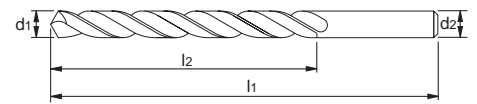
## > 11.568 Phantom

Ref.	d1	d2	l1	l2
11.568.0580	5.8	5.8	93	57
11.568.0590	5.9	5.9	93	57
11.568.0600	6	6	93	57
11.568.0610	6.1	6.1	101	63
11.568.0620	6.2	6.2	101	63
11.568.0630	6.3	6.3	101	63
11.568.0640	6.4	6.4	101	63
11.568.0650	6.5	6.5	101	63
11.568.0660	6.6	6.6	101	63
11.568.0670	6.7	6.7	101	63
11.568.0680	6.8	6.8	109	69
11.568.0690	6.9	6.9	109	69
11.568.0700	7	7	109	69
11.568.0710	7.1	7.1	109	69
11.568.0720	7.2	7.2	109	69
11.568.0730	7.3	7.3	109	69
11.568.0740	7.4	7.4	109	69
11.568.0750	7.5	7.5	109	69
11.568.0760	7.6	7.6	117	75

Ref.	d1	d2	l1	l2
11.568.0770	7.7	7.7	117	75
11.568.0780	7.8	7.8	117	75
11.568.0790	7.9	7.9	117	75
11.568.0800	8	8	117	75
11.568.0810	8.1	8.1	117	75
11.568.0820	8.2	8.2	117	75
11.568.0830	8.3	8.3	117	75
11.568.0840	8.4	8.4	117	75
11.568.0850	8.5	8.5	117	75
11.568.0860	8.6	8.6	125	81
11.568.0870	8.7	8.7	125	81
11.568.0880	8.8	8.8	125	81
11.568.0900	9	9	125	81
11.568.0910	9.1	9.1	125	81
11.568.0920	9.2	9.2	125	81
11.568.0930	9.3	9.3	125	81
11.568.0940	9.4	9.4	125	81
11.568.0950	9.5	9.5	125	81
11.568.0960	9.6	9.6	133	87

Ref.	d1	d2	l1	l2
11.568.0970	9.7	9.7	133	87
11.568.0980	9.8	9.8	133	87
11.568.0990	9.9	9.9	133	87
11.568.1000	10	10	133	87
11.568.1010	10.1	10.1	133	87
11.568.1020	10.2	10.2	133	87
11.568.1030	10.3	10.3	133	87
11.568.1040	10.4	10.4	133	87
11.568.1050	10.5	10.5	133	87
11.568.1100	11	11	142	94
11.568.1150	11.5	11.5	142	94
11.568.1200	12	12	151	101
11.568.1230	12.3	12.3	151	101
11.568.1250	12.5	12.5	151	101
11.568.1300	13	13	151	101
11.568.1350	13.5	13.5	160	108
11.568.1400	14	14	160	108

## > 11.600 Phantom



NL HM-tip Spiraalboor  
FR Foret HSS à plaquettes carbure brasées  
ES Broca punta MD  
DE HM-Schneiden Spiralbohrer



P 11	P 12	P 13	P 14	H 15	M 21	M 22	K 31	K 32	N 42	N 52	N 62	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	HRC	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	CuAlFe	GFK/CFK	Ni/Co	Ti
75-85	60-70	55-65	30-40	10-20	20-35	18-30	70-85	60-75	120-150	35-40	70-130	25-30	30-35

Ref.	d1	d2	l1	l2
11.600.0200	2	2	49	24
11.600.0210	2.1	2.1	49	24
11.600.0220	2.2	2.2	53	27
11.600.0230	2.3	2.3	53	27
11.600.0240	2.4	2.4	57	30
11.600.0250	2.5	2.5	57	30
11.600.0260	2.6	2.6	57	30
11.600.0270	2.7	2.7	61	33
11.600.0280	2.8	2.8	61	33
11.600.0290	2.9	2.9	61	33
11.600.0300	3	3	61	33
11.600.0310	3.1	3.1	65	36
11.600.0320	3.2	3.2	65	36
11.600.0330	3.3	3.3	65	36
11.600.0340	3.4	3.4	70	39
11.600.0350	3.5	3.5	70	39
11.600.0360	3.6	3.6	70	39
11.600.0370	3.7	3.7	70	39
11.600.0380	3.8	3.8	75	43
11.600.0390	3.9	3.9	75	43
11.600.0400	4	4	75	43
11.600.0410	4.1	4.1	75	43
11.600.0420	4.2	4.2	75	43
11.600.0430	4.3	4.3	80	47
11.600.0440	4.4	4.4	80	47
11.600.0450	4.5	4.5	80	47
11.600.0460	4.6	4.6	80	47
11.600.0470	4.7	4.7	80	47
11.600.0480	4.8	4.8	86	52
11.600.0490	4.9	4.9	86	52
11.600.0500	5	5	86	52
11.600.0510	5.1	5.1	86	52

Ref.	d1	d2	l1	l2
11.600.0520	5.2	5.2	86	52
11.600.0530	5.3	5.3	86	52
11.600.0540	5.4	5.4	93	57
11.600.0550	5.5	5.5	93	57
11.600.0560	5.6	5.6	93	57
11.600.0570	5.7	5.7	93	57
11.600.0580	5.8	5.8	93	57
11.600.0590	5.9	5.9	93	57
11.600.0600	6	6	93	57
11.600.0610	6.1	6.1	101	63
11.600.0620	6.2	6.2	101	63
11.600.0630	6.3	6.3	101	63
11.600.0640	6.4	6.4	101	63
11.600.0650	6.5	6.5	101	63
11.600.0660	6.6	6.6	101	63
11.600.0670	6.7	6.7	101	63
11.600.0680	6.8	6.8	109	69
11.600.0690	6.9	6.9	109	69
11.600.0700	7	7	109	69
11.600.0710	7.1	7.1	109	69
11.600.0720	7.2	7.2	109	69
11.600.0730	7.3	7.3	109	69
11.600.0740	7.4	7.4	109	69
11.600.0750	7.5	7.5	109	69
11.600.0760	7.6	7.6	117	75
11.600.0770	7.7	7.7	117	75
11.600.0780	7.8	7.8	117	75
11.600.0790	7.9	7.9	117	75
11.600.0800	8	8	117	75
11.600.0810	8.1	8.1	117	75
11.600.0820	8.2	8.2	117	75
11.600.0830	8.3	8.3	117	75

Ref.	d1	d2	l1	l2
11.600.0840	8.4	8.4	117	75
11.600.0850	8.5	8.5	117	75
11.600.0860	8.6	8.6	125	81
11.600.0870	8.7	8.7	125	81
11.600.0880	8.8	8.8	125	81
11.600.0890	8.9	8.9	125	81
11.600.0900	9	9	125	81
11.600.0910	9.1	9.1	125	81
11.600.0920	9.2	9.2	125	81
11.600.0930	9.3	9.3	125	81
11.600.0940	9.4	9.4	125	81
11.600.0950	9.5	9.5	125	81
11.600.0960	9.6	9.6	133	87
11.600.0970	9.7	9.7	133	87
11.600.0980	9.8	9.8	133	87
11.600.0990	9.9	9.9	133	87
11.600.1000	10	10	133	87
11.600.1020	10.2	10.2	133	87
11.600.1050	10.5	10.5	133	87
11.600.1100	11	11	142	94
11.600.1150	11.5	11.5	142	94
11.600.1200	12	12	151	101
11.600.1250	12.5	12.5	151	101
11.600.1300	13	13	151	101
11.600.1350	13.5	13.5	160	108
11.600.1400	14	14	160	108
11.600.1450	14.5	14.5	169	114
11.600.1500	15	15	169	114
11.600.1550	15.5	15.5	178	120
11.600.1600	16	16	178	120



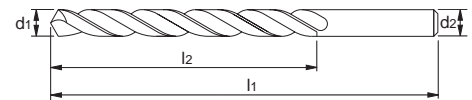


> 11.710 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.710.0610	6.1	6.1	101	63	11.710.0780	7.8	7.8	117	75	11.710.0950	9.5	9.5	125	81
11.710.0620	6.2	6.2	101	63	11.710.0790	7.9	7.9	117	75	11.710.0960	9.6	9.6	133	87
11.710.0630	6.3	6.3	101	63	11.710.0800	8	8	117	75	11.710.0970	9.7	9.7	133	87
11.710.0640	6.4	6.4	101	63	11.710.0810	8.1	8.1	117	75	11.710.0980	9.8	9.8	133	87
11.710.0650	6.5	6.5	101	63	11.710.0820	8.2	8.2	117	75	11.710.0990	9.9	9.9	133	87
11.710.0660	6.6	6.6	101	63	11.710.0830	8.3	8.3	117	75	11.710.1000	10	10	133	87
11.710.0670	6.7	6.7	101	63	11.710.0840	8.4	8.4	117	75	11.710.1020	10.2	10.2	133	87
11.710.0680	6.8	6.8	109	69	11.710.0850	8.5	8.5	117	75	11.710.1050	10.5	10.5	133	87
11.710.0690	6.9	6.9	109	69	11.710.0860	8.6	8.6	125	81	11.710.1100	11	11	142	94
11.710.0700	7	7	109	69	11.710.0870	8.7	8.7	125	81	11.710.1150	11.5	11.5	142	94
11.710.0710	7.1	7.1	109	69	11.710.0880	8.8	8.8	125	81	11.710.1200	12	12	151	101
11.710.0720	7.2	7.2	109	69	11.710.0890	8.9	8.9	125	81	11.710.1250	12.5	12.5	151	101
11.710.0730	7.3	7.3	109	69	11.710.0900	9	9	125	81	11.710.1300	13	13	151	101
11.710.0740	7.4	7.4	109	69	11.710.0910	9.1	9.1	125	81	11.710.1400	14	14	160	108
11.710.0750	7.5	7.5	109	69	11.710.0920	9.2	9.2	125	81	11.710.1500	15	15	169	114
11.710.0760	7.6	7.6	117	75	11.710.0930	9.3	9.3	125	81	11.710.1600	16	16	178	120
11.710.0770	7.7	7.7	117	75	11.710.0940	9.4	9.4	125	81					

> 11.760 Phantom

NL HSS-E Spiraalboor roestvaststaal  
 FR Foret HSS-E Inox  
 ES Broca HSS-E acero inoxidable  
 DE HSS-E Spiralbohrer rostfreien Stahl



+6 ( DIN 338 >N 130° INOX

P 14 M 21 M 22 S 71 S 72  
 S1400 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> NiCo Ti

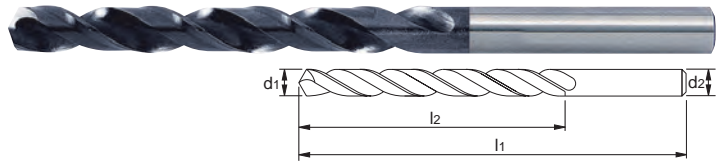
12-16 E 14-18 D 12-16 C 6-8 A 6-10 B

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.760.0100	1	1	34	12	11.760.0480	4.8	4.8	86	52	11.760.0860	8.6	8.6	125	81
11.760.0110	1.1	1.1	36	14	11.760.0490	4.9	4.9	86	52	11.760.0870	8.7	8.7	125	81
11.760.0120	1.2	1.2	38	16	11.760.0500	5	5	86	52	11.760.0880	8.8	8.8	125	81
11.760.0130	1.3	1.3	38	16	11.760.0510	5.1	5.1	86	52	11.760.0890	8.9	8.9	125	81
11.760.0140	1.4	1.4	40	18	11.760.0520	5.2	5.2	86	52	11.760.0900	9	9	125	81
11.760.0150	1.5	1.5	40	18	11.760.0530	5.3	5.3	86	52	11.760.0910	9.1	9.1	125	81
11.760.0160	1.6	1.6	43	20	11.760.0540	5.4	5.4	93	57	11.760.0920	9.2	9.2	125	81
11.760.0170	1.7	1.7	43	20	11.760.0550	5.5	5.5	93	57	11.760.0930	9.3	9.3	125	81
11.760.0180	1.8	1.8	46	22	11.760.0560	5.6	5.6	93	57	11.760.0940	9.4	9.4	125	81
11.760.0190	1.9	1.9	46	22	11.760.0570	5.7	5.7	93	57	11.760.0950	9.5	9.5	125	81
11.760.0200	2	2	49	24	11.760.0580	5.8	5.8	93	57	11.760.0960	9.6	9.6	133	87
11.760.0210	2.1	2.1	49	24	11.760.0590	5.9	5.9	93	57	11.760.0970	9.7	9.7	133	87
11.760.0220	2.2	2.2	53	27	11.760.0600	6	6	93	57	11.760.0980	9.8	9.8	133	87
11.760.0230	2.3	2.3	53	27	11.760.0610	6.1	6.1	101	63	11.760.0990	9.9	9.9	133	87
11.760.0240	2.4	2.4	57	30	11.760.0620	6.2	6.2	101	63	11.760.1000	10	10	133	87
11.760.0250	2.5	2.5	57	30	11.760.0630	6.3	6.3	101	63	11.760.1020	10.2	10.2	133	87
11.760.0260	2.6	2.6	57	30	11.760.0640	6.4	6.4	101	63	11.760.1040	10.4	10.4	133	87
11.760.0270	2.7	2.7	61	33	11.760.0650	6.5	6.5	101	63	11.760.1050	10.5	10.5	133	87
11.760.0280	2.8	2.8	61	33	11.760.0660	6.6	6.6	101	63	11.760.1070	10.7	10.7	142	94
11.760.0290	2.9	2.9	61	33	11.760.0670	6.7	6.7	101	63	11.760.1100	11	11	142	94
11.760.0300	3	3	61	33	11.760.0680	6.8	6.8	109	69	11.760.1120	11.2	11.2	142	94
11.760.0310	3.1	3.1	65	36	11.760.0690	6.9	6.9	109	69	11.760.1150	11.5	11.5	142	94
11.760.0320	3.2	3.2	65	36	11.760.0700	7	7	109	69	11.760.1200	12	12	151	101
11.760.0330	3.3	3.3	65	36	11.760.0710	7.1	7.1	109	69	11.760.1210	12.1	12.1	151	101
11.760.0340	3.4	3.4	70	39	11.760.0720	7.2	7.2	109	69	11.760.1230	12.3	12.3	151	101
11.760.0350	3.5	3.5	70	39	11.760.0730	7.3	7.3	109	69	11.760.1250	12.5	12.5	151	101
11.760.0360	3.6	3.6	70	39	11.760.0740	7.4	7.4	109	69	11.760.1300	13	13	151	101
11.760.0370	3.7	3.7	70	39	11.760.0750	7.5	7.5	109	69	11.760.1350	13.5	13.5	160	108
11.760.0380	3.8	3.8	75	43	11.760.0760	7.6	7.6	117	75	11.760.1400	14	14	160	108
11.760.0390	3.9	3.9	75	43	11.760.0770	7.7	7.7	117	75	11.760.1450	14.5	14.5	169	114
11.760.0400	4	4	75	43	11.760.0780	7.8	7.8	117	75	11.760.1500	15	15	169	114
11.760.0410	4.1	4.1	75	43	11.760.0790	7.9	7.9	117	75	11.760.1550	15.5	15.5	178	120
11.760.0420	4.2	4.2	75	43	11.760.0800	8	8	117	75	11.760.1600	16	16	178	120
11.760.0430	4.3	4.3	80	47	11.760.0810	8.1	8.1	117	75	11.760.1700	17	17	184	125
11.760.0440	4.4	4.4	80	47	11.760.0820	8.2	8.2	117	75	11.760.1800	18	18	191	130
11.760.0450	4.5	4.5	80	47	11.760.0830	8.3	8.3	117	75	11.760.1900	19	19	198	135
11.760.0460	4.6	4.6	80	47	11.760.0840	8.4	8.4	117	75	11.760.2000	20	20	205	140
11.760.0470	4.7	4.7	80	47	11.760.0850	8.5	8.5	117	75					



> **11.764 Phantom**

NL HSS-E Spiraalboor TiAlN, roestvaststaal  
 FR Foret HSS-E TiAlN, Inox  
 ES Broca HSS-E TiAlN, acero inoxidable  
 DE HSS-E Spiralbohrer TiAlN, rostfreier Stahl



+6 6 ( TiAlN DIN 338 >N INOX

**P 14** **M 21** **M 22** **S 71** **S 72**  
≤1400 N/mm<sup>2</sup> INOX ≤850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> Ni/Co Ti

28-34 E 17-22 D 16-20 C 8-10 A 12-16 B

Ref.	d1	d2	l1	l2
11.764.0100	1	1	34	12
11.764.0110	1.1	1.1	36	14
11.764.0120	1.2	1.2	38	16
11.764.0130	1.3	1.3	38	16
11.764.0140	1.4	1.4	40	18
11.764.0150	1.5	1.5	40	18
11.764.0160	1.6	1.6	43	20
11.764.0170	1.7	1.7	43	20
11.764.0180	1.8	1.8	46	22
11.764.0190	1.9	1.9	46	22
11.764.0200	2	2	49	24
11.764.0210	2.1	2.1	49	24
11.764.0220	2.2	2.2	53	27
11.764.0230	2.3	2.3	53	27
11.764.0240	2.4	2.4	57	30
11.764.0250	2.5	2.5	57	30
11.764.0260	2.6	2.6	57	30
11.764.0270	2.7	2.7	61	33
11.764.0280	2.8	2.8	61	33
11.764.0290	2.9	2.9	61	33
11.764.0300	3	3	61	33
11.764.0310	3.1	3.1	65	36
11.764.0320	3.2	3.2	65	36
11.764.0330	3.3	3.3	65	36
11.764.0340	3.4	3.4	70	39
11.764.0350	3.5	3.5	70	39
11.764.0360	3.6	3.6	70	39
11.764.0370	3.7	3.7	70	39
11.764.0380	3.8	3.8	75	43
11.764.0390	3.9	3.9	75	43
11.764.0400	4	4	75	43
11.764.0410	4.1	4.1	75	43
11.764.0420	4.2	4.2	75	43
11.764.0430	4.3	4.3	80	47

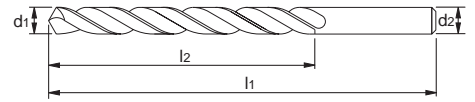
Ref.	d1	d2	l1	l2
11.764.0440	4.4	4.4	80	47
11.764.0450	4.5	4.5	80	47
11.764.0460	4.6	4.6	80	47
11.764.0470	4.7	4.7	80	47
11.764.0480	4.8	4.8	86	52
11.764.0490	4.9	4.9	86	52
11.764.0500	5	5	86	52
11.764.0510	5.1	5.1	86	52
11.764.0520	5.2	5.2	86	52
11.764.0530	5.3	5.3	86	52
11.764.0540	5.4	5.4	93	57
11.764.0550	5.5	5.5	93	57
11.764.0560	5.6	5.6	93	57
11.764.0570	5.7	5.7	93	57
11.764.0580	5.8	5.8	93	57
11.764.0590	5.9	5.9	93	57
11.764.0600	6	6	93	57
11.764.0610	6.1	6.1	101	63
11.764.0620	6.2	6.2	101	63
11.764.0630	6.3	6.3	101	63
11.764.0640	6.4	6.4	101	63
11.764.0650	6.5	6.5	101	63
11.764.0660	6.6	6.6	101	63
11.764.0670	6.7	6.7	101	63
11.764.0680	6.8	6.8	109	69
11.764.0690	6.9	6.9	109	69
11.764.0700	7	7	109	69
11.764.0710	7.1	7.1	109	69
11.764.0720	7.2	7.2	109	69
11.764.0730	7.3	7.3	109	69
11.764.0740	7.4	7.4	109	69
11.764.0750	7.5	7.5	109	69
11.764.0760	7.6	7.6	117	75
11.764.0770	7.7	7.7	117	75

Ref.	d1	d2	l1	l2
11.764.0780	7.8	7.8	117	75
11.764.0790	7.9	7.9	117	75
11.764.0800	8	8	117	75
11.764.0810	8.1	8.1	117	75
11.764.0820	8.2	8.2	117	75
11.764.0830	8.3	8.3	117	75
11.764.0840	8.4	8.4	117	75
11.764.0850	8.5	8.5	117	75
11.764.0860	8.6	8.6	125	81
11.764.0870	8.7	8.7	125	81
11.764.0880	8.8	8.8	125	81
11.764.0890	8.9	8.9	125	81
11.764.0900	9	9	125	81
11.764.0910	9.1	9.1	125	81
11.764.0920	9.2	9.2	125	81
11.764.0930	9.3	9.3	125	81
11.764.0940	9.4	9.4	125	81
11.764.0950	9.5	9.5	125	81
11.764.0960	9.6	9.6	133	87
11.764.0970	9.7	9.7	133	87
11.764.0980	9.8	9.8	133	87
11.764.0990	9.9	9.9	133	87
11.764.1000	10	10	133	87
11.764.1020	10.2	10.2	133	87
11.764.1030	10.3	10.3	133	87
11.764.1050	10.5	10.5	133	87
11.764.1100	11	11	142	94
11.764.1150	11.5	11.5	142	94
11.764.1200	12	12	151	101
11.764.1250	12.5	12.5	151	101
11.764.1300	13	13	151	101
11.764.1350	13.5	13.5	160	108
11.764.1400	14	14	160	108



**> 11.770 Phantom**

NL HSS-E Spiraalboor, type TS  
 FR Foret HSS-E, type TS  
 ES Broca HSS-E, tipo TS  
 DE HSS-E Spiralbohrer, Typ TS



+6 ( **DIN 338** TS

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si-10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
35-40 E	20-40 E	30-40 D	12-16 C	14-18 E	12-16 D	30-35 E	28-30 E	70-80 F	10-15 D	25-30 D

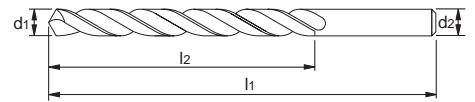
Ref.	d1	d2	l1	l2
11.770.0200	2	2	49	24
11.770.0250	2.5	2.5	57	30
11.770.0300	3	3	61	33
11.770.0310	3.1	3.1	65	36
11.770.0320	3.2	3.2	65	36
11.770.0330	3.3	3.3	65	36
11.770.0340	3.4	3.4	70	39
11.770.0350	3.5	3.5	70	39
11.770.0360	3.6	3.6	70	39
11.770.0370	3.7	3.7	70	39
11.770.0380	3.8	3.8	75	43
11.770.0390	3.9	3.9	75	43
11.770.0400	4	4	75	43
11.770.0410	4.1	4.1	75	43
11.770.0420	4.2	4.2	75	43
11.770.0430	4.3	4.3	80	47
11.770.0440	4.4	4.4	80	47
11.770.0450	4.5	4.5	80	47
11.770.0460	4.6	4.6	80	47
11.770.0470	4.7	4.7	80	47

Ref.	d1	d2	l1	l2
11.770.0480	4.8	4.8	86	52
11.770.0490	4.9	4.9	86	52
11.770.0500	5	5	86	52
11.770.0510	5.1	5.1	86	52
11.770.0520	5.2	5.2	86	52
11.770.0530	5.3	5.3	86	52
11.770.0540	5.4	5.4	93	57
11.770.0550	5.5	5.5	93	57
11.770.0560	5.6	5.6	93	57
11.770.0570	5.7	5.7	93	57
11.770.0580	5.8	5.8	93	57
11.770.0590	5.9	5.9	93	57
11.770.0600	6	6	93	57
11.770.0610	6.1	6.1	101	63
11.770.0620	6.2	6.2	101	63
11.770.0630	6.3	6.3	101	63
11.770.0640	6.4	6.4	101	63
11.770.0650	6.5	6.5	101	63
11.770.0660	6.6	6.6	101	63
11.770.0670	6.7	6.7	101	63

Ref.	d1	d2	l1	l2
11.770.0680	6.8	6.8	109	69
11.770.0690	6.9	6.9	109	69
11.770.0700	7	7	109	69
11.770.0750	7.5	7.5	109	69
11.770.0780	7.8	7.8	117	75
11.770.0800	8	8	117	75
11.770.0850	8.5	8.5	117	75
11.770.0880	8.8	8.8	125	81
11.770.0900	9	9	125	81
11.770.0950	9.5	9.5	125	81
11.770.0980	9.8	9.8	133	87
11.770.1000	10	10	133	87
11.770.1020	10.2	10.2	133	87
11.770.1050	10.5	10.5	133	87
11.770.1100	11	11	142	94
11.770.1150	11.5	11.5	142	94
11.770.1200	12	12	151	101
11.770.1250	12.5	12.5	151	101
11.770.1300	13	13	151	101
11.770.1400	14	14	160	108

**> 11.774 Phantom**

NL HSS-E Spiraalboor TiAIN, type TS  
 FR Foret HSS-E TiAIN, type TS  
 ES Broca HSS-E TiAIN, tipo TS  
 DE HSS-E Spiralbohrer TiAIN, Typ TS



+6 ( **TiAIN** **DIN 338** TS

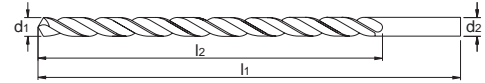
<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si-10%	<b>N 52</b> CuAlFe
38-42 E	22-48 E	30-40 D	20-34 D	17-22 E	16-20 D	40-45 F	30-36 F	72-85 G	15-20 E

Ref.	d1	d2	l1	l2
11.774.0200	2	2	49	24
11.774.0250	2.5	2.5	57	30
11.774.0300	3	3	61	33
11.774.0320	3.2	3.2	65	36
11.774.0330	3.3	3.3	65	36
11.774.0350	3.5	3.5	70	39
11.774.0400	4	4	75	43
11.774.0420	4.2	4.2	75	43
11.774.0450	4.5	4.5	80	47
11.774.0500	5	5	86	52
11.774.0510	5.1	5.1	86	52
11.774.0550	5.5	5.5	93	57

Ref.	d1	d2	l1	l2
11.774.0560	5.6	5.6	93	57
11.774.0600	6	6	93	57
11.774.0650	6.5	6.5	101	63
11.774.0680	6.8	6.8	109	69
11.774.0690	6.9	6.9	109	69
11.774.0700	7	7	109	69
11.774.0750	7.5	7.5	109	69
11.774.0800	8	8	117	75
11.774.0850	8.5	8.5	117	75
11.774.0860	8.6	8.6	125	81
11.774.0870	8.7	8.7	125	81
11.774.0900	9	9	125	81

Ref.	d1	d2	l1	l2
11.774.0950	9.5	9.5	125	81
11.774.1000	10	10	133	87
11.774.1020	10.2	10.2	133	87
11.774.1050	10.5	10.5	133	87
11.774.1100	11	11	142	94
11.774.1150	11.5	11.5	142	94
11.774.1200	12	12	151	101
11.774.1250	12.5	12.5	151	101
11.774.1300	13	13	151	101
11.774.1400	14	14	160	108

> 11.810 INTERNATIONAL TOOLS



NL ECO HSS Spiraalboor gewalst  
FR Foret HSS ECO laminé  
ES Broca HSS ECO laminada  
DE ECO HSS Spiralbohrer Gewalzt

HSS DIN 340 N ECO

P 11 P 12 P 13 K 31 K 32

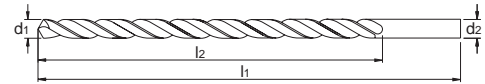
20-25 E 20-25 E 15-20 D 15-20 E 25-30 E

Ref.	d1	d2	l1	l2
11.810.0200	2	2	85	56
11.810.0210	2.1	2.1	85	56
11.810.0220	2.2	2.2	90	59
11.810.0230	2.3	2.3	90	59
11.810.0240	2.4	2.4	95	62
11.810.0250	2.5	2.5	95	62
11.810.0260	2.6	2.6	95	62
11.810.0270	2.7	2.7	100	66
11.810.0280	2.8	2.8	100	66
11.810.0290	2.9	2.9	100	66
11.810.0300	3	3	100	66
11.810.0310	3.1	3.1	106	69
11.810.0320	3.2	3.2	106	69
11.810.0330	3.3	3.3	106	69
11.810.0340	3.4	3.4	112	73
11.810.0350	3.5	3.5	112	73
11.810.0360	3.6	3.6	112	73
11.810.0370	3.7	3.7	112	73
11.810.0380	3.8	3.8	119	78

Ref.	d1	d2	l1	l2
11.810.0390	3.9	3.9	119	78
11.810.0400	4	4	119	78
11.810.0410	4.1	4.1	119	78
11.810.0420	4.2	4.2	119	78
11.810.0430	4.3	4.3	126	82
11.810.0440	4.4	4.4	126	82
11.810.0450	4.5	4.5	126	82
11.810.0460	4.6	4.6	126	82
11.810.0470	4.7	4.7	126	82
11.810.0480	4.8	4.8	132	87
11.810.0490	4.9	4.9	132	87
11.810.0500	5	5	132	87
11.810.0510	5.1	5.1	132	87
11.810.0520	5.2	5.2	132	87
11.810.0530	5.3	5.3	132	87
11.810.0540	5.4	5.4	139	91
11.810.0550	5.5	5.5	139	91
11.810.0560	5.6	5.6	139	91
11.810.0570	5.7	5.7	139	91

Ref.	d1	d2	l1	l2
11.810.0580	5.8	5.8	139	91
11.810.0590	5.9	5.9	139	91
11.810.0600	6	6	139	91
11.810.0650	6.5	6.5	148	97
11.810.0680	6.8	6.8	156	102
11.810.0700	7	7	156	102
11.810.0750	7.5	7.5	156	102
11.810.0800	8	8	165	109
11.810.0850	8.5	8.5	165	109
11.810.0900	9	9	175	115
11.810.0950	9.5	9.5	175	115
11.810.1000	10	10	184	121
11.810.1050	10.5	10.5	184	121
11.810.1100	11	11	195	128
11.810.1150	11.5	11.5	195	128
11.810.1200	12	12	205	134
11.810.1250	12.5	12.5	205	134
11.810.1300	13	13	205	134

> 11.813 INTERNATIONAL TOOLS



NL ECO PRO HSS Spiraalboor  
FR Foret HSS ECO PRO  
ES Broca HSS ECO PRO  
DE ECO PRO HSS Spiralbohrer

HSS DIN 340 N ECO PRO

P 11 P 12 P 13 K 31 K 32 N 42 N 51 N 61

25-27 F 22-30 F 15-20 E 15-20 E 25-30 E 45-90 G 25-40 D 22-28 D

NIEUW / NOUVEAU / NUEVO / NEU

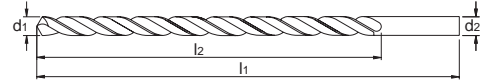
Ref.	d1	d2	l1	l2
11.813.0100	1	1	56	33
11.813.0110	1.1	1.1	60	37
11.813.0120	1.2	1.2	65	41
11.813.0130	1.3	1.3	65	41
11.813.0140	1.4	1.4	70	45
11.813.0150	1.5	1.5	70	45
11.813.0160	1.6	1.6	76	50
11.813.0170	1.7	1.7	76	50
11.813.0180	1.8	1.8	80	53
11.813.0190	1.9	1.9	80	53
11.813.0200	2	2	85	56
11.813.0210	2.1	2.1	85	56
11.813.0220	2.2	2.2	90	59
11.813.0230	2.3	2.3	90	59
11.813.0240	2.4	2.4	95	62
11.813.0250	2.5	2.5	95	62
11.813.0260	2.6	2.6	95	62
11.813.0270	2.7	2.7	100	66
11.813.0280	2.8	2.8	100	66
11.813.0290	2.9	2.9	100	66
11.813.0300	3	3	100	66
11.813.0310	3.1	3.1	106	69
11.813.0320	3.2	3.2	106	69

Ref.	d1	d2	l1	l2
11.813.0330	3.3	3.3	106	69
11.813.0340	3.4	3.4	112	73
11.813.0350	3.5	3.5	112	73
11.813.0360	3.6	3.6	112	73
11.813.0370	3.7	3.7	112	73
11.813.0380	3.8	3.8	119	78
11.813.0390	3.9	3.9	119	78
11.813.0400	4	4	119	78
11.813.0410	4.1	4.1	119	78
11.813.0420	4.2	4.2	119	78
11.813.0430	4.3	4.3	126	82
11.813.0440	4.4	4.4	126	82
11.813.0450	4.5	4.5	126	82
11.813.0460	4.6	4.6	126	82
11.813.0470	4.7	4.7	126	82
11.813.0480	4.8	4.8	132	87
11.813.0490	4.9	4.9	132	87
11.813.0500	5	5	132	87
11.813.0510	5.1	5.1	132	87
11.813.0520	5.2	5.2	132	87
11.813.0530	5.3	5.3	132	87
11.813.0540	5.4	5.4	139	91
11.813.0550	5.5	5.5	139	91

Ref.	d1	d2	l1	l2
11.813.0560	5.6	5.6	139	91
11.813.0570	5.7	5.7	139	91
11.813.0580	5.8	5.8	139	91
11.813.0590	5.9	5.9	139	91
11.813.0600	6	6	139	91
11.813.0650	6.5	6.5	148	97
11.813.0680	6.8	6.8	156	102
11.813.0700	7	7	156	102
11.813.0750	7.5	7.5	156	102
11.813.0800	8	8	165	109
11.813.0850	8.5	8.5	165	109
11.813.0900	9	9	175	115
11.813.0950	9.5	9.5	175	115
11.813.1000	10	10	184	121
11.813.1020	10.2	10.2	184	121
11.813.1050	10.5	10.5	184	121
11.813.1100	11	11	195	128
11.813.1150	11.5	11.5	195	128
11.813.1200	12	12	205	134
11.813.1250	12.5	12.5	205	134
11.813.1300	13	13	205	134



**> 11.815 Phantom**



NL HSS Spiraalboor  
FR Foret HSS  
ES Broca HSS  
DE HSS Spiralbohrer

**HSS OX. DIN 340 N**

**118°**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 42** **N 51** **N 61**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Si<10% Cu PVC

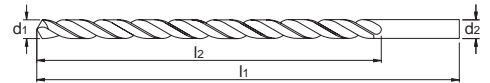
25-27 F 22-30 F 15-20 E 8-12 D 15-20 E 25-30 E 45-50 G 25-40 D 22-28 D

Ref.	d1	d2	l1	l2
11.815.0100	1	1	56	33
11.815.0110	1.1	1.1	60	37
11.815.0120	1.2	1.2	65	41
11.815.0130	1.3	1.3	65	41
11.815.0140	1.4	1.4	70	45
11.815.0150	1.5	1.5	70	45
11.815.0160	1.6	1.6	76	50
11.815.0170	1.7	1.7	76	50
11.815.0180	1.8	1.8	80	53
11.815.0190	1.9	1.9	80	53
11.815.0200	2	2	85	56
11.815.0210	2.1	2.1	85	56
11.815.0220	2.2	2.2	90	59
11.815.0230	2.3	2.3	90	59
11.815.0240	2.4	2.4	95	62
11.815.0250	2.5	2.5	95	62
11.815.0260	2.6	2.6	95	62
11.815.0270	2.7	2.7	100	66
11.815.0280	2.8	2.8	100	66
11.815.0290	2.9	2.9	100	66
11.815.0300	3	3	100	66
11.815.0310	3.1	3.1	106	69
11.815.0320	3.2	3.2	106	69
11.815.0330	3.3	3.3	106	69

Ref.	d1	d2	l1	l2
11.815.0340	3.4	3.4	112	73
11.815.0350	3.5	3.5	112	73
11.815.0360	3.6	3.6	112	73
11.815.0370	3.7	3.7	112	73
11.815.0380	3.8	3.8	119	78
11.815.0390	3.9	3.9	119	78
11.815.0400	4	4	119	78
11.815.0410	4.1	4.1	119	78
11.815.0420	4.2	4.2	119	78
11.815.0430	4.3	4.3	126	82
11.815.0440	4.4	4.4	126	82
11.815.0450	4.5	4.5	126	82
11.815.0460	4.6	4.6	126	82
11.815.0470	4.7	4.7	126	82
11.815.0480	4.8	4.8	132	87
11.815.0490	4.9	4.9	132	87
11.815.0500	5	5	132	87
11.815.0510	5.1	5.1	132	87
11.815.0520	5.2	5.2	132	87
11.815.0530	5.3	5.3	132	87
11.815.0540	5.4	5.4	139	91
11.815.0550	5.5	5.5	139	91
11.815.0560	5.6	5.6	139	91
11.815.0570	5.7	5.7	139	91

Ref.	d1	d2	l1	l2
11.815.0580	5.8	5.8	139	91
11.815.0590	5.9	5.9	139	91
11.815.0600	6	6	139	91
11.815.0620	6.2	6.2	148	97
11.815.0650	6.5	6.5	148	97
11.815.0680	6.8	6.8	156	102
11.815.0700	7	7	156	102
11.815.0750	7.5	7.5	156	102
11.815.0780	7.8	7.8	165	109
11.815.0800	8	8	165	109
11.815.0850	8.5	8.5	165	109
11.815.0880	8.8	8.8	175	115
11.815.0900	9	9	175	115
11.815.0950	9.5	9.5	175	115
11.815.0980	9.8	9.8	184	121
11.815.1000	10	10	184	121
11.815.1050	10.5	10.5	184	121
11.815.1100	11	11	195	128
11.815.1150	11.5	11.5	195	128
11.815.1200	12	12	205	134
11.815.1250	12.5	12.5	205	134
11.815.1300	13	13	205	134

**> 11.820 Phantom**



NL HSS-E Spiraalboor roestvaststaal  
FR Foret HSS-E Inox  
ES Broca HSS-E acero inoxidable  
DE HSS-E Spiralbohrer rostfreien Stahl

**+6 ( DIN 340 >N**

**130°**

**INOX**

**P 14** **M 21** **M 22** **S 71** **S 72**

≤1400 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> Ni/Co Ti

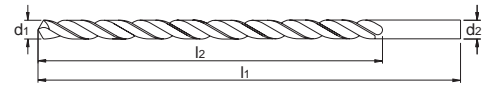
12-16 E 14-18 D 12-16 C 6-8 A 6-10 B

Ref.	d1	d2	l1	l2
11.820.0100	1	1	56	33
11.820.0150	1.5	1.5	70	45
11.820.0200	2	2	85	56
11.820.0250	2.5	2.5	95	62
11.820.0300	3	3	100	66
11.820.0310	3.1	3.1	106	69
11.820.0320	3.2	3.2	106	69
11.820.0350	3.5	3.5	112	73
11.820.0400	4	4	119	78
11.820.0410	4.1	4.1	119	78
11.820.0420	4.2	4.2	119	78
11.820.0450	4.5	4.5	126	82

Ref.	d1	d2	l1	l2
11.820.0500	5	5	132	87
11.820.0510	5.1	5.1	132	87
11.820.0520	5.2	5.2	132	87
11.820.0550	5.5	5.5	139	91
11.820.0600	6	6	139	91
11.820.0650	6.5	6.5	148	97
11.820.0670	6.7	6.7	148	97
11.820.0680	6.8	6.8	156	102
11.820.0700	7	7	156	102
11.820.0750	7.5	7.5	156	102
11.820.0800	8	8	165	109
11.820.0850	8.5	8.5	165	109

Ref.	d1	d2	l1	l2
11.820.0900	9	9	175	115
11.820.0950	9.5	9.5	175	115
11.820.1000	10	10	184	121
11.820.1050	10.5	10.5	184	121
11.820.1100	11	11	195	128
11.820.1110	11.1	11.1	195	128
11.820.1150	11.5	11.5	195	128
11.820.1200	12	12	205	134
11.820.1250	12.5	12.5	205	134
11.820.1300	13	13	205	134

> **11.840 Phantom**



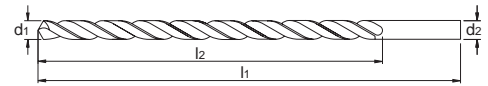
NL **HM-tip Spiraalboor**  
FR **Foret HSS à plaquettes carbure brasées**  
ES **Broca punta MD**  
DE **HM-Schneiden Spiralbohrer**

**HM-TIP** **DIN 340** **N**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
75-85	60-70	55-65	30-40	15-20	20-35	18-30	70-85	60-75	120-150	35-40	70-130	25-30	30-35

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.840.0200	2	2	85	56	11.840.0510	5.1	5.1	132	87	11.840.0950	9.5	9.5	175	115
11.840.0250	2.5	2.5	95	62	11.840.0520	5.2	5.2	132	87	11.840.1000	10	10	184	121
11.840.0300	3	3	100	66	11.840.0550	5.5	5.5	139	91	11.840.1020	10.2	10.2	184	121
11.840.0310	3.1	3.1	106	69	11.840.0560	5.6	5.6	139	91	11.840.1050	10.5	10.5	184	121
11.840.0320	3.2	3.2	106	69	11.840.0600	6	6	139	91	11.840.1100	11	11	195	128
11.840.0330	3.3	3.3	106	69	11.840.0610	6.1	6.1	148	97	11.840.1150	11.5	11.5	195	128
11.840.0350	3.5	3.5	112	73	11.840.0620	6.2	6.2	148	97	11.840.1200	12	12	205	134
11.840.0370	3.7	3.7	112	73	11.840.0630	6.3	6.3	148	97	11.840.1250	12.5	12.5	205	134
11.840.0380	3.8	3.8	119	78	11.840.0640	6.4	6.4	148	97	11.840.1300	13	13	205	134
11.840.0400	4	4	119	78	11.840.0650	6.5	6.5	148	97	11.840.1400	14	14	214	140
11.840.0410	4.1	4.1	119	78	11.840.0700	7	7	156	102	11.840.1500	15	15	220	144
11.840.0420	4.2	4.2	119	78	11.840.0750	7.5	7.5	156	102	11.840.1600	16	16	227	149
11.840.0450	4.5	4.5	126	82	11.840.0800	8	8	165	109	11.840.1700	17	17	235	154
11.840.0480	4.8	4.8	132	87	11.840.0850	8.5	8.5	165	109	11.840.1800	18	18	241	158
11.840.0500	5	5	132	87	11.840.0900	9	9	175	115	11.840.2000	20	20	254	166

> **11.850 Phantom**



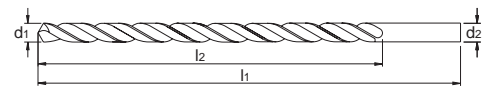
NL **HSS Spiraalboor, type TS**  
FR **Foret HSS, type TS**  
ES **Broca HSS, tipo TS**  
DE **HSS Spiralbohrer, Typ TS**

**HSS** **DIN 340** **TS**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 43</b> Mg	<b>N 61</b> PVC
18-25 E	60-65 F	55-60 E	18-21 E

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.850.0300	3	3	100	66	11.850.0550	5.5	5.5	139	91	11.850.0850	8.5	8.5	165	109
11.850.0350	3.5	3.5	112	73	11.850.0600	6	6	139	91	11.850.0900	9	9	175	115
11.850.0400	4	4	119	78	11.850.0650	6.5	6.5	148	97	11.850.1000	10	10	184	121
11.850.0450	4.5	4.5	126	82	11.850.0700	7	7	156	102	11.850.1050	10.5	10.5	184	121
11.850.0500	5	5	132	87	11.850.0800	8	8	165	109	11.850.1200	12	12	205	134

> **11.860 Phantom**



NL **HSS Spiraalboor, type TS**  
FR **Foret HSS, type TS**  
ES **Broca HSS, tipo TS**  
DE **HSS Spiralbohrer, Typ TS**

**HSS** **DIN 340** **TS**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
22-24 E	14-22 E	20-25 E	18-22 E	40-45 F	30-36 E	18-21 E

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.860.0100	1	1	56	33	11.860.0300	3	3	100	66	11.860.0420	4.2	4.2	119	78
11.860.0150	1.5	1.5	70	45	11.860.0310	3.1	3.1	106	69	11.860.0430	4.3	4.3	126	82
11.860.0200	2	2	85	56	11.860.0320	3.2	3.2	106	69	11.860.0440	4.4	4.4	126	82
11.860.0210	2.1	2.1	85	56	11.860.0330	3.3	3.3	106	69	11.860.0450	4.5	4.5	126	82
11.860.0220	2.2	2.2	90	59	11.860.0340	3.4	3.4	112	73	11.860.0460	4.6	4.6	126	82
11.860.0230	2.3	2.3	90	59	11.860.0350	3.5	3.5	112	73	11.860.0470	4.7	4.7	126	82
11.860.0240	2.4	2.4	95	62	11.860.0360	3.6	3.6	112	73	11.860.0480	4.8	4.8	132	87
11.860.0250	2.5	2.5	95	62	11.860.0370	3.7	3.7	112	73	11.860.0490	4.9	4.9	132	87
11.860.0260	2.6	2.6	95	62	11.860.0380	3.8	3.8	119	78	11.860.0500	5	5	132	87
11.860.0270	2.7	2.7	100	66	11.860.0390	3.9	3.9	119	78	11.860.0510	5.1	5.1	132	87
11.860.0280	2.8	2.8	100	66	11.860.0400	4	4	119	78	11.860.0520	5.2	5.2	132	87





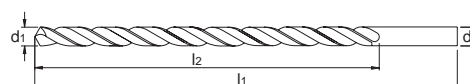
## > 11.860 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.860.0290	2.9	2.9	100	66	11.860.0410	4.1	4.1	119	78	11.860.0530	5.3	5.3	132	87
11.860.0540	5.4	5.4	139	91	11.860.0680	6.8	6.8	156	102	11.860.0850	8.7	8.7	175	115
11.860.0550	5.5	5.5	139	91	11.860.0690	6.9	6.9	156	102	11.860.0900	9	9	175	115
11.860.0560	5.6	5.6	139	91	11.860.0700	7	7	156	102	11.860.0950	9.5	9.5	175	115
11.860.0570	5.7	5.7	139	91	11.860.0710	7.1	7.1	156	102	11.860.1000	10	10	184	121
11.860.0580	5.8	5.8	139	91	11.860.0720	7.2	7.2	156	102	11.860.1020	10.2	10.2	184	121
11.860.0590	5.9	5.9	139	91	11.860.0730	7.3	7.3	156	102	11.860.1050	10.5	10.5	184	121
11.860.0600	6	6	139	91	11.860.0740	7.4	7.4	156	102	11.860.1100	11	11	195	128
11.860.0610	6.1	6.1	148	97	11.860.0750	7.5	7.5	156	102	11.860.1150	11.5	11.5	195	128
11.860.0620	6.2	6.2	148	97	11.860.0760	7.6	7.6	165	109	11.860.1200	12	12	205	134
11.860.0630	6.3	6.3	148	97	11.860.0770	7.7	7.7	165	109	11.860.1250	12.5	12.5	205	134
11.860.0640	6.4	6.4	148	97	11.860.0780	7.8	7.8	165	109	11.860.1300	13	13	205	134
11.860.0650	6.5	6.5	148	97	11.860.0790	7.9	7.9	165	109	11.860.1400	14	14	214	140
11.860.0660	6.6	6.6	148	97	11.860.0800	8	8	165	109	11.860.1500	15	15	220	144
11.860.0670	6.7	6.7	148	97	11.860.0850	8.5	8.5	165	109	11.860.1600	16	16	227	149

## > 11.870 Phantom



NL HSS-E Spiraalboor, type TS  
FR Foret HSS-E, type TS  
ES Broca HSS-E, tipo TS  
DE HSS-E Spiralbohrer, Typ TS



+6 ( DIN 340 TS    130°

P 11  P 12  P 13  P 14  M 21  M 22  K 31  K 32  N 42  N 51  N 52 

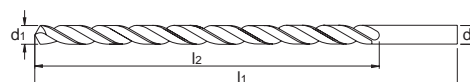
35-40 E 20-40 E 30-40 D 12-16 C 14-18 E 12-16 D 30-35 E 28-30 E 70-80 F 10-15 D 25-30 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.870.0200	2	2	85	56	11.870.0550	5.5	5.5	139	91	11.870.0950	9.5	9.5	175	115
11.870.0250	2.5	2.5	95	62	11.870.0600	6	6	139	91	11.870.1000	10	10	184	121
11.870.0300	3	3	100	66	11.870.0650	6.5	6.5	148	97	11.870.1020	10.2	10.2	184	121
11.870.0330	3.3	3.3	106	69	11.870.0680	6.8	6.8	156	102	11.870.1050	10.5	10.5	184	121
11.870.0350	3.5	3.5	112	73	11.870.0700	7	7	156	102	11.870.1100	11	11	195	128
11.870.0400	4	4	119	78	11.870.0750	7.5	7.5	156	102	11.870.1150	11.5	11.5	195	128
11.870.0420	4.2	4.2	119	78	11.870.0800	8	8	165	109	11.870.1200	12	12	205	134
11.870.0450	4.5	4.5	126	82	11.870.0850	8.5	8.5	165	109	11.870.1250	12.5	12.5	205	134
11.870.0500	5	5	132	87	11.870.0900	9	9	175	115	11.870.1300	13	13	205	134

## > 11.874 Phantom



NL HSS-E Spiraalboor TiAlN, type TS  
FR Foret HSS-E TiAlN, type TS  
ES Broca HSS-E TiAlN, tipo TS  
DE HSS-E Spiralbohrer TiAlN, Typ TS



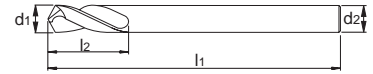
+6 ( TiAlN DIN 340 TS    130°

P 11  P 12  P 13  P 14  M 21  M 22  K 31  K 32  N 42  N 52 

38-42 E 22-48 E 30-40 D 20-34 D 17-22 E 16-20 D 40-45 F 30-36 F 72-85 G 15-20 E

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.874.0200	2	2	85	56	11.874.0550	5.5	5.5	139	91	11.874.0950	9.5	9.5	175	115
11.874.0250	2.5	2.5	95	62	11.874.0600	6	6	139	91	11.874.1000	10	10	184	121
11.874.0300	3	3	100	66	11.874.0650	6.5	6.5	148	97	11.874.1020	10.2	10.2	184	121
11.874.0330	3.3	3.3	106	69	11.874.0680	6.8	6.8	156	102	11.874.1050	10.5	10.5	184	121
11.874.0350	3.5	3.5	112	73	11.874.0700	7	7	156	102	11.874.1100	11	11	195	128
11.874.0400	4	4	119	78	11.874.0750	7.5	7.5	156	102	11.874.1150	11.5	11.5	195	128
11.874.0420	4.2	4.2	119	78	11.874.0800	8	8	165	109	11.874.1200	12	12	205	134
11.874.0450	4.5	4.5	126	82	11.874.0850	8.5	8.5	165	109					
11.874.0500	5	5	132	87	11.874.0900	9	9	175	115					

> **11.890** **Phantom**



NL HSS Dakdekkersboor  
FR Foret HSS pour couvreurs  
ES Broca para tejados HSS  
DE HSS Blechschälbohrer

HSS NORM N

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

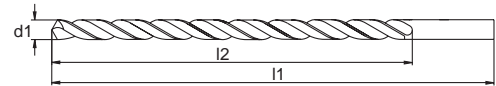
Ref.	d1	d2	l1	l2
11.890.4910	4.9	4.9	100	30
11.890.4915	4.9	4.9	150	30
11.890.5007	5	5	70	30
11.890.5010	5	5	100	30
11.890.5015	5	5	150	30
11.890.5021	5	5	210	30
11.890.5110	5.1	5.1	100	30
11.890.5115	5.1	5.1	150	30

Ref.	d1	d2	l1	l2
11.890.5121	5.1	5.1	210	30
11.890.5310	5.3	5.3	100	30
11.890.5315	5.3	5.3	150	30
11.890.5321	5.3	5.3	210	30
11.890.5510	5.5	5.5	100	30
11.890.5515	5.5	5.5	150	30
11.890.5521	5.5	5.5	210	30
11.890.5707	5.7	5.7	70	30

Ref.	d1	d2	l1	l2
11.890.5710	5.7	5.7	100	30
11.890.5715	5.7	5.7	150	30
11.890.5721	5.7	5.7	210	30
11.890.5810	5.8	5.8	100	30
11.890.5815	5.8	5.8	150	30
11.890.5821	5.8	5.8	210	30

> **11.900** **Phantom**

NL HSS Spiraalboor  
FR Foret HSS  
ES Broca HSS  
DE HSS Spiralbohrer



HSS DIN 1869 N

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu
20-25 D	15-25 D	8-20 C	18-22 E	14-20 E	35-40 F	50-55 E	20-28 D

Ref.	d1	d2	l1	l2
11.900.0201	2	2	125	85
11.900.0251	2.5	2.5	140	95
11.900.0301	3	3	150	100
11.900.0303	3	3	190	130
11.900.0351	3.5	3.5	165	115
11.900.0353	3.5	3.5	210	145
11.900.0401	4	4	175	120
11.900.0403	4	4	220	150
11.900.0451	4.5	4.5	185	125
11.900.0453	4.5	4.5	235	160
11.900.0481	4.8	4.8	195	135
11.900.0501	5	5	195	135
11.900.0503	5	5	245	170

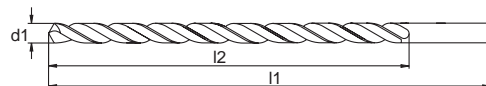
Ref.	d1	d2	l1	l2
11.900.0511	5.1	5.1	195	135
11.900.0551	5.5	5.5	205	140
11.900.0553	5.5	5.5	260	180
11.900.0581	5.8	5.8	205	140
11.900.0601	6	6	205	140
11.900.0603	6	6	260	180
11.900.0651	6.5	6.5	215	150
11.900.0653	6.5	6.5	275	190
11.900.0701	7	7	225	155
11.900.0703	7	7	290	200
11.900.0751	7.5	7.5	225	155
11.900.0753	7.5	7.5	290	200
11.900.0801	8	8	240	165

Ref.	d1	d2	l1	l2
11.900.0803	8	8	305	210
11.900.0851	8.5	8.5	240	165
11.900.0853	8.5	8.5	305	210
11.900.0901	9	9	250	175
11.900.0903	9	9	320	220
11.900.0951	9.5	9.5	250	175
11.900.0953	9.5	9.5	320	220
11.900.1001	10	10	265	185
11.900.1003	10	10	340	235
11.900.1101	11	11	280	195
11.900.1103	11	11	365	250
11.900.1201	12	12	295	205
11.900.1203	12	12	375	260



## > 11.920 Phantom

NL HSS Spiraalboor, type TS  
FR Foret HSS, type TS  
ES Broca HSS, tipo TS  
DE HSS Spiralbohrer, Typ TS



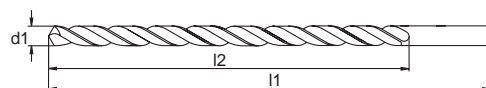
<b>P 11</b> S500 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>M 21</b> INOX S850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
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20-25 D	16-25 D	16-22 C	6-10 C	18-22 E	14-20 E	35-40 F	50-55 E	20-28 D	18-30 E
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Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.920.0201	2	2	125	85	11.920.0603	6	6	260	180	11.920.0953	9.5	9.5	320	220
11.920.0251	2.5	2.5	140	95	11.920.0605	6	6	330	225	11.920.0955	9.5	9.5	410	280
11.920.0301	3	3	150	100	11.920.0607	6	6	600	400	11.920.1001	10	10	265	185
11.920.0303	3	3	190	130	11.920.0608	6	6	500	400	11.920.1003	10	10	340	235
11.920.0305	3	3	240	160	11.920.0651	6.5	6.5	215	150	11.920.1005	10	10	430	295
11.920.0351	3.5	3.5	165	115	11.920.0653	6.5	6.5	275	190	11.920.1008	10	10	600	500
11.920.0353	3.5	3.5	210	145	11.920.0655	6.5	6.5	350	235	11.920.1051	10.5	10.5	265	185
11.920.0355	3.5	3.5	265	180	11.920.0701	7	7	225	155	11.920.1053	10.5	10.5	340	235
11.920.0401	4	4	175	120	11.920.0703	7	7	290	200	11.920.1054	10.5	10.5	430	295
11.920.0403	4	4	220	150	11.920.0705	7	7	370	250	11.920.1101	11	11	280	195
11.920.0405	4	4	280	190	11.920.0751	7.5	7.5	225	155	11.920.1103	11	11	365	250
11.920.0407	4	4	400	300	11.920.0753	7.5	7.5	290	200	11.920.1104	11	11	455	310
11.920.0451	4.5	4.5	185	125	11.920.0755	7.5	7.5	370	250	11.920.1151	11.5	11.5	280	195
11.920.0453	4.5	4.5	235	160	11.920.0801	8	8	240	165	11.920.1153	11.5	11.5	365	250
11.920.0455	4.5	4.5	295	200	11.920.0803	8	8	305	210	11.920.1201	12	12	295	205
11.920.0501	5	5	195	135	11.920.0805	8	8	390	265	11.920.1203	12	12	375	260
11.920.0503	5	5	245	170	11.920.0809	8	8	500	400	11.920.1205	12	12	480	330
11.920.0505	5	5	315	210	11.920.0851	8.5	8.5	240	165	11.920.1206	12	12	600	500
11.920.0507	5	5	500	350	11.920.0853	8.5	8.5	305	210	11.920.1251	12.5	12.5	295	205
11.920.0551	5.5	5.5	205	140	11.920.0901	9	9	250	175	11.920.1253	12.5	12.5	375	260
11.920.0553	5.5	5.5	260	180	11.920.0903	9	9	320	220	11.920.1301	13	13	295	205
11.920.0557	5.5	5.5	330	225	11.920.0905	9	9	410	280	11.920.1303	13	13	375	260
11.920.0601	6	6	205	140	11.920.0951	9.5	9.5	250	175	11.920.1401	14	14	300	200

## > 11.940 Phantom

NL HSS-E Spiraalboor, type TS  
FR Foret HSS-E, type TS  
ES Broca HSS-E, tipo TS  
DE HSS-E Spiralbohrer, Typ TS



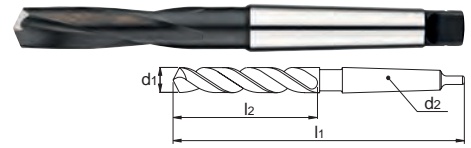
<b>P 11</b> S600 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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30-35 D	20-30 D	10-20 C	8-10 B	8-10 C	6-10 B	25-30 D	20-25 D	40-50 F	20-30 D	25-30 C
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**NIUW NOUVEAU NUEVO NEU**

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.940.0301	3	3	150	100	11.940.0603	6	6	260	180	11.940.0905	9	9	410	280
11.940.0303	3	3	190	130	11.940.0605	6	6	330	225	11.940.0951	9.5	9.5	250	175
11.940.0351	3.5	3.5	165	115	11.940.0651	6.5	6.5	215	150	11.940.0953	9.5	9.5	320	220
11.940.0353	3.5	3.5	210	145	11.940.0653	6.5	6.5	275	190	11.940.1001	10	10	265	185
11.940.0355	3.5	3.5	265	180	11.940.0701	7	7	225	155	11.940.1003	10	10	340	235
11.940.0401	4	4	175	120	11.940.0703	7	7	290	200	11.940.1005	10	10	430	295
11.940.0403	4	4	220	150	11.940.0705	7	7	370	250	11.940.1101	11	11	280	195
11.940.0405	4	4	280	190	11.940.0751	7.5	7.5	225	155	11.940.1103	11	11	365	250
11.940.0451	4.5	4.5	185	125	11.940.0753	7.5	7.5	290	200	11.940.1104	11	11	455	310
11.940.0453	4.5	4.5	235	160	11.940.0801	8	8	240	165	11.940.1201	12	12	295	205
11.940.0501	5	5	195	135	11.940.0803	8	8	305	210	11.940.1203	12	12	375	260
11.940.0503	5	5	245	170	11.940.0805	8	8	390	265	11.940.1205	12	12	480	330
11.940.0505	5	5	315	210	11.940.0851	8.5	8.5	240	165	11.940.1301	13	13	295	205
11.940.0551	5.5	5.5	205	140	11.940.0853	8.5	8.5	305	210	11.940.1303	13	13	375	260
11.940.0553	5.5	5.5	260	180	11.940.0901	9	9	250	175					
11.940.0601	6	6	205	140	11.940.0903	9	9	320	220					

› **12.150 Phantom**



NL HSS-E 8% Spiraalboor Hardox, MK  
FR Foret HSS-E 8% Hardox, CM  
ES Broca HSS-E 8% Hardox, CM  
DE HSS-E 8% Spiralbohrer Hardox, MK

HSS-E 8% NORM H DIN 228-B 130°

**P 14**  
S1400 N/mm<sup>2</sup>

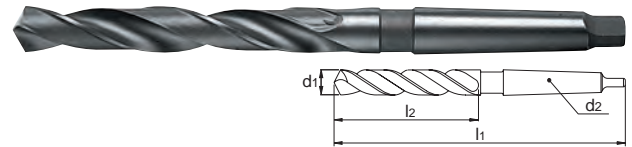
4-15  
C

Ref.	d1	d2	l1	l2
12.150.1000	10	MK 1	131	50
12.150.1050	10.5	MK 1	131	50
12.150.1100	11	MK 1	136	55
12.150.1200	12	MK 2	157	59
12.150.1250	12.5	MK 2	157	59
12.150.1300	13	MK 2	157	59
12.150.1400	14	MK 2	161	63
12.150.1450	14.5	MK 2	164	66
12.150.1500	15	MK 2	164	66
12.150.1600	16	MK 2	168	70
12.150.1650	16.5	MK 2	171	73
12.150.1700	17	MK 2	171	73

Ref.	d1	d2	l1	l2
12.150.1750	17.5	MK 2	175	77
12.150.1800	18	MK 2	175	77
12.150.1850	18.5	MK 2	201	80
12.150.1900	19	MK 3	201	80
12.150.1950	19.5	MK 3	204	83
12.150.2000	20	MK 3	204	83
12.150.2100	21	MK 3	208	87
12.150.2200	22	MK 3	211	90
12.150.2300	23	MK 3	215	94
12.150.2400	24	MK 3	219	98
12.150.2500	25	MK 3	219	98
12.150.2600	26	MK 3	224	103

Ref.	d1	d2	l1	l2
12.150.2700	27	MK 4	256	107
12.150.2800	28	MK 4	256	107
12.150.2900	29	MK 4	261	112
12.150.3000	30	MK 4	261	112
12.150.3100	31	MK 4	266	117
12.150.3200	32	MK 4	271	122
12.150.3300	33	MK 4	271	122
12.150.3400	34	MK 4	277	128
12.150.3500	35	MK 4	277	128
12.150.3800	38	MK 4	288	139
12.150.4000	40	MK 4	288	139

› **12.400 INTERNATIONAL TOOLS**



NL ECO HSS Spiraalboor gewalst, MK  
FR Foret HSS ECO laminé, CM  
ES Broca HSS ECO laminada, CM  
DE ECO HSS Spiralbohrer Gewalzt, MK

HSS DIN 345 N DIN 228-B 118° ECO

**P 11** S580 N/mm<sup>2</sup> **P 12** S850 N/mm<sup>2</sup> **P 13** S1000 N/mm<sup>2</sup> **K 31** GG **K 32** GGG GTS-GTW

20-25 E 20-25 E 15-20 D 15-20 E 25-30 E

Ref.	d1	d2	l1	l2
12.400.0800	8	MK 1	156	75
12.400.0850	8.5	MK 1	156	75
12.400.0900	9	MK 1	162	81
12.400.0950	9.5	MK 1	162	81
12.400.1000	10	MK 1	168	87
12.400.1050	10.5	MK 1	168	87
12.400.1100	11	MK 1	175	94
12.400.1150	11.5	MK 1	175	94
12.400.1200	12	MK 1	182	101
12.400.1250	12.5	MK 1	182	101
12.400.1300	13	MK 1	182	101
12.400.1350	13.5	MK 1	189	108
12.400.1400	14	MK 1	189	108
12.400.1450	14.5	MK 2	212	114
12.400.1500	15	MK 2	212	114
12.400.1550	15.5	MK 2	218	120
12.400.1600	16	MK 2	218	120
12.400.1650	16.5	MK 2	223	125
12.400.1700	17	MK 2	223	125
12.400.1750	17.5	MK 2	228	130
12.400.1800	18	MK 2	228	130
12.400.1850	18.5	MK 2	233	135
12.400.1900	19	MK 2	233	135
12.400.1950	19.5	MK 2	238	140
12.400.2000	20	MK 2	238	140
12.400.2050	20.5	MK 2	243	145
12.400.2100	21	MK 2	243	145
12.400.2150	21.5	MK 2	248	150

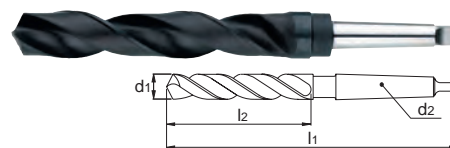
Ref.	d1	d2	l1	l2
12.400.2200	22	MK 2	248	150
12.400.2250	22.5	MK 2	253	155
12.400.2300	23	MK 2	253	155
12.400.2350	23.5	MK 3	276	155
12.400.2400	24	MK 3	281	160
12.400.2450	24.5	MK 3	281	160
12.400.2500	25	MK 3	281	160
12.400.2550	25.5	MK 3	286	165
12.400.2600	26	MK 3	286	165
12.400.2650	26.5	MK 3	286	165
12.400.2700	27	MK 3	291	170
12.400.2750	27.5	MK 3	291	170
12.400.2800	28	MK 3	291	170
12.400.2850	28.5	MK 3	296	175
12.400.2900	29	MK 3	296	175
12.400.2950	29.5	MK 3	296	175
12.400.3000	30	MK 3	296	175
12.400.3050	30.5	MK 3	301	180
12.400.3100	31	MK 3	301	180
12.400.3150	31.5	MK 3	301	180
12.400.3200	32	MK 4	334	185
12.400.3250	32.5	MK 4	334	185
12.400.3300	33	MK 4	334	185
12.400.3350	33.5	MK 4	334	185
12.400.3400	34	MK 4	339	190
12.400.3450	34.5	MK 4	339	190
12.400.3500	35	MK 4	339	190
12.400.3550	35.5	MK 4	339	190

Ref.	d1	d2	l1	l2
12.400.3600	36	MK 4	344	195
12.400.3650	36.5	MK 4	344	195
12.400.3700	37	MK 4	344	195
12.400.3750	37.5	MK 4	344	195
12.400.3800	38	MK 4	349	200
12.400.3850	38.5	MK 4	349	200
12.400.3900	39	MK 4	349	200
12.400.3950	39.5	MK 4	349	200
12.400.4000	40	MK 4	349	200
12.400.4050	40.5	MK 4	354	205
12.400.4100	41	MK 4	354	205
12.400.4150	41.5	MK 4	354	205
12.400.4200	42	MK 4	354	205
12.400.4250	42.5	MK 4	354	205
12.400.4300	43	MK 4	359	210
12.400.4350	43.5	MK 4	359	210
12.400.4400	44	MK 4	359	210
12.400.4450	44.5	MK 4	359	210
12.400.4500	45	MK 4	359	210
12.400.4550	45.5	MK 4	364	215
12.400.4600	46	MK 4	364	215
12.400.4650	46.5	MK 4	364	215
12.400.4700	47	MK 4	364	215
12.400.4800	48	MK 4	369	220
12.400.4850	48.5	MK 4	369	220
12.400.4900	49	MK 4	369	220
12.400.4950	49.5	MK 4	369	220
12.400.5000	50	MK 4	369	220



**> 12.420 INTERNATIONAL TOOLS**

NL ECO HSS Spiraalboor gewalst, met verjongde MK  
 FR Foret HSS ECO laminé, à queue CM réduite  
 ES Broca HSS ECO laminada, con CM rebajado  
 DE ECO HSS Spiralbohrer Gewalzt, mit kleinerem MK



HSS NORM N 118° ECO

P 11 P 12 P 13 K 31 K 32

20-25 E 20-25 E 15-20 D 15-20 E 25-30 E

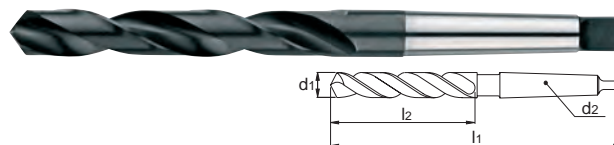
Ref.	d1	d2	l1	l2
12.420.2400	24	MK 2	262	160
12.420.2500	25	MK 2	262	160
12.420.2600	26	MK 2	267	165
12.420.2700	27	MK 2	272	170
12.420.2800	28	MK 2	272	170
12.420.2900	29	MK 2	277	175
12.420.3000	30	MK 2	277	175
12.420.3100	31	MK 2	282	180
12.420.3200	32	MK 3	310	185

Ref.	d1	d2	l1	l2
12.420.3300	33	MK 3	310	185
12.420.3400	34	MK 3	315	190
12.420.3500	35	MK 3	315	190
12.420.3600	36	MK 3	320	195
12.420.3700	37	MK 3	320	195
12.420.3800	38	MK 3	325	200
12.420.3900	39	MK 3	325	200
12.420.4000	40	MK 3	325	200
12.420.4100	41	MK 3	330	205

Ref.	d1	d2	l1	l2
12.420.4200	42	MK 3	330	205
12.420.4300	43	MK 3	335	210
12.420.4400	44	MK 3	335	210
12.420.4500	45	MK 3	335	210
12.420.4600	46	MK 3	340	215
12.420.4700	47	MK 3	340	215
12.420.4800	48	MK 3	345	220
12.420.4900	49	MK 3	345	220
12.420.5000	50	MK 3	345	220

**> 12.440 Phantom**

NL HSS Spiraalboor MK  
 FR Foret HSS CM  
 ES Broca HSS CM  
 DE HSS Spiralbohrer MK



HSS OX. DIN 345 N DIN 228-B 14 118°

P 11 P 12 P 13 M 21 K 31 K 32 N 42 N 51 N 61

25-27 F 22-30 F 15-20 E 8-12 D 15-20 E 25-30 E 45-50 G 25-40 D 22-28 D

Ref.	d1	d2	l1	l2
12.440.0500	5	MK 1	133	52
12.440.0550	5.5	MK 1	138	57
12.440.0600	6	MK 1	138	57
12.440.0625	6.25	MK 1	144	63
12.440.0650	6.5	MK 1	144	63
12.440.0675	6.75	MK 1	150	69
12.440.0700	7	MK 1	150	69
12.440.0750	7.5	MK 1	150	69
12.440.0775	7.75	MK 1	156	75
12.440.0800	8	MK 1	156	75
12.440.0825	8.25	MK 1	156	75
12.440.0850	8.5	MK 1	156	75
12.440.0875	8.75	MK 1	162	81
12.440.0900	9	MK 1	162	81
12.440.0925	9.25	MK 1	162	81
12.440.0950	9.5	MK 1	162	81
12.440.0975	9.75	MK 1	168	87
12.440.1000	10	MK 1	168	87
12.440.1025	10.25	MK 1	168	87
12.440.1050	10.5	MK 1	168	87
12.440.1075	10.75	MK 1	175	94
12.440.1100	11	MK 1	175	94
12.440.1125	11.25	MK 1	175	94
12.440.1150	11.5	MK 1	175	94
12.440.1175	11.75	MK 1	175	94
12.440.1200	12	MK 1	182	101
12.440.1225	12.25	MK 1	182	101
12.440.1250	12.5	MK 1	182	101
12.440.1275	12.75	MK 1	182	101
12.440.1300	13	MK 1	182	101
12.440.1325	13.25	MK 1	189	108
12.440.1350	13.5	MK 1	189	108
12.440.1375	13.75	MK 1	189	108
12.440.1400	14	MK 1	189	108
12.440.1425	14.25	MK 2	212	114
12.440.1450	14.5	MK 2	212	114
12.440.1475	14.75	MK 2	212	114
12.440.1500	15	MK 2	212	114
12.440.1525	15.25	MK 2	218	120
12.440.1550	15.5	MK 2	218	120
12.440.1575	15.75	MK 2	218	120
12.440.1600	16	MK 2	218	120

Ref.	d1	d2	l1	l2
12.440.1625	16.25	MK 2	223	125
12.440.1650	16.5	MK 2	223	125
12.440.1675	16.75	MK 2	223	125
12.440.1700	17	MK 2	223	125
12.440.1725	17.25	MK 2	228	130
12.440.1750	17.5	MK 2	228	130
12.440.1775	17.75	MK 2	228	130
12.440.1800	18	MK 2	228	130
12.440.1825	18.25	MK 2	233	135
12.440.1850	18.5	MK 2	233	135
12.440.1875	18.75	MK 2	233	135
12.440.1900	19	MK 2	233	135
12.440.1925	19.25	MK 2	238	140
12.440.1950	19.5	MK 2	238	140
12.440.1975	19.75	MK 2	238	140
12.440.2000	20	MK 2	238	140
12.440.2025	20.25	MK 2	243	145
12.440.2050	20.5	MK 2	243	145
12.440.2075	20.75	MK 2	243	145
12.440.2100	21	MK 2	243	145
12.440.2125	21.25	MK 2	248	150
12.440.2150	21.5	MK 2	248	150
12.440.2175	21.75	MK 2	248	150
12.440.2200	22	MK 2	248	150
12.440.2225	22.25	MK 2	248	150
12.440.2250	22.5	MK 2	253	155
12.440.2275	22.75	MK 2	253	155
12.440.2300	23	MK 2	253	155
12.440.2325	23.25	MK 3	276	155
12.440.2350	23.5	MK 3	276	155
12.440.2375	23.75	MK 3	281	160
12.440.2400	24	MK 3	281	160
12.440.2425	24.25	MK 3	281	160
12.440.2450	24.5	MK 3	281	160
12.440.2475	24.75	MK 3	281	160
12.440.2500	25	MK 3	281	160
12.440.2525	25.25	MK 3	286	165
12.440.2550	25.5	MK 3	286	165
12.440.2575	25.75	MK 3	286	165
12.440.2600	26	MK 3	286	165
12.440.2625	26.25	MK 3	286	165
12.440.2650	26.5	MK 3	286	165

Ref.	d1	d2	l1	l2
12.440.2675	26.75	MK 3	291	170
12.440.2700	27	MK 3	291	170
12.440.2725	27.25	MK 3	291	170
12.440.2750	27.5	MK 3	291	170
12.440.2775	27.75	MK 3	291	170
12.440.2800	28	MK 3	291	170
12.440.2825	28.25	MK 3	296	175
12.440.2850	28.5	MK 3	296	175
12.440.2875	28.75	MK 3	296	175
12.440.2900	29	MK 3	296	175
12.440.2925	29.25	MK 3	296	175
12.440.2950	29.5	MK 3	296	175
12.440.2975	29.75	MK 3	296	175
12.440.3000	30	MK 3	296	175
12.440.3025	30.25	MK 3	301	180
12.440.3050	30.5	MK 3	301	180
12.440.3075	30.75	MK 3	301	180
12.440.3100	31	MK 3	301	180
12.440.3125	31.25	MK 3	301	180
12.440.3150	31.5	MK 3	301	180
12.440.3200	32	MK 4	334	185
12.440.3250	32.5	MK 4	334	185
12.440.3300	33	MK 4	334	185
12.440.3350	33.5	MK 4	334	185
12.440.3400	34	MK 4	339	190
12.440.3450	34.5	MK 4	339	190
12.440.3500	35	MK 4	339	190
12.440.3550	35.5	MK 4	339	190
12.440.3600	36	MK 4	344	195
12.440.3650	36.5	MK 4	344	195
12.440.3700	37	MK 4	344	195
12.440.3750	37.5	MK 4	344	195
12.440.3800	38	MK 4	349	200
12.440.3850	38.5	MK 4	349	200
12.440.3900	39	MK 4	349	200
12.440.3950	39.5	MK 4	349	200
12.440.4000	40	MK 4	349	200
12.440.4050	40.5	MK 4	354	205
12.440.4100	41	MK 4	354	205
12.440.4150	41.5	MK 4	354	205
12.440.4200	42	MK 4	354	205
12.440.4250	42.5	MK 4	354	205

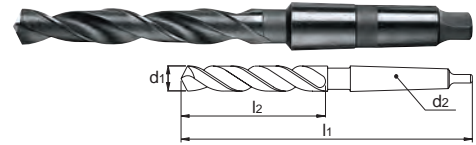


› **12.440 Phantom**

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.440.4300	43	MK 4	359	210	12.440.4750	47.5	MK 4	364	215	12.440.5400	54	MK 5	417	230
12.440.4350	43.5	MK 4	359	210	12.440.4800	48	MK 4	369	220	12.440.5500	55	MK 5	417	230
12.440.4400	44	MK 4	359	210	12.440.4850	48.5	MK 4	369	220	12.440.5600	56	MK 5	417	230
12.440.4450	44.5	MK 4	359	210	12.440.4900	49	MK 4	369	220	12.440.5700	57	MK 5	422	235
12.440.4500	45	MK 4	359	210	12.440.4950	49.5	MK 4	369	220	12.440.5800	58	MK 5	422	235
12.440.4550	45.5	MK 4	364	215	12.440.5000	50	MK 4	369	220	12.440.5900	59	MK 5	422	235
12.440.4600	46	MK 4	364	215	12.440.5100	51	MK 5	412	225	12.440.6000	60	MK 5	422	235
12.440.4650	46.5	MK 4	364	215	12.440.5200	52	MK 5	412	225					
12.440.4700	47	MK 4	364	215	12.440.5300	53	MK 5	412	225					

› **12.480 Phantom**

NL HSS Spiraalboor met verzwaaarde MK  
FR Foret HSS à queue CM renforcée  
ES Broca HSS con mango CM reforzado  
DE HSS Spiralbohrer mit verstärktem MK



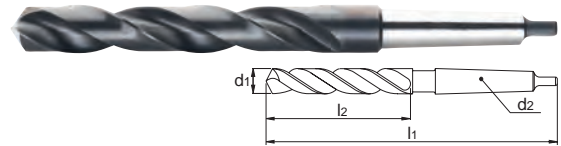
**HSS OX.** DIN 346 N DIN 228-B 12 118°

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.480.1100	11	MK 2	175	94	12.480.1800	18	MK 3	228	130	12.480.2300	23	MK 3	253	155
12.480.1200	12	MK 2	182	101	12.480.1900	19	MK 3	233	135	12.480.2600	26	MK 4	286	165
12.480.1300	13	MK 2	182	101	12.480.2000	20	MK 3	238	140	12.480.2800	28	MK 4	291	170
12.480.1400	14	MK 2	189	108	12.480.2100	21	MK 3	243	145	12.480.2900	29	MK 4	296	175
12.480.1700	17	MK 3	223	125	12.480.2200	22	MK 3	248	150					

› **12.500 Phantom**

NL HSS-E Spiraalboor MK  
FR Foret HSS-E CM  
ES Broca HSS-E CM  
DE HSS-E Spiralbohrer MK



**+6 E** OX. DIN 345 N DIN 228-B 12 118°

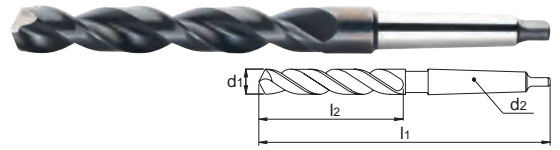
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.500.0700	7	MK 1	150	69	12.500.1850	18.5	MK 2	233	135	12.500.2750	27.5	MK 3	291	170
12.500.0800	8	MK 1	156	75	12.500.1900	19	MK 2	233	135	12.500.2800	28	MK 3	291	170
12.500.0900	9	MK 1	162	81	12.500.1950	19.5	MK 2	238	140	12.500.2850	28.5	MK 3	296	175
12.500.1000	10	MK 1	168	87	12.500.2000	20	MK 2	238	140	12.500.2900	29	MK 3	296	175
12.500.1100	11	MK 1	175	94	12.500.2050	20.5	MK 2	243	145	12.500.2950	29.5	MK 3	296	175
12.500.1200	12	MK 1	182	101	12.500.2100	21	MK 2	243	145	12.500.3000	30	MK 3	296	175
12.500.1250	12.5	MK 1	182	101	12.500.2150	21.5	MK 2	248	150	12.500.3100	31	MK 3	301	180
12.500.1300	13	MK 1	182	101	12.500.2200	22	MK 2	248	150	12.500.3200	32	MK 4	334	185
12.500.1350	13.5	MK 1	189	108	12.500.2250	22.5	MK 2	253	155	12.500.3300	33	MK 4	334	185
12.500.1400	14	MK 1	189	108	12.500.2300	23	MK 2	253	155	12.500.3400	34	MK 4	339	190
12.500.1450	14.5	MK 2	212	114	12.500.2350	23.5	MK 3	276	155	12.500.3500	35	MK 4	339	190
12.500.1500	15	MK 2	212	114	12.500.2400	24	MK 3	281	160	12.500.3600	36	MK 4	344	195
12.500.1550	15.5	MK 2	218	120	12.500.2450	24.5	MK 3	281	160	12.500.3700	37	MK 4	344	195
12.500.1600	16	MK 2	218	120	12.500.2500	25	MK 3	281	160	12.500.3800	38	MK 4	349	200
12.500.1650	16.5	MK 2	223	125	12.500.2550	25.5	MK 3	286	165	12.500.3900	39	MK 4	349	200
12.500.1700	17	MK 2	223	125	12.500.2600	26	MK 3	286	165	12.500.4000	40	MK 4	349	200
12.500.1750	17.5	MK 2	228	130	12.500.2650	26.5	MK 3	286	165					
12.500.1800	18	MK 2	228	130	12.500.2700	27	MK 3	291	170					



**> 12.520 Phantom**

NL HSS-E Spiraalboor type TS, MK  
 FR Foret HSS-E type TS, CM  
 ES Broca HSS-E tipo TS, CM  
 DE HSS-E Spiralbohrer Typ TS, MK



+6 6 ( **OX.** **DIN 345** **TS** **DIN 228-B**

<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
35-40 E	20-40 E	16-35 D	12-16 C	14-18 D	12-16 C	18-22 E	14-20 E	35-40 F	50-55 E	20-28 D	18-30 E

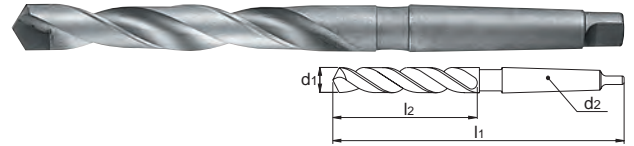
Ref.	d1	d2	l1	l2
12.520.1000	10	MK 1	168	87
12.520.1050	10.5	MK 1	168	87
12.520.1100	11	MK 1	175	94
12.520.1150	11.5	MK 1	175	94
12.520.1200	12	MK 1	182	101
12.520.1250	12.5	MK 1	182	101
12.520.1300	13	MK 1	182	101
12.520.1350	13.5	MK 1	189	108
12.520.1400	14	MK 1	189	108

Ref.	d1	d2	l1	l2
12.520.1450	14.5	MK 2	212	114
12.520.1500	15	MK 2	212	114
12.520.1550	15.5	MK 2	218	120
12.520.1600	16	MK 2	218	120
12.520.1650	16.5	MK 2	223	125
12.520.1700	17	MK 2	223	125
12.520.1750	17.5	MK 2	228	130
12.520.1800	18	MK 2	228	130
12.520.1850	18.5	MK 2	233	135

Ref.	d1	d2	l1	l2
12.520.1900	19	MK 2	233	135
12.520.2000	20	MK 2	238	140
12.520.2050	20.5	MK 2	243	145
12.520.2100	21	MK 2	243	145
12.520.2200	22	MK 2	248	150
12.520.2250	22.5	MK 2	253	155
12.520.2300	23	MK 2	253	155
12.520.2400	24	MK 3	281	160
12.520.2500	25	MK 3	281	160

**> 12.600 Phantom**

NL HM-tip Spiraalboor MK  
 FR Foret à plaquettes carbure brasées CM  
 ES Broca punta MD CM  
 DE HM-Schneiden Spiralbohrer MK



**HM-TIP** **DIN 345** **N** **DIN 228-B**

<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
75-85	60-70	55-65	30-40	10-20	20-35	18-30	70-85	60-75	120-150	35-40	70-130	25-30	30-35

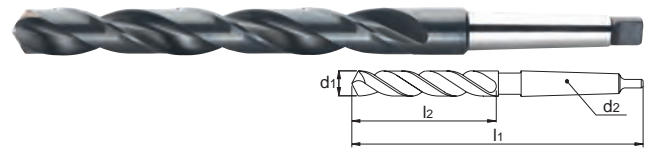
Ref.	d1	d2	l1	l2
12.600.1000	10	MK 1	168	87
12.600.1050	10.5	MK 1	168	87
12.600.1100	11	MK 1	175	94
12.600.1150	11.5	MK 1	175	94
12.600.1200	12	MK 1	182	101
12.600.1250	12.5	MK 1	182	101
12.600.1300	13	MK 1	182	101
12.600.1350	13.5	MK 1	189	108
12.600.1400	14	MK 1	189	108
12.600.1450	14.5	MK 2	212	114
12.600.1500	15	MK 2	212	114
12.600.1550	15.5	MK 2	218	120
12.600.1600	16	MK 2	218	120
12.600.1650	16.5	MK 2	223	125
12.600.1700	17	MK 2	223	125

Ref.	d1	d2	l1	l2
12.600.1750	17.5	MK 2	228	130
12.600.1800	18	MK 2	228	130
12.600.1850	18.5	MK 2	233	135
12.600.1900	19	MK 2	233	135
12.600.1950	19.5	MK 2	238	140
12.600.2000	20	MK 2	238	140
12.600.2050	20.5	MK 2	243	145
12.600.2100	21	MK 2	243	145
12.600.2150	21.5	MK 2	248	150
12.600.2200	22	MK 2	248	150
12.600.2250	22.5	MK 2	253	155
12.600.2300	23	MK 2	253	155
12.600.2350	23.5	MK 3	276	155
12.600.2400	24	MK 3	281	160
12.600.2450	24.5	MK 3	281	160

Ref.	d1	d2	l1	l2
12.600.2500	25	MK 3	281	160
12.600.2550	25.5	MK 3	286	165
12.600.2600	26	MK 3	286	165
12.600.2650	26.5	MK 3	286	165
12.600.2700	27	MK 3	291	170
12.600.2750	27.5	MK 3	291	170
12.600.2800	28	MK 3	291	170
12.600.2850	28.5	MK 3	296	175
12.600.2900	29	MK 3	296	175
12.600.2950	29.5	MK 3	296	175
12.600.3000	30	MK 3	296	175
12.600.3300	33	MK 4	334	185
12.600.4000	40	MK 4	349	200

**> 12.800 Phantom**

NL HSS Spiraalboor MK  
 FR Foret HSS CM  
 ES Broca HSS CM  
 DE HSS Spiralbohrer MK



**HSS** **OX.** **DIN 341** **N** **DIN 228-B**

<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2
12.800.1000	10	MK 1	197	116
12.800.1050	10.5	MK 1	197	116
12.800.1100	11	MK 1	206	125
12.800.1150	11.5	MK 1	206	125
12.800.1200	12	MK 1	215	134
12.800.1250	12.5	MK 1	215	134
12.800.1300	13	MK 1	215	134
12.800.1350	13.5	MK 1	223	142

Ref.	d1	d2	l1	l2
12.800.1400	14	MK 1	223	142
12.800.1450	14.5	MK 2	245	147
12.800.1500	15	MK 2	245	147
12.800.1550	15.5	MK 2	251	153
12.800.1600	16	MK 2	251	153
12.800.1650	16.5	MK 2	257	159
12.800.1700	17	MK 2	257	159
12.800.1750	17.5	MK 2	263	165

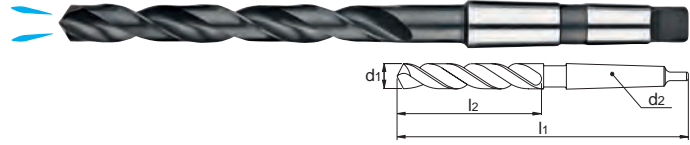
Ref.	d1	d2	l1	l2
12.800.1800	18	MK 2	263	165
12.800.1850	18.5	MK 2	269	171
12.800.1900	19	MK 2	269	171
12.800.1950	19.5	MK 2	275	177
12.800.2000	20	MK 2	275	177
12.800.2050	20.5	MK 2	282	184
12.800.2100	21	MK 2	282	184
12.800.2150	21.5	MK 2	289	191

> 12.800 Phantom

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.800.2200	22	MK 2	289	191	12.800.2700	27	MK 3	343	222	12.800.3400	34	MK 4	406	257
12.800.2250	22.5	MK 2	296	198	12.800.2800	28	MK 3	343	222	12.800.3500	35	MK 4	406	257
12.800.2300	23	MK 2	296	198	12.800.2900	29	MK 3	351	230	12.800.3600	36	MK 4	416	267
12.800.2350	23.5	MK 3	319	198	12.800.3000	30	MK 3	351	230	12.800.3700	37	MK 4	416	267
12.800.2400	24	MK 3	327	206	12.800.3100	31	MK 3	360	239	12.800.3800	38	MK 4	426	277
12.800.2500	25	MK 3	327	206	12.800.3200	32	MK 4	397	248	12.800.3900	39	MK 4	426	277
12.800.2600	26	MK 3	335	214	12.800.3300	33	MK 4	397	248	12.800.4000	40	MK 4	426	277

> 12.840 Phantom

NL HSS Spiraalboor met koelkanaal, axiaal, MK  
 FR Foret HSS à trou d'huile, axial, CM  
 ES Broca HSS con canal de refrigeración, axial, CM  
 DE HSS Spiralbohrer mit Innenkühlung, axial, MK



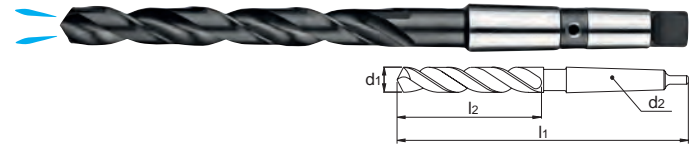
HSS OX. NORM N DIN 228-B 118°

P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.840.1000	10	MK 2	233	116	12.840.1500	15	MK 2	264	147	12.840.2400	24	MK 3	342	206
12.840.1100	11	MK 2	242	125	12.840.1600	16	MK 2	270	153	12.840.2500	25	MK 3	342	206
12.840.1200	12	MK 2	251	134	12.840.1800	18	MK 2	282	165	12.840.2600	26	MK 3	350	214
12.840.1300	13	MK 2	251	134	12.840.2000	20	MK 3	313	177	12.840.2800	28	MK 4	385	222
12.840.1400	14	MK 2	259	142	12.840.2200	22	MK 3	327	191	12.840.3000	30	MK 4	393	230

> 12.860 Phantom

NL HSS Spiraalboor met koelkanaal, radiaal, MK  
 FR Foret HSS à trou d'huile, radial, CM  
 ES Broca HSS con canal de refrigeración, radial, CM  
 DE HSS Spiralbohrer mit Innenkühlung, radial, MK



HSS OX. NORM N DIN 228-B 118°

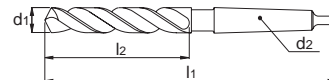
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.860.1000	10	MK 2	233	116	12.860.1500	15	MK 2	264	147	12.860.2400	24	MK 3	342	206
12.860.1100	11	MK 2	242	125	12.860.1600	16	MK 2	270	153	12.860.2500	25	MK 3	342	206
12.860.1200	12	MK 2	251	134	12.860.1800	18	MK 2	282	165	12.860.2600	26	MK 3	350	214
12.860.1300	13	MK 2	251	134	12.860.2000	20	MK 3	313	177	12.860.2800	28	MK 4	385	222
12.860.1400	14	MK 2	259	142	12.860.2200	22	MK 3	327	191	12.860.3000	30	MK 4	393	230



## > 12.900 Phantom

NL HSS Spiraalboor MK  
FR Foret HSS CM  
ES Broca HSS CM  
DE HSS Spiralbohrer MK

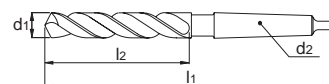


HSS	OX.	DIN 1870	N	DIN 228-B		118°		
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si<10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.900.1001	10	MK 1	285	185	12.900.1603	16	MK 2	445	295	12.900.2303	23	MK 2	515	345
12.900.1003	10	MK 1	360	235	12.900.1651	16.5	MK 2	355	230	12.900.2401	24	MK 3	440	290
12.900.1051	10.5	MK 1	285	185	12.900.1653	16.5	MK 2	445	295	12.900.2403	24	MK 3	555	365
12.900.1053	10.5	MK 1	360	235	12.900.1701	17	MK 2	355	230	12.900.2501	25	MK 3	440	290
12.900.1101	11	MK 1	300	195	12.900.1703	17	MK 2	445	295	12.900.2503	25	MK 3	555	365
12.900.1103	11	MK 1	375	250	12.900.1751	17.5	MK 2	370	245	12.900.2601	26	MK 3	440	290
12.900.1151	11.5	MK 1	300	195	12.900.1753	17.5	MK 2	465	310	12.900.2603	26	MK 3	555	365
12.900.1201	12	MK 1	310	205	12.900.1801	18	MK 2	370	245	12.900.2701	27	MK 3	460	305
12.900.1203	12	MK 1	395	260	12.900.1803	18	MK 2	465	310	12.900.2801	28	MK 3	460	305
12.900.1251	12.5	MK 1	310	205	12.900.1851	18.5	MK 2	370	245	12.900.2803	28	MK 3	580	385
12.900.1253	12.5	MK 1	395	260	12.900.1853	18.5	MK 2	465	310	12.900.2901	29	MK 3	460	305
12.900.1301	13	MK 1	310	205	12.900.1901	19	MK 2	370	245	12.900.3001	30	MK 3	460	305
12.900.1303	13	MK 1	395	260	12.900.1903	19	MK 2	465	310	12.900.3003	30	MK 3	580	385
12.900.1351	13.5	MK 1	325	220	12.900.1951	19.5	MK 2	385	260	12.900.3201	32	MK 4	505	320
12.900.1353	13.5	MK 1	410	275	12.900.1953	19.5	MK 2	490	325	12.900.3203	32	MK 4	635	410
12.900.1401	14	MK 1	325	220	12.900.2001	20	MK 2	385	260	12.900.3501	35	MK 4	530	340
12.900.1403	14	MK 1	410	275	12.900.2003	20	MK 2	490	325	12.900.3801	38	MK 4	555	360
12.900.1451	14.5	MK 2	340	220	12.900.2051	20.5	MK 2	385	260	12.900.4001	40	MK 4	555	360
12.900.1453	14.5	MK 2	425	275	12.900.2053	20.5	MK 2	490	325	12.900.4003	40	MK 4	695	460
12.900.1501	15	MK 2	340	220	12.900.2101	21	MK 2	385	260	12.900.4201	42	MK 4	555	360
12.900.1503	15	MK 2	425	275	12.900.2103	21	MK 2	490	325	12.900.4501	45	MK 4	585	385
12.900.1551	15.5	MK 2	355	230	12.900.2201	22	MK 2	405	270	12.900.4503	45	MK 4	735	490
12.900.1553	15.5	MK 2	445	295	12.900.2203	22	MK 2	515	345	12.900.5001	50	MK 4	605	405
12.900.1601	16	MK 2	355	230	12.900.2301	23	MK 2	405	270					

## > 12.910 Phantom

NL HSS Spiraalboor type TS, MK  
FR Foret HSS type TS, CM  
ES Broca HSS tipo TS, CM  
DE HSS Spiralbohrer Typ TS, MK



HSS	OX.	DIN 1870	TS	DIN 228-B		130°		
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si<10%	N 51 Cu	N 61 PVC
25-27 E	22-30 E	15-20 D	8-12 C	15-20 D	25-30 D	45-50 F	25-40 D	22-28 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.910.1005	10	MK 1	500	420	12.910.1705	17	MK 2	600	500	12.910.2405	24	MK 3	600	475
12.910.1205	12	MK 1	500	420	12.910.1805	18	MK 2	600	500	12.910.2505	25	MK 3	600	475
12.910.1405	14	MK 1	500	420	12.910.1905	19	MK 2	600	500	12.910.2605	26	MK 3	600	475
12.910.1407	14	MK 1	650	500	12.910.2005	20	MK 2	600	500	12.910.2805	28	MK 3	600	475
12.910.1505	15	MK 2	600	475	12.910.2105	21	MK 2	600	500	12.910.3005	30	MK 3	600	475
12.910.1507	15	MK 2	750	650	12.910.2205	22	MK 2	600	500	12.910.3503	35	MK 4	600	450
12.910.1605	16	MK 2	600	500	12.910.2305	23	MK 2	600	500	12.910.3803	38	MK 4	600	450

> **12.920 Phantom**

NL HSS-E Spiraalboor type TS, MK  
FR Foret HSS-E type TS, CM  
ES Broca HSS-E tipo TS, CM  
DE HSS-E Spiralbohrer Typ TS, MK



+6 Flutes (OX), DIN 1870 TS, DIN 228-B, 130°

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe
30-35 D	20-30 D	10-20 C	8-10 B	8-10 C	6-10 B	40-50 F	20-30 D	8-10 C

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.920.1001	10	MK 1	285	185	12.920.1451	14.5	MK 2	340	220	12.920.1801	18	MK 2	370	245
12.920.1002	10	MK 1	360	235	12.920.1501	15	MK 2	340	220	12.920.1802	18	MK 2	465	310
12.920.1201	12	MK 1	310	205	12.920.1502	15	MK 2	425	275	12.920.1851	18.5	MK 2	370	245
12.920.1202	12	MK 1	395	260	12.920.1551	15.5	MK 2	355	230	12.920.1901	19	MK 2	370	245
12.920.1301	13	MK 1	310	205	12.920.1601	16	MK 2	355	230	12.920.1902	19	MK 2	465	310
12.920.1302	13	MK 1	395	260	12.920.1602	16	MK 2	445	295	12.920.2001	20	MK 2	385	260
12.920.1351	13.5	MK 1	325	220	12.920.1651	16.5	MK 2	355	230	12.920.2002	20	MK 2	490	325
12.920.1401	14	MK 1	325	220	12.920.1701	17	MK 2	355	230					
12.920.1402	14	MK 1	410	275	12.920.1751	17.5	MK 2	370	245					

> **13.200 Phantom**

NL HSS Conische Pengatboor  
FR Foret conique HSS  
ES Broca para pasadores cónicos HSS  
DE HSS konische Stiftlochbohrer



HSS (OX), DIN 1898 A, 1:50, 118°

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>
20-25 C	18-22 C	14-20 C

Ref.	d1	d3	d2	l1	l2	l3	Ref.	d1	d3	d2	l1	l2	l3
13.200.0300	2.84	4.25	4	100	63	58	13.200.0600	5.71	8.25	8	160	114	105
13.200.0400	3.78	5.45	5	112	74	68	13.200.0800	7.64	11.11	10	207	157	145
13.200.0500	4.7	6.58	6.3	122	81	73	13.200.1000	9.65	13.79	12.5	245	190	175

> **13.300 Phantom**

NL HSS Opboor (Driellippenboor)  
FR Foret aléteur (à trois lèvres) HSS  
ES Broca escariador (con tres labios) HSS  
DE HSS Aufbohrer



HSS, DIN 344

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	N 41 Alu
28-35 C	18-22 C	14-22 C	8-12 B	40-45 C

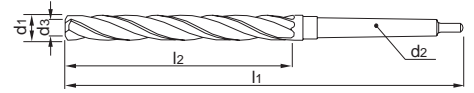
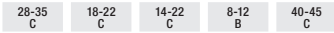
Ref.	d1	d2	l1	l2	d3	Ref.	d1	d2	l1	l2	d3	Ref.	d1	d2	l1	l2	d3
13.300.0480	4.8	4.8	108	74	3.5	13.300.0880	8.8	8.8	151	107	6.3	13.300.1275	12.75	12.75	184	134	8.4
13.300.0500	5	5	108	74	3.5	13.300.0900	9	9	151	107	6.3	13.300.1300	13	13	184	134	9.1
13.300.0580	5.8	5.8	116	80	4.2	13.300.0980	9.8	9.8	162	116	7	13.300.1375	13.75	13.75	194	142	9.8
13.300.0600	6	6	116	80	4.2	13.300.1000	10	10	162	116	7	13.300.1400	14	14	194	142	9.8
13.300.0680	6.8	6.8	133	93	4.9	13.300.1075	10.75	10.75	173	125	7.7	13.300.1475	14.75	14.75	202	147	10.5
13.300.0700	7	7	133	93	4.9	13.300.1100	11	11	173	125	7.7	13.300.1500	15	15	202	147	10.5
13.300.0780	7.8	7.8	142	100	5.6	13.300.1175	11.75	11.75	184	134	8.4	13.300.1575	15.75	15.75	211	153	11.2
13.300.0800	8	8	142	100	5.6	13.300.1200	12	12	184	134	8.4	13.300.1600	16	16	211	153	11.2





## > 13.320 Phantom

NL HSS Opboor (Drielippenboor) MK  
 FR Foret aléreur (à trois lèvres) HSS CM  
 ES Broca escariador (con tres labios) HSS CM  
 DE HSS Aufbohrer MK



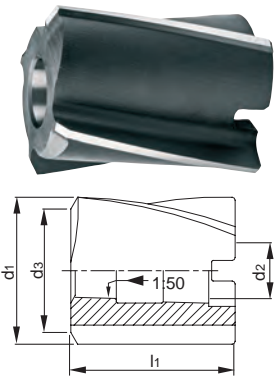
Ref.	d1	d2	d3	l1	l2
13.320.0780	7.8	MK 1	5.6	156	75
13.320.0800	8	MK 1	5.6	156	75
13.320.0880	8.8	MK 1	6.3	162	81
13.320.0900	9	MK 1	6.3	162	81
13.320.0980	9.8	MK 1	7	168	87
13.320.1000	10	MK 1	7	168	87
13.320.1075	10.75	MK 1	7.7	175	94
13.320.1100	11	MK 1	7.7	175	94
13.320.1175	11.75	MK 1	8.4	182	101
13.320.1200	12	MK 1	8.4	182	101
13.320.1275	12.75	MK 1	8.4	182	101
13.320.1300	13	MK 1	9.1	182	101
13.320.1375	13.75	MK 1	9.8	189	108
13.320.1400	14	MK 1	9.8	189	108
13.320.1475	14.75	MK 2	10.5	212	114
13.320.1500	15	MK 2	10.5	212	114
13.320.1575	15.75	MK 2	11.2	218	120
13.320.1600	16	MK 2	11.2	218	120
13.320.1675	16.75	MK 2	11.9	223	125
13.320.1700	17	MK 2	11.9	223	125
13.320.1775	17.75	MK 2	12.6	228	130
13.320.1800	18	MK 2	12.6	228	130
13.320.1870	18.7	MK 2	13.3	233	135
13.320.1900	19	MK 2	13.3	233	135
13.320.1970	19.7	MK 2	14	238	140
13.320.2000	20	MK 2	14	238	140
13.320.2070	20.7	MK 2	14.6	243	145
13.320.2100	21	MK 2	14.6	243	145
13.320.2170	21.7	MK 2	15.3	248	150

Ref.	d1	d2	d3	l1	l2
13.320.2200	22	MK 2	15.3	248	150
13.320.2270	22.7	MK 2	16	253	155
13.320.2300	23	MK 2	16	253	155
13.320.2370	23.7	MK 3	16.6	281	160
13.320.2400	24	MK 3	16.6	281	160
13.320.2470	24.7	MK 3	16.6	281	160
13.320.2500	25	MK 3	17.3	281	160
13.320.2570	25.7	MK 3	18	286	165
13.320.2600	26	MK 3	18	286	165
13.320.2670	26.7	MK 3	18.6	291	170
13.320.2700	27	MK 3	18.6	291	170
13.320.2770	27.7	MK 3	18.6	291	170
13.320.2800	28	MK 3	19.3	291	170
13.320.2870	28.7	MK 3	20	296	175
13.320.2900	29	MK 3	20	296	175
13.320.2970	29.7	MK 3	20	296	175
13.320.3000	30	MK 3	20.5	296	175
13.320.3060	30.6	MK 3	21	301	180
13.320.3100	31	MK 3	21	301	180
13.320.3160	31.6	MK 4	22	334	185
13.320.3200	32	MK 4	22	334	185
13.320.3260	32.6	MK 4	22	334	185
13.320.3300	33	MK 4	23	334	185
13.320.3360	33.6	MK 4	24	339	190
13.320.3400	34	MK 4	24	339	190
13.320.3460	34.6	MK 4	24	339	190
13.320.3500	35	MK 4	25	339	190
13.320.3560	35.6	MK 4	25.5	344	195
13.320.3600	36	MK 4	25.5	344	195

Ref.	d1	d2	d3	l1	l2
13.320.3660	36.6	MK 4	25.5	344	195
13.320.3700	37	MK 4	26	344	195
13.320.3760	37.6	MK 4	26.5	349	200
13.320.3800	38	MK 4	26.5	349	200
13.320.3860	38.6	MK 4	26.5	349	200
13.320.3900	39	MK 4	27	349	200
13.320.3960	39.6	MK 4	27	349	200
13.320.4000	40	MK 4	28	349	200
13.320.4060	40.6	MK 4	28.5	354	205
13.320.4100	41	MK 4	28.5	354	205
13.320.4160	41.6	MK 4	28.5	354	205
13.320.4200	42	MK 4	29	354	205
13.320.4260	42.6	MK 4	30	359	210
13.320.4300	43	MK 4	30	359	210
13.320.4360	43.6	MK 4	30	359	210
13.320.4400	44	MK 4	30.5	359	210
13.320.4460	44.6	MK 4	30.5	359	210
13.320.4500	45	MK 4	31	359	210
13.320.4560	45.6	MK 4	32	364	215
13.320.4600	46	MK 4	32	364	215
13.320.4660	46.6	MK 4	32	364	215
13.320.4700	47	MK 4	32.5	364	215
13.320.4760	47.6	MK 4	33	369	220
13.320.4800	48	MK 4	33	369	220
13.320.4860	48.6	MK 4	33	369	220
13.320.4900	49	MK 4	34	369	220
13.320.4960	49.6	MK 4	34	369	220
13.320.5000	50	MK 4	34.5	369	220

> **13.350 Phantom**

NL HSS Opsteekopboor  
FR Foret creux HSS  
ES Broca escariador hueco HSS  
DE HSS Aufsteckaufbohrer

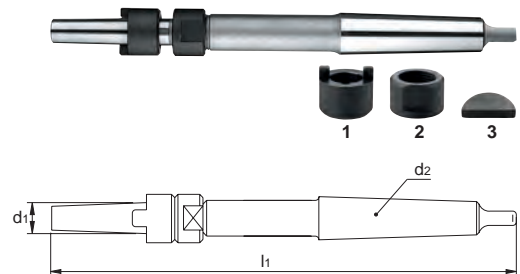


<b>HSS</b>	<b>DIN 222</b>
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>
<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>
<b>N 41</b> Alu	
28-35 C	18-22 C
14-22 C	8-12 B
	40-45 C

Ref.	d1	d2	d3	l1	84.410
13.350.3960	39.6	16	35	50	Nr. 3
13.350.4000	40	16	35	50	Nr. 3
13.350.4160	41.6	16	37	50	Nr. 3
13.350.4200	42	16	37	50	Nr. 3
13.350.4360	43.6	16	39	50	Nr. 3
13.350.4400	44	16	39	50	Nr. 3
13.350.4460	44.6	16	40	50	Nr. 3
13.350.4500	45	16	40	50	Nr. 3
13.350.4560	45.6	19	40	56	Nr. 4
13.350.4600	46	19	40	56	Nr. 4
13.350.4660	46.6	19	41	56	Nr. 4
13.350.4700	47	19	41	56	Nr. 4
13.350.4760	47.6	19	42	56	Nr. 4
13.350.4800	48	19	42	56	Nr. 4
13.350.4960	49.6	19	44	56	Nr. 4
13.350.5000	50	19	44	56	Nr. 4

> **84.410 Phantom**

NL Opsteekhouder, voor opsteekruimers DIN 219 en opsteekopboor DIN 222, MK  
FR Arbre de montage, pour alésoirs creux DIN 219 et forets creux DIN 222, CM  
ES Porta-escariadores, para escariadores huecos DIN 219 y brocas escariadores huecos DIN 222, CM  
DE Aufsteckhalter, für Aufsteckreibahlen DIN 219 und Aufsteckaufbohrer DIN 222, MK



**DIN 217**

Ref.	Nr.	d1	l1	d2	Ø 51.650	Ø 13.350	1	2	3
84.410.0200	2	13	250	MK 3	25-30	25-35	84.411.0200	84.412.0200	84.413.0200
84.410.0300	3	16	261	MK 3	31-35	36-45	84.411.0300	84.412.0300	84.413.0300
84.410.0400	4	19	298	MK 4	36-42	46-52	84.411.0400	84.412.0400	84.413.0400
84.410.0500	5	22	312	MK 4	43-50	53-62	84.411.0500	84.412.0500	84.413.0500
84.410.0600	6	27	359	MK 5	51-60	63-75	84.411.0600	84.412.0600	84.413.0600
84.410.0700	7	32	376	MK 5	61-71	76-90	84.411.0700	84.412.0700	84.413.0700
84.410.0800	8	40	396	MK 5	72-85	91-100	84.411.0800	84.412.0800	84.413.0800
84.410.0900	9	50	416	MK 5	86-100	-	84.411.0900	84.412.0900	84.413.0900



## > 13.603 Phantom



NL CV Houtspiraalboor  
FR Foret à bois Acier spécial (Chrome)  
ES Broca para madera Cromo Vanadium  
DE CV Holzspiralbohrer



Ref.	d1	d2	l1	l2
13.603.0300	3	3	61	33
13.603.0400	4	4	75	43
13.603.0500	5	5	86	52
13.603.0600	6	6	93	57
13.603.0700	7	7	109	69

Ref.	d1	d2	l1	l2
13.603.0800	8	8	117	75
13.603.0900	9	9	125	81
13.603.1000	10	10	133	87
13.603.1100	11	10	142	94
13.603.1200	12	10	151	101

Ref.	d1	d2	l1	l2
13.603.1300	13	10	151	101
13.603.1400	14	10	160	108
13.603.1500	15	10	169	114
13.603.1600	16	10	178	120

## > 13.606 Phantom



NL CV Opsteekverzinkboor voor hout, 90°  
FR Fraisoir à rapporter Acier spécial (Chrome) pour bois, 90°  
ES Avellanador Cromo Vanadium para madera, 90°  
DE CV Aufsteck-Kegelsenker für Holz, 90°



Ref.	d1
13.606.0300	3
13.606.0400	4

Ref.	d1
13.606.0500	5
13.606.0600	6

## > 13.610 Phantom



NL CV Speedboor  
FR Mèche plate Acier spécial (Chrome)  
ES Broca plana Cromo Vanadium  
DE CV Speedbohrer



Ref.	d1	l1
13.610.0600	6	150
13.610.0800	8	150
13.610.1000	10	150
13.610.1200	12	150
13.610.1400	14	150
13.610.1600	16	150

Ref.	d1	l1
13.610.1800	18	150
13.610.1900	19	150
13.610.2000	20	150
13.610.2200	22	150
13.610.2400	24	150
13.610.2500	25	150

Ref.	d1	l1
13.610.2600	26	150
13.610.2800	28	150
13.610.3000	30	150
13.610.3200	32	150
13.610.3500	35	150

## > 13.615 Phantom

NL Verlengstuk voor Speedboor  
FR Rallonge pour Mèches plates  
ES Alargador para Brocas planas  
DE Verlängerungsstück für Speedbohrer



Ref.	l1
13.615.1000	300

> **13.640 Phantom**

NL CV Slangenboor type Lewis  
FR Foret Acier spécial (Chrome) modèle Lewis  
ES Broca Hueca Cromo Vanadium modelo Lewis  
DE CV Schlangenbohrer Typ Lewis



Ref.	d1	l1	l2	Ref.	d1	l1	l2	Ref.	d1	l1	l2
13.640.0823	8	235	150	13.640.1646	16	460	390	13.640.2546	25	460	390
13.640.0846	8	460	390	13.640.1823	18	235	150	13.640.2623	26	235	140
13.640.1023	10	235	150	13.640.1846	18	460	390	13.640.2646	26	460	390
13.640.1046	10	460	390	13.640.2023	20	235	150	13.640.2823	28	235	140
13.640.1223	12	235	150	13.640.2046	20	460	390	13.640.2846	28	460	390
13.640.1246	12	460	390	13.640.2223	22	235	145	13.640.3023	30	235	135
13.640.1423	14	235	150	13.640.2246	22	460	390	13.640.3046	30	460	390
13.640.1446	14	460	390	13.640.2423	24	235	145	13.640.3223	32	235	135
13.640.1523	15	235	150	13.640.2446	24	460	390	13.640.3246	32	460	390
13.640.1623	16	235	150	13.640.2523	25	235	140				

> **13.650 Phantom**

NL CV Bekistingsboor  
FR Foret pour bardages Acier spécial (Chrome)  
ES Broca encofrado Cromo Vanadium  
DE CV Schalungsbohrer



Ref.	d1	d2	l1	Ref.	d1	d2	l1	Ref.	d1	d2	l1
13.650.0804	8	6	400	13.650.1406	14	8	600	13.650.2006	20	10	600
13.650.0806	8	6	600	13.650.1408	14	8	800	13.650.2008	20	10	800
13.650.1004	10	8	400	13.650.1604	16	10	400	13.650.2204	22	12	400
13.650.1006	10	8	600	13.650.1606	16	10	600	13.650.2206	22	12	600
13.650.1008	10	8	800	13.650.1608	16	10	800	13.650.2404	24	12	400
13.650.1204	12	8	400	13.650.1804	18	10	400	13.650.2406	24	12	600
13.650.1206	12	8	600	13.650.1806	18	10	600	13.650.2604	26	12	400
13.650.1208	12	8	800	13.650.1808	18	10	800	13.650.2606	26	12	600
13.650.1404	14	8	400	13.650.2004	20	10	400	13.650.3006	30	12	600

> **13.680 Phantom**

NL HM-tip Allround Spiraalboor voor hout, steen en staal  
FR Foret multi-matériaux pointe carb. mét. pour bois, pierre et acier  
ES Broca multiuso punta MD para madera, piedra y acero  
DE HM-Schneiden Allround Spiralbohrer für Holz, Stein und Stahl



Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
13.680.0400	4	3.5	75	39	13.680.0600	6	5.5	100	54	13.680.1000	10	9.5	120	80
13.680.0500	5	4.5	85	39	13.680.0800	8	7.5	120	80					



## > 13.700 Phantom



NL **HM-tip Steenboor**  
 FR **Foret à pierre pointe carb. mét.**  
 ES **Broca para piedra punta MD**  
 DE **HM-Schneiden Steinbohrer**



Ref.	d1	d2	l1	l2
13.700.0300	3	2.5	60	30
13.700.0400	4	3.5	75	39
13.700.0500	5	4.5	85	39
13.700.0550	5.5	5	85	39
13.700.0600	6	5.5	100	54
13.700.0650	6.5	6	100	54

Ref.	d1	d2	l1	l2
13.700.0700	7	6.5	100	54
13.700.0800	8	7.5	120	80
13.700.0900	9	8.5	120	80
13.700.1000	10	9.5	120	80
13.700.1100	11	10	150	90
13.700.1200	12	10	150	90

Ref.	d1	d2	l1	l2
13.700.1300	13	10	150	90
13.700.1400	14	10	150	90
13.700.1500	15	10	150	90
13.700.1600	16	10	150	90
13.700.1800	18	10	160	100
13.700.2000	20	13	160	100

## > 13.710 Phantom

NL **HM-tip Steenboor lang**  
 FR **Foret à pierre pointe carb. mét. version longue**  
 ES **Broca para piedra punta MD larga**  
 DE **HM-Schneiden Steinbohrer lang**



Ref.	d1	d2	l1	l2
13.710.0515	5	4.5	150	90
13.710.0615	6	5.5	150	90
13.710.0620	6	5.5	200	140
13.710.0640	6	5.5	400	300
13.710.0715	7	6.5	150	90
13.710.0815	8	7.5	150	90
13.710.0820	8	7.5	200	140
13.710.0840	8	7.5	400	300

Ref.	d1	d2	l1	l2
13.710.1015	10	9.5	150	90
13.710.1020	10	9.5	200	140
13.710.1040	10	9.5	400	300
13.710.1060	10	9.5	600	500
13.710.1220	12	10	200	140
13.710.1240	12	10	400	300
13.710.1260	12	10	600	500
13.710.1420	14	10	200	140

Ref.	d1	d2	l1	l2
13.710.1460	14	10	600	500
13.710.1640	16	10	400	300
13.710.1660	16	10	600	500
13.710.1840	18	10	400	300
13.710.1860	18	10	600	500
13.710.2040	20	13	400	300
13.710.2060	20	13	600	500

## > 13.720 Phantom



NL **HM-tip Betonboor**  
 FR **Foret Béton pointe carb. mét.**  
 ES **Broca para hormigón punta MD**  
 DE **HM-Schneiden Betonbohrer**



Ref.	d1	d2	l1	l2
13.720.0300	3	2.5	60	30
13.720.0400	4	3.5	75	39
13.720.0500	5	4.5	85	39
13.720.0600	6	5.5	100	54
13.720.0650	6.5	6	100	54
13.720.0700	7	6.5	100	54

Ref.	d1	d2	l1	l2
13.720.0800	8	7.5	120	80
13.720.0900	9	8.5	120	80
13.720.1000	10	9.5	120	80
13.720.1100	11	10	150	90
13.720.1200	12	10	150	90
13.720.1300	13	10	150	90

Ref.	d1	d2	l1	l2
13.720.1400	14	10	150	90
13.720.1500	15	10	150	90
13.720.1600	16	10	150	90
13.720.1800	18	10	160	100
13.720.2000	20	13	160	100



▶ **13.730 Phantom**

NL SUPER HM-tip Betonboor lang  
FR Foret Béton SUPER pointe carb. mét. version longue  
ES Broca para hormigón SUPER punta MD larga  
DE SUPER HM-Schneiden Betonbohrer lang



Ref.	d1	d2	l1	l2
13.730.0615	6	5.5	150	90
13.730.0815	8	7.5	150	90

Ref.	d1	d2	l1	l2
13.730.0820	8	7.5	200	140
13.730.1015	10	9.5	150	90

Ref.	d1	d2	l1	l2
13.730.1020	10	9.5	200	140
13.730.1220	12	10	200	140

▶ **13.740 Phantom**

NL SDS-PLUS HM-tip Hamerboor met 2 snijkanten  
FR Foret Béton SDS-PLUS pointe carb. mét. à 2 taillants  
ES Broca martillo SDS-PLUS punta MD con 2 labios  
DE SDS-PLUS HM-Schneiden Hammerbohrer mit 2 Schneiden



Ref.	d1	l1	l2
13.740.0411	4	110	50
13.740.0511	5	110	50
13.740.0516	5	160	100
13.740.0551	5.5	110	50
13.740.0552	5.5	160	100
13.740.0611	6	110	50
13.740.0616	6	160	100
13.740.0621	6	210	150
13.740.0626	6	260	200
13.740.0631	6	310	250
13.740.0651	6.5	110	50
13.740.0652	6.5	160	100
13.740.0711	7	110	50
13.740.0716	7	160	100
13.740.0721	7	210	150
13.740.0811	8	110	50
13.740.0816	8	160	100
13.740.0821	8	210	150
13.740.0826	8	260	200
13.740.0831	8	310	250
13.740.0846	8	450	400
13.740.0916	9	160	100
13.740.0921	9	210	150
13.740.1011	10	110	50
13.740.1016	10	160	100

Ref.	d1	l1	l2
13.740.1021	10	210	150
13.740.1026	10	260	200
13.740.1031	10	310	250
13.740.1046	10	450	400
13.740.1116	11	160	100
13.740.1216	12	160	100
13.740.1221	12	210	150
13.740.1226	12	260	200
13.740.1231	12	310	250
13.740.1246	12	450	400
13.740.1316	13	160	100
13.740.1326	13	260	200
13.740.1346	13	450	400
13.740.1416	14	160	100
13.740.1421	14	210	150
13.740.1426	14	260	200
13.740.1431	14	310	250
13.740.1446	14	450	400
13.740.1516	15	160	100
13.740.1521	15	210	150
13.740.1526	15	260	200
13.740.1546	15	450	400
13.740.1616	16	160	100
13.740.1621	16	210	150
13.740.1626	16	260	200

Ref.	d1	l1	l2
13.740.1631	16	310	250
13.740.1646	16	450	400
13.740.1660	16	600	550
13.740.1690	16	1000	950
13.740.1821	18	210	150
13.740.1826	18	260	200
13.740.1831	18	310	250
13.740.1846	18	450	400
13.740.1860	18	600	550
13.740.1890	18	1000	950
13.740.2021	20	210	150
13.740.2026	20	260	200
13.740.2031	20	310	250
13.740.2046	20	450	400
13.740.2090	20	1000	950
13.740.2226	22	260	200
13.740.2231	22	310	250
13.740.2246	22	450	400
13.740.2426	24	260	200
13.740.2446	24	450	400
13.740.2526	25	260	200
13.740.2531	25	310	250
13.740.2546	25	450	400
13.740.2590	25	1000	950

▶ **13.744 Phantom**

NL SDS-PLUS HM-tip Hamerboor met 4 snijkanten  
FR Foret Béton SDS-PLUS pointe carb. mét. à 4 taillants  
ES Broca martillo SDS-PLUS punta MD con 4 labios  
DE SDS-PLUS HM-Schneiden Hammerbohrer mit 4 Schneiden



Ref.	d1	l1	l2
13.744.0511	5	110	50
13.744.0516	5	160	100
13.744.0552	5.5	160	100
13.744.0611	6	110	50
13.744.0616	6	160	100
13.744.0621	6	210	150
13.744.0626	6	260	200
13.744.0631	6	310	250
13.744.0652	6.5	160	100
13.744.0716	7	160	100
13.744.0811	8	110	50
13.744.0816	8	160	100
13.744.0821	8	210	150
13.744.0826	8	260	200

Ref.	d1	l1	l2
13.744.0831	8	310	250
13.744.0846	8	450	400
13.744.0916	9	160	100
13.744.1011	10	110	50
13.744.1016	10	160	100
13.744.1021	10	210	150
13.744.1026	10	260	200
13.744.1031	10	310	250
13.744.1046	10	450	400
13.744.1216	12	160	100
13.744.1221	12	210	150
13.744.1226	12	260	200
13.744.1231	12	310	250
13.744.1246	12	450	400

Ref.	d1	l1	l2
13.744.1416	14	160	100
13.744.1421	14	210	150
13.744.1426	14	260	200
13.744.1431	14	310	250
13.744.1446	14	450	400
13.744.1516	15	160	100
13.744.1526	15	260	200
13.744.1616	16	160	100
13.744.1621	16	210	150
13.744.1626	16	260	200
13.744.1631	16	310	250
13.744.1646	16	450	400
13.744.1660	16	600	550
13.744.1690	16	1000	950



## > 13.744 Phantom

Ref.	d1	l1	l2
13.744.1825	18	250	200
13.744.1846	18	450	400
13.744.2025	20	250	200

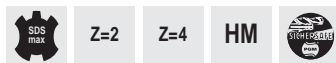
Ref.	d1	l1	l2
13.744.2046	20	450	400
13.744.2225	22	250	200
13.744.2246	22	450	400

Ref.	d1	l1	l2
13.744.2426	24	250	200
13.744.2525	25	250	200
13.744.2546	25	450	400

## > 13.750 Phantom



NL SDS-MAX HM-tip Hamerboor  
FR Foret Béton SDS-MAX pointe carb. mét.  
ES Broca martillo SDS-MAX punta MD  
DE SDS-MAX HM-Schneiden Hammerbohrer



Ref.	d1	l1	l2
13.750.1234	12	340	200
13.750.1254	12	540	400
13.750.1269	12	690	550
13.750.1434	14	340	200
13.750.1454	14	540	400
13.750.1534	15	340	200
13.750.1554	15	540	400
13.750.1634	16	340	200
13.750.1654	16	540	400
13.750.1692	16	920	800
13.750.1834	18	340	200
13.750.1854	18	540	400
13.750.1894	18	940	800
13.750.2032	20	320	200

Ref.	d1	l1	l2
13.750.2052	20	520	400
13.750.2092	20	920	800
13.750.2232	22	320	200
13.750.2252	22	520	400
13.750.2292	22	920	800
13.750.2432	24	320	200
13.750.2452	24	520	400
13.750.2532	25	320	200
13.750.2552	25	520	400
13.750.2592	25	920	800
13.750.2832	28	320	200
13.750.2857	28	570	450
13.750.3032	30	320	200
13.750.3057	30	570	450

Ref.	d1	l1	l2
13.750.3232	32	320	200
13.750.3257	32	570	450
13.750.3292	32	920	800
13.750.3532	35	320	200
13.750.3557	35	570	450
13.750.3832	38	320	200
13.750.3857	38	570	450
13.750.4032	40	320	200
13.750.4057	40	570	450
13.750.4092	40	920	800
13.750.4557	45	570	450
13.750.5057	50	570	450

## > 13.765 Phantom

NL SDS-PLUS HM-tip Dozenboor  
FR Couronne-Trépan SDS-PLUS pointe carb. mét.  
ES Corona de taladrado SDS-PLUS punta MD  
DE SDS-PLUS HM-Schneiden Hohlbohrer

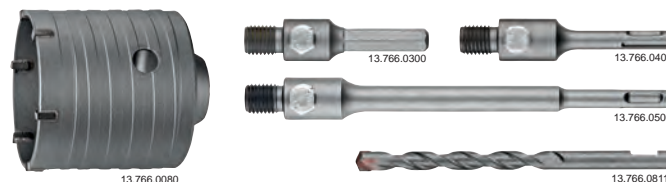


Ref.	d1	l1
13.765.0040	40	85
13.765.0050	50	85

Ref.	d1	l1
13.765.0068	68	85
13.765.0080	80	85

## > 13.766 Phantom

NL Toebehoren voor Dozenboor  
FR Accessoires pour Couronne-Trépan  
ES Accesorios para Corona de taladrado  
DE Zubehör für Hohlbohrer



Ref.	d1	l1	Type
13.766.0040	40		
13.766.0050	50		
13.766.0068	68		

Ref.	d1	l1	Type
13.766.0080	80		
13.766.0300		95	Hexa
13.766.0400		110	SDS-PLUS

Ref.	d1	l1	Type
13.766.0500		220	SDS-PLUS
13.766.0811	8	110	

> **13.770** **Phantom**

NL SDS-PLUS Beitel  
FR Burin SDS-PLUS  
ES Cincel SDS-PLUS  
DE SDS-PLUS Meißel



13.770.1010  
13.770.1510  
13.770.2010  
13.770.2510  
13.770.8010  
13.770.8510



Ref.	b1	l1
13.770.1010	250	
13.770.1510	250	20

Ref.	b1	l1
13.770.2010	250	40
13.770.2510	250	50

Ref.	b1	l1
13.770.8010	250	22
13.770.8510	250	22

> **13.775** **Phantom**

NL SDS-MAX Beitel  
FR Burin SDS-MAX  
ES Cincel SDS-MAX  
DE SDS-MAX Meißel



13.775.1010  
13.775.1020  
13.775.1510  
13.775.1515  
13.775.1520  
13.775.2010  
13.775.8010  
13.775.8510



Ref.	b1	l1
13.775.1010	280	
13.775.1020	400	
13.775.1510	280	25

Ref.	b1	l1
13.775.1515	400	25
13.775.1520	600	25
13.775.2010	400	50

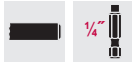
Ref.	b1	l1
13.775.8010	300	26
13.775.8510	380	35



## > 13.790 Phantom



NL **HM-tip Boor voor keramiek en glas**  
 FR **Foret Spécial pointe carb. mét. pour céramique et verre**  
 ES **Broca vidrio punta MD para vidrio y cerámico**  
 DE **HM-Schneiden Glasbohrer für Keramik und Glas**



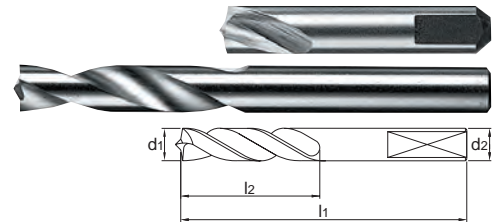
Ref.	d1	l1	d2
13.790.0300	3	65	1/4" BIT
13.790.0400	4	65	1/4" BIT
13.790.0500	5	65	1/4" BIT

Ref.	d1	l1	d2
13.790.0600	6	65	1/4" BIT
13.790.0800	8	105	1/4" BIT
13.790.1000	10	110	1/4" BIT

Ref.	d1	l1	d2
13.790.1200	12	113	Ø 10 mm

## > 13.800 Phantom

NL **HSS-E Puntlasboor**  
 FR **Foret à dépointer HSS-E**  
 ES **Broca para puntos de soldadura HSS-E**  
 DE **HSS-E Bohrer zum Bohren von Punktschweißstellen**



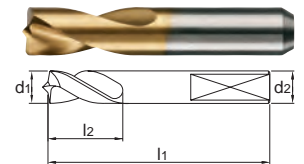
P 11	P 12	P 13	P 14	M 21	M 22
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>
28-35	30-36	20-27	12-20	14-18	10-15

Ref.	d1	d2	l1	l2
13.800.0844	8	8	44	23

Ref.	d1	d2	l1	l2
13.800.0879	8	8	79	30

## > 13.801 Phantom

NL **HSS-E Puntlasboor TiN**  
 FR **Foret à dépointer HSS-E TiN**  
 ES **Broca para puntos de soldadura HSS-E TiN**  
 DE **HSS-E Bohrer zum Bohren von Punktschweißstellen TiN**



P 11	P 12	P 13	P 14	M 21	M 22
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>
28-35	30-36	20-27	12-20	14-18	10-15

Ref.	d1	d2	l1	l2
13.801.0644	6	6	44	16
13.801.0666	6	6	66	28

Ref.	d1	d2	l1	l2
13.801.0844	8	8	44	23
13.801.0879	8	8	79	37

Ref.	d1	d2	l1	l2
13.801.1089	10	10	89	43

> **15.095** **INTERNATIONAL TOOLS**

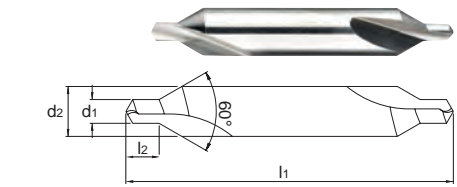
NL ECO PRO HSS Centerboor 60°  
FR Foret à centrer HSS ECO PRO 60°  
ES Broca de centrar HSS ECO PRO 60°  
DE ECO PRO HSS Zentrierbohrer 60°



<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E

Ref.	d1	d2	l1	l2
15.095.1031	1	3.15	31	1,3-1,7
15.095.1040	1	4	35	1,3-1,7
15.095.1231	1.25	3.15	31	1,6-2,0
15.095.1550	1.5	5	40	2,0-2,6
15.095.1640	1.6	4	35	2,0-2,6
15.095.2050	2	5	40	2,5-3,1

Ref.	d1	d2	l1	l2
15.095.2060	2	6	45	2,5-3,1
15.095.2563	2.5	6.3	45	3,1-3,8
15.095.2580	2.5	8	50	3,1-3,8
15.095.3090	3	10	55	3,9-4,6
15.095.3180	3.15	8	50	3,9-4,6
15.095.3190	3.15	10	55	3,9-4,6



Ref.	d1	d2	l1	l2
15.095.4010	4	10	55	5,0-5,9
15.095.4012	4	12	63	5,0-5,9
15.095.5013	5	12.5	63	6,3-7,2
15.095.6316	6.3	16	71	8,0-8,9
15.095.8020	8	20	80	10,1-11,1
15.095.9025	10	25	100	12,8-13,8

> **15.096** **INTERNATIONAL TOOLS**

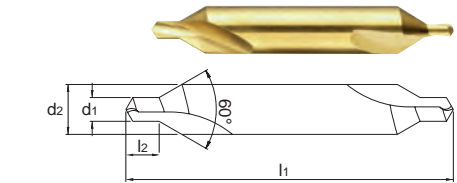
NL ECO PRO HSS Centerboor TiN, 60°  
FR Foret à centrer HSS ECO PRO TiN, 60°  
ES Broca de centrar HSS ECO PRO TiN, 60°  
DE ECO PRO HSS Zentrierbohrer TiN, 60°



<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E

Ref.	d1	d2	l1	l2
15.096.1040	1	4	35	1,3-1,7
15.096.1640	1.6	4	35	2,0-2,6
15.096.2050	2	5	40	2,5-3,1

Ref.	d1	d2	l1	l2
15.096.2563	2.5	6.3	45	3,1-3,8
15.096.3180	3.15	8	50	3,9-4,6
15.096.4010	4	10	55	5,0-5,9



Ref.	d1	d2	l1	l2
15.096.5013	5	12.5	63	6,3-7,2

> **15.100** **Phantom**

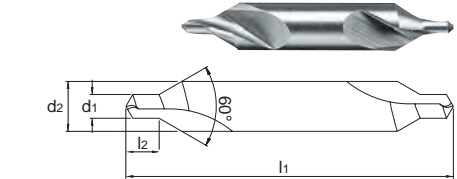
NL HSS Centerboor 60°  
FR Foret à centrer HSS 60°  
ES Broca de centrar HSS 60°  
DE HSS Zentrierbohrer 60°



<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E

Ref.	d1	d2	l1	l2
15.100.0531	0.5	3.15	25	0,6-0,9
15.100.0735	0.75	3.5	35	1,0-1,3
15.100.0831	0.8	3.15	25	1,0-1,3
15.100.1031	1	3.15	31	1,3-1,7
15.100.1040	1	4	35	1,3-1,7
15.100.1231	1.25	3.15	31	1,6-2,0
15.100.1240	1.25	4	35	1,6-2,0
15.100.1550	1.5	5	40	2,0-2,6
15.100.1640	1.6	4	35	2,0-2,6
15.100.1650	1.6	5	40	2,0-2,6
15.100.2050	2	5	40	2,5-3,1

Ref.	d1	d2	l1	l2
15.100.2060	2	6	45	2,5-3,1
15.100.2063	2	6.3	45	2,5-3,1
15.100.2563	2.5	6.3	45	3,1-3,8
15.100.2580	2.5	8	50	3,1-3,8
15.100.3090	3	10	55	3,9-4,6
15.100.3180	3.15	8	50	3,9-4,6
15.100.3190	3.15	10	55	3,9-4,6
15.100.3590	3.5	10	55	4,0-4,5
15.100.4010	4	10	55	5,0-5,9
15.100.4012	4	12	63	5,0-5,9
15.100.4013	4	12.5	63	5,0-5,9



Ref.	d1	d2	l1	l2
15.100.5013	5	12.5	63	6,3-7,2
15.100.5014	5	14	69	6,3-7,2
15.100.5016	5	16	71	6,3-7,2
15.100.6018	6	18	77	8,0-8,9
15.100.6316	6.3	16	71	8,0-8,9
15.100.6320	6.3	20	80	8,0-8,9
15.100.8020	8	20	80	10,1-11,1
15.100.9025	10	25	100	12,8-13,8
15.100.9531	12.5	31.5	125	16,5-17,5





## > 15.120 Phantom

NL HSS-E Centerboor 60°  
FR Foret à centrer HSS-E 60°  
ES Broca de centrar HSS-E 60°  
DE HSS-E Zentrierbohrer 60°

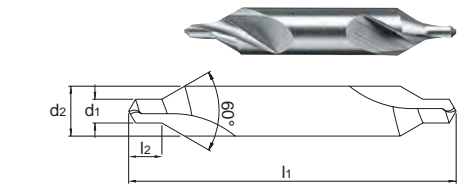


<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D	18-21 E
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Ref.	d1	d2	l1	l2
15.120.0735	0.75	3.5	35	1,0-1,3
15.120.0831	0.8	3.15	25	1,0-1,3
15.120.1040	1	4	35	1,3-1,7
15.120.1231	1.25	3.15	31	1,6-2,0
15.120.1550	1.5	5	40	2,0-2,6
15.120.1640	1.6	4	35	2,0-2,6

Ref.	d1	d2	l1	l2
15.120.2050	2	5	40	2,5-3,1
15.120.2060	2	6	45	2,5-3,1
15.120.2563	2.5	6.3	45	3,1-3,8
15.120.2580	2.5	8	50	3,1-3,8
15.120.3090	3	10	55	5,0-4,6
15.120.3180	3.15	8	50	3,9-4,6



## > 15.124 Phantom

NL HSS-E Centerboor TiAIN, 60°  
FR Foret à centrer HSS-E TiAIN, 60°  
ES Broca de centrar HSS-E TiAIN, 60°  
DE HSS-E Zentrierbohrer TiAIN, 60°

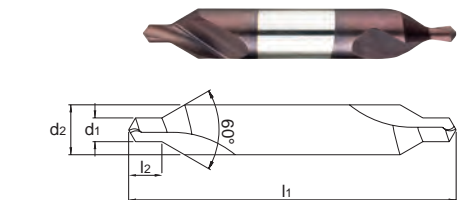


<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
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35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D	18-21 E
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Ref.	d1	d2	l1	l2
15.124.0531	0.5	3.15	25	0,6-0,9
15.124.0831	0.8	3.15	25	1,0-1,3
15.124.1031	1	3.15	31	1,3-1,7
15.124.1040	1	4	35	1,3-1,7
15.124.1231	1.25	3.15	31	1,6-2,0
15.124.1550	1.5	5	40	2,0-2,6

Ref.	d1	d2	l1	l2
15.124.1640	1.6	4	35	2,0-2,6
15.124.2050	2	5	40	2,5-3,1
15.124.2060	2	6	45	2,5-3,1
15.124.2563	2.5	6.3	45	3,1-3,8
15.124.2580	2.5	8	50	3,1-3,8
15.124.3090	3	10	55	5-4,6



## > 15.150 Phantom

NL HSS-E Centerboor 60°, lang  
FR Foret à centrer HSS-E 60°, version longue  
ES Broca de centrar HSS-E 60°, larga  
DE HSS-E Zentrierbohrer 60°, lang

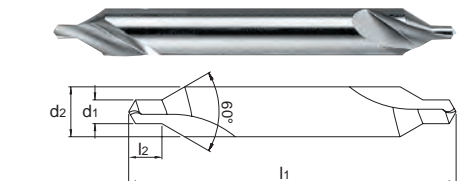


<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D	18-21 E
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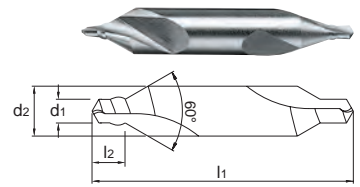
Ref.	d1	d2	l1	l2
15.150.0753	0.75	3.5	60	1,0-1,3
15.150.0756	0.75	3.5	120	1,0-1,3
15.150.1003	1	4	60	1,3-1,7
15.150.1005	1	4	100	1,3-1,7
15.150.1006	1	4	120	1,3-1,7
15.150.1007	1	4	150	1,3-1,7
15.150.1503	1.5	5	60	2,0-2,6
15.150.1505	1.5	5	100	2,0-2,6
15.150.1506	1.5	5	120	2,0-2,6
15.150.1507	1.5	5	150	2,0-2,6
15.150.2004	2	6	80	2,5-3,1
15.150.2005	2	6	100	2,5-3,1
15.150.2006	2	6	120	2,5-3,1

Ref.	d1	d2	l1	l2
15.150.2007	2	6	150	2,5-3,1
15.150.2008	2	5	200	2,5-3,1
15.150.2504	2.5	8	80	3,1-3,8
15.150.2505	2.5	8	100	3,1-3,8
15.150.2506	2.5	8	120	3,1-3,8
15.150.2507	2.5	8	150	3,1-3,8
15.150.2508	2.5	6.3	200	2,5-3,8
15.150.3004	3	8	80	3,9-4,6
15.150.3005	3	8	100	3,9-4,6
15.150.3006	3	8	120	3,9-4,6
15.150.3007	3	8	150	3,9-4,6
15.150.3015	3	10	100	3,9-4,6
15.150.3016	3	10	120	3,9-4,6



» 15.200 **Phantom**

NL HSS Centerboor met kraag, 60°  
FR Foret à centrer HSS à collerette, 60°  
ES Broca de centrar HSS con valona, 60°  
DE HSS Zentrierbohrer mit Kragen, 60°



**HSS** **60°** **NFE 66051-W** **DIN 333-W**

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
20-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E

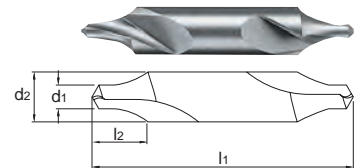
Ref.	d1	d2	l1	l2
15.200.0530	0.5	3	31	0,6-0,9
15.200.0531	0.5	3.15	25	0,6-0,9
15.200.0831	0.8	3.15	25	1-1,3
15.200.1031	1	3.15	31	1,3-1,7
15.200.1040	1	4	35	1,3-1,7
15.200.1231	1.25	3.15	31	1,6-2,0
15.200.1240	1.25	4	35	1,6-2,0
15.200.1550	1.5	5	40	2,0-2,6
15.200.1640	1.6	4	35	2,0-2,6
15.200.1650	1.6	5	40	2,0-2,6
15.200.2050	2	5	40	2,5-3,1

Ref.	d1	d2	l1	l2
15.200.2060	2	6	45	2,5-3,1
15.200.2063	2	6.3	45	2,5-3,1
15.200.2563	2.5	6.3	45	3,1-3,8
15.200.2580	2.5	8	50	3,1-3,8
15.200.3080	3	8	50	3,9-4,6
15.200.3090	3	10	55	3,9-4,6
15.200.3180	3.15	8	50	3,9-4,6
15.200.3190	3.15	10	55	3,9-4,6
15.200.4010	4	10	55	5,0-5,9
15.200.4012	4	12	63	5,0-5,9
15.200.4013	4	12.5	63	5,0-5,9

Ref.	d1	d2	l1	l2
15.200.5012	5	12	63	6,3-7,2
15.200.5013	5	12.5	63	6,3-7,2
15.200.5014	5	14	69	6,3-7,2
15.200.5016	5	16	71	6,3-7,2
15.200.6018	6	18	77	8,0-8,9
15.200.6316	6.3	16	71	8,0-8,9
15.200.6320	6.3	20	80	8,0-8,9
15.200.8020	8	20	80	10,1-11,1
15.200.9025	10	25	100	12,8-13,8

» 15.250 **Phantom**

NL HSS Centerboor met radius, 60°  
FR Foret à centrer HSS à rayon, 60°  
ES Broca de centrar HSS con radio, 60°  
DE HSS Zentrierbohrer mit Radius, 60°



**HSS** **60°** **NFE 66051-R** **DIN 333-R**

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
20-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E

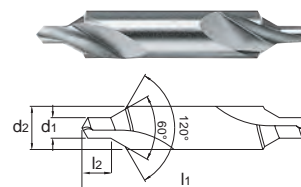
Ref.	d1	d2	l1	l2	r
15.250.0530	0.5	3	31	2,3-2,6	2
15.250.0531	0.5	3.15	25	2,3-2,6	2
15.250.0735	0.75	3.5	35	2,8-3,0	3.4
15.250.0831	0.8	3.15	25	2,6-2,9	2.5
15.250.1031	1	3.15	31	3,0-3,3	2.9
15.250.1040	1	4	35	3,3-3,6	3.9
15.250.1231	1.25	3.15	31	3,3-3,6	3.15
15.250.1240	1.25	4	35	3,7-4,1	4
15.250.1550	1.5	5	40	4,5-4,9	5
15.250.1640	1.6	4	35	4,2-4,7	4
15.250.1650	1.6	5	40	4,5-4,9	5
15.250.2050	2	5	40	5,0-5,4	5
15.250.2060	2	6	45	5,4-5,8	5.8
15.250.2063	2	6.3	45	5,6-6,0	6.3
15.250.2563	2.5	6.3	45	6,3-6,8	6.3
15.250.2580	2.5	8	50	7,5-8,0	8

Ref.	d1	d2	l1	l2	r
15.250.3080	3	8	50	8,0-8,5	8
15.250.3090	3	10	55	8,9-9,4	10
15.250.3180	3.15	8	50	8,0-8,5	8
15.250.3190	3.15	10	55	8,9-9,4	10
15.250.4010	4	10	55	10,0-10,6	10
15.250.4012	4	12	63	10,7-11,3	11.5
15.250.4013	4	12.5	63	11,2-11,8	12.5
15.250.5012	5	12	63	11,4-12,0	11.5
15.250.5013	5	12.5	63	12,5-13,1	12.5
15.250.5014	5	14	69	12,8-13,4	13.4
15.250.5016	5	16	71	14,4-15,0	16
15.250.6018	6	18	77	16,6-17,2	17.8
15.250.6316	6.3	16	71	16,0-16,6	16
15.250.6320	6.3	20	80	17,8-19,0	20
15.250.8020	8	20	80	20,0-20,7	20



## > 15.380 Phantom

NL HSS Centerboor met dubbele hoek, 60°, 120°  
 FR Foret à centrer HSS à centre protégé, 60°, 120°  
 ES Broca de centrar HSS con chaflan, 60°, 120°  
 DE HSS Zentrierbohrer mit Schutzsenkung, 60°, 120°



HSS NFE 66051-B DIN 333-B

P 11 P 12 P 13 K 31 K 32 N 41 N 42 N 43 N 51 N 61

20-25 E 15-25 E 16-22 F 25-30 E 20-25 D 50-60 E 60-70 E 45-50 E 25-40 E 18-28 E

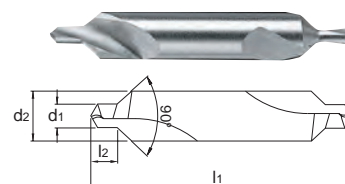
Ref.	d1	d2	l1	l2
15.380.0740	0.75	4	35	1,3-1,7
15.380.1060	1	6	45	2,0-2,6
15.380.1550	1.5	5	40	2,0-2,6
15.380.1580	1.5	8	50	2,5-3,1
15.380.2060	2	6	45	2,5-3,1
15.380.2090	2	10	55	3,1-3,8
15.380.2580	2.5	8	50	3,1-3,8

Ref.	d1	d2	l1	l2
15.380.2592	2.5	12	63	3,9-4,6
15.380.3080	3	8	50	3,9-4,6
15.380.3090	3	10	55	3,9-4,6
15.380.3094	3	14	69	5,0-5,9
15.380.4010	4	10	55	5,0-5,9
15.380.4012	4	12	63	5,0-5,9
15.380.4016	4	16	71	5,0-5,9

Ref.	d1	d2	l1	l2
15.380.4018	4	18	77	6,3-7,2
15.380.5012	5	12	63	6,3-7,2
15.380.5014	5	14	69	6,3-7,2
15.380.5018	5	18	77	8,0-8,9
15.380.6025	6	25	100	1,0-1,3

## > 15.500 Phantom

NL HSS Centerboor 90°  
 FR Foret à centrer HSS 90°  
 ES Broca de centrar HSS 90°  
 DE HSS Zentrierbohrer 90°



HSS NORM

P 11 P 12 P 13 K 31 K 32 N 41 N 42 N 43 N 51 N 61

20-25 E 15-25 E 16-22 F 25-30 E 20-25 D 50-60 E 60-70 E 45-50 E 25-40 E 18-28 E

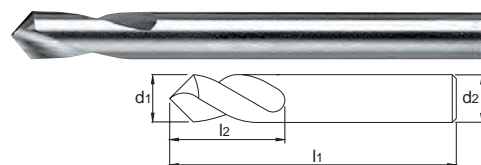
Ref.	d1	d2	l1	l2
15.500.0735	0.75	3.5	35	1,0-1,3
15.500.1040	1	4	35	1,3-1,7
15.500.1550	1.5	5	40	2,0-2,6
15.500.2060	2	6	45	2,5-3,1

Ref.	d1	d2	l1	l2
15.500.2580	2.5	8	50	3,1-3,8
15.500.3080	3	8	50	3,9-4,6
15.500.3090	3	10	55	3,9-4,6
15.500.4010	4	10	55	5,0-5,9

Ref.	d1	d2	l1	l2
15.500.4012	4	12	63	5,0-5,9
15.500.5012	5	12	63	6,3-7,2
15.500.5014	5	14	69	6,3-7,2
15.500.6018	6	18	77	8,0-8,9

## > 15.600 Phantom

NL HSS-E NC-Centreeerboor 90°  
 FR Foret à pointer NC HSS-E 90°  
 ES Broca de puntear NC HSS-E 90°  
 DE HSS-E NC Anbohrer 90°



+6

P 11 P 12 P 13 M 21 M 22 K 31 K 32 N 41 N 42 N 43 N 51 N 52 N 61

25-30 E 20-40 E 16-22 F 8-10 D 6-8 C 25-30 E 20-25 D 60-70 E 50-80 E 45-50 E 30-40 E 10-15 D 18-28 E

Ref.	d1	d2	l1	l2
15.600.0200	2	2	49	8
15.600.0300	3	3	50	10
15.600.0400	4	4	52	12
15.600.0500	5	5	60	15
15.600.0600	6	6	66	20

Ref.	d1	d2	l1	l2
15.600.0800	8	8	79	25
15.600.1000	10	10	89	25
15.600.1200	12	12	102	30
15.600.1400	14	14	115	35
15.600.1600	16	16	115	35

Ref.	d1	d2	l1	l2
15.600.1800	18	18	130	40
15.600.2000	20	20	131	40
15.600.2500	25	25	138	45

> **15.604 Phantom**

NL HSS-E NC-Centreerboor TiAIN, 90°  
FR Foret à pointer NC HSS-E TiAIN, 90°  
ES Broca de puntear NC HSS-E TiAIN, 90°  
DE HSS-E NC Anbohrer TiAIN, 90°

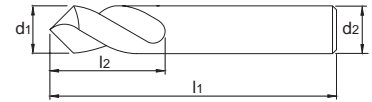
+6.6 ( **90°** TiAIN

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D

Ref.	d1	d2	l1	l2
15.604.0300	3	3	50	10
15.604.0400	4	4	52	12
15.604.0500	5	5	60	15
15.604.0600	6	6	66	20

Ref.	d1	d2	l1	l2
15.604.0800	8	8	79	25
15.604.1000	10	10	89	25
15.604.1200	12	12	102	30
15.604.1600	16	16	115	35

Ref.	d1	d2	l1	l2
15.604.1800	18	18	130	40
15.604.2000	20	20	131	40
15.604.2500	25	25	138	45



> **15.606 Phantom**

NL HSS-E 8% NC-Centreerboor AlCrN-X, 90°  
FR Foret à pointer NC HSS-E 8% AlCrN-X, 90°  
ES Broca de puntear NC HSS-E 8% AlCrN-X, 90°  
DE HSS-E 8% NC Anbohrer AlCrN-X, 90°

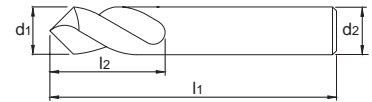
HSS-E 8% AlCrN-X **90°**

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
35-50 E	25-50 E	20-30 F	10-25 D	10-20 C	45-50 E	35-45 D	100-110 E	70-90 E	45-50 D	25-30 D

Ref.	d1	d2	l1	l2
15.606.0300	3	3	50	10
15.606.0400	4	4	52	12
15.606.0500	5	5	60	15

Ref.	d1	d2	l1	l2
15.606.0600	6	6	66	20
15.606.0800	8	8	79	25
15.606.1000	10	10	89	25

Ref.	d1	d2	l1	l2
15.606.1200	12	12	102	30



> **15.611 Phantom**

NL HSS-E NC Duo-Centreerboor AlCrN-X, 90°  
FR Foret à pointer Duo HSS-E AlCrN-X, 90°  
ES Broca de puntear NC Duo HSS-E AlCrN-X, 90°  
DE HSS-E NC Duo Anbohrer AlCrN-X, 90°

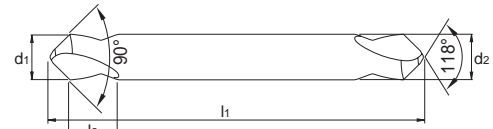
+6.6 ( AlCrN-X **90°**

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D

Ref.	d1	d2	l1	l2
15.611.0300	3	3	40	7
15.611.0400	4	4	45	9
15.611.0600	6	6	55	11

Ref.	d1	d2	l1	l2
15.611.0800	8	8	65	12
15.611.1000	10	10	75	15
15.611.1200	12	12	85	18

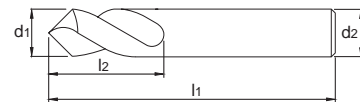
Ref.	d1	d2	l1	l2
15.611.1600	16	16	90	24
15.611.2000	20	20	100	29





## > 15.640 Phantom

NL HSS-E NC-Centreeerboor 90°, lang  
FR Foret à pointer NC HSS-E 90°, version longue  
ES Broca de puntear NC HSS-E 90°, larga  
DE HSS-E NC Anbohrer 90°, lang



+6.6 ( 90°

P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe	N 61 PVC
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	45-50 E	30-40 E	10-15 D	18-28 E
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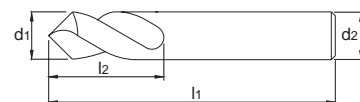
Ref.	d1	d2	l1	l2
15.640.0400	4	4	100	12
15.640.0500	5	5	120	15
15.640.0600	6	6	140	20

Ref.	d1	d2	l1	l2
15.640.0800	8	8	140	25
15.640.1000	10	10	170	25
15.640.1200	12	12	170	30

Ref.	d1	d2	l1	l2
15.640.1600	16	16	200	35
15.640.2000	20	20	200	40

## > 15.644 Phantom

NL HSS-E NC-Centreeerboor TiAlN, 90°, lang  
FR Foret à pointer NC HSS-E TiAlN, 90°, version longue  
ES Broca de puntear NC HSS-E TiAlN, 90°, larga  
DE HSS-E NC Anbohrer TiAlN, 90°, lang



+6.6 ( 90° TiAlN

P 11 s600 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe
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35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D
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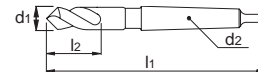
Ref.	d1	d2	l1	l2
15.644.0400	4	4	100	12
15.644.0500	5	5	120	15
15.644.0600	6	6	140	20

Ref.	d1	d2	l1	l2
15.644.0800	8	8	140	25
15.644.1000	10	10	170	25
15.644.1200	12	12	170	30

Ref.	d1	d2	l1	l2
15.644.1600	16	16	200	35
15.644.2000	20	20	200	40

## > 15.650 Phantom

NL HSS-E NC-Centreeerboor 90°, MK  
FR Foret à pointer NC HSS-E 90°, CM  
ES Broca de puntear NC HSS-E 90°, CM  
DE HSS-E NC Anbohrer 90°, MK



+6.6 ( 90° DIN 228-B

P 11 s600 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe	N 61 PVC
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	45-50 E	30-40 E	10-15 D	18-28 E
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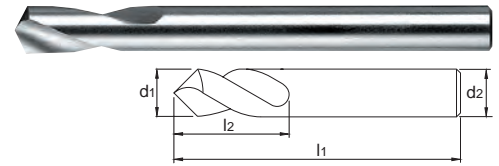
Ref.	d1	d2	l1	l2
15.650.1600	16	MK 2	148	35

Ref.	d1	d2	l1	l2
15.650.2000	20	MK 2	148	40

Ref.	d1	d2	l1	l2
15.650.2500	25	MK 3	171	45



» 15.700 **Phantom**



NL HSS-E NC-Centreerboor 120°  
FR Foret à pointer NC HSS-E 120°  
ES Broca de puntear NC HSS-E 120°  
DE HSS-E NC Anbohrer 120°



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	45-50 E	30-40 E	10-15 D	18-28 E

Ref.	d1	d2	l1	l2
15.700.0200	2	2	49	8
15.700.0300	3	3	50	10
15.700.0400	4	4	52	12
15.700.0500	5	5	60	15
15.700.0600	6	6	66	20

Ref.	d1	d2	l1	l2
15.700.0800	8	8	79	25
15.700.1000	10	10	89	25
15.700.1200	12	12	102	30
15.700.1400	14	14	115	35
15.700.1600	16	16	115	35

Ref.	d1	d2	l1	l2
15.700.1800	18	18	130	40
15.700.2000	20	20	131	40
15.700.2500	25	25	138	45

» 15.704 **Phantom**



NL HSS-E NC-Centreerboor TiAlN, 120°  
FR Foret à pointer NC HSS-E TiAlN, 120°  
ES Broca de puntear NC HSS-E TiAlN, 120°  
DE HSS-E NC Anbohrer TiAlN, 120°



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D

Ref.	d1	d2	l1	l2
15.704.0300	3	3	50	10
15.704.0400	4	4	52	12
15.704.0500	5	5	60	15
15.704.0600	6	6	66	20

Ref.	d1	d2	l1	l2
15.704.0800	8	8	79	25
15.704.1000	10	10	89	25
15.704.1200	12	12	102	30
15.704.1600	16	16	115	35

Ref.	d1	d2	l1	l2
15.704.2000	20	20	131	40
15.704.2500	25	25	138	45

» 15.740 **Phantom**



NL HSS-E NC-Centreerboor 120°, lang  
FR Foret à pointer NC HSS-E 120°, version longue  
ES Broca de puntear NC HSS-E 120°, larga  
DE HSS-E NC Anbohrer 120°, lang



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	45-50 E	30-40 E	10-15 D	18-28 E

Ref.	d1	d2	l1	l2
15.740.0400	4	4	100	12
15.740.0500	5	5	120	15
15.740.0600	6	6	140	20

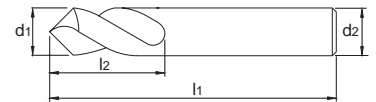
Ref.	d1	d2	l1	l2
15.740.0800	8	8	140	25
15.740.1000	10	10	170	25
15.740.1200	12	12	170	30

Ref.	d1	d2	l1	l2
15.740.1600	16	16	200	35
15.740.2000	20	20	200	40



## > 15.744 Phantom

NL HSS-E NC-Centreerboor TiAIN, 120°, lang  
FR Foret à pointer NC HSS-E TiAIN, 120°, version longue  
ES Broca de puntear NC HSS-E TiAIN, 120°, larga  
DE HSS-E NC Anbohrer TiAIN, 120°, lang



+6 6 (  TiAIN

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D
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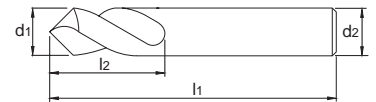
Ref.	d1	d2	l1	l2
15.744.0400	4	4	100	12
15.744.0500	5	5	120	15
15.744.0600	6	6	140	20

Ref.	d1	d2	l1	l2
15.744.0800	8	8	140	25
15.744.1000	10	10	170	25
15.744.1200	12	12	170	30

Ref.	d1	d2	l1	l2
15.744.1600	16	16	200	35
15.744.2000	20	20	200	40

## > 15.751 Phantom

NL HSS-E NC-Centreerboor TiN, 142°  
FR Foret à pointer NC HSS-E TiN, 142°  
ES Broca de puntear NC HSS-E TiN, 142°  
DE HSS-E NC Anbohrer TiN, 142°



+6 6 (  TiN

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D
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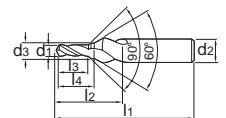
Ref.	d1	d2	l1	l2
15.751.0300	3	3	50	10
15.751.0400	4	4	52	12
15.751.0500	5	5	60	15

Ref.	d1	d2	l1	l2
15.751.0600	6	6	66	20
15.751.0800	8	8	79	25
15.751.1000	10	10	89	25

Ref.	d1	d2	l1	l2
15.751.1200	12	12	102	30
15.751.1600	16	16	115	35
15.751.2000	20	20	131	40

## > 15.820 Phantom

NL HSS-E Centerboor voor tapgaten, 60°  
FR Foret à centrer HSS-E pour trous à tarauder, 60°  
ES Broca de centrar HSS-E para pretaladros con centraje, 60°  
DE HSS-E Zentrierbohrer für Gewindelöcher, 60°



+6 6 (  DIN 332-2   118°

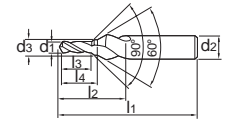
<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D
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Ref.	M	d1	d3	l1	l2	l4	l3	d2
15.820.0400	4	3.3	4.3	63	23	12.6	11	8
15.820.0500	5	4.2	5.3	67	27	15.1	13	10
15.820.0600	6	5	6.4	71	33	18.9	16	12.5

Ref.	M	d1	d3	l1	l2	l4	l3	d2
15.820.0800	8	6.8	8.4	88	41	23	19	14
15.820.1000	10	8.5	10.5	90	47	27.7	23	16
15.820.1200	12	10.2	13	105	59	34.5	28	20

> **15.840 Phantom**



NL HSS-E Centerboor voor tapgaten, 60°, met spanvlak  
 FR Foret à centrer HSS-E pour trous à tarauder, 60°, avec méplat  
 ES Broca de centrar HSS-E para pretaladros con centrado, 60°, con plano de arrastre  
 DE HSS-E Zentrierbohrer für Gewindelöcher, 60°, mit ebener Fläche

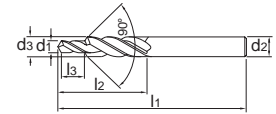
+6 6 ( )

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D

Ref.	M	d1	d3	l1	l2	l4	l3	d2
15.840.0400	4	3.3	4.3	63	23	12.6	11	8
15.840.0500	5	4.2	5.3	67	27	15.1	13	10
15.840.0600	6	5	6.4	71	33	18.9	16	12.5
15.840.0800	8	6.8	8.4	88	41	23	19	14
15.840.1000	10	8.5	10.5	90	47	27.7	23	16

Ref.	M	d1	d3	l1	l2	l4	l3	d2
15.840.1200	12	10.2	13	105	59	34.5	28	20
15.840.1600	16	14	17	132	67	41.3	33	25
15.840.2000	20	17.5	21	145	77	48.3	38	31.5
15.840.2400	24	21	25	160	90	57	45	40

> **15.880 Phantom**



NL HSS-E Kerngat-spiraalboor voor tapgaten, 90°  
 FR Foret étagé HSS-E pour trous à tarauder, 90°  
 ES Broca de centrar HSS-E para pretaladros con centrado, 90°  
 DE HSS-E Kernlochbohrer für Gewindelöcher, 90°

+6 6 ( )

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D

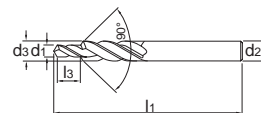
Ref.	M	d1	d3	l1	l2	l3	d2
15.880.0300	3	2.5	3.4	52	20	8	3.4
15.880.0400	4	3.3	4.5	58	24	11	4.5
15.880.0500	5	4.2	5.5	66	28	13	5.5
15.880.0600	6	5	6.6	70	31	16	6.6

Ref.	M	d1	d3	l1	l2	l3	d2
15.880.0800	8	6.8	9	64	40	20	9
15.880.1000	10	8.5	11	95	47	24	11
15.880.1200	12	10.2	14	107	54	29	14



## > 16.100 Phantom

NL HSS-E Meerfasenboor fijnpassing, kort, 90°  
 FR Foret étagé HSS-E ajustement fin, version courte, 90°  
 ES Broca bidiametral HSS-E ajuste fino, corto, 90°  
 DE HSS-E Mehrfasenstufenbohrer Senkung fein, kurz, 90°



<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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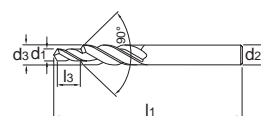
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D
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Ref.	M	d1	d3	l1	l3	d2
16.100.0200	2	2.2	4.6	45	6	4.6
16.100.0250	2.5	2.7	5.7	45	7	5.7
16.100.0300	3	3.2	6.5	45	9	6.5
16.100.0400	4	4.3	8.6	50	11	8.6

Ref.	M	d1	d3	l1	l3	d2
16.100.0500	5	5.3	10.4	55	13	10.4
16.100.0600	6	6.4	12.4	63	15	12.4
16.100.0800	8	8.4	16.4	100	19	12.5
16.100.1000	10	10.5	20.4	110	23	12.5

## > 16.104 Phantom

NL HSS-E Meerfasenboor fijnpassing, AlCrN-X, kort, 90°  
 FR Foret étagé HSS-E ajustement fin, AlCrN-X, version courte, 90°  
 ES Broca bidiametral HSS-E ajuste fino, AlCrN-X, corto, 90°  
 DE HSS-E Mehrfasenstufenbohrer Senkung fein, AlCrN-X, kurz, 90°



<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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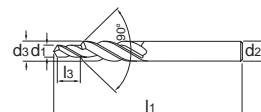
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 E	20-25 D
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Ref.	M	d1	d3	l1	l3	d2
16.104.0300	3	3.2	6.5	45	9	6.5
16.104.0400	4	4.3	8.6	50	11	8.6
16.104.0500	5	5.3	10.4	55	13	10.4

Ref.	M	d1	d3	l1	l3	d2
16.104.0600	6	6.4	12.4	63	15	12.4
16.104.0800	8	8.4	16.4	100	19	12.5
16.104.1000	10	10.5	20.4	110	23	12.5

## > 16.120 Phantom

NL HSS-E Meerfasenboor fijnpassing, lang, 90°  
 FR Foret étagé HSS-E ajustement fin, version longue, 90°  
 ES Broca bidiametral HSS-E ajuste fino, larga, 90°  
 DE HSS-E Mehrfasenstufenbohrer Senkung fein, lang, 90°



<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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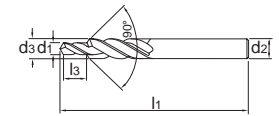
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D
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Ref.	M	d1	d3	l1	l3	d2
16.120.0400	4	4.3	8.6	110	30	8.6
16.120.0500	5	5.3	10.4	110	30	10.4

Ref.	M	d1	d3	l1	l3	d2
16.120.0600	6	6.4	12.4	110	30	12.4
16.120.0800	8	8.4	16.4	110	30	12.5

Ref.	M	d1	d3	l1	l3	d2
16.120.1000	10	10.5	20.4	110	30	12.5

> **16.124 Phantom**



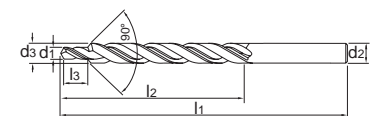
NL HSS-E Meerfasenboor fijnpassing, AlCrN-X, lang, 90°  
 FR Foret étagé HSS-E ajustement fin, AlCrN-X, version longue, 90°  
 ES Broca bidiametral HSS-E ajuste fino, AlCrN-X, larga, 90°  
 DE HSS-E Mehrfasenstufenbohrer Senkung fein, AlCrN-X, lang, 90°

+6 l ( AlCrN-X 90° N 1 118°

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> GG >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 E	20-25 D

Ref.	M	d1	d3	l1	l3	d2	Ref.	M	d1	d3	l1	l3	d2	Ref.	M	d1	d3	l1	l3	d2
16.124.0400	4	4.3	8.6	110	30	8.6	16.124.0600	6	6.4	12.4	110	30	12.4	16.124.1000	10	10.5	20.4	110	30	12.5
16.124.0500	5	5.3	10.4	110	30	10.4	16.124.0800	8	8.4	16.4	110	30	12.5							

> **16.200 Phantom**



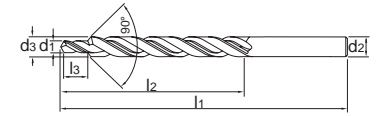
NL HSS Meerfasenboor middelpassing, kort, 90°  
 FR Foret étagé HSS ajustement moyen, version courte, 90°  
 ES Broca bidiametral HSS ajuste medio, corto, 90°  
 DE HSS Mehrfasenstufenbohrer mittelpassung, kurz, 90°

HSS 90° DIN 8374 N 2 118°

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2
16.200.0300	3	3.4	6.6	101	63	9	6.6	16.200.0500	5	5.5	11	142	94	13	11	16.200.0800	8	9	17.2	191	130	19	17.2
16.200.0400	4	4.5	9	125	81	11	9	16.200.0600	6	6.6	13	151	101	15	13								

> **16.220 Phantom**



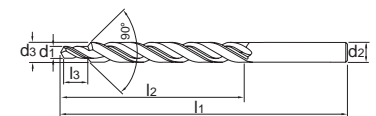
NL HSS Meerfasenboor fijnpassing, kort, 90°  
 FR Foret étagé HSS ajustement fin, version courte, 90°  
 ES Broca bidiametral HSS ajuste fino, corto, 90°  
 DE HSS Mehrfasenstufenbohrer Senkung fein, kurz, 90°

HSS 90° DIN 8374 N 1 118°

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2
16.220.0300	3	3.2	6	93	57	9	6	16.220.0500	5	5.3	10	133	87	13	10	16.220.0800	8	8.4	15	169	114	19	15
16.220.0400	4	4.3	8	117	75	11	8	16.220.0600	6	6.4	11.5	142	94	15	11.5	16.220.1000	10	10.5	19	198	135	23	19

> **16.250 Phantom**



NL HSS Kerngat-spiraalboor voor tapgaten, 90°  
 FR Foret étagé HSS pour trous à tarauder, 90°  
 ES Broca de centrar HSS para pretaladros con centraje, 90°  
 DE HSS Kernlochbohrer für Gewindelöcher, 90°

HSS 90° DIN 8378 N 1 118°

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2
16.250.0300	3	2.5	3.4	70	39	8.8	3.4	16.250.0600	6	5	6.6	101	63	16.5	6.6	16.250.1200	12	10.2	13.5	160	108	30	13.5
16.250.0400	4	3.3	4.5	80	47	11.4	4.5	16.250.0800	8	6.8	9	125	81	21	9								
16.250.0500	5	4.2	5.5	93	57	13.6	5.5	16.250.1000	10	8.5	11	142	94	25.5	11								





## > 16.300 Phantom

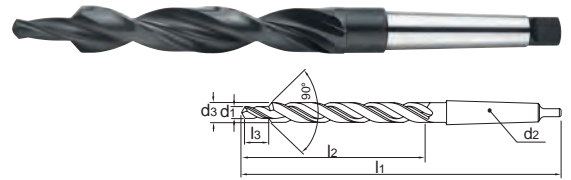
NL HSS Meerfasenboor middelpassing, kort, 90°, MK  
 FR Foret étagé HSS ajustement moyen, version courte, 90°, CM  
 ES Broca bidiametral HSS ajuste medio, corto, 90°, CM  
 DE HSS Mehrfasenstufenbohrer Senkung mittel, kurz, 90°, MK

HSS	90°	DIN 8375	N	DIN 228-B		2	118°	
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d1	d3	I1	I2	I3	d2
16.300.0500	5	5.5	11	175	94	13	MK 1
16.300.0600	6	6.6	13	182	101	15	MK 1

Ref.	M	d1	d3	I1	I2	I3	d2
16.300.0800	8	9	17.2	228	130	19	MK 2
16.300.1000	10	11	21.5	248	150	23	MK 2

Ref.	M	d1	d3	I1	I2	I3	d2



## > 16.350 Phantom

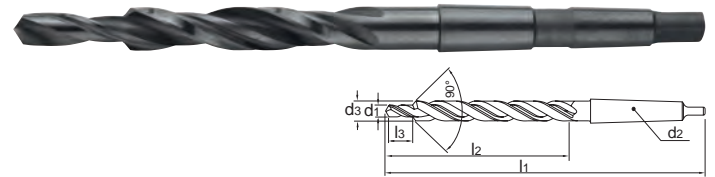
NL HSS Kerngat-spiraalboor voor tapgaten, 90°, MK  
 FR Foret étagé HSS pour trous à tarauder, 90°, CM  
 ES Broca de centrar HSS para pretaladros con centraje, 90°, CM  
 DE HSS Kernlochbohrer für Gewindelöcher, 90°, MK

HSS	90°	DIN 8379	N	DIN 228-B		118°		
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d1	d3	I1	I2	I3	d2
16.350.0800	8	6.8	9	162	81	21	MK 1
16.350.1000	10	8.5	11	175	94	25.5	MK 1
16.350.1200	12	10.2	13.5	189	108	30	MK 1

Ref.	M	d1	d3	I1	I2	I3	d2
16.350.1400	14	12	15.5	218	120	34.5	MK 2
16.350.1600	16	14	17.5	228	130	38.5	MK 2
16.350.1800	18	15.5	20	238	140	43.5	MK 2

Ref.	M	d1	d3	I1	I2	I3	d2
16.350.2000	20	17.5	22	248	150	47.5	MK 2



## > 16.500 Phantom

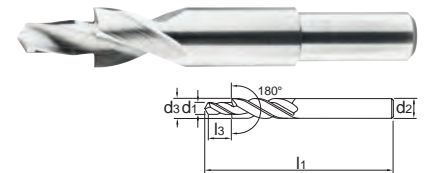
NL HSS-E Meerfasenboor 180°  
 FR Foret étagé HSS-E 180°  
 ES Broca bidiametral HSS-E 180°  
 DE HSS-E Mehrfasenstufenbohrer 180°

+6	180°			118°						
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe
25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D

Ref.	M	d1	d3	I1	I3	d2
16.500.0300	3	3.4	6	45	9	6
16.500.0400	4	4.5	8	50	11	8
16.500.0500	5	5.5	10	55	13	10

Ref.	M	d1	d3	I1	I3	d2
16.500.0600	6	6.6	11	63	15	11
16.500.0800	8	9	15	100	19	12.5
16.500.1000	10	11	18	110	23	12.5

Ref.	M	d1	d3	I1	I3	d2
16.500.1200	12	14	20	110	28	12.5



## > 16.504 Phantom

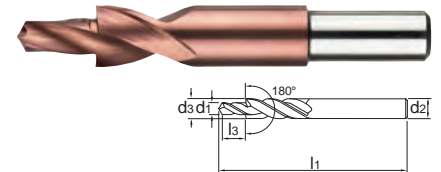
NL HSS-E Meerfasenboor AlCrN-X, 180°  
 FR Foret étagé HSS-E AlCrN-X, 180°  
 ES Broca bidiametral HSS-E AlCrN-X, 180°  
 DE HSS-E Mehrfasenstufenbohrer AlCrN-X, 180°

+6	AlCrN-X	180°		118°						
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 E	20-25 D

Ref.	M	d1	d3	I1	I3	d2
16.504.0400	4	4.5	8	50	11	8
16.504.0500	5	5.5	10	55	13	10

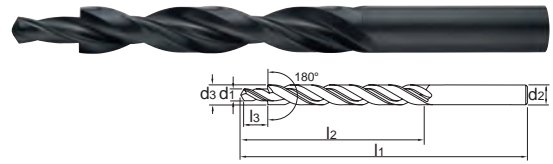
Ref.	M	d1	d3	I1	I3	d2
16.504.0600	6	6.6	11	63	15	11
16.504.0800	8	9	15	100	19	12.5

Ref.	M	d1	d3	I1	I3	d2
16.504.1000	10	11	18	110	23	12.5



> **16.600 Phantom**

NL HSS Meerfasenboor 180°  
FR Foret étagé HSS 180°  
ES Broca bidiametral HSS 180°  
DE HSS Mehrfasenstufenbohrer 180°



HSS 180° DIN 8376 N

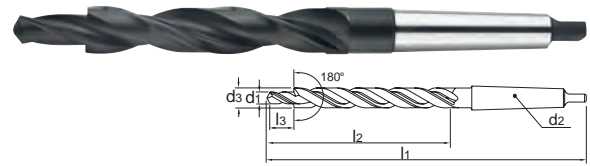
P 11 ≤600 N/mm²
P 12 ≤850 N/mm²
P 13 ≤1000 N/mm²
M 21 INOX ≤850 N/mm²
K 31 GG
K 32 GGG GTS-GTW
N 42 Alu Si>10%
N 51 Cu
N 61 PVC

25-27 F    22-30 F    15-20 E    8-12 D    15-20 E    25-30 E    45-50 G    25-40 D    22-28 D

Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2
16.600.0300	3	3.4	6	93	57	9	6	16.600.0500	5	5.5	10	133	87	13	10	16.600.0800	8	9	15	169	114	19	15
16.600.0400	4	4.5	8	117	75	11	8	16.600.0600	6	6.6	11	142	94	15	11	16.600.1000	10	11	18	191	130	23	18

> **16.700 Phantom**

NL HSS Meerfasenboor 180°, MK  
FR Foret étagé HSS 180°, CM  
ES Broca bidiametral HSS 180°, CM  
DE HSS Mehrfasenstufenbohrer 180°, MK



HSS 180° DIN 8377 N DIN 228-B

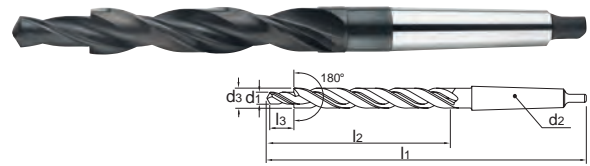
P 11 ≤600 N/mm²
P 12 ≤850 N/mm²
P 13 ≤1000 N/mm²
M 21 INOX ≤850 N/mm²
K 31 GG
K 32 GGG GTS-GTW
N 42 Alu Si>10%
N 51 Cu
N 61 PVC

25-27 F    22-30 F    15-20 E    8-12 D    15-20 E    25-30 E    45-50 G    25-40 D    22-28 D

Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2
16.700.0500	5	5.5	10	168	87	13	MK 1	16.700.1000	10	11	18	228	130	23	MK 2	16.700.1600	16	17.5	26	286	165	35	MK 3
16.700.0600	6	6.6	11	175	94	15	MK 1	16.700.1200	12	13.5	20	238	140	27	MK 2	16.700.1800	18	20	30	296	175	39	MK 3
16.700.0800	8	9	15	212	114	19	MK 2	16.700.1400	14	15.5	24	281	160	31	MK 3	16.700.2000	20	22	33	334	185	43	MK 4

> **16.730 Phantom**

NL HSS Meerfasenboor 180°, MK  
FR Foret étagé HSS 180°, CM  
ES Broca bidiametral HSS 180°, CM  
DE HSS Mehrfasenstufenbohrer 180°, MK



HSS 180° N DIN 228-B

P 11 ≤600 N/mm²
P 12 ≤850 N/mm²
P 13 ≤1000 N/mm²
M 21 INOX ≤850 N/mm²
K 31 GG
K 32 GGG GTS-GTW
N 42 Alu Si>10%
N 51 Cu
N 61 PVC

25-27 F    22-30 F    15-20 E    8-12 D    15-20 E    25-30 E    45-50 G    25-40 D    22-28 D

Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2	Ref.	M	d1	d3	l1	l2	l3	d2
16.730.0800	8	8.4	13.5	189	108	20	MK 1	16.730.1200	12	13	19	233	135	28	MK 2	16.730.1600	16	17	25	281	160	36	MK 3
16.730.1000	10	10.5	16.5	223	125	24	MK 2	16.730.1400	14	15	23	253	155	32	MK 2								



## > 19.100 Phantom

NL Set Spiraalboren leeg  
FR Coffret de Forets vide  
ES Estuche de brocas vacío  
DE Satz Spiralbohrer Leer



Ref.	Ø mm
19.100.1050	1-10 mm x 0,5 mm
19.100.1350	1-13 mm x 0,5 mm

Ref.	Ø mm
19.100.1602	6-10 mm x 0,1 mm
19.100.1605	1-5,9 mm x 0,1 mm

## > 19.105 Phantom

NL Set Spiraalboren leeg, MK  
FR Coffret de Forets vide, CM  
ES Estuche de brocas vacío, CM  
DE Satz Spiralbohrer Leer, MK



Ref.	Contents
19.105.3500	25xMT3 + 8x19.105.9352 + 8x19.105.9353
19.105.9351	10xMT3 + 4x19.105.9352 + 4x19.105.9353
19.105.9352	MK 1
19.105.9353	MK 2

## > 19.113 Phantom

NL HSS Set Spiraalboren  
FR Coffret de Forets HSS  
ES Estuche de brocas HSS  
DE HSS Satz Spiralbohrer



HSS	OX.	DIN 1897	N					
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.113.1000	11.130	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.113.1300	11.130	1-13 mm x 0,5 mm

> **19.116 Phantom**

NL HSS-E Set Spiraalboren  
FR Coffret de Forets HSS-E  
ES Estuche de brocas HSS-E  
DE HSS-E Satz Spiralbohrer



+6 6	DIN 1897	N			135°				
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	Type	Ø mm
19.116.1000	11.160	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.116.1300	11.160	1-13 mm x 0,5 mm

> **19.120 INTERNATIONAL TOOLS**

NL ECO HSS Set Spiraalboren  
FR Coffret de Forets HSS ECO  
ES Estuche de brocas HSS ECO  
DE ECO HSS Satz Spiralbohrer



HSS	DIN 338	N			118°	<b>ECO</b>		
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	45-50 E	35-40 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.120.1000	11.416	1-10 mm x 0,5 mm
19.120.1300	11.416	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.120.6000	11.416	1-10 mm x 0,5 mm (170x)



## > 19.124 INTERNATIONAL TOOLS

NL ECO PRO HSS Set Spiraalboren  
 FR Coffret de Forets HSS ECO PRO  
 ES Estuche de brocas HSS ECO PRO  
 DE ECO PRO HSS Satz Spiralbohrer



HSS	DIN 338	N						
P 11 S600 N/mm <sup>2</sup>	P 12 S850 N/mm <sup>2</sup>	P 13 S1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	45-50 E	35-40 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.124.1000	11.420	1-10 mm x 0,5 mm
19.124.1010	11.420	1-10 mm x 0,1 mm (91x)
19.124.1300	11.420	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.124.6000	11.420	1-10 mm x 0,5 mm (170x)
19.124.6100	11.420	1-13 mm x 0,5 mm + 3,3 - 4,2 mm (220x)

## > 19.127 INTERNATIONAL TOOLS

NL ECO HSS Set Spiraalboren blank  
 FR Coffret de Forets HSS ECO finition polie  
 ES Estuche de brocas HSS ECO blanca  
 DE ECO HSS Satz Spiralbohrer blank



HSS	DIN 338	N					
P 11 S600 N/mm <sup>2</sup>	P 12 S850 N/mm <sup>2</sup>	P 13 S1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	35-40 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.127.1000	11.423	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.127.1300	11.423	1-13 mm x 0,5 mm

**NIEUW NOUVEAU NUEVO NEU**

**> 19.130 INTERNATIONAL TOOLS**

NL ECO HSS Set Spiraalboren Kruisaanslijping  
 FR Coffret de Forets HSS ECO Affûtage en croix  
 ES Estuche de brocas HSS ECO Afilado en cruz  
 DE ECO HSS Satz Spiralbohrer Kreuzanschliff



HSS	DIN 338	N			ECO		
P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	35-40 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.130.1000	11.426	1-10 mm x 0,5 mm
19.130.1300	11.426	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.130.6000	11.426	1-10 mm x 0,5 mm (170x)

**> 19.134 INTERNATIONAL TOOLS**

NL ECO PRO HSS Set Spiraalboren Kruisaanslijping  
 FR Coffret de Forets HSS ECO PRO Affûtage en croix  
 ES Estuche de brocas HSS ECO PRO Afilado en cruz  
 DE ECO PRO HSS Satz Spiralbohrer Kreuzanschliff



HSS	DIN 338	N			ECO PRO		
P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	15-20 E	25-30 E	35-40 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.134.1000	11.430	1-10 mm x 0,5 mm
19.134.1300	11.430	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.134.6000	11.430	1-10 mm x 0,5 mm (170x)
19.134.6100	11.430	1-13 mm x 0,5 mm + 3,3 - 4,2 mm (220x)





> **19.138** **Phantom**

- NL HSS Set Spiraalboren TiN-tip, met 3-vlaks schacht, (handgebruik)
- FR Coffret de Forets HSS avec revêtement TiN sur la partie utile, à 3 pans, (usage à la main)
- ES Estuche de brocas HSS con punta TiN, con 3 chaflanes, (uso manual)
- DE HSS Satz Spiralbohrer TiN-Tip, mit drei platten Flächen, (handgebrauch)



HSS	TiN	DIN 338	>N	<4	4	1,6	118°		
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Sl>10%	N 51 Cu	N 61 PVC
27-30 F	25-28 F	17-22 E	10-14 D	20-33 E	20-28 E	50-80 E	45-70 G	40-65 D	25-36 D

**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	Ø mm
19.138.1000	11.441	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.138.1300	11.441	1-13 mm x 0,5 mm

> **19.139** **Phantom**

- NL HSS Set Spiraalboren, Step-point, met 3-vlaks schacht
- FR Coffret de Forets, Step-point HSS, à 3 pans
- ES Estuche de brocas, Step-point HSS, con 3 chaflanes
- DE HSS Satz Spiralbohrer, Step-point, mit drei platten Flächen



HSS	OX.	DIN 338	N	4		118°		
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Sl>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	Ø mm
19.139.1000	11.443	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.139.1300	11.443	1-13 mm x 0,5 mm

> **19.140** **Phantom**

- NL HSS-E Set Spiraalboren, met 3-vlaks schacht
- FR Coffret de Forets HSS-E, à 3 pans
- ES Estuche de brocas HSS-E, con 3 chaflanes
- DE HSS-E Satz Spiralbohrer, mit drei platten Flächen



+6.6 (	TiN	DIN 338	>N	<4	4	2	135°		
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	N 52 CuAlFe
32-40 E	35-40 E	25-32 E	12-20 D	15-20 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	Ø mm
19.140.1000	11.445	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.140.1300	11.445	1-13 mm x 0,5 mm



## > 19.141 Phantom

- NL HSS-E Set Spiraalboren TiN-tip, met 3-vlaks schacht, (handgebruik)  
 FR Coffret de Forets HSS-E avec revêtement TiN sur la partie utile, à 3 pans, (usage à la main)  
 ES Estuche de brocas HSS-E con punta TiN, con 3 chaflanes, (uso manual)  
 DE HSS-E Satz Spiralbohrer TiN-Tip, mit drei platten Flächen, (handgebrauch)



+6.6	TiN	DIN 338	>N	<4	4	1,6	118°		
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	N 52 CuAlFe
32-40 E	35-40 E	25-32 E	12-20 D	15-20 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	Type	Ø mm
19.141.1000	11.446	1-10 mm x 0,5 mm

NIEUW NOUVEAU NUEVO NEU

Ref.	Type	Ø mm
19.141.1300	11.446	1-13 mm x 0,5 mm

## > 19.144 INTERNATIONAL TOOLS

- NL ECO HSS Set Spiraalboren gewalst  
 FR Coffret de Forets HSS ECO laminé  
 ES Estuche de brocas HSS ECO laminada  
 DE ECO HSS Satz Spiralbohrer Gewalzt



HSS	DIN 338	N			118°	ECO
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW		
20-25 E	20-25 E	15-20 D	15-20 E	25-30 E		

Ref.	Type	Ø mm
19.144.1002	11.400	1-10 mm x 0,5 mm
19.144.1302	11.400	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.144.6001	11.400	1-10 mm x 0,5 mm (170x)
19.144.6100	11.400	1-13 mm x 0,5 mm + 3,3 - 4,2 mm (220x)

## > 19.145 Phantom

- NL HSS Set Spiraalboren  
 FR Coffret de Forets HSS  
 ES Estuche de brocas HSS  
 DE HSS Satz Spiralbohrer



HSS	OX.	DIN 338	N			118°			
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC	
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D	

Ref.	Type	Ø mm
19.145.1000	11.450	1-10 mm x 0,5 mm
19.145.1010	11.450	1-10 mm x 0,1 mm (91x)
19.145.1150	11.450	1-10,5 mm x 0,5 mm + 3,3 - 4,2 - 6,8 - 10,2
19.145.1300	11.450	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.145.1590	11.450	1-5,9 mm x 0,1 mm
19.145.1600	11.450	6-10 mm x 0,1 mm
19.145.6000	11.450	1-10 mm x 0,5 mm (170x)
19.145.6100	11.450	1-13 mm x 0,5 mm + 3,3 - 4,2 mm (220x)

> **19.146** **Phantom**

NL HSS Set Spiraalboren TiN-tip  
 FR Coffret de Forets HSS avec revêtement TiN sur la partie utile  
 ES Estuche de brocas HSS con punta TiN  
 DE HSS Satz Spiralbohrer TiN-Tip



HSS	TiN	DIN 338	N								
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC		
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	48-60 E	45-50 G	25-40 D	22-28 D		
Ref.	Type	Ø mm									
19.146.1000	11.451	1-10 mm x 0,5 mm									
19.146.1010	11.451	1-10 mm x 0,1 mm (91x)									

Ref.	Type	Ø mm
19.146.1150	11.451	1-10,5 mm x 0,5 mm + 3,3 - 4,2 - 6,8 - 10,2
19.146.1300	11.451	1-13 mm x 0,5 mm

> **19.147** **Phantom**

NL HSS Set Spiraalboren TiN-tip, (handgebruik)  
 FR Coffret de Forets HSS avec revêtement TiN sur la partie utile,  
 (usage à la main)  
 ES Estuche de brocas HSS con punta TiN, (uso manual)  
 DE HSS Satz Spiralbohrer TiN-Tip, (handgebrauch)



HSS	TiN	DIN 338	>N								
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC		
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	48-60 E	45-50 G	25-40 D	22-28 D		
Ref.	Type	Ø mm									
19.147.1000	11.461	1-10 mm x 0,5 mm									

Ref.	Type	Ø mm
19.147.1300	11.461	1-13 mm x 0,5 mm



## > 19.149 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Set Spiraalboren  
 FR Coffret de Forets HSS-E ECO PRO  
 ES Estuche de brocas HSS-E ECO PRO  
 DE ECO PRO HSS-E Satz Spiralbohrer



+6 6 (	DIN 338	N			135°	ECO PRO	
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	N 52 CuAlFe
28-35 E	30-36 E	20-27 E	14-18 D	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	Type	Ø mm
19.149.1000	11.490	1-10 mm x 0,5 mm
19.149.1300	11.490	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.149.6000	11.490	1-10 mm x 0,5 mm (170x)
19.149.6100	11.490	1-13 mm x 0,5 mm + 3,3 - 4,2 mm (220x)

## > 19.150 Phantom

NL HSS-E Set Spiraalboren  
 FR Coffret de Forets HSS-E  
 ES Estuche de brocas HSS-E  
 DE HSS-E Satz Spiralbohrer



+6 6 (	DIN 338	N			135°				
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	N 52 CuAlFe
28-35 E	30-36 E	20-27 E	12-20 D	14-18 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

Ref.	Type	Ø mm
19.150.1000	11.500	1-10 mm x 0,5 mm
19.150.1010	11.500	1-10 mm x 0,1 mm (91x)
19.150.1150	11.500	1-10,5 mm x 0,5 mm + 3,3 - 4,2 - 6,8 - 10,2
19.150.1300	11.500	1-13 mm x 0,5 mm

Ref.	Type	Ø mm
19.150.1590	11.500	1-5,9 mm x 0,1 mm
19.150.1600	11.500	6-10 mm x 0,1 mm
19.150.6000	11.500	1-10 mm x 0,5 mm (170x)
19.150.6100	11.500	1-13 mm x 0,5 mm + 3,3 - 4,2 mm (220x)

> **19.152 Phantom**

- NL HSS-E Set Spiraalboren TiN-tip, (handgebruik)
- FR Coffret de Forets HSS-E avec revêtement TiN sur la partie utile, (usage à la main)
- ES Estuche de brocas HSS-E avec revêtement TiN sur la partie utile, (usage à la main)
- DE HSS-E Satz Spiralbohrer TiN-Tip, (handgebrauch)



+6 6 ( TiN DIN 338 >N 1,6 118°

P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu	N 52 CuAlFe
32-40 E	35-40 E	25-32 E	12-20 D	15-20 D	10-15 C	30-35 F	24-30 F	30-40 E	8-15 C

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	Ø mm
19.152.1000	11.506	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.152.1300	11.506	1-13 mm x 0,5 mm

> **19.154 Phantom**

- NL HSS-E 8% Set Spiraalboren Aero
- FR Coffret de Forets HSS-E 8% Aéro
- ES Estuche de brocas HSS-E 8% Aero
- DE HSS-E 8% Satz Spiralbohrer Aero



HSS-E 8% NAS 907 P3 DIN 338 N 135°

P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe	N 61 PVC	S 71 Ni/Co	S 72 Ti
35-40 E	30-40 E	12-30 E	12-20 C	14-20 D	10-15 C	30-35 F	24-30 F	50-90 F	40-60 F	60-80 F	30-40 E	15-20 D	20-30 D	6-8 A	6-10 B

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	Ø mm
19.154.1000	11.510	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.154.1300	11.510	1-13 mm x 0,5 mm





## > 19.156 Phantom

NL HP2 UNI HSS-E Set Spiraalboren TiN  
 FR Coffret de Forets HSS-E HP2 UNI TiN  
 ES Estuche de brocas HSS-E HP2 UNI TiN  
 DE HP2 UNI HSS-E Satz Spiralbohrer TiN



+6 6 (	TiN	DIN 338	>N			HP2 UNI							
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe	N 61 PVC
38-42 F	20-44 E	20-40 E	16-22 C	15-20 D	12-18 C	40-45 F	35-40 F	50-70 E	40-60 F	60-80 F	40-44 E	15-20 D	24-28 D
Ref.	Type	Ø mm		Ref.		Type	Ø mm						
19.156.1000	11.568	1-10 mm x 0,5 mm		19.156.1300		11.568	1-13 mm x 0,5 mm						

## > 19.160 Phantom

NL HM-tip Set Spiraalboren  
 FR Coffret de Foret à plaquettes carbure brasées  
 ES Estuche de brocas punta MD  
 DE HM-Schneiden Satz Spiralbohrer



HM-TIP	DIN 338	N											
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	H 15 HRC	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 52 CuAlFe	N 62 GFK/CFK	S 71 Ni/Co	S 72 Ti
75-85	60-70	55-65	30-40	10-20	20-35	18-30	70-85	60-75	120-150	35-40	70-130	25-30	30-35
Ref.	Type	Ø mm		Ref.		Type	Ø mm						
19.160.0300	11.600	3-4-5-6-8-10 mm											

## > 19.171 Phantom

NL HSS Set Spiraalboren Aluminium  
 FR Coffret de Forets HSS Aluminium  
 ES Estuche de brocas HSS Aluminio  
 DE HSS Satz Spiralbohrer Aluminium



HSS	DIN 338	W			ALU			
N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 61 PVC					
50-70 F	40-60 F	35-40 E	18-28 E					
Ref.	Type	Ø mm		Ref.		Type	Ø mm	
19.171.1000	11.710	1-10 mm x 0,5 mm		19.171.1590		11.710	1-5,9 mm x 0,1 mm	
19.171.1300	11.710	1-13 mm x 0,5 mm		19.171.1600		11.710	6-10 mm x 0,1 mm	



> **19.176 Phantom**

NL HSS-E Set Spiraalboren roestvaststaal  
 FR Coffret de Forets HSS-E Inox  
 ES Estuche de brocas HSS-E acero inoxidable  
 DE HSS-E Satz Spiralbohrer rostfreien Stahl

+6 6 [ DIN 338 >N 130° INOX

P 14 M 21 M 22 S 71 S 72  
≤1400 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> Ni/Co Ti

12-16 E 14-18 D 12-16 C 6-8 A 6-10 B

Ref.	Type	Ø mm
19.176.1000	11.760	1-10 mm x 0,5 mm
19.176.1150	11.760	1-10,5 x 0,5 mm + 3,3 - 4,2 - 6,8 - 10,2

Ref.	Type	Ø mm
19.176.1300	11.760	1-13 mm x 0,5 mm

> **19.370 Phantom**

NL HM-tip set Steenboren  
 FR Jeu de Forets à pierre pointe carb. mét.  
 ES Juego de brocas para piedra punta MD  
 DE HM-Schneiden Satz Steinbohrer



HM DIN 8039

Ref.	Type	Ø mm
19.370.0100	13.700	3, 4, 5, 6, 7, 8, 9, 10 mm

Ref.	Type	Ø mm

> **19.372 Phantom**

NL HM-tip Set Betonboren  
 FR Jeu de Forets à béton pointe carb. mét.  
 ES Juego de brocas para hormigón punta MD  
 DE HM-Schneiden Satz Betonbohrer



HM

Ref.	Type	Ø mm
19.372.0100	13.720	3, 4, 5, 6, 7, 8, 9, 10 mm

Ref.	Type	Ø mm



## > 19.374 Phantom

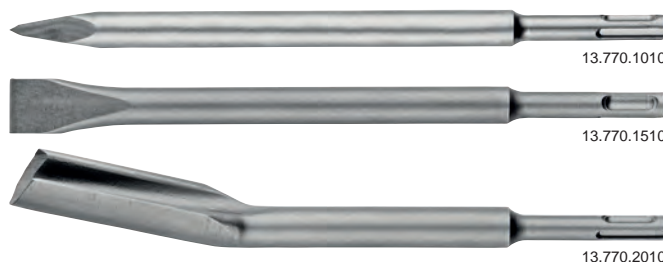
NL SDS-PLUS HM-tip Set Hamerboren  
 FR Jeu Forets à béton SDS-PLUS pointe carb. mét.  
 ES Juego de brocas SDS-PLUS martillo punta MD  
 DE SDS-PLUS HM-Schneiden Satz Hammerbohrer



Ref.	Type	Ø mm
19.374.0100	13.740	5x160, 6x160, 8x160, 10x160 mm
19.374.1000	13.740	5x110 (5x), 6x160 (5x), 8x160 (5x), 10x160 (5x), 12x160 (5x), 8x210 (5x), 10x210 (5x), 12x210 mm (5x)

## > 19.377 Phantom

NL SDS-PLUS Set Beitel  
 FR Jeu de Burins SDS-PLUS  
 ES Juego de Cincel SDS-PLUS  
 DE SDS-PLUS Satz Meißel



Ref.	Type	Ø mm	Ref.	Type	Ø mm
19.377.0100	13.770	13.770.1010-13.770.1510-13.770.2010			

## > 19.540 Phantom

NL HSS Set Centerboren  
 FR Jeu de Forets à centrer HSS  
 ES Juego de brocas de centrar HSS  
 DE HSS Satz Zentrierbohrer



P 11	P 12	P 13	K 31	K 32	N 41	N 42	N 43	N 51	N 61
≤500 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC
20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E

Ref.	Type	Ø mm
19.540.0000	15.100	DIN 333A 0,5x3 (5) - 1x4 (5) - 1,5x5 (5) - 2x6 (5) - 2,5x8 (5) - 3x10 (4)- 4x12 (1)
19.540.0001	15.100	DIN 333A 1x3,15 (5) - 1,6x4 (5) - 2x5 (5) - 2,5x6,3 (5) - 3,15x8 (5) - 4x10 (4) - 5x12,5 (1)
19.540.0101	15.100	DIN 333A 1x4 (3) - 1,5x5 (3) - 2x6 (3) - 2,5x8 (3) - 3x10 (2) - 4x12 (1)

> **19.910 Phantom**

NL HSS Set Spiraalboren links  
FR Coffret de Forets HSS à gauche  
ES Estuche de brocas HSS izquierda  
DE HSS Satz Spiralbohrer links

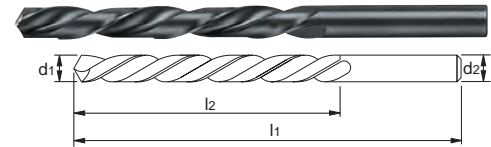


HSS		DIN 338	N					
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.910.1000	19.914	1-10 mm x 0,5 mm

> **19.914 Phantom**

NL HSS Spiraalboor links  
FR Foret HSS à gauche  
ES Broca HSS izquierda  
DE HSS Spiralbohrer links



HSS		DIN 338	N					
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

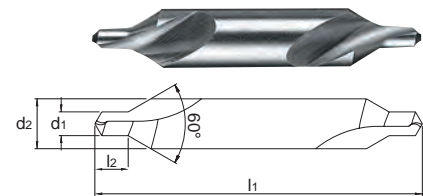
Ref.	d1	d2	l1	l2
19.914.0100	1	1	34	12
19.914.0150	1.5	1.5	40	18
19.914.0200	2	2	49	24
19.914.0250	2.5	2.5	57	30
19.914.0300	3	3	61	33
19.914.0350	3.5	3.5	70	39
19.914.0400	4	4	75	43

Ref.	d1	d2	l1	l2
19.914.0420	4.2	4.2	75	43
19.914.0450	4.5	4.5	80	47
19.914.0500	5	5	86	52
19.914.0550	5.5	5.5	93	57
19.914.0600	6	6	93	57
19.914.0650	6.5	6.5	101	63
19.914.0700	7	7	109	69

Ref.	d1	d2	l1	l2
19.914.0750	7.5	7.5	109	69
19.914.0800	8	8	117	75
19.914.0850	8.5	8.5	117	75
19.914.0900	9	9	125	81
19.914.0950	9.5	9.5	125	81
19.914.1000	10	10	133	87

> **19.951 Phantom**

NL HSS Centerboor links, 60°  
FR Foret à centrer HSS à gauche, 60°  
ES Broca de centrar HSS izquierda, 60°  
DE HSS Zentrierbohrer links, 60°



HSS			NFE 66051-A	DIN 333-A				
P 11	P 12	P 13	K 31	K 32	N 42	N 43	N 51	N 61
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Mg	Cu	PVC
20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	60-70 E	45-50 E	25-40 E	18-28 E

Ref.	d1	d2	l1	l2
19.951.0531	0.5	3.15	25	0,6-0,9
19.951.0735	0.75	3.5	35	1,0-1,3
19.951.1040	1	4	35	1,3-1,7
19.951.1550	1.5	5	40	2,0-2,6
19.951.1640	1.6	4	35	2,0-2,6

Ref.	d1	d2	l1	l2
19.951.2050	2	5	40	2,5-3,1
19.951.2060	2	6	45	2,5-3,1
19.951.2563	2.5	6.3	45	3,1-3,8
19.951.2580	2.5	8	50	3,1-3,8
19.951.3090	3	10	55	3,9-4,6

Ref.	d1	d2	l1	l2
19.951.3180	3.15	8	50	3,9-4,6
19.951.4010	4	10	55	5,0-5,9
19.951.4012	4	12	63	5,0-5,9
19.951.4013	4	12.5	63	5,0-5,9
19.951.5014	5	14	69	6,3-7,2



## > 19.956 Phantom

NL HSS-E NC-Centreerboor links, 90°  
 FR Foret à pointer NC HSS-E à gauche, 90°  
 ES Broca de puntear NC HSS-E izquierda, 90°  
 DE HSS-E NC Anbohrer links, 90°

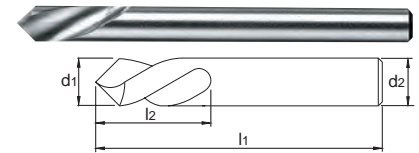


<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si-10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D
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Ref.	d1	d2	l1	l2
19.956.0300	3	3	50	10
19.956.0400	4	4	52	12
19.956.0500	5	5	60	15

Ref.	d1	d2	l1	l2
19.956.0600	6	6	66	20
19.956.0800	8	8	79	25
19.956.1000	10	10	89	25



## > 19.957 Phantom

NL HSS-E NC-Centreerboor links, 120°  
 FR Foret à pointer NC HSS-E à gauche, 120°  
 ES Broca de puntear NC HSS-E izquierda, 120°  
 DE HSS-E NC Anbohrer links, 120°

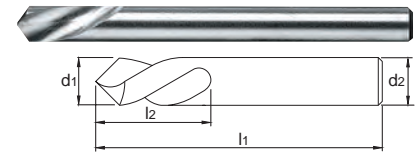


<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si-10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
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25-30 E	20-40 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D
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Ref.	d1	d2	l1	l2
19.957.0300	3	3	50	10
19.957.0400	4	4	52	12
19.957.0500	5	5	60	15

Ref.	d1	d2	l1	l2
19.957.0600	6	6	66	20
19.957.0800	8	8	79	25
19.957.1000	10	10	89	25



Ref.	d1	d2	l1	l2
19.957.1200	12	12	102	30

NL Voedingswaardentabel  
 FR Tableau des avances  
 ES Tabla de avances  
 DE Vorschubtabelle

**P 11** = ISO  
 5000 N/mm<sup>2</sup>  
 25-35 Vc = 25-35  
 E FRC = E

FRC										
d1 (mm)	A	B	C	D	E	F	G	H	I	
	f (mm/n)									
0,3	0,002	0,003	0,003	0,004	0,010	0,010	0,010	0,010	0,010	0,010
0,5	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	0,019
0,8	0,005	0,007	0,008	0,009	0,012	0,014	0,016	0,018	0,023	0,023
1	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	0,025
1,5	0,012	0,014	0,016	0,018	0,020	0,023	0,025	0,032	0,040	0,040
2	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,125
3	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
4	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,250
5	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,250
6	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
8	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
10	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,500
12	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,500
14	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
16	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
18	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
20	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
22	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
25	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,000
30	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,000
40	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,250
50	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
60	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

NL Toerentabel  
 FR Tableau des vitesses de rotation  
 ES Tabla de número de revoluciones  
 DE Drehzahltable

$$n = \frac{Vc \times 1000}{3,14 \times d1} \quad Vc = \frac{n \times 3,14 \times d1}{1000}$$

Vc (m/min)																		
d1 (mm)	5	8	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120
	n = rpm																	
1	1592	2546	3183	3820	4775	6366	7958	9549	11141	12732	15915	19099	22282	25465	28648	31831	35014	38197
1,5	1061	1698	2122	2546	3183	4244	5305	6366	7427	8588	10610	12732	14854	16977	19099	21221	23343	25465
2	796	1273	1592	1910	2387	3183	3937	4775	5570	6366	7958	9549	11141	12732	14324	15915	17507	19099
2,5	637	1019	1273	1528	1910	2546	3183	3820	4456	5093	6366	7639	8913	10186	11459	12732	14006	15279
3	531	849	1061	1273	1592	2122	2653	3183	3714	4244	5305	6366	7427	8488	9549	10610	11671	12732
3,5	455	728	909	1091	1364	1819	2274	2728	3183	3638	4547	5457	6366	7276	8185	9095	10004	10913
4	398	637	796	955	1194	1592	1989	2387	2785	3183	3979	4775	5570	6366	7162	7958	8754	9549
4,5	354	566	707	849	1061	1415	1768	2122	2476	2829	3537	4244	4951	5659	6366	7074	7781	8488
5	318	509	637	764	955	1273	1592	1910	2228	2546	3183	3820	4456	5093	5730	6366	7003	7639
5,5	289	463	579	694	868	1157	1447	1739	2026	2315	2894	3472	4051	4630	5209	5787	6366	6945
6	265	424	531	637	796	1061	1326	1592	1857	2122	2653	3183	3714	4244	4775	5305	5836	6366
7	227	364	455	546	682	909	1137	1364	1592	1819	2274	2728	3183	3638	4093	4547	5002	5457
8	199	318	398	477	597	796	995	1194	1393	1592	1989	2387	2785	3183	3581	3979	4377	4775
9	177	283	354	424	531	707	884	1061	1238	1415	1768	2122	2476	2829	3183	3537	3890	4244
10	159	255	318	382	477	637	796	955	1114	1273	1592	1910	2228	2546	2865	3183	3501	3820
11	145	321	289	347	434	579	723	868	1013	1157	1447	1736	2026	2315	2604	2894	3183	3472
12	133	212	265	318	398	531	663	796	928	1061	1326	1592	1857	2122	2387	2653	2918	3183
13	122	196	245	294	367	490	612	735	857	979	1224	1469	1714	1959	2204	2449	2693	2938
14	114	182	227	273	341	455	568	682	796	909	1137	1364	1592	1819	2046	2274	2501	2728
15	106	170	212	255	318	424	531	637	743	849	1061	1273	1485	1698	1910	2122	2334	2546
16	99	159	199	239	298	398	497	597	696	796	995	1194	1393	1592	1790	1989	2188	2387
18	88	141	177	212	265	354	442	531	619	707	884	1061	1238	1415	1592	1768	1945	2122
20	80	127	159	191	239	318	398	477	557	637	796	955	1114	1273	1432	1592	1751	1910
22	72	116	145	174	217	289	362	434	506	579	723	868	1013	1157	1302	1447	1592	1736
24	66	106	133	159	199	265	332	398	464	531	663	796	928	1061	1194	1326	1459	1592
25	64	102	127	153	191	255	318	382	446	509	637	764	891	1019	1146	1273	1401	1528
26	61	98	122	147	184	245	306	367	428	490	612	735	857	979	1102	1224	1347	1469
28	57	91	114	136	171	227	284	341	398	455	568	682	796	909	1023	1137	1251	1364
30	53	85	106	127	159	212	265	318	371	424	531	637	743	849	955	1061	1167	1273
35	45	73	91	109	136	182	227	273	318	364	455	546	637	728	819	909	1000	1091
40	40	64	80	95	119	159	199	239	279	318	398	477	557	637	716	796	875	955
45	35	57	71	85	106	141	177	212	248	283	354	424	495	566	637	707	778	849
50	32	51	64	76	95	127	159	191	223	255	318	382	446	509	573	637	700	764
55	29	46	58	69	87	116	145	174	203	231	289	347	405	463	521	579	637	694
60	27	42	53	64	80	106	133	159	186	212	265	318	371	424	477	531	584	637

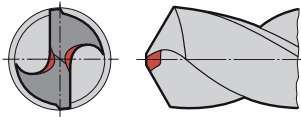
<b>FRC</b>	<b>f (mm/n)</b>	<b>Vc</b>	<b>n=rpm</b>
NL: Voedingscode	NL: Voeding per omwenteling (mm/n)	NL: Snijsnelheid (m/min)	NL: Spiltoerental (omw/min)
FR: Codification vitesse d'avance	FR: Avance par tour (mm/tr)	FR: Vitesse de coupe (m/min)	FR: Vitesse de broche (tr/min)
ES: Codificación de velocidad de avance	ES: Avance por revolucion (mm/r)	ES: Velocidad de corte (m/min)	ES: Velocidad del husillo (rpm)
DE: Vorschubgeschwindigkeit Codierung	DE: Vorschub pro Umdrehung (mm/U)	DE: Schnittgeschwindigkeit (m/min)	DE: Spindeldrehzahl (U/min)



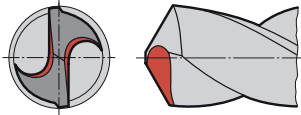


## DIN 1412

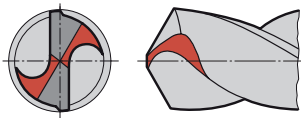
NL Boorpunten volgens DIN 1412  
 FR Affûtage des forets selon DIN 1412  
 ES Afilado de brocas según DIN 1412  
 DE Anschliffformen DIN 1412



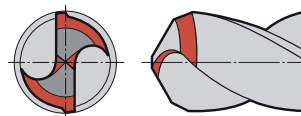
Form A  
 NL Uitgedunde punt  
 FR Pointe amincie  
 ES Con alma delgado  
 DE Ausgespitzte Querschneide



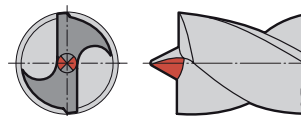
Form B  
 NL Uitgedunde punt met gecorrigeerde hoofdsnijkant  
 FR Pointe amincie avec correction des lèvres  
 ES Con alma delgado, corregido  
 DE Ausgespitzte Querschneide mit korrigierte Haupschneide



Form C  
 NL Kruisaanslijping  
 FR Affûtage en croix  
 ES Afilado en cruz  
 DE Kreuzanschliff



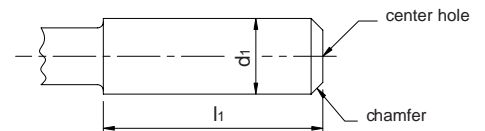
Form D  
 NL Boorpunt voor grijs gietijzer  
 FR Affûtage pour fonte grise  
 ES Filo para fundición gris  
 DE Anschliff für Grauguss



Form E  
 NL Centreerpunt  
 FR Pointe centrale  
 ES Punta de centrage  
 DE Zentrums Spitze

## DIN 1835

NL Cilindrische schacht  
 FR Queue cylindrique  
 ES Mango cilíndrico  
 DE Zylinderschaft



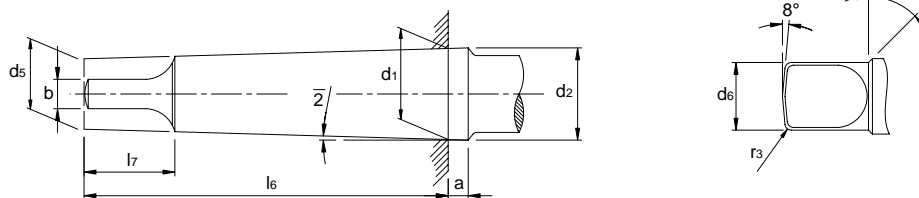
Dimensions in mm	
$d_1$	$l_1$ +2
<b>h6</b>	<b>0</b>
3	28
4	28
5	28
6	36
8	36

Dimensions in mm	
$d_1$	$l_1$ +2
<b>h6</b>	<b>0</b>
10	40
12	45
16	48
20	50
25	56

Dimensions in mm	
$d_1$	$l_1$ +2
<b>h6</b>	<b>0</b>
32	60
40	70
50	80
63	90

**DIN 228**

NL Morse Konus DIN 228  
 FR Cône morse DIN 228  
 ES Mango cónico DIN 228  
 DE Morsekegel DIN 228



Dimensions in mm

shank to DIN 228 form B size	a	limiting dim.	b	$d_1$	$d_{\approx 2}$	$d_{\approx 5}$	$d_6$ max.	$l_6$ 0 -1	$l_7$ max.	$r_2$ max.	r $\approx 3$	$\frac{a}{2}$
MK 1	3.5	+1.4 0	5.2	12.065	12.2	9.0	8.7	62	13.5	5	1.2	1°25'43"
MK 2	5.0	+1.4 0	6.3	17.780	18.0	14.0	13.5	75	16	6	1.6	1°25'50"
MK 3	5.0	+1.7 0	7.9	23.825	24.1	19.1	18.5	94	20	7	2	1°26'16"
MK 4	6.5	+1.9 0	11.9	31.267	31.6	25.2	24.5	117.5	24	8	2.5	1°29'15"
MK 5	6.5	+1.9 0	15.9	44.399	44.7	36.5	35.7	149.5	29	10	3	1°30'26"



1



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1 SC

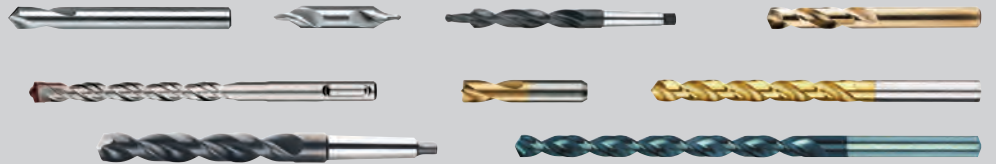


1 HSS(+E)

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



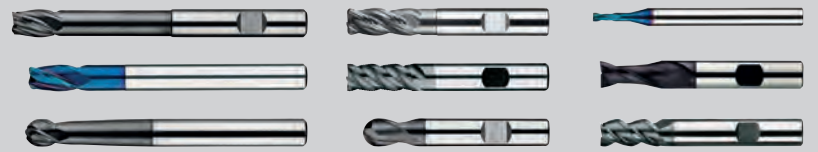
NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



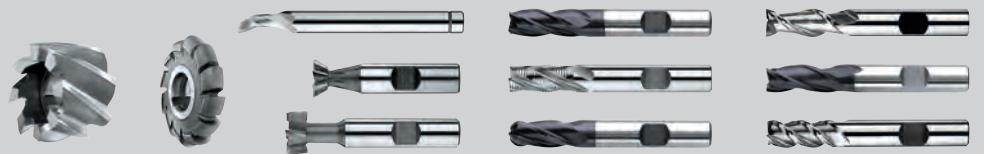
NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



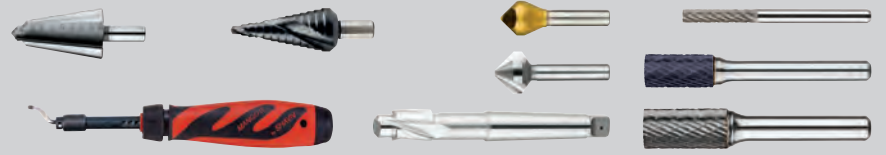
NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



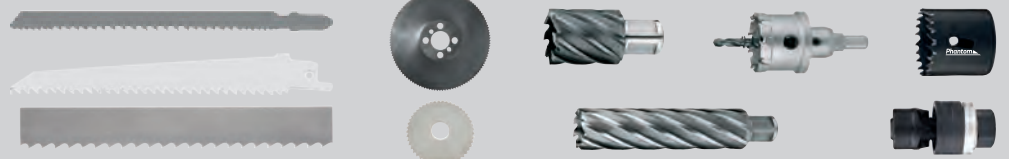
NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



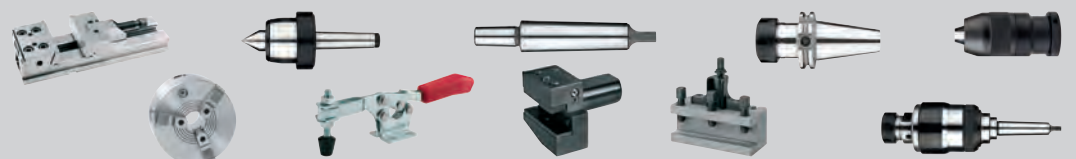
NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



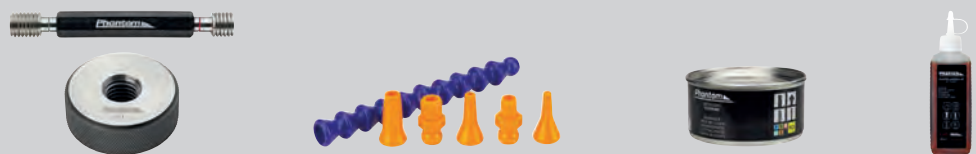
NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
<b>HSS</b>	HSS	HSS	HSS	HSS
<b>HSS-E</b>	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalto)	HSS-E (5% Cobalt)
<b>HSS-E PM</b>	PowderMetal HSS-E (5% Cobalt)	Acier rapide fritté de haute qualité	Acero rápido pulvimetalúrgico	Pulvermetall HSS-E (5% Cobalt)
<b>MG HM</b>	Micro-Grain volhardmetaal	Carbure micrograin	Metal duro micrograno	Micro-Grain Vollhartmetall
<b>M</b>	Metrisch	Metrique	Métrica	Metrisch
<b>MF</b>	Metrisch Fijn	Métrique pas fin	Métrica Fina	Metrisch Fein
<b>UNC</b>	UNC schroefdraad	Filetage UNC	Rosca UNF	UNF Gewinde
<b>UNF</b>	UNF schroefdraad	Filetage UNF	Norma DIN	DIN Norm
<b>NFE 66103</b>	NFE 66103	NFE 66103	NFE 66103	NFE 66103
<b>UN-8</b>	Unified schroefdraad	Filetage UN-8	Rosca UN-8	Unified Gewinde
<b>BA</b>	British Association schroefdraad	Filetage BA	Rosca BA	British Association Gewinde
<b>BSC FG</b>	British Standard Cycle schroefdraad	Filetage BSC (pour bicyclettes)	Rosca BSC (para bicicletas)	British Standard Cycle (Fahrradgewinde)
<b>BSF</b>	British Standard Whit- worth, Fijne schroefdraad	Filetage BSF, pas fin	Rosca BSF, paso fino	British Standard Whit- worth, Feingewinde
<b>BSP G</b>	British Standard Pipe (Gasdraad)	Filetage BSP(Gaz)	Rosca BSP (Gas)	British Standard Pipe (Gasgewinde)
<b>BSPP Rp</b>	BSP Parallel schroefdraad (drukdicht)	Filetage BSPP Gaz (Paral- lèle, étanche à la pression)	Rosca BSPP Paralelo (estanco a la presión)	BSP Parallel Gewinde (drukdicht)
<b>BSPT Rc</b>	BSP Taper schroefdraad (conisch, drukdicht)	Filetage BSPT Gaz (conique, étanche à la pression)	Rosca BSPT (cónica, estanco a la presión)	BSP Gewinde (konisch, drukdicht)
<b>BSW</b>	British Standard Whit- worth schroefdraad	Filetage BSW	Rosca BSW	British Standard Whitworth Gewinde
<b>NPT</b>	National Pipe Taper schroefdraad	Filetage NPT	Rosca NPT	National Pipe Taper Gewinde
<b>NPTF</b>	National Pipe Taper Fuel schroefdraad	Filetage NPTF	Rosca NPTF	National Pipe Taper Fuel Gewinde
<b>Tr</b>	Trapezium schroefdraad	Filetage Trapèze	Rosca Trapezoidal	Trapezgewinde (Regel)
<b>PG</b>	Panzerrohr- Gewinde	Filetage PG	Rosca PG	Panzerrohr- Gewinde
<b>EG</b>	EG (Phan-Coil)	EG (Phan-Coil)	EG (Phan-Coil)	EG (Phan-Coil)
<b>Phan- Coil</b>	Schroefdraad- reparatie	Réparation de filetage	Reparar de rosca	Gewindereparatur
<b>60°</b>	Tophoek schroefdraad	Angle au sommet	Ángulo de punta de la rosca	Flankenwinkel
<b>NIT.</b>	Genitreerd	Nitruré	Nitrurado	Nitriert
<b>OX.</b>	Stoomontlaten	Vaporisé	Vaporizado	Dampfangelassen
<b>TiN</b>	TiN gecoat	Revêtement TiN	Recubrimiento TiN	TiN Beschichtung
<b>TiCN</b>	TiCN gecoat	Revêtement TiCN	Recubrimiento TiCN	TiCN Beschicht- ung
<b>HARD LUBE</b>	HARDLUBE- gecoat	Revêtement HARDLUBE	Recubrimiento HARDLUBE	HARDLUBE Beschichtung
<b>DIN 371</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm

	NL	FR	ES	DE
<b>NFE 66103</b>	NFE norm	Norme NFE	Norma NFE	NFE Norm
<b>ISO 529</b>	ISO norm	Norme ISO	Norma ISO	ISO Norm
<b>NORM</b>	Phantom Norm	Norme Phantom	Norma Phantom	Werksnorm
<b>ECO</b>	ECO, basis kwaliteit	ECO, qualité standard	ECO, calidad básica	ECO, grund- legende Qualität
<b>ECO PRO</b>	ECO PRO, industrie kwaliteit	ECO PRO, qualité industrielle	ECO PRO, calidad de la industria	ECO PRO, Industriequalität
<b>2,5xD</b>	Max. draadlengte	Profondeur max. de taraudage	Profundidad máx. de roscar	Max. Gewindelänge
	Eindsnijder	Taraud finisseur	Macho de acabado	Fertigschneider
	Set a 3 stuks	Jeu de 3 pièces	Juego de 3 piezas	Satz von 3 Stück
	Voor handgebruik	Pour usage à la main	Para uso manual	für Handgebrauch
	Coniciteit	Conicité	Conicidad	Konizität
	Spiraalhoek	Angle d'hélice	Angulo de hélice	Spiralwinkel
	Met schilaansnijding	Coupe GUN	Con entrada corregida (GUN)	Schälanschnitt
	Aantal gangen aansnijding	Nombre de filets	Número de hilos	Anzahl Gängen Anschnitt
	Draad teruglopend na de 5e gang	Tronqués après le 5ème filet	Roasca rebajada a partir de 5° hilo	Rücklaufend nach dem 5. Gang
	Schilaansnijding snijplaten	Entrée GUN	Entrada corregida (GUN)	Schälanschnitt Schneideisen
	Koelkanaal	A trous d'huile	Canal de refrigeración	Mit Kühlkanal
	Doorlopende gaten	Trou débouchant	Agujero pasante	Durchgangslöcher
	Blinde gaten	Trou borgne	Agujero ciego	Sacklöcher
	Max. draadlengte 2xD	Profondeur max. du filetage 2xD	Profundidad máx. de roscar 2xD	Max. Gewin- delänge 2xD
	Max. draadlengte 1,5xD	Profondeur max. du filetage 1,5xD	Profundidad máx. de roscar 1,5xD	Max. Gewindelän- ge 1,5xD
<b>2B</b>	Tolerantie 2B	Tolérance 2B	Tolerancia 2B	Toleranz 2B
<b>+0,1 +0,2</b>	Overmaats	Surcoté	Sobremedida	Übermass
<b>INOX</b>	T.b.v. roestvast- staal	Pour Inox	Para acero inoxidable	Für Rostfreier Stahl
<b>ALU</b>	T.b.v. aluminium	Pour aluminium	Para aluminio	Für Aluminium
<b>GG GGG</b>	Voor gietijzer	Pour fonte	Para fundición	Für Gusseisen
<b>UNI</b>	Universeel	Universel	Universal	Universal High Performance
<b>HP2 UNI</b>	High Performance Universeel	Haute Perfor- mance Universel	Alta Rendimiento Universal	High Performance Universal
	Linkssnijdend	Coupe à gauche	Corte a izquierda	Linksschneidend
<b>DIN 6535-HA</b>	Cilindrische schacht DIN 6535-HA	Queue cylindrique DIN 6535-HA	Mango cilíndrico DIN 6535-HA	Zylinderschaft DIN 6535-HA

NL Draadsnijden  
FR Filetage  
ES Roscar  
DE Gewinde Schneiden



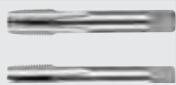























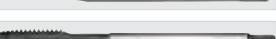





**P K** Bij uitstek geschikt  
**H N** Très approprié  
**M S** Muy adecuado  
**M S** Ideal geeignet

**P K** Beperkt geschikt  
**H N** Approprié  
**M S** Adecuado  
**M S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

> 21.100	<b>Phantom</b>	M	ISO 529	<b>P M K N</b>			P. 10
> 21.103	<b>Phantom</b>			<b>P M K N</b>			P. 10
> 21.110	<b>Phantom</b>	M	ISO 529	<b>P M K N</b>			P. 10
> 21.140	INTERNATIONAL TOOLS	M	DIN 352	<b>ECO P M K N</b>			P. 11
> 21.145	<b>Phantom</b>	M	DIN 352	<b>P M K N</b>			P. 11
> 21.148	<b>Phantom</b>	M	DIN 352	<b>P M K N</b>			P. 11
> 21.150	<b>Phantom</b>	M	DIN 352	<b>INOX P M K N</b>			P. 12
> 21.163	<b>Phantom</b>	M	ISO 529	+0,1 +0,2 <b>P M K N</b>			P. 12
> 21.200	<b>Phantom</b>	MF	ISO 529	<b>P M K N</b>			P. 12
> 21.202	<b>Phantom</b>	MF	ISO 529	<b>P M K N</b>			P. 13
> 21.240	INTERNATIONAL TOOLS	MF	DIN 2181	<b>ECO P M K N</b>			P. 13
> 21.250	<b>Phantom</b>	MF	DIN 2181	<b>P M K N</b>			P. 14
> 21.252	<b>Phantom</b>	MF	DIN 2181	<b>P M K N</b>			P. 14
> 21.300	<b>Phantom</b>	UNC	ISO 529	<b>P M K N</b>			P. 15
> 21.350	<b>Phantom</b>	UNF	ISO 529	<b>P M K N</b>			P. 15
> 21.392	<b>Phantom</b>	UN-8	ISO 529	<b>P M K N</b>			P. 16
> 21.400	<b>Phantom</b>	BSP G	ISO 529	<b>P M K N</b>			P. 16
> 21.402	<b>Phantom</b>	BSP G	ISO 529	<b>P M K N</b>			P. 16
> 21.404	INTERNATIONAL TOOLS	BSP G	DIN 353	<b>ECO P M K N</b>			P. 17
> 21.405	<b>Phantom</b>	BSP G		<b>P M K N</b>			P. 17
> 21.407	<b>Phantom</b>	BSP G		<b>P M K N</b>			P. 17
> 21.410	<b>Phantom</b>	BSPT Rc	ISO 529	<b>P M K N</b>			P. 18


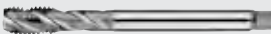













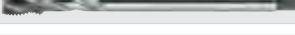

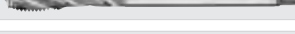



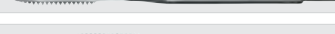



















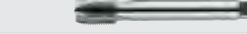





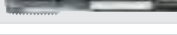



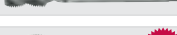

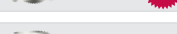



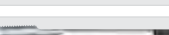














> 21.420	<b>Phantom</b>	BSW	ISO 529		<b>P M K N</b>			P. 18
> 21.430	<b>Phantom</b>	BSF	ISO 529		<b>P M K N</b>			P. 19
> 21.500	<b>Phantom</b>	NPT	ISO 529		<b>P M K N</b>			P. 19
> 21.600	<b>Phantom</b>	PG	ISO 529		<b>P M K N</b>			P. 19
> 21.812	<b>Phantom</b>	M	ISO 529	Phan-Coil	<b>P M K N</b>			P. 20
> 21.822	<b>Phantom</b>	MF	ISO 529	Phan-Coil	<b>P M K N</b>			P. 20
> 21.832	<b>Phantom</b>	UNC	ISO 529	Phan-Coil	<b>P M K N</b>			P. 20
> 21.840	<b>Phantom</b>	UNF	ISO 529	Phan-Coil	<b>P M K N</b>			P. 20
> 81.900								P. 21
> 81.905								P. 21
> 81.930								P. 21
> 81.935								P. 21
> 81.950								P. 22
> 22.190	INTERNATIONAL TOOLS	M	DIN 352		<b>P K N</b>			P. 23
> 22.191	INTERNATIONAL TOOLS	M	DIN 371		<b>P K N</b>			P. 23
> 22.192	INTERNATIONAL TOOLS	M	DIN 376		<b>P K N</b>			P. 23
> 22.195	INTERNATIONAL TOOLS	M	DIN 371		<b>P K N</b>			P. 23
> 22.196	INTERNATIONAL TOOLS	M	DIN 376		<b>P K N</b>			P. 24
> 22.197	INTERNATIONAL TOOLS	M	DIN 371		<b>P M K N</b>			P. 24
> 22.198	INTERNATIONAL TOOLS	M	DIN 376		<b>P M K N</b>			P. 24
> 22.200	<b>Phantom</b>	M	DIN 371		<b>P M K N S</b>			P. 25
> 22.201	<b>Phantom</b>	M	DIN 376		<b>P M K N S</b>			P. 25
> 22.205	<b>Phantom</b>	M	ISO 529		<b>P K N</b>			P. 25
> 22.210	<b>Phantom</b>	M	DIN 371		<b>P M K N S</b>			P. 26
> 22.211	<b>Phantom</b>	M	DIN 376		<b>P M K N S</b>			P. 26
> 22.220	<b>Phantom</b>	M	DIN 371		<b>P M K</b>			P. 26
> 22.221	<b>Phantom</b>	M	DIN 376		<b>P M K</b>			P. 27
> 22.230	<b>Phantom</b>	M	DIN 371		<b>P M K N S</b>			<b>NEW</b> P. 27
> 22.231	<b>Phantom</b>	M	DIN 376		<b>P M K N S</b>			<b>NEW</b> P. 27
> 22.240	<b>Phantom</b>	M	DIN 371		<b>P M K N S</b>			P. 28
> 22.241	<b>Phantom</b>	M	DIN 376		<b>P M K N S</b>			P. 28
> 22.252	<b>Phantom</b>	M	DIN 371		<b>P K N S</b>			P. 28


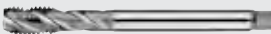







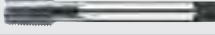
























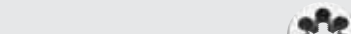
















> 22.253	Phantom	M	DIN 376		P	K	N	S		P. 29	
> 22.268	Phantom	M	DIN 371		P	M	K	N	S		P. 29
> 22.269	Phantom	M	DIN 376		P	M	K	N	S		P. 29
> 22.350	Phantom	M	NORM		P	M	K	N	S		P. 30
> 22.351	Phantom	M	NORM		P	M	K	N	S		P. 30
> 22.500	Phantom	M	DIN 371		P	M				P. 30	
> 22.501	Phantom	M	DIN 376		P	M				P. 31	
> 22.504	Phantom	M	DIN 371		P	M				P. 31	
> 22.505	Phantom	M	DIN 376		P	M				P. 31	
> 22.530	Phantom	M	DIN 371		P		N	S		P. 32	
> 22.531	Phantom	M	DIN 376		P		N	S		P. 32	
> 22.550	Phantom	M	DIN 371				N			P. 32	
> 22.595	INTERNATIONAL TOOLS	M	DIN 371		P	M				P. 33	
> 22.596	INTERNATIONAL TOOLS	M	DIN 376		P	M				P. 33	
> 22.600	Phantom	M	DIN 371		P	M				P. 33	
> 22.601	Phantom	M	DIN 376		P	M				P. 34	
> 22.604	Phantom	M	DIN 371		P	M				P. 34	
> 22.605	Phantom	M	DIN 376		P	M				P. 34	
> 22.610	Phantom	M	DIN 371		P	M				P. 35	
> 22.611	Phantom	M	DIN 376		P	M				P. 35	
> 22.650	Phantom	M	DIN 371				K			P. 35	
> 22.651	Phantom	M	DIN 376				K			P. 35	
> 22.700	Phantom	M	DIN 371		P		N			P. 36	
> 22.701	Phantom	M	DIN 376		P		N			P. 36	
> 22.705	Phantom	M	ISO 529		P		N			P. 36	
> 22.720	Phantom	M	DIN 371				N			P. 37	
> 22.721	Phantom	M	DIN 376				N			P. 37	
> 22.895	Phantom	M	Phan-Coil		P	K	N			P. 37	
> 22.896	Phantom	M	Phan-Coil		P	K	N			P. 37	
> 23.150	Phantom	M	DIN 371		P	K	N			P. 38	
> 23.151	Phantom	M	DIN 376		P	K	N			P. 38	
> 23.291	INTERNATIONAL TOOLS	M	DIN 371		P	K	N			P. 38	
> 23.292	INTERNATIONAL TOOLS	M	DIN 376		P	K	N			P. 38	
> 23.295	INTERNATIONAL TOOLS	M	DIN 371		P	K	N			P. 39	
> 23.296	INTERNATIONAL TOOLS	M	DIN 376		P	K	N			P. 39	

1  
HSS (4)  
2






































































> 23.297	INTERNATIONAL TOOLS	M	DIN 371		P	M	K	N		P. 39	
> 23.298	INTERNATIONAL TOOLS	M	DIN 376		P	M	K	N		P. 39	
> 23.300	Phantom	M	DIN 371		P	M	K	N	S		P. 40
> 23.301	Phantom	M	DIN 376		P	M	K	N	S		P. 40
> 23.305	Phantom	M	ISO 529		P		K	N			P. 40
> 23.310	Phantom	M	DIN 371		P		K				NEW P. 41
> 23.311	Phantom	M	DIN 376		P		K				NEW P. 41
> 23.320	Phantom	M	DIN 371		P	M	K	N	S		NEW P. 41
> 23.321	Phantom	M	DIN 376		P	M	K	N	S		NEW P. 42
> 23.324	Phantom	M	DIN 371		P	M	K	N	S		P. 42
> 23.325	Phantom	M	DIN 376		P	M	K	N	S		P. 42
> 23.352	Phantom	M	DIN 371		P		K	N	S		P. 42
> 23.353	Phantom	M	DIN 376		P		K	N	S		P. 43
> 23.368	Phantom	M	DIN 371		P	M	K	N	S		P. 43
> 23.369	Phantom	M	DIN 376		P	M	K	N	S		P. 43
> 23.370	Phantom	M	NORM		P	M	K	N	S		P. 44
> 23.371	Phantom	M	NORM		P	M	K	N	S		P. 44
> 23.400	Phantom	M	DIN 371		P	M					P. 44
> 23.401	Phantom	M	DIN 376		P	M					P. 45
> 23.404	Phantom	M	DIN 371		P	M					P. 45
> 23.405	Phantom	M	DIN 376		P	M					P. 45
> 23.430	Phantom	M	DIN 371		P				S		P. 46
> 23.431	Phantom	M	DIN 376		P				S		P. 46
> 23.440	Phantom	M			P	M		N	H		P. 46
> 23.445	INTERNATIONAL TOOLS	M	DIN 371		P	M					P. 47
> 23.446	INTERNATIONAL TOOLS	M	DIN 376		P	M					P. 47
> 23.450	Phantom	M	DIN 371		P	M			S		P. 47
> 23.451	Phantom	M	DIN 376		P	M			S		P. 48
> 23.454	Phantom	M	DIN 371		P	M			S		P. 48
> 23.455	Phantom	M	DIN 376		P	M			S		P. 48
> 23.480	Phantom	M	DIN 371		P			N			P. 49
> 23.481	Phantom	M	DIN 376		P			N			P. 49
> 23.500	Phantom	M	DIN 371					N			P. 49
> 23.501	Phantom	M	DIN 376					N			P. 49
> 23.585	Phantom	M	Phan-Coil		P		K	N			P. 50

> 23.586	<b>Phantom</b>	M	Phan-Coil		P	K	N			P. 50	
> 23.615	INTERNATIONAL TOOLS	MF	DIN 374		P	K	N			P. 51	
> 23.620	<b>Phantom</b>	MF	DIN 374		P	M	K	N	S		P. 51
> 23.621	<b>Phantom</b>	MF	DIN 374		P	M	K	N	S		P. 52
> 23.625	<b>Phantom</b>	MF	ISO 529		P	K	N			P. 52	
> 23.668	<b>Phantom</b>	MF	DIN 374		P	M	K	N	S		P. 53
> 23.750	<b>Phantom</b>	MF	DIN 374		P	M		N	S		P. 53
> 23.835	INTERNATIONAL TOOLS	MF	DIN 374		P	K	N			P. 53	
> 23.840	<b>Phantom</b>	MF	DIN 374		P	M	K	N	S		P. 54
> 23.868	<b>Phantom</b>	MF	DIN 374		P	M	K	N	S		P. 54
> 24.120	<b>Phantom</b>	UNC	DIN 371		P	M	K	N	S		P. 55
> 24.121	<b>Phantom</b>	UNC	DIN 376		P	M	K	N	S		P. 55
> 24.125	<b>Phantom</b>	UNC	ISO 529		P	K	N			P. 55	
> 24.340	<b>Phantom</b>	UNC	DIN 371		P	M	K	N	S		P. 56
> 24.341	<b>Phantom</b>	UNC	DIN 376		P	M	K	N	S		P. 56
> 24.520	<b>Phantom</b>	UNF	DIN 371		P	M	K	N	S		P. 56
> 24.521	<b>Phantom</b>	UNF	DIN 376		P	M	K	N	S		P. 57
> 24.525	<b>Phantom</b>	UNF	ISO 529		P	K	N			P. 57	
> 24.740	<b>Phantom</b>	UNF	DIN 371		P	M	K	N	S		P. 57
> 24.741	<b>Phantom</b>	UNF	DIN 376		P	M	K	N	S		P. 58
> 24.991	<b>Phantom</b>	UNEF	DIN 374		P	M	K	N			P. 58
> 25.095	INTERNATIONAL TOOLS	BSP G	DIN 5156		P	K	N			P. 58	
> 25.097	<b>Phantom</b>	BSP G	DIN 5156		P	M	K	N	S		P. 59
> 25.100	<b>Phantom</b>	BSP G	DIN 5156		P	K	N			P. 59	
> 25.105	<b>Phantom</b>	BSP G	ISO 529		P	K	N			P. 59	
> 25.160	<b>Phantom</b>	BSP G	DIN 5156		P	M					P. 60
> 25.295	INTERNATIONAL TOOLS	BSP G	DIN 5156		P	K	N			P. 60	
> 25.297	<b>Phantom</b>	BSP G	DIN 5156		P	M	K	N	S		P. 60
> 25.300	<b>Phantom</b>	BSP G	DIN 5156		P	K	N			P. 61	
> 25.360	<b>Phantom</b>	BSP G	DIN 5156		P	M					P. 61
> 25.480	<b>Phantom</b>	BSPT Rc	DIN 5156		P	M	K	N			P. 61
> 25.500	<b>Phantom</b>	BSPP Rp	DIN 5156		P	M	K	N			P. 62
> 25.520	<b>Phantom</b>	BSW	DIN 2182		P	K	N			P. 62	
> 25.521	<b>Phantom</b>	BSW	DIN 2183		P	K	N			P. 62	
> 25.640	<b>Phantom</b>	BSW	DIN 2182		P	K	N			P. 63	



















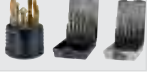


1  
2  
HSS-E

> 25.641	<b>Phantom</b>	BSW	DIN 2183		P	K	N		P. 63			
> 25.720	<b>Phantom</b>	BSF	DIN 371		P	K	N		P. 63			
> 25.721	<b>Phantom</b>	BSF	DIN 376		P	K	N		P. 64			
> 25.760	<b>Phantom</b>	BSC FG	DIN 79012		P	K	N		P. 64			
> 25.820	<b>Phantom</b>	NPT	DIN 374		P	K	N		P. 64			
> 25.840	<b>Phantom</b>	NPTF	DIN 374		P	K	N		P. 65			
> 25.900	<b>Phantom</b>	PG	DIN 40433		P	K	N		P. 65			
> 25.950	<b>Phantom</b>	Tr	DIN 103		P	K	N		P. 65			
> 26.100	<b>Phantom</b>	M	DIN 371		P		N		P. 66			
> 26.101	<b>Phantom</b>	M	DIN 376		P		N		P. 66			
> 26.110	<b>Phantom</b>	M	DIN 371		P	M	N		P. 66			
> 26.111	<b>Phantom</b>	M	DIN 376		P	M			P. 66			
> 26.160	<b>Phantom</b>	M	DIN 371		P	M	N		P. 67			
> 26.161	<b>Phantom</b>	M	DIN 376		P	M	N		P. 67			
> 26.310	<b>Phantom</b>	M	DIN 376		P	M	K	N		P. 67		
> 26.316	<b>Phantom</b>	M	DIN 376		P	M	K	N	S	H		P. 68
> 26.384	<b>Phantom</b>	M	DIN 376		P	M	K	N	S	H		P. 68
> 26.500	<b>Phantom</b>	M	NORM		P	K	N		P. 68			
> 26.700	<b>Phantom</b>	M	NORM		P		N		P. 69			
> 27.100	INTERNATIONAL TOOLS	M	DIN EN 22568		P	K	N		P. 70			
> 27.110	INTERNATIONAL TOOLS	M	DIN EN 22568		P	K	N		P. 70			
> 27.120	<b>Phantom</b>	M	DIN EN 22568		P	M	N		P. 70			
> 27.150	<b>Phantom</b>	M	DIN EN 22568		P	M	N	S		P. 71		
> 27.175	<b>Phantom</b>	M	DIN EN 22568				N		P. 71			
> 27.200	INTERNATIONAL TOOLS	MF	DIN EN 22568		P	K	N		P. 71			
> 27.220	<b>Phantom</b>	MF	DIN EN 22568		P	M	N		P. 72			
> 27.300	INTERNATIONAL TOOLS	UNC	DIN EN 22568		P	K	N		P. 72			
> 27.320	<b>Phantom</b>	UNC	DIN EN 22568		P	M	N		P. 73			



> 27.400	INTERNATIONAL TOOLS	UNF	DIN EN 22568	  		P. 73
> 27.420	<b>Phantom</b>	UNF	DIN EN 22568	   		P. 73
> 27.470	<b>Phantom</b>	UNEF	DIN EN 22568	   		P. 74
> 27.500	INTERNATIONAL TOOLS	BSP G	DIN EN 24231	  		P. 74
> 27.520	<b>Phantom</b>	BSP G	DIN EN 24231	   		P. 74
> 27.530	<b>Phantom</b>	BSPT Rc	DIN EN 24230	   		P. 75
> 27.550	INTERNATIONAL TOOLS	BSW	DIN EN 22568	  		P. 75
> 27.560	<b>Phantom</b>	BSW	DIN EN 22568	   		P. 75
> 27.575	<b>Phantom</b>	BSF	DIN EN 22568	   		P. 76
> 27.590	<b>Phantom</b>	BSC FG	DIN EN 22568	   		P. 76
> 27.600	<b>Phantom</b>	NPT	DIN EN 24230	   		P. 76
> 27.610	<b>Phantom</b>	NPTF	DIN EN 24230	   		P. 77
> 27.650	<b>Phantom</b>	PG	DIN EN 40434	   		P. 77
> 81.910						P. 78
> 27.700	INTERNATIONAL TOOLS	M	DIN 382			P. 79
> 27.750	INTERNATIONAL TOOLS	MF	DIN 382			P. 79
> 27.800	INTERNATIONAL TOOLS	UNC	DIN 382			P. 79
> 27.840	INTERNATIONAL TOOLS	UNF	DIN 382			P. 80
> 27.900	INTERNATIONAL TOOLS	BSP G	DIN 382			P. 80
> 27.940	INTERNATIONAL TOOLS	BSW	DIN 382			P. 80



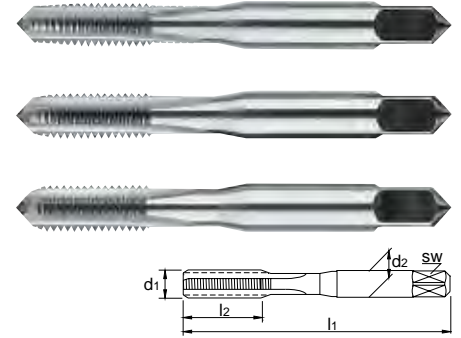
> 27.980	<b>Phantom</b>	NPT	DIN 382		P. 80
> 28.800	INTERNATIONAL TOOLS				P. 81
> 28.810	INTERNATIONAL TOOLS				P. 81
> 28.830	<b>Phantom</b>	M	Phan- Coil		P. 82
> 28.831	<b>Phantom</b>	MF	Phan- Coil		P. 82
> 28.832	<b>Phantom</b>	UNC	Phan- Coil		P. 83
> 28.833	<b>Phantom</b>	UNF	Phan- Coil		P. 83
> 28.860	<b>Phantom</b>		Phan- Coil		P. 83
> 28.865	<b>Phantom</b>		Phan- Coil		P. 84
> 28.870	<b>Phantom</b>	M	Phan- Coil		P. 84
> 28.871	<b>Phantom</b>	MF	Phan- Coil		P. 85
> 28.872	<b>Phantom</b>	UNC	Phan- Coil		P. 85
> 28.880	<b>Phantom</b>	M	Phan- Coil		P. 86
> 29.100	INTERNATIONAL TOOLS				P. 87
> 29.120	INTERNATIONAL TOOLS				P. 87
> 29.130	INTERNATIONAL TOOLS				P. 87
> 29.180	INTERNATIONAL TOOLS				P. 88
> 29.190	INTERNATIONAL TOOLS				P. 88
> 29.195	INTERNATIONAL TOOLS				P. 89
> 29.220	<b>Phantom</b>				P. 89
> 29.240	<b>Phantom</b>				P. 90

> 29.250	<b>Phantom</b>					P. 90
> 29.260	<b>Phantom</b>					P. 91
> 29.280						P. 91
> 29.300	INTERNATIONAL TOOLS					P. 91
> 29.910	<b>Phantom</b>	M	ISO 529	← P M K N		P. 92
> 29.950	<b>Phantom</b>	M		← P M K N S		P. 92
> 29.951	<b>Phantom</b>	M		← P M K N S		P. 92
> 29.956	<b>Phantom</b>	M		← P M K N S		P. 93
> 29.957	<b>Phantom</b>	M		← P M K N S		P. 93
> 29.960	<b>Phantom</b>	MF		← P M K N S		P. 93
> 29.961	<b>Phantom</b>	MF		← P M K N S		P. 94
> 29.969	<b>Phantom</b>	BSC FG		← P K N		P. 94
> 29.970	INTERNATIONAL TOOLS	M	DIN EN 22568	← P K N		P. 94
> 29.971	<b>Phantom</b>	M	DIN EN 22568	← P M N		P. 95
> 29.972	INTERNATIONAL TOOLS	MF	DIN EN 22568	← P K N		P. 95
> 29.973	<b>Phantom</b>	MF	DIN EN 22568	← P M N		P. 95
> 29.978	<b>Phantom</b>	UNF	DIN EN 22568	← P M N		P. 96
> 29.985	INTERNATIONAL TOOLS	BSP G	DIN EN 24230	← P K N		P. 96
> 29.989	<b>Phantom</b>	BSC FG	DIN EN 22568	← P M N		P. 96
> 29.990	INTERNATIONAL TOOLS	M	DIN 382	←		P. 97

SC 1  
HSS (4) 1  
2

## > 21.100 Phantom

NL HSS Handtappen Metrisch, set à 3 stuks  
 FR Tarauds à main HSS Métrique, Jeu de 3 pièces  
 ES Machos mano HSS Métrica, juego de 3 piezas  
 DE HSS Handgewindebohrer Metrisch, Satz von 3 Stück



HSS	M	60°	NFE 66103	ISO 529			ISO 2 6H
P 11 s500 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

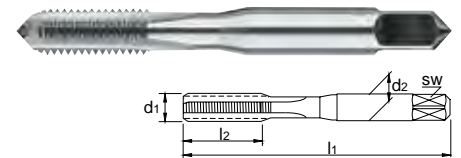
Ref.	d1	P	l1	l2	d2	sw
21.100.0160	M1,6	0.35	28	9	3	2.35
21.100.0200	M2	0.4	41	8	2.5	2
21.100.0220	M2,2	0.45	44.5	8	2.8	2.24
21.100.0250	M2,5	0.45	44.5	9.5	2.8	2.24
21.100.0260	M2,6	0.45	44.5	9.5	2.8	2.24
21.100.0300	M3	0.5	48	11	3.15	2.5
21.100.0350	M3,5	0.6	50	13	3.55	2.8
21.100.0400	M4	0.7	53	13	4	3.15
21.100.0450	M4,5	0.75	53	13	4	3.15
21.100.0500	M5	0.8	58	16	5	4
21.100.0550	M5,5	0.9	58	16	5	4

Ref.	d1	P	l1	l2	d2	sw
21.100.0600	M6	1	66	19	6.3	5
21.100.0700	M7	1	66	19	7.1	5.6
21.100.0800	M8	1.25	72	22	8	6.3
21.100.0900	M9	1.25	72	22	9	7.1
21.100.1000	M10	1.5	80	24	10	8
21.100.1100	M11	1.5	85	25	8	6.3
21.100.1200	M12	1.75	89	29	9	7.1
21.100.1400	M14	2	95	30	11.2	9
21.100.1600	M16	2	102	32	12.5	10
21.100.1800	M18	2.5	112	37	14	11.2
21.100.2000	M20	2.5	112	37	14	11.2

Ref.	d1	P	l1	l2	d2	sw
21.100.2200	M22	2.5	118	38	16	12.5
21.100.2400	M24	3	130	45	18	14
21.100.2700	M27	3	135	45	20	16
21.100.3000	M30	3.5	138	48	20	16
21.100.3300	M33	3.5	151	51	22.4	18
21.100.3600	M36	4	162	57	25	20
21.100.3900	M39	4	170	60	28	22.4
21.100.4200	M42	4.5	170	60	28	22.4
21.100.4500	M45	4.5	187	67	31.5	25
21.100.4800	M48	5	187	67	31.5	25
21.100.5200	M52	5	200	70	35.5	28

## > 21.103 Phantom

NL HSS Handtappen vorm C, Metrisch  
 FR Tarauds à main HSS Forme C, Métrique  
 ES Machos mano HSS Forma C, Métrica  
 DE HSS Handgewindebohrer Form C, Metrisch



HSS	M	60°	NFE 66103	ISO 529			ISO 2 6H
P 11 s500 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

**NEUW / NOUVEAU / NUEVO / NEU**

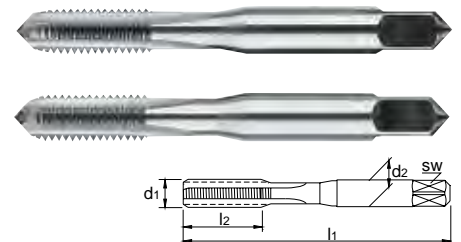
Ref.	d1	P	l1	l2	d2	sw
21.103.0200	M2	0.4	41	8	2.5	2
21.103.0250	M2,5	0.45	44.5	9.5	2.8	2.24
21.103.0300	M3	0.5	48	11	3.15	2.5
21.103.0400	M4	0.7	53	13	4	3.15

Ref.	d1	P	l1	l2	d2	sw
21.103.0800	M8	1.25	72	22	8	6.3
21.103.1200	M12	1.75	89	29	9	7.1
21.103.1400	M14	2	95	30	11.2	9
21.103.1600	M16	2	102	32	12.5	10

Ref.	d1	P	l1	l2	d2	sw
21.103.2000	M20	2.5	112	37	14	11.2
21.103.2400	M24	3	130	45	18	14

## > 21.110 Phantom

NL HSS Handtappen Metrisch, set à 2 stuks, Nr. 2+3  
 FR Tarauds à main HSS Métrique, Jeu de 2 pièces, N° 2+3  
 ES Machos mano HSS Métrica, juego de 2 piezas, N° 2+3  
 DE HSS Handgewindebohrer Metrisch, Satz von 2 Stück, Nr. 2+3



HSS	M	60°	NFE 66103	ISO 529			ISO 2 6H
P 11 s500 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

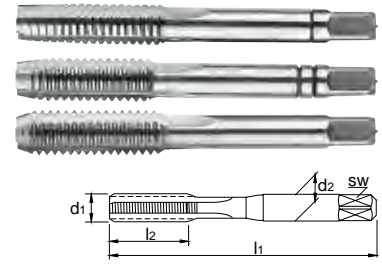
Ref.	d1	P	l1	l2	d2	sw
21.110.0250	M2,5	0.45	44.5	9.5	2.8	2.24
21.110.0300	M3	0.5	48	11	3.15	2.5
21.110.0400	M4	0.7	53	13	4	3.15
21.110.0500	M5	0.8	58	16	5	4
21.110.0600	M6	1	66	19	6.3	5

Ref.	d1	P	l1	l2	d2	sw
21.110.0800	M8	1.25	72	22	8	6.3
21.110.1000	M10	1.5	80	24	10	8
21.110.1200	M12	1.75	89	29	9	7.1
21.110.1400	M14	2	95	30	11.2	9
21.110.1600	M16	2	102	32	12.5	10

Ref.	d1	P	l1	l2	d2	sw
21.110.1800	M18	2.5	112	37	14	11.2
21.110.2000	M20	2.5	112	37	14	11.2
21.110.2400	M24	3	130	45	18	14
21.110.2700	M27	3	135	45	20	16
21.110.3000	M30	3.5	138	48	20	16

> **21.140** **INTERNATIONAL TOOLS**

NL ECO HSS Handtappen Metrisch, set à 3 stuks  
 FR Tarauds à main HSS ECO Métrique, Jeu de 3 pièces  
 ES Machos mano HSS ECO Métrica, juego de 3 piezas  
 DE ECO HSS Handgewindebohrer Metrisch, Satz von 3 Stück



**HSS** **M** **60°** **DIN 352** **ISO 2 6H** **ECO**

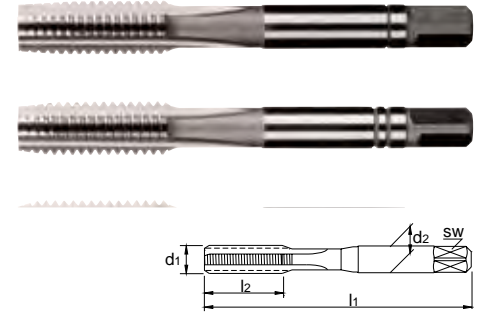
**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.140.0300	M3	0.5	40	11	3.5	2.7	21.140.1000	M10	1.5	70	24	7	5.5	21.140.2000	M20	2.5	95	34	16	12
21.140.0400	M4	0.7	45	13	4.5	3.4	21.140.1200	M12	1.75	75	28	9	7	21.140.2200	M22	2.5	100	34	18	14.5
21.140.0500	M5	0.8	50	16	6	4.9	21.140.1400	M14	2	80	30	11	9	21.140.2400	M24	3	110	38	18	14.5
21.140.0600	M6	1	56	19	6	4.9	21.140.1600	M16	2	80	32	12	9	21.140.2700	M27	3	110	38	20	16
21.140.0800	M8	1.25	63	22	6	4.9	21.140.1800	M18	2.5	95	34	14	11	21.140.3000	M30	3.5	125	45	22	18

> **21.145** **Phantom**

NL HSS Handtappen Metrisch, set à 3 stuks  
 FR Tarauds à main HSS Métrique, Jeu de 3 pièces  
 ES Machos mano HSS Métrica, juego de 3 piezas  
 DE HSS Handgewindebohrer Metrisch, Satz von 3 Stück



**NIEUW / NOUVEAU / NUEVO / NEU**

**HSS** **M** **60°** **DIN 352** **ISO 2 6H**

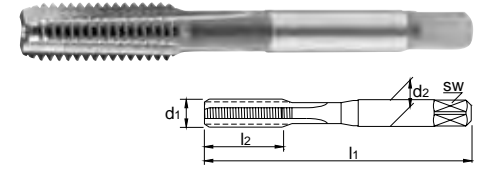
**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.145.0160	M1,6	0.35	32	8	2.5	2.1	21.145.0800	M8	1.25	63	22	6	4.9	21.145.2200	M22	2.5	100	34	18	14.5
21.145.0200	M2	0.4	36	8	2.8	2.1	21.145.0900	M9	1.25	63	22	7	5.5	21.145.2400	M24	3	110	38	18	14.5
21.145.0250	M2,5	0.45	40	9	2.8	2.1	21.145.1000	M10	1.5	70	24	7	5.5	21.145.2700	M27	3	110	38	20	16
21.145.0300	M3	0.5	40	11	3.5	2.7	21.145.1100	M11	1.5	70	24	8	6.2	21.145.3000	M30	3.5	125	45	22	18
21.145.0350	M3,5	0.6	45	12	4	3	21.145.1200	M12	1.75	75	28	9	7	21.145.3300	M33	3.5	125	50	25	20
21.145.0400	M4	0.7	45	13	4.5	3.4	21.145.1400	M14	2	80	30	11	9	21.145.3600	M36	4	150	56	28	22
21.145.0500	M5	0.8	50	16	6	4.9	21.145.1600	M16	2	80	32	12	9	21.145.3900	M39	4	150	60	32	24
21.145.0600	M6	1	56	19	6	4.9	21.145.1800	M18	2.5	95	34	14	11	21.145.4200	M42	4.5	150	60	32	24
21.145.0700	M7	1	56	19	6	4.9	21.145.2000	M20	2.5	95	34	16	12							

> **21.148** **Phantom**

NL HSS Eindsnijder Metrisch  
 FR Taraud finisseur HSS Métrique  
 ES Macho de acabado HSS Métrica  
 DE HSS Fertigschneider Metrisch



**NIEUW / NOUVEAU / NUEVO / NEU**

**HSS** **M** **60°** **DIN 352** **ISO 2 6H**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

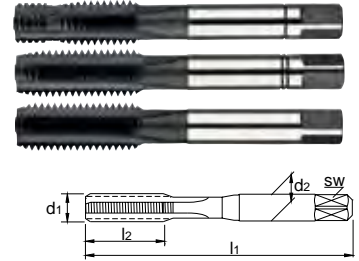
Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.148.0160	M1,6	0.35	32	8	2.5	2.1	21.148.0600	M6	1	56	19	6	4.9	21.148.1400	M14	2	80	30	11	9
21.148.0200	M2	0.4	36	8	2.8	2.1	21.148.0700	M7	1	56	19	6	4.9	21.148.1600	M16	2	80	32	12	9
21.148.0250	M2,5	0.45	40	9	2.8	2.1	21.148.0800	M8	1.25	63	22	6	4.9	21.148.1800	M18	2.5	95	34	14	11
21.148.0300	M3	0.5	40	11	3.5	2.7	21.148.0900	M9	1.25	63	22	7	5.5	21.148.2000	M20	2.5	95	34	16	12
21.148.0350	M3,5	0.6	45	12	4	3	21.148.1000	M10	1.5	70	24	7	5.5	21.148.2200	M22	2.5	100	34	18	14.5
21.148.0400	M4	0.7	45	13	4.5	3.4	21.148.1100	M11	1.5	70	24	8	6.2	21.148.2400	M24	3	110	38	18	14.5
21.148.0500	M5	0.8	50	16	6	4.9	21.148.1200	M12	1.75	75	28	9	7	21.148.2700	M27	3	110	38	20	16

## > 21.148 Phantom

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.148.3000	M30	3.5	125	45	22	18	21.148.3600	M36	4	150	56	28	22	21.148.4200	M42	4.5	150	60	32	24
21.148.3300	M33	3.5	125	50	25	20	21.148.3900	M39	4	150	60	32	24							

## > 21.150 Phantom

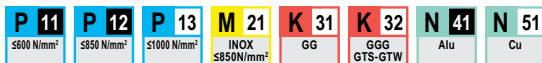
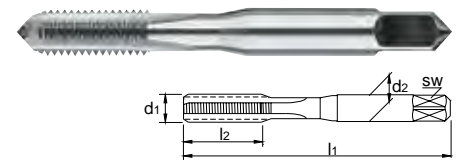
- NL HSS-E Handtappen Metrisch, set à 3 stuks, stoomontlaten, Nr. 1: met geleiding  
 FR Tarauds à main HSS-E Métrique, Jeu de 3 pièces, vaporisée, N° 1: avec guidage  
 ES Machos mano HSS-E Métrica, juego de 3 piezas, vaporizada, N° 1: con guía  
 DE HSS-E Handgewindebohrer Metrisch, Satz von 3 Stück, dampfangelassen, Nr. 1: mit einfacher Führung



Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.150.0300	M3	0.5	40	11	3.5	2.7	21.150.0600	M6	1	56	19	6	4.9	21.150.1200	M12	1.75	75	28	9	7
21.150.0400	M4	0.7	45	13	4.5	3.4	21.150.0800	M8	1.25	63	22	6	4.9							
21.150.0500	M5	0.8	50	16	6	4.9	21.150.1000	M10	1.5	70	24	7	5.5							

## > 21.163 Phantom

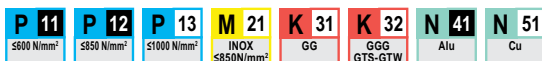
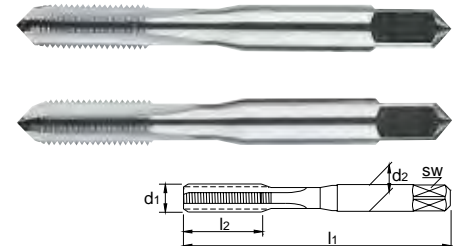
- NL HSS Eindsnijder Metrisch, Overmaats  
 FR Taraud finisseur HSS Métrique, surcoté  
 ES Macho de acabado HSS Métrica, sobremedida  
 DE HSS Fertigschneider Metrisch, Übermaß



Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.163.0610	M6+0,1	1	66	19	6.3	5	21.163.1220	M12+0,2	1.75	89	29	9	7.1	21.163.1620	M16+0,2	2	102	32	12.5	10
21.163.0820	M8+0,2	1.25	72	22	8	6.3	21.163.1620	M16+0,2	2	102	32	12.5	10	21.163.2020	M20+0,2	2.5	112	37	14	11.2
21.163.1010	M10+0,1	1.5	80	24	10	8	21.163.2020	M20+0,2	2.5	112	37	14	11.2	21.163.2420	M24+0,2	3	130	45	18	14
21.163.1210	M12+0,1	1.75	89	29	9	7.1														

## > 21.200 Phantom

- NL HSS Handtappen Metrisch Fijn, set à 2 stuks  
 FR Tarauds à main HSS Métrique Fin, Jeu de 2 pièces  
 ES Machos mano HSS Métrica Fina, juego de 2 piezas  
 DE HSS Handgewindebohrer Metrisch Fein, Satz von 2 Stück



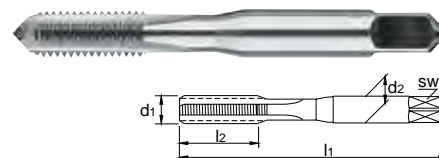
Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.200.0303	MF3	0.35	48	11	3.15	2.5	21.200.1007	MF10	0.75	80	24	10	8	21.200.1010	MF10	1	80	24	10	8
21.200.0405	MF4	0.5	53	13	4	3.15	21.200.1010	MF10	1	80	24	10	8	21.200.1012	MF10	1.25	80	24	10	8
21.200.0505	MF5	0.5	58	16	5	4	21.200.1012	MF10	1.25	80	24	10	8	21.200.1110	MF11	1	85	25	8	6.3
21.200.0605	MF6	0.5	66	19	6.3	5	21.200.1110	MF11	1	85	25	8	6.3	21.200.1210	MF12	1	89	29	9	7.1
21.200.0607	MF6	0.75	66	19	6.3	5	21.200.1210	MF12	1	89	29	9	7.1	21.200.1212	MF12	1.25	89	29	9	7.1
21.200.0707	MF7	0.75	66	19	7.1	5.6	21.200.1212	MF12	1.25	89	29	9	7.1	21.200.1215	MF12	1.5	89	29	9	7.1
21.200.0807	MF8	0.75	72	22	8	6.3	21.200.1215	MF12	1.5	89	29	9	7.1	21.200.1410	MF14	1	95	30	11.2	9
21.200.0810	MF8	1	72	22	8	6.3	21.200.1410	MF14	1	95	30	11.2	9	21.200.1412	MF14	1.25	95	30	11.2	9
21.200.0910	MF9	1	72	22	9	7.1	21.200.1412	MF14	1.25	95	30	11.2	9							

› **21.200 Phantom**

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
21.200.1415	MF14	1.5	95	30	11.2	9	21.200.2210	MF22	1	118	38	16	12.5
21.200.1610	MF16	1	102	32	12.5	10	21.200.2215	MF22	1.5	118	38	16	12.5
21.200.1612	MF16	1.25	102	32	12.5	10	21.200.2220	MF22	2	118	38	16	12.5
21.200.1615	MF16	1.5	102	32	12.5	10	21.200.2415	MF24	1.5	120	35	18	14
21.200.1810	MF18	1	112	37	14	11.2	21.200.2420	MF24	2	120	35	18	14
21.200.1815	MF18	1.5	112	37	14	11.2	21.200.2715	MF27	1.5	127	37	20	16
21.200.1820	MF18	2	112	37	14	11.2	21.200.2720	MF27	2	127	37	20	16
21.200.2010	MF20	1	112	37	14	11.2	21.200.3015	MF30	1.5	127	37	20	16
21.200.2015	MF20	1.5	112	37	14	11.2	21.200.3020	MF30	2	127	37	20	16
21.200.2020	MF20	2	112	37	14	11.2	21.200.3320	MF33	2	137	37	22.4	18

› **21.202 Phantom**

NL HSS Handtappen vorm C, Metrisch Fijn  
 FR Tarauts à main HSS Forme C, Métrique Fin  
 ES Machos mano HSS Forma C, Métrica Fina  
 DE HSS Handgewindebohrer Form C, Metrisch Fein



**NIEUW NOUVEAU NUEVO NEU**

HSS MF 60° NFE 66103 ISO 529

ISO 2 6H

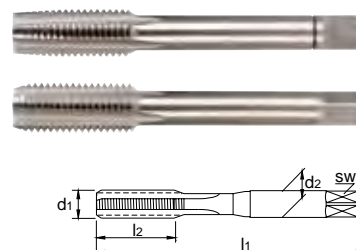
P 11 ≤800 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² M 21 INOX ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu

Ref.	d1	P	l1	l2	d2	sw
21.202.0810	MF8	1	72	22	8	6.3
21.202.1012	MF10	1.25	80	24	10	8
21.202.1210	MF12	1	89	29	9	7.1
21.202.1212	MF12	1.25	89	29	9	7.1

Ref.	d1	P	l1	l2	d2	sw
21.202.1215	MF12	1.5	89	29	9	7.1
21.202.1415	MF14	1.5	95	30	11.2	9
21.202.1615	MF16	1.5	102	32	12.5	10
21.202.2015	MF20	1.5	112	37	14	11.2

› **21.240 INTERNATIONAL TOOLS**

NL ECO HSS Handtappen Metrisch Fijn, set à 2 stuks  
 FR Tarauts à main HSS ECO Métrique Fin, Jeu de 2 pièces  
 ES Machos mano HSS ECO Métrica Fina, juego de 2 piezas  
 DE ECO HSS Handgewindebohrer Metrisch Fein, Satz von 2 Stück



HSS MF 60° DIN 2181

ISO 2 6H ECO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² M 21 INOX ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu

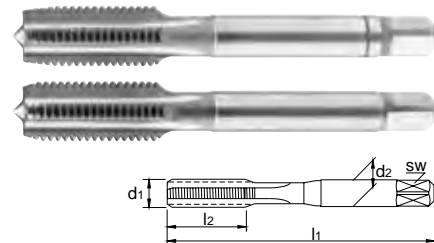
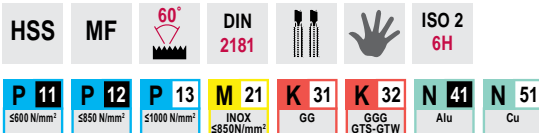
Ref.	d1	P	l1	l2	d2	sw
21.240.0405	MF4	0.5	45	10	4.5	3.4
21.240.0505	MF5	0.5	52	12	6	4.9
21.240.0607	MF6	0.75	56	14	6	4.9
21.240.0807	MF8	0.75	63	18	6	4.9
21.240.0810	MF8	1	63	22	6	4.9
21.240.1010	MF10	1	63	20	7	5.5
21.240.1012	MF10	1.25	70	24	7	5.5
21.240.1210	MF12	1	70	22	9	7
21.240.1212	MF12	1.25	70	22	9	7
21.240.1215	MF12	1.5	70	22	9	7
21.240.1410	MF14	1	70	22	11	9

Ref.	d1	P	l1	l2	d2	sw
21.240.1412	MF14	1.25	70	22	11	9
21.240.1415	MF14	1.5	70	22	11	9
21.240.1615	MF16	1.5	70	22	12	9
21.240.1810	MF18	1	80	22	14	11
21.240.1815	MF18	1.5	80	22	14	11
21.240.2015	MF20	1.5	80	22	16	12
21.240.2215	MF22	1.5	80	22	18	14.5
21.240.2415	MF24	1.5	90	22	18	14.5
21.240.2420	MF24	2	90	22	18	14.5
21.240.3015	MF30	1.5	90	22	22	18
21.240.3020	MF30	2	90	22	22	18



## > 21.250 Phantom

NL HSS Handtappen Metrisch Fijn, set à 2 stuks  
 FR Tarauds à main HSS Métrique Fin, Jeu de 2 pièces  
 ES Machos mano HSS Métrica Fina, juego de 2 piezas  
 DE HSS Handgewindebohrer Metrisch Fein, Satz von 2 Stück



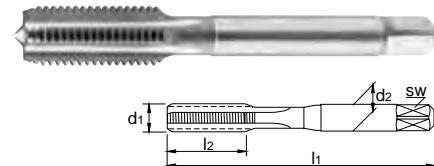
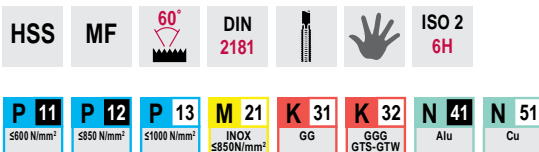
**NIEUW NOUVEAU NUEVO NEU**

Ref.	d1	P	l1	l2	d2	sw
21.250.0405	MF4	0.5	45	10	4.5	3.4
21.250.0505	MF5	0.5	52	12	6	4.9
21.250.0607	MF6	0.75	56	14	6	4.9
21.250.0810	MF8	1	63	22	6	4.9
21.250.1010	MF10	1	63	20	7	5.5
21.250.1012	MF10	1.25	70	24	7	5.5
21.250.1210	MF12	1	70	22	9	7
21.250.1212	MF12	1.25	70	22	9	7
21.250.1215	MF12	1.5	70	22	9	7
21.250.1410	MF14	1	70	22	11	9
21.250.1412	MF14	1.25	70	22	11	9

Ref.	d1	P	l1	l2	d2	sw
21.250.1415	MF14	1.5	70	22	11	9
21.250.1610	MF16	1	70	22	12	9
21.250.1615	MF16	1.5	70	22	12	9
21.250.1810	MF18	1	80	22	14	11
21.250.1815	MF18	1.5	80	22	14	11
21.250.2015	MF20	1.5	80	22	16	12
21.250.2020	MF20	2	80	22	16	12
21.250.2215	MF22	1.5	80	22	18	14.5
21.250.2415	MF24	1.5	90	22	18	14.5
21.250.2420	MF24	2	90	22	18	14.5

## > 21.252 Phantom

NL HSS Eindsnijder Metrisch Fijn  
 FR Taraud finisseur HSS Métrique Fin  
 ES Macho de acabado HSS Métrica Fina  
 DE HSS Fertigschneider Metrisch Fein



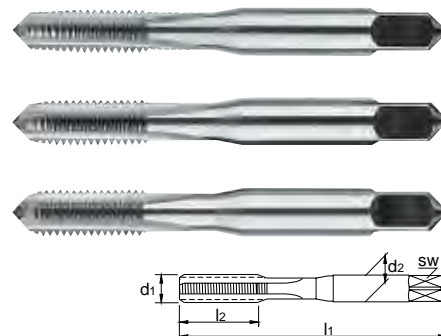
**NIEUW NOUVEAU NUEVO NEU**

Ref.	d1	P	l1	l2	d2	sw
21.252.0405	MF4	0.5	45	10	4.5	3.4
21.252.0505	MF5	0.5	52	12	6	4.9
21.252.0607	MF6	0.75	56	14	6	4.9
21.252.0810	MF8	1	63	22	6	4.9
21.252.1010	MF10	1	63	20	7	5.5
21.252.1012	MF10	1.25	70	24	7	5.5
21.252.1210	MF12	1	70	22	9	7
21.252.1212	MF12	1.25	70	22	9	7
21.252.1215	MF12	1.5	70	22	9	7
21.252.1410	MF14	1	70	22	11	9
21.252.1412	MF14	1.25	70	22	11	9

Ref.	d1	P	l1	l2	d2	sw
21.252.1415	MF14	1.5	70	22	11	9
21.252.1610	MF16	1	70	22	12	9
21.252.1615	MF16	1.5	70	22	12	9
21.252.1810	MF18	1	80	22	14	11
21.252.1815	MF18	1.5	80	22	14	11
21.252.2015	MF20	1.5	80	22	16	12
21.252.2020	MF20	2	80	22	16	12
21.252.2215	MF22	1.5	80	22	18	14.5
21.252.2415	MF24	1.5	90	22	18	14.5
21.252.2420	MF24	2	90	22	18	14.5

» 21.300 **Phantom**

NL HSS Handtappen UNC, set à 3 stuks  
 FR Tarauds à main HSS UNC, Jeu de 3 pièces  
 ES Machos mano HSS UNC, juego de 3 piezas  
 DE HSS Handgewindebohrer UNC, Satz von 3 Stück



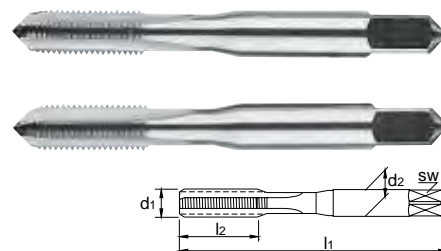
<b>HSS</b>	<b>UNC</b>	<b>60°</b>	<b>NFE 66104</b>	<b>ISO 529</b>			<b>2B</b>
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu

Ref.	d1	P	l1	l2	d2	sw
21.300.0218	UNC Nr. 2	56	41	8	2.5	2
21.300.0251	UNC Nr. 3	48	44	9.5	2.8	2.24
21.300.0284	UNC Nr. 4	40	48	11	3.15	2.5
21.300.0317	UNC Nr. 5	40	50	13	3.55	2.8
21.300.0350	UNC Nr. 6	32	50	13	3.55	2.8
21.300.0416	UNC Nr. 8	32	53	13	4	3.15
21.300.0482	UNC Nr. 10	24	58	16	5	4
21.300.0548	UNC Nr. 12	24	66	19	6.3	5
21.300.0635	UNC 1/4	20	66	19	6.3	5
21.300.0794	UNC 5/16	18	72	22	8	6.3
21.300.0952	UNC 3/8	16	80	24	10	8

Ref.	d1	P	l1	l2	d2	sw
21.300.1111	UNC 7/16	14	85	25	8	6.3
21.300.1270	UNC 1/2	13	89	29	9	7.1
21.300.1429	UNC 9/16	12	95	30	11.2	9
21.300.1588	UNC 5/8	11	102	32	12.5	10
21.300.1905	UNC 3/4	10	112	37	14	11.2
21.300.2222	UNC 7/8	9	118	38	16	12.5
21.300.2540	UNC 1	8	120	35	18	14
21.300.2858	UNC 1.1/8	7	127	37	20	16
21.300.3175	UNC 1.1/4	7	137	37	22.4	18
21.300.3493	UNC 1.3/8	6	144	39	25	20
21.300.3810	UNC 1.1/2	6	149	39	28	22.4

» 21.350 **Phantom**

NL HSS Handtappen UNF, set à 2 stuks  
 FR Tarauds à main HSS UNF, Jeu de 2 pièces  
 ES Machos mano HSS UNF, juego de 2 piezas  
 DE HSS Handgewindebohrer UNF, Satz von 2 Stück



<b>HSS</b>	<b>UNF</b>	<b>60°</b>	<b>NFE 66104</b>	<b>ISO 529</b>			<b>2B</b>
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu

Ref.	d1	P	l1	l2	d2	sw
21.350.0218	UNF Nr. 2	64	41	8	2.5	2
21.350.0284	UNF Nr. 4	48	48	11	3.15	2.5
21.350.0416	UNF Nr. 8	36	53	13	4	3.15
21.350.0482	UNF Nr. 10	32	58	16	5	4
21.350.0548	UNF Nr. 12	28	66	19	6.3	5
21.350.0635	UNF 1/4	28	66	19	6.3	5
21.350.0794	UNF 5/16	24	72	22	8	6.3
21.350.0952	UNF 3/8	24	80	24	10	8
21.350.1111	UNF 7/16	20	85	25	8	6.3
21.350.1270	UNF 1/2	20	89	29	9	7.1

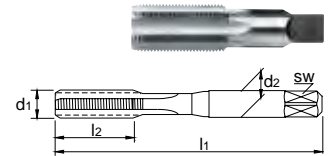
Ref.	d1	P	l1	l2	d2	sw
21.350.1429	UNF 9/16	18	95	30	11.2	9
21.350.1588	UNF 5/8	18	102	32	12.5	10
21.350.1905	UNF 3/4	16	112	37	14	11.2
21.350.2222	UNF 7/8	14	118	38	16	12.5
21.350.2540	UNF 1	12	130	45	18	14
21.350.2858	UNF 1.1/8	12	138	48	20	16
21.350.3175	UNF 1.1/4	12	151	51	22.4	18
21.350.3493	UNF 1.3/8	12	162	57	25	20
21.350.3810	UNF 1.1/2	12	170	60	28	22.4

## > 21.392 Phantom

NL HSS Eindsnijder vorm D, UN-8  
FR Taraud finisseur HSS Forme D, UN-8  
ES Macho de acabado HSS Forma D, UN-8  
DE HSS Fertigschneider Form D, UN-8

HSS UN-8 60° NFE 66103 ISO 529 2B

P 11 ≤500 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu



Ref.	d1	P	l1	l2	d2	sw
21.392.2858	UN 1.1/8	8	138	48	20	16
21.392.3175	UN 1.1/4	8	151	51	22.4	18
21.392.3493	UN 1.3/8	8	162	57	25	20
21.392.3810	UN 1.1/2	8	170	60	28	22.4

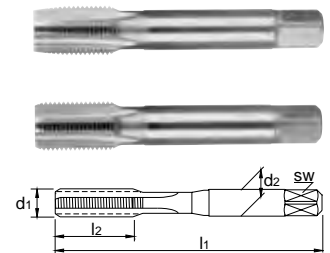
Ref.	d1	P	l1	l2	d2	sw
21.392.4128	UN 1.5/8	8	170	60	28	22.4
21.392.4445	UN 1.3/4	8	187	67	31.5	25
21.392.4763	UN 1.7/8	8	187	67	31.5	25
21.392.5080	UN 2	8	200	70	33.5	28

## > 21.400 Phantom

NL HSS Handtappen BSP (Gasdraad), set à 2 stuks  
FR Tarauds à main HSS BSP (pas gaz), Jeu de 2 pièces  
ES Machos mano HSS BSP (gas), juego de 2 piezas  
DE HSS Handgewindebohrer BSP (Rohrgewinde), Satz von 2 Stück

HSS BSP G 55° NFE 66103 ISO 529

P 11 ≤500 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu



Ref.	d1	P	l1	l2	d2	sw
21.400.0973	BSP 1/8	28	59	15	8	6.3
21.400.1316	BSP 1/4	19	67	19	11	9
21.400.1666	BSP 3/8	19	75	21	12.5	10
21.400.2096	BSP 1/2	14	87	26	16	12.5
21.400.2291	BSP 5/8	14	91	26	18	14
21.400.2644	BSP 3/4	14	96	28	20	16

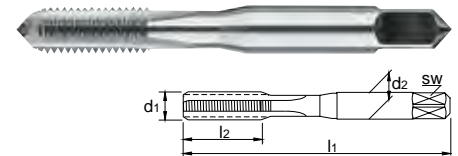
Ref.	d1	P	l1	l2	d2	sw
21.400.3020	BSP 7/8	14	102	29	22.4	18
21.400.3325	BSP 1	11	109	33	25	20
21.400.4191	BSP 1.1/4	11	119	39	31.5	25.5
21.400.4780	BSP 1.1/2	11	125	37	35.5	28
21.400.5375	BSP 1.3/4	11	132	39	35.5	28
21.400.5961	BSP 2	11	140	41	40	31.5

## > 21.402 Phantom

NL HSS Handtappen vorm C, BSP (Gasdraad)  
FR Tarauds à main HSS Forme C, BSP (pas gaz)  
ES Machos mano HSS Forma C, BSP (gas)  
DE HSS Handgewindebohrer Form C, BSP (Rohrgewinde)

HSS BSP G 55° NFE 66103 ISO 529

P 11 ≤500 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu



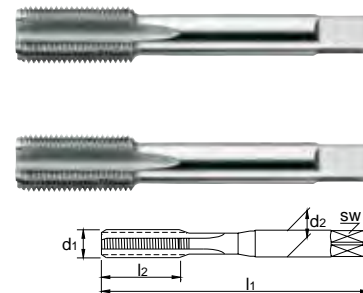
**NIEUW NOUVEAU NUEVO NEU**

Ref.	d1	P	l1	l2	d2	sw
21.402.1666	BSP 3/8	19	75	21	12.5	10
21.402.2096	BSP 1/2	14	87	26	16	12.5

Ref.	d1	P	l1	l2	d2	sw
21.402.2644	BSP 3/4	14	96	28	20	16
21.402.3325	BSP 1	11	109	33	25	20

> **21.404** **INTERNATIONAL TOOLS**

NL ECO HSS Handtappen BSP (Gasdraad), set à 2 stuks  
 FR Tarauds à main HSS ECO BSP (pas gaz), Jeu de 2 pièces  
 ES Machos mano HSS ECO BSP (gas), juego de 2 piezas  
 DE ECO HSS Handgewindebohrer BSP (Rohrgewinde), Satz von 2 Stück



**HSS** **BSP G** **55°** **DIN 353** **ECO**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

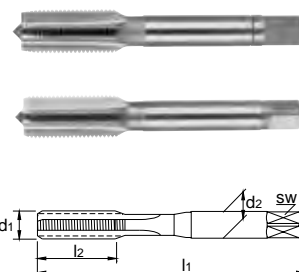
≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw
21.404.0973	BSP 1/8	28	63	20	7	5.5
21.404.1316	BSP 1/4	19	70	22	11	9
21.404.1666	BSP 3/8	19	70	22	12	9

Ref.	d1	P	l1	l2	d2	sw
21.404.2096	BSP 1/2	14	80	22	16	12
21.404.2644	BSP 3/4	14	90	22	20	16
21.404.3325	BSP 1	11	100	25	25	20

> **21.405** **Phantom**

NL HSS Handtappen BSP (Gasdraad), set à 2 stuks  
 FR Tarauds à main HSS BSP (pas gaz), Jeu de 2 pièces  
 ES Machos mano HSS BSP (gas), juego de 2 piezas  
 DE HSS Handgewindebohrer BSP (Rohrgewinde), Satz von 2 Stück



**NIEUW / NOUVEAU / NUEVO / NEU**

**HSS** **BSP G** **55°** **DIN 5157** **ECO**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

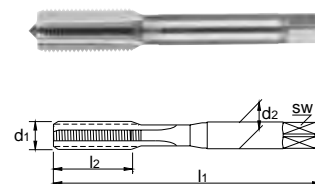
≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw
21.405.0973	BSP 1/8	28	63	20	7	5.5
21.405.1316	BSP 1/4	19	70	22	11	9
21.405.1666	BSP 3/8	19	70	22	12	9
21.405.2096	BSP 1/2	14	80	22	16	12
21.405.2291	BSP 5/8	14	80	22	18	14.5

Ref.	d1	P	l1	l2	d2	sw
21.405.2644	BSP 3/4	14	90	22	20	16
21.405.3020	BSP 7/8	14	90	22	22	18
21.405.3325	BSP 1	11	100	25	25	20
21.405.4191	BSP 1.1/4	11	125	40	32	24
21.405.4780	BSP 1.1/2	11	140	40	36	29

> **21.407** **Phantom**

NL HSS Eindsnijder BSP (Gasdraad)  
 FR Taraud finisseur HSS BSP (pas gaz)  
 ES Macho de acabado HSS BSP (gas)  
 DE HSS Fertigschneider BSP (Rohrgewinde)



**NIEUW / NOUVEAU / NUEVO / NEU**

**HSS** **BSP G** **55°** **DIN 5157** **ECO**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

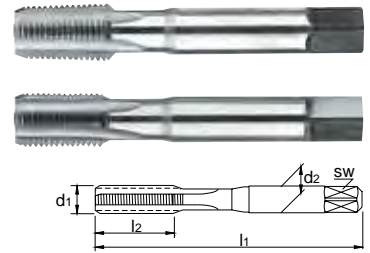
≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw
21.407.0973	BSP 1/8	28	63	20	7	5.5
21.407.1316	BSP 1/4	19	70	22	11	9
21.407.1666	BSP 3/8	19	70	22	12	9
21.407.2096	BSP 1/2	14	80	22	16	12
21.407.2291	BSP 5/8	14	80	22	18	14.5

Ref.	d1	P	l1	l2	d2	sw
21.407.2644	BSP 3/4	14	90	22	20	16
21.407.3020	BSP 7/8	14	90	22	22	18
21.407.3325	BSP 1	11	100	25	25	20
21.407.4191	BSP 1.1/4	11	125	40	32	24
21.407.4780	BSP 1.1/2	11	140	40	36	29

## > 21.410 Phantom

NL HSS Handtappen BSPT (Rc), set à 2 stuks  
 FR Tarauds à main HSS BSPT (Rc), Jeu de 2 pièces  
 ES Machos mano HSS BSPT (Rc), juego de 2 piezas  
 DE HSS Handgewindebohrer BSPT (Rc), Satz von 2 Stück



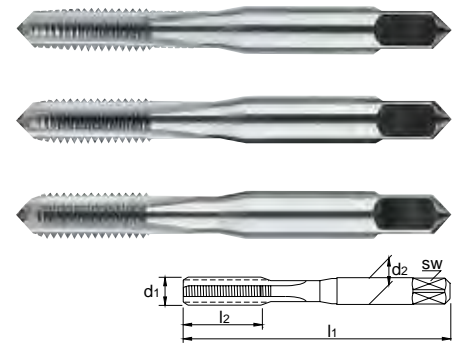
HSS	BSPT Rc	55°	NFE 66103	ISO 529			
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

Ref.	d1	P	l1	l2	d2	sw
21.410.0973	BSPT 1/8	28	59	15	8	6.3
21.410.1316	BSPT 1/4	19	67	19	10	8
21.410.1666	BSPT 3/8	19	75	21	12.5	10

Ref.	d1	P	l1	l2	d2	sw
21.410.2096	BSPT 1/2	14	87	26	16	12.5
21.410.2644	BSPT 3/4	14	96	28	20	16

## > 21.420 Phantom

NL HSS Handtappen BSW (Whitworth), set à 3 stuks  
 FR Tarauds à main HSS BSW (Whitworth), Jeu de 3 pièces  
 ES Machos mano HSS BSW (Whitworth), juego de 3 piezas  
 DE HSS Handgewindebohrer BSW (Whitworth), Satz von 3 Stück



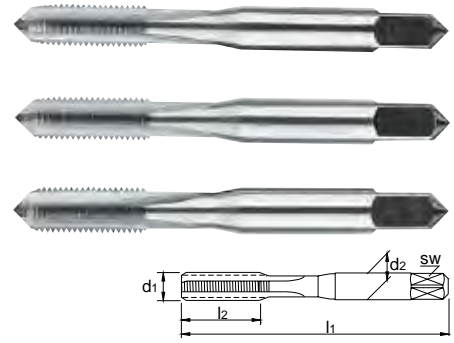
HSS	BSW	55°	NFE 66104	ISO 529			
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

Ref.	d1	P	l1	l2	d2	sw
21.420.0317	BSW 1/8	40	50	18	3.55	2.8
21.420.0397	BSW 5/32	32	53	13	4	3.15
21.420.0476	BSW 3/16	24	58	16	5	4
21.420.0635	BSW 1/4	20	66	19	7.1	5.6
21.420.0794	BSW 5/16	18	72	22	8	6.3
21.420.0952	BSW 3/8	16	80	24	10	8
21.420.1111	BSW 7/16	14	85	25	8	6.3

Ref.	d1	P	l1	l2	d2	sw
21.420.1270	BSW 1/2	12	89	29	9	7.1
21.420.1429	BSW 9/16	12	95	30	11.2	9
21.420.1588	BSW 5/8	11	102	32	12.5	10
21.420.1905	BSW 3/4	10	112	37	14	11.2
21.420.2222	BSW 7/8	9	118	38	16	12.5
21.420.2540	BSW 1	8	130	45	18	14

> **21.430 Phantom**

NL HSS Handtappen BSF, set à 3 stuks  
 FR Tarauds à main HSS BSF, Jeu de 3 pièces  
 ES Machos mano HSS BSF, juego de 3 piezas  
 DE HSS Handgewindebohrer BSF, Satz von 3 Stück



**HSS** **BSF** **55°** **NFE 66104** **ISO 529**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

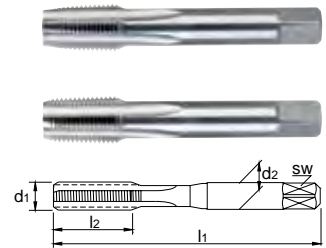
≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw
21.430.0476	BSF 3/16	32	58	16	5	4
21.430.0635	BSF 1/4	26	66	19	7.1	5.6
21.430.0794	BSF 5/16	22	72	22	8	6.3
21.430.0952	BSF 3/8	20	80	24	10	8
21.430.1111	BSF 7/16	18	85	25	8	6.3

Ref.	d1	P	l1	l2	d2	sw
21.430.1270	BSF 1/2	16	89	29	9	7.1
21.430.1588	BSF 5/8	14	102	32	12.5	10
21.430.1905	BSF 3/4	12	112	37	14	11.2
21.430.2222	BSF 7/8	11	118	38	16	12.5
21.430.2540	BSF 1	10	130	45	18	14

> **21.500 Phantom**

NL HSS Handtappen NPT, set à 2 stuks  
 FR Tarauds à main HSS NPT, Jeu de 2 pièces  
 ES Machos mano HSS NPT, juego de 2 piezas  
 DE HSS Handgewindebohrer NPT, Satz von 2 Stück



**HSS** **NPT** **60°** **ISO 529**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

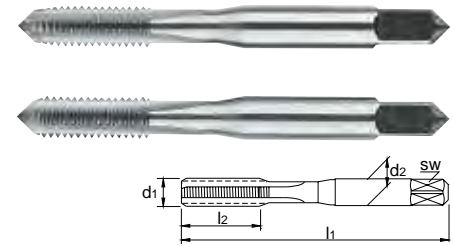
≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw
21.500.0794	NPT 1/16	27	52	14	5.6	4.5
21.500.1029	NPT 1/8	27	59	15	8	6.3
21.500.1372	NPT 1/4	18	67	19	10	8
21.500.1715	NPT 3/8	18	75	21	12.5	10
21.500.2134	NPT 1/2	14	87	26	16	12.5

Ref.	d1	P	l1	l2	d2	sw
21.500.2667	NPT 3/4	14	96	28	20	16
21.500.3340	NPT 1	11.5	109	33	25	20
21.500.4216	NPT 1.1/4	11.5	119	36	31.5	25
21.500.4826	NPT 1.1/2	11.5	125	37	35.5	28
21.500.6033	NPT 2	11.5	140	41	40	31.5

> **21.600 Phantom**

NL HSS Handtappen PG, set à 2 stuks  
 FR Tarauds à main HSS PG, Jeu de 2 pièces  
 ES Machos mano HSS PG, juego de 2 piezas  
 DE HSS Handgewindebohrer PG, Satz von 2 Stück



**HSS** **PG** **80°** **ISO 529**

**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 51**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Cu

Ref.	d1	P	l1	l2	d2	sw
21.600.0700	PG 7	20	89	29	9	7.1
21.600.0900	PG 9	18	95	30	12.5	10
21.600.1100	PG 11	18	112	37	14	11.2

Ref.	d1	P	l1	l2	d2	sw
21.600.1350	PG 13.5	18	112	37	14	11.2
21.600.1600	PG 16	18	118	38	16	12.5
21.600.2100	PG 21	16	127	37	20	16



## > 21.812 Phantom

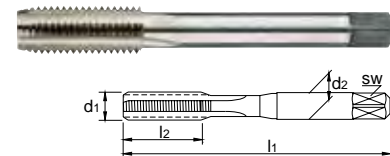
NL HSS Eindsnijder Metrisch, voor Phan-Coil  
 FR Taraud finisseur HSS Métrique, pour Phan-Coil  
 ES Macho de acabado HSS Métrica, para Phan-Coil  
 DE HSS Fertigschneider Metrisch, für Phan-Coil

HSS	EG	M	60°	ISO 529	Phan-Coil		
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

Ref.	d1	P	l1	l2	d2	sw
21.812.0300	M3	3.65	0.5	53	13	4
21.812.0400	M4	4.91	0.7	58	16	5
21.812.0500	M5	6.04	0.8	66	19	6.3

Ref.	d1	P	l1	l2	d2	sw
21.812.0600	M6	7.3	1	72	22	8
21.812.0800	M8	9.62	1.25	80	24	10
21.812.1000	M10	11.95	1.5	89	29	9

Ref.	d1	P	l1	l2	d2	sw
21.812.1200	M12	14.27	1.75	95	30	11.2
21.812.1400	M14	16.6	2	102	32	12.5
21.812.1600	M16	18.6	2	112	37	14



## > 21.822 Phantom

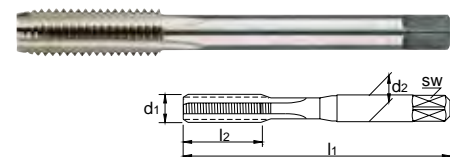
NL HSS Eindsnijder Metrisch Fijn, voor Phan-Coil  
 FR Taraud finisseur HSS Métrique Fin, pour Phan-Coil  
 ES Macho de acabado HSS Métrica Fina, para Phan-Coil  
 DE HSS Fertigschneider Metrisch Fein, für Phan-Coil

HSS	EG	MF	60°	ISO 529	Phan-Coil		
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

Ref.	d1	P	l1	l2	d2	sw
21.822.0810	MF8	9.7	1	80	24	10
21.822.1010	MF10	11.95	1	89	29	9
21.822.1025	MF10	12.1	1.25	89	29	9

Ref.	d1	P	l1	l2	d2	sw
21.822.1215	MF12	14.25	1.5	95	30	11.2
21.822.1415	MF14	16.55	1.5	102	32	12.5
21.822.1615	MF16	18.9	1.5	112	34	14

Ref.	d1	P	l1	l2	d2	sw
21.822.1815	MF18	21.05	1.5	112	34	14



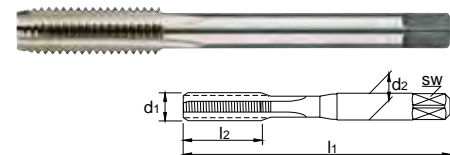
## > 21.832 Phantom

NL HSS Eindsnijder UNC, voor Phan-Coil  
 FR Taraud finisseur HSS UNC, pour Phan-Coil  
 ES Macho de acabado HSS UNC, para Phan-Coil  
 DE HSS Fertigschneider UNC, für Phan-Coil

HSS	EG	UNC	60°	ISO 529	Phan-Coil		
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

Ref.	d1	P	l1	l2	d2	sw
21.832.0482	UNC Nr. 10	6.2		24	66	25
21.832.0635	UNC 1/4	8		20	72	23
21.832.0794	UNC 5/16	9.77		18	80	24

Ref.	d1	P	l1	l2	d2	sw
21.832.0952	UNC 3/8	11.58		16	85	24
21.832.1270	UNC 1/2	15.23		13	102	32
21.832.1588	UNC 5/8	18.87		11	112	37



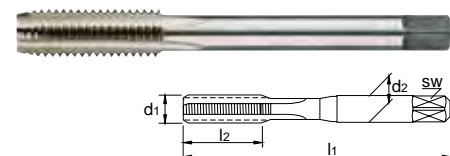
## > 21.840 Phantom

NL HSS Eindsnijder UNF, voor Phan-Coil  
 FR Taraud finisseur HSS UNF, pour Phan-Coil  
 ES Macho de acabado HSS UNF, para Phan-Coil  
 DE HSS Fertigschneider UNF, für Phan-Coil

HSS	EG	UNF	60°	ISO 529	Phan-Coil		
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu

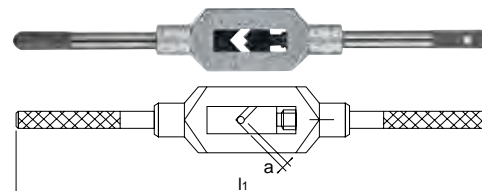
Ref.	d1	P	l1	l2	d2	sw
21.840.0482	UNF Nr. 10	5.85		32	66	19
21.840.0635	UNF 1/4	7.52		28	72	22
21.840.0794	UNF 5/16	9.31		24	80	24

Ref.	d1	P	l1	l2	d2	sw
21.840.0952	UNF 3/8	10.89		24	85	25
21.840.1270	UNF 1/2	14.35		20	90	25
21.840.1588	UNF 5/8	17.7		18	112	37



> **81.900 Phantom**

NL Verstelbaar Wringijzer, standaard kwaliteit, Zink-legering  
 FR Tourne à gauche expansible, qualité standard, alliage de zinc  
 ES Giramacho extensible, calidad estándar, aleación de cinc  
 DE Verstellbare Windeisen, Standard-Qualität, Zinkdruckgu



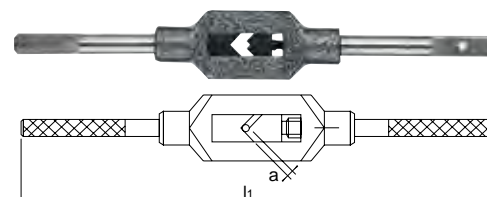
DIN  
1814

Ref.	Nr.	M	BSW	BSP	l1	a
81.900.0000	0	M1-M8	1/16-1/4	-	125	2,1-4,9
81.900.0100	1	M1-M10	1/16-3/8	1/8	180	2,1-5,5
81.900.0150	1,5	M1-M12	1/16-1/2	1/8	200	2,1-7
81.900.0200	2	M3,5-M12	5/32-1/2	1/8	280	3-8

Ref.	Nr.	M	BSW	BSP	l1	a
81.900.0300	3	M5-M20	7/32-3/4	1/8-1/2	375	4,9-12
81.900.0400	4	M11-M27	7/16-1	1/4-3/4	500	6,2-16
81.900.0500	5L	M13-M32	1/2-1.1/4	1/4-1	750	7-20

> **81.905 Phantom**

NL Verstelbaar Wringijzer, extra kwaliteit, staal  
 FR Tourne à gauche expansible, qualité supérieure, acier  
 ES Giramacho extensible, calidad superior, acero  
 DE Verstellbare Windeisen, Extra-Qualität, Stahl



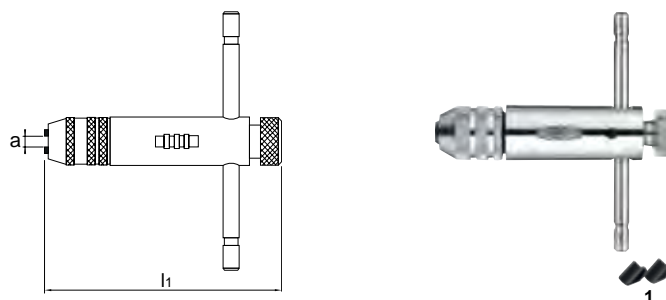
DIN  
1814

Ref.	Nr.	M	BSW	BSP	l1	a
81.905.0000	0	M1-M8	1/16-1/4	-	130	2,1-4,9
81.905.0100	1	M1-M10	1/16-3/8	1/8	180	2,1-5,5
81.905.0150	1,5	M1-M12	1/16-1/2	1/8	200	2,1-7
81.905.0200	2	M3,5-M12	5/32-1/2	1/8	280	3-8
81.905.0300	3	M5-M20	7/32-3/4	1/8-1/2	375	4,9-12

Ref.	Nr.	M	BSW	BSP	l1	a
81.905.0400	4	M11-M27	7/16-1	1/4-3/4	500	6,2-16
81.905.0500	5S	M13-M32	1/2-1.1/4	1/4-1	750	7-20
81.905.0600	6L	M18-M42	3/4-1.1/2	1/2-1.1/4	1000	11-24
81.905.0800	8	M25-M64	1-2.1/2	3/4-3	1250	16-40

> **81.930**

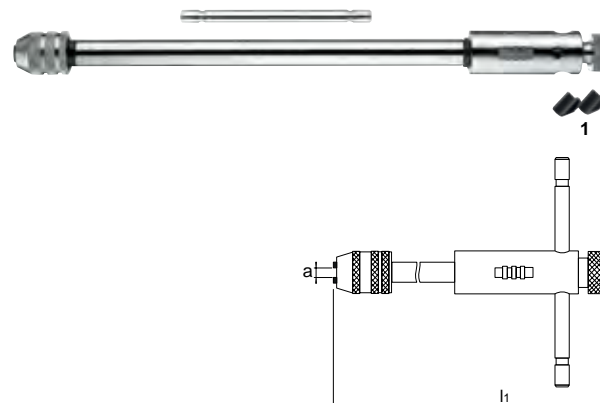
NL Ratelapkrukje  
 FR Porte-tarauds à cliquet  
 ES Giromacho en T con carraca  
 DE Werkzeughalter mit Knarre



Ref.	Nr.	M	BSW	BSP	a	l1	1
81.930.0100	1	M3-M10	1/8-3/8		2,4-5,5	85	81.938.0100
81.930.0200	2	M5-M12	7/32-1/2	1/8	4,5-7	100	81.938.0200

> **81.935**

NL Ratelapkrukje, lang  
 FR Porte-tarauds à cliquet, version longue  
 ES Giromacho en T con carraca, larga  
 DE Werkzeughalter mit Knarre, lang

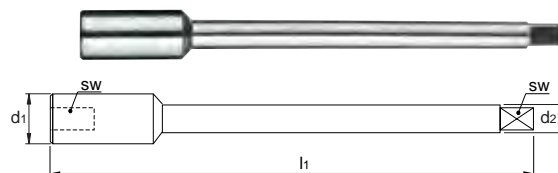


Ref.	Nr.	M	BSW	BSP	a	l1	1
81.935.1000	10	M3-M10	1/8-3/8		2,4-5,5	250	81.938.0100
81.935.2000	20	M5-M12	7/32-1/2	1/8	4,5-7	300	81.938.0200

## &gt; 81.950

NL Tapverlengstuk  
 FR Rallonge pour tarauds  
 ES Prolongador de machos  
 DE Gewindebohrer Verlängerung

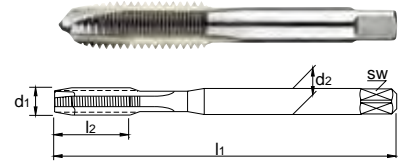
DIN  
 377



Ref.	sw	M	BSW	BSP	l1	d1	d2
81.950.0210	2.1	M1-M2,6	1/16-3/32		60	5	2.5
81.950.0240	2.4				70	6	3
81.950.0270	2.7	M3	1/8		80	7	3.5
81.950.0300	3	M3,5			90	7	4
81.950.0340	3.4	M4	5/32		95	8	4.5
81.950.0380	3.8				100	9	5
81.950.0430	4.3				105	10	5.5
81.950.0490	4.9	M4,5-M8	3/16-5/16		110	11	6.5
81.950.0550	5.5	M9-M10	3/8	1/16-1/8	115	12	7
81.950.0620	6.2	M11	7/16		120	14	8
81.950.0700	7	M12	1/2		125	15	9
81.950.0800	8				125	17	10
81.950.0900	9	M13-M16	9/16-5/8	1/4-3/8	130	19	11.2
81.950.1000	10				140	21	12.5
81.950.1100	11	M18	11/16-3/4		150	23	14
81.950.1200	12	M20		1/2	155	25	16
81.950.1300	13				165	27	17
81.950.1450	14.5	M22-M24	7/8-15/16	5/8	175	29	19
81.950.1600	16	M27	1	3/4	180	30	20
81.950.1800	18	M30	1.1/8	7/8	200	33	22.4
81.950.2000	20	M33	1.1/4	-	210	36	25
81.950.2200	22	M36	1.3/8	1.1/8	220	38	29
81.950.2400	24	M39-M42	1.1/2-1.5/8	1.1/4	235	42	32
81.950.2600	26				250	45	34.5
81.950.2900	29	M45-M48	1.3/4-1.7/8	1.3/8-2	265	50	38.5
81.950.3200	32	M52	2	2.1/4	285	55	42.5

**> 22.190 INTERNATIONAL TOOLS**

NL ECO HSS Machinetap Metrisch, kort  
 FR Taraud machine HSS ECO Métrique, version courte  
 ES Macho máquina HSS ECO Métrica, corto  
 DE ECO HSS Maschinengewindebohrer Metrisch, kurz



HSS M DIN 352 3xD Form B ISO 2 6H **ECO**

**P 11** **P 12** **K 31** **N 41**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG Alu

12-17 9-15 7-12 20-30

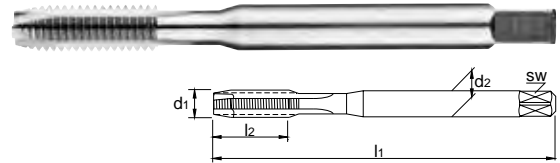
Ref.	d1	P	l1	l2	d2	sw
22.190.0300	M3	0.5	40	11	3.5	2.7
22.190.0400	M4	0.7	45	13	4.5	3.4
22.190.0500	M5	0.8	50	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.190.0600	M6	1	56	19	6	4.9
22.190.0800	M8	1.25	63	22	6	4.9
22.190.1000	M10	1.5	70	24	7	5.5

Ref.	d1	P	l1	l2	d2	sw
22.190.1200	M12	1.75	75	28	9	7

**> 22.191 INTERNATIONAL TOOLS**

NL ECO HSS Machinetap Metrisch  
 FR Taraud machine HSS ECO Métrique  
 ES Macho máquina HSS ECO Métrica  
 DE ECO HSS Maschinengewindebohrer Metrisch



HSS M DIN 371 3xD Form B ISO 2 6H **ECO**

**P 11** **P 12** **K 31** **N 41**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG Alu

12-17 9-15 7-12 20-30

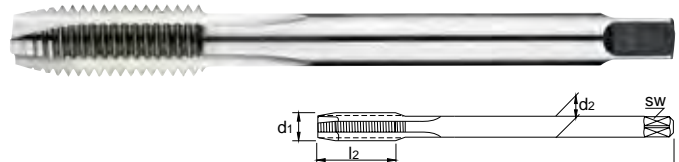
Ref.	d1	P	l1	l2	d2	sw
22.191.0300	M3	0.5	56	11	3.5	2.7
22.191.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.191.0500	M5	0.8	70	16	6	4.9
22.191.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.191.0800	M8	1.25	90	22	8	6.2
22.191.1000	M10	1.5	100	24	10	8

**> 22.192 INTERNATIONAL TOOLS**

NL ECO HSS Machinetap Metrisch  
 FR Taraud machine HSS ECO Métrique  
 ES Macho máquina HSS ECO Métrica  
 DE ECO HSS Maschinengewindebohrer Metrisch



HSS M DIN 376 3xD Form B ISO 2 6H **ECO**

**P 11** **P 12** **K 31** **N 41**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG Alu

12-17 9-15 7-12 20-30

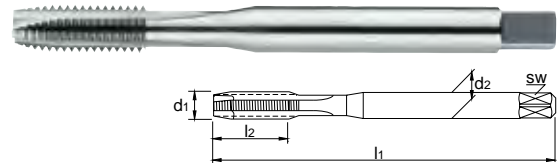
Ref.	d1	P	l1	l2	d2	sw
22.192.1200	M12	1.75	110	28	9	7

Ref.	d1	P	l1	l2	d2	sw

Ref.	d1	P	l1	l2	d2	sw

**> 22.195 INTERNATIONAL TOOLS**

NL ECO PRO HSS-E Machinetap Metrisch  
 FR Taraud machine ECO PRO HSS-E Métrique  
 ES Macho máquina ECO PRO HSS-E Métrica  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch



+6 M DIN 371 3xD Form B ISO 2 6H **ECO PRO**

**P 11** **P 12** **K 31** **N 41**

≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG Alu

15-20 12-18 10-15 25-35

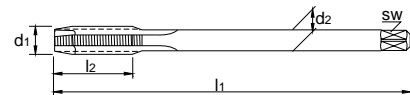
Ref.	d1	P	l1	l2	d2	sw
22.195.0200	M2	0.4	45	8	2.8	2.1
22.195.0300	M3	0.5	56	11	3.5	2.7
22.195.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.195.0500	M5	0.8	70	16	6	4.9
22.195.0600	M6	1	80	19	6	4.9
22.195.0800	M8	1.25	90	22	8	6.2

Ref.	d1	P	l1	l2	d2	sw
22.195.1000	M10	1.5	100	24	10	8

## > 22.196 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch  
 FR Taraud machine HSS-E ECO PRO Métrique  
 ES Macho máquina HSS-E ECO PRO Métrica  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch



+6 6 ( M 60° DIN 376 3xD Form B 3,5-6 ISO 2 6H ECO PRO

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> K 31 GG N 41 Alu

15-20 12-18 10-15 25-35

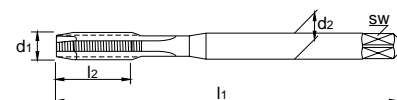
Ref.	d1	P	l1	l2	d2	sw
22.196.1000	M10	1.5	100	24	7	5.5
22.196.1200	M12	1.75	110	28	9	7
22.196.1400	M14	2	110	30	11	9
22.196.1600	M16	2	110	32	12	9

Ref.	d1	P	l1	l2	d2	sw
22.196.2000	M20	2.5	140	34	16	12
22.196.2200	M22	2.5	140	34	18	14.5
22.196.2400	M24	3	160	38	18	14.5
22.196.2700	M27	3	160	38	20	16

Ref.	d1	P	l1	l2	d2	sw
22.196.3000	M30	3.5	180	45	22	18
22.196.3300	M33	3.5	180	50	25	20
22.196.3600	M36	4	200	56	28	22

## > 22.197 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E ECO PRO Métrique, TiN  
 ES Macho máquina HSS-E ECO PRO Métrica, TiN  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, TiN



+6 6 ( M 60° TiN DIN 371 3xD Form B 3,5-6 ISO 2 6H ECO PRO

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> K 31 GG N 41 Alu N 42 Alu Si>10% N 51 Cu

22-30 18-27 7-10 15-22 32-52 15-20 5-12

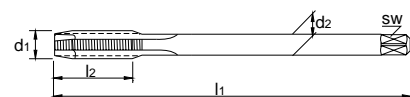
Ref.	d1	P	l1	l2	d2	sw
22.197.0300	M3	0.5	56	11	3.5	2.7
22.197.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.197.0500	M5	0.8	70	16	6	4.9
22.197.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.197.0800	M8	1.25	90	22	8	6.2
22.197.1000	M10	1.5	100	24	10	8

## > 22.198 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E ECO PRO Métrique, TiN  
 ES Macho máquina HSS-E ECO PRO Métrica, TiN  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, TiN



+6 6 ( M 60° TiN DIN 376 3xD Form B 3,5-6 ISO 2 6H ECO PRO

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> K 31 GG N 41 Alu N 42 Alu Si>10% N 51 Cu

22-30 18-27 7-10 15-22 32-52 15-20 5-12

Ref.	d1	P	l1	l2	d2	sw
22.198.1200	M12	1.75	110	28	9	7

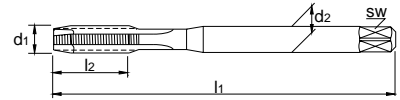
Ref.	d1	P	l1	l2	d2	sw

Ref.	d1	P	l1	l2	d2	sw

> 22.200 Phantom



NL UNI HSS-E Machinetap Metrisch  
 FR Taraud machine HSS-E UNI Métrique  
 ES Macho máquina HSS-E UNI Métrica  
 DE UNI HSS-E Maschinengewindebohrer Metrisch



+6 6 ( M 60° DIN 371 3xD Form B 4-5 ISO 2 6H UNI

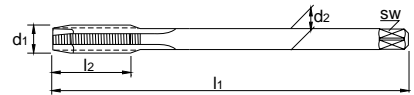
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si<10%	N 51 Cu	S 71 Ni/Co	S 72 Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	
22.200.0100	M1	0.25	40	5.5	2.5	2.1	22.200.0220	M2,2	0.45	45	9	2.8	2.1	22.200.0500	M5	0.8	70	16	6	4.9	
22.200.0110	M1,1	0.25	40	5.5	2.5	2.1	22.200.0230	M2,3	0.4	45	9	2.8	2.1	22.200.0600	M6	1	80	19	6	4.9	
22.200.0120	M1,2	0.25	40	5.5	2.5	2.1	22.200.0250	M2,5	0.45	50	9	2.8	2.1	22.200.0700	M7	1	80	19	7	5.5	
22.200.0140	M1,4	0.3	40	7	2.5	2.1	22.200.0260	M2,6	0.45	50	9	2.8	2.1	22.200.0800	M8	1.25	90	22	8	6.2	
22.200.0160	M1,6	0.35	40	8	2.5	2.1	22.200.0300	M3	0.5	56	11	3.5	2.7	22.200.0900	M9	1.25	90	22	9	7	
22.200.0170	M1,7	0.35	40	8	2.5	2.1	22.200.0350	M3,5	0.6	56	12	4	3	22.200.1000	M10	1.5	100	24	10	8	
22.200.0180	M1,8	0.35	40	8	2.5	2.1	22.200.0400	M4	0.7	63	13	4.5	3.4								
22.200.0200	M2	0.4	45	8	2.8	2.1	22.200.0450	M4,5	0.75	70	16	6	4.9								

> 22.201 Phantom



NL UNI HSS-E Machinetap Metrisch  
 FR Taraud machine HSS-E UNI Métrique  
 ES Macho máquina HSS-E UNI Métrica  
 DE UNI HSS-E Maschinengewindebohrer Metrisch



+6 6 ( M 60° DIN 376 3xD Form B 4-5 ISO 2 6H UNI

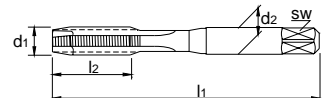
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si<10%	N 51 Cu	S 71 Ni/Co	S 72 Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	
22.201.0200	M2	0.4	45	8	1.4		22.201.1000	M10	1.5	100	24	7	5.5	22.201.3000	M30	3.5	180	45	22	18	
22.201.0250	M2,5	0.45	50	9	1.8		22.201.1200	M12	1.75	110	28	9	7	22.201.3300	M33	3.5	180	50	25	20	
22.201.0300	M3	0.5	56	11	2.2		22.201.1400	M14	2	110	30	11	9	22.201.3600	M36	4	200	56	28	22	
22.201.0400	M4	0.7	63	13	2.8	2.1	22.201.1600	M16	2	110	32	12	9	22.201.3900	M39	4	200	60	32	24	
22.201.0500	M5	0.8	70	16	3.5	2.7	22.201.1800	M18	2.5	125	34	14	11	22.201.4200	M42	4.5	200	60	32	24	
22.201.0600	M6	1	80	19	4.5	3.4	22.201.2000	M20	2.5	140	34	16	12	22.201.4500	M45	4.5	220	65	36	29	
22.201.0700	M7	1	80	19	5.5	4.3	22.201.2200	M22	2.5	140	34	18	14.5	22.201.4800	M48	5	250	70	36	29	
22.201.0800	M8	1.25	90	22	6	4.9	22.201.2400	M24	3	160	38	18	14.5	22.201.5200	M52	5	250	70	40	32	
22.201.0900	M9	1.25	90	22	7	5.5	22.201.2700	M27	3	160	38	20	16								

> 22.205 Phantom



NL HSS Machinetap Metrisch  
 FR Taraud machine HSS Métrique  
 ES Macho máquina HSS Métrica  
 DE HSS Maschinengewindebohrer Metrisch



HSS M 60° NFE 66103 ISO 529 2xD Form B 5 ISO 2 6H

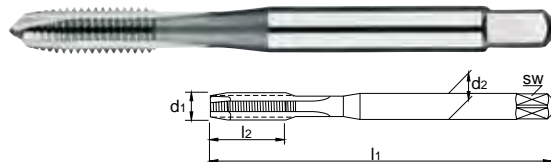
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 52 CuAlFe
12-17	10-15	7-12	3-6	15-20	5-12

Ref.	d1	P	l1	d2	sw	Ref.	d1	P	l1	d2	sw	Ref.	d1	P	l1	d2	sw
22.205.0200	M2	0.4	41	2.5	2	22.205.0600	M6	1	66	6.3	5	22.205.1600	M16	2	102	12.5	10
22.205.0250	M2,5	0.45	44	2.8	2.24	22.205.0700	M7	1	66	7.1	5.6	22.205.1800	M18	2.5	112	14	11.2
22.205.0300	M3	0.5	48	3.15	2.5	22.205.0800	M8	1.25	72	8	6.3	22.205.2000	M20	2.5	112	14	11.2
22.205.0350	M3,5	0.6	50	3.55	2.8	22.205.0900	M9	1.25	72	9	7.1	22.205.2200	M22	2.5	118	16	12.5
22.205.0400	M4	0.7	53	4.5	3.15	22.205.1000	M10	1.5	80	10	8	22.205.2400	M24	3	130	18	14
22.205.0450	M4,5	0.75	58	5	4	22.205.1200	M12	1.75	89	9	7.1	22.205.2700	M27	3	135	20	16
22.205.0500	M5	0.8	58	5	4	22.205.1400	M14	2	95	11.2	9	22.205.3000	M30	3.5	138	20	16



## > 22.210 Phantom

NL UNI HSS-E Machinetap Metrisch, Overmaats  
 FR Taraud machine HSS-E UNI Métrique, surcoté  
 ES Macho máquina HSS-E UNI Métrica, sobremedida  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, Übermaß



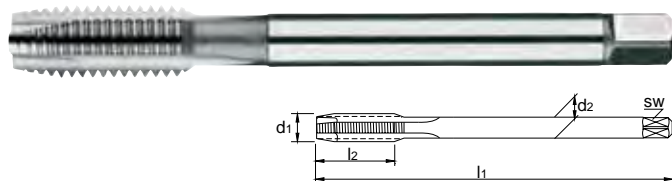
+6 (	M	60°	DIN 371	3xD	Form B	4-5	ISO 2 6H	+0,1 +0,2	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
22.210.0510	M5+0,1	0.8	70	16	6	4.9
22.210.0610	M6+0,1	1	80	19	6	4.9
22.210.0620	M6+0,2	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.210.0820	M8+0,2	1.25	90	22	8	6.2
22.210.1020	M10+0,2	1.5	100	24	10	8

## > 22.211 Phantom

NL UNI HSS-E Machinetap Metrisch, Overmaats  
 FR Taraud machine HSS-E UNI Métrique, surcoté  
 ES Macho máquina HSS-E UNI Métrica, sobremedida  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, Übermaß



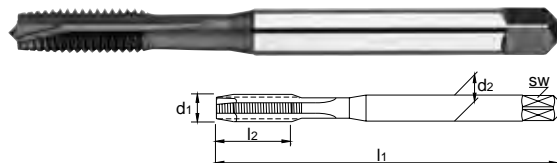
+6 (	M	60°	DIN 376	3xD	Form B	4-5	ISO 2 6H	+0,1 +0,2	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
22.211.1220	M12+0,2	1.75	110	28	9	7
22.211.1420	M14+0,2	2	110	30	11	9

Ref.	d1	P	l1	l2	d2	sw
22.211.1610	M16+0,1	2	110	32	12	9
22.211.1620	M16+0,2	2	110	32	12	9

## > 22.220 Phantom

NL HSS-E Machinetap Metrisch, stoomontlaten  
 FR Taraud machine HSS-E Métrique, vaporisée  
 ES Macho máquina HSS-E Métrica, vaporizada  
 DE HSS-E Maschinengewindebohrer Metrisch, dampfangelassen



+6 (	M	60°	OX.	DIN 371	3xD	Form B	4-5	ISO 2 6H
P 11	P 12	K 31	K 32					
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	GG	GGG GTS-GTW					
15-20	10-20	10-15	5-8					

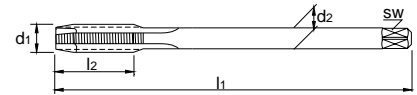
Ref.	d1	P	l1	l2	d2	sw
22.220.0200	M2	0.4	45	8	2.8	2.1
22.220.0220	M2,2	0.45	45	9	2.8	2.1
22.220.0230	M2,3	0.4	45	9	2.8	2.1
22.220.0250	M2,5	0.45	50	9	2.8	2.1
22.220.0260	M2,6	0.45	50	9	2.8	2.1

Ref.	d1	P	l1	l2	d2	sw
22.220.0300	M3	0.5	56	11	3.5	2.7
22.220.0350	M3,5	0.6	56	12	4	3
22.220.0400	M4	0.7	63	13	4.5	3.4
22.220.0500	M5	0.8	70	16	6	4.9
22.220.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.220.0700	M7	1	80	19	7	5.5
22.220.0800	M8	1.25	90	22	8	6.2
22.220.1000	M10	1.5	100	24	10	8

» 22.221 **Phantom**

NL HSS-E Machinetap Metrisch, stoomontlaten  
 FR Taraud machine HSS-E Métrique, vaporisée  
 ES Macho máquina HSS-E Métrica, vaporizada  
 DE HSS-E Maschinengewindebohrer Metrisch, dampfangelassen



+6.6 ( M 60° OX. DIN 376 3xD Form B 4-5 ISO 2 6H

P 11 ≤600 N/mm² P 12 ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW

15-20 10-20 10-15 5-8

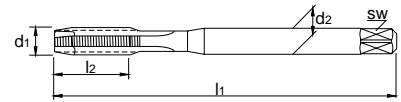
Ref.	d1	P	l1	l2	d2	sw
22.221.0300	M3	0.5	56	11	2.2	
22.221.0400	M4	0.7	63	13	2.8	2.1
22.221.0500	M5	0.8	70	16	3.5	2.7
22.221.0600	M6	1	80	19	4.5	3.4
22.221.0800	M8	1.25	90	22	6	4.9
22.221.0900	M9	1.25	90	22	7	5.5

Ref.	d1	P	l1	l2	d2	sw
22.221.1000	M10	1.5	100	24	7	5.5
22.221.1200	M12	1.75	110	28	9	7
22.221.1400	M14	2	110	30	11	9
22.221.1600	M16	2	110	32	12	9
22.221.1800	M18	2.5	125	34	14	11
22.221.2000	M20	2.5	140	34	16	12

Ref.	d1	P	l1	l2	d2	sw
22.221.2200	M22	2.5	140	34	18	14.5
22.221.2400	M24	3	160	38	18	14.5
22.221.2700	M27	3	160	38	20	16
22.221.3000	M30	3.5	180	45	22	18

» 22.230 **Phantom**

NL UNI HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E UNI Métrique, TiN  
 ES Macho máquina HSS-E UNI Métrica, TiN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiN



**NIEUW NOUVEAU NUEVO NEU**

+6.6 ( M 60° TiN DIN 371 3xD Form B 4-5 ISO 2 6H UNI

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² M 21 INOX ≤850N/mm² M 22 INOX >850N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu S 71 Ni/Co S 72 Ti

15-20 10-20 6-10 7-10 4-8 10-15 10-15 25-35 10-20 15-35 2-8 2-8

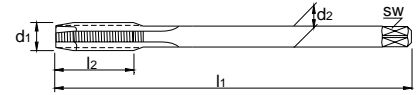
Ref.	d1	P	l1	l2	d2	sw
22.230.0200	M2	0.4	45	8	2.8	2.1
22.230.0250	M2,5	0.45	50	9	2.8	2.1
22.230.0300	M3	0.5	56	11	3.5	2.7
22.230.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.230.0500	M5	0.8	70	16	6	4.9
22.230.0600	M6	1	80	19	6	4.9
22.230.0700	M7	1	80	19	7	5.5
22.230.0800	M8	1.25	90	22	8	6.2

Ref.	d1	P	l1	l2	d2	sw
22.230.0900	M9	1.25	90	22	9	7
22.230.1000	M10	1.5	100	24	10	8

» 22.231 **Phantom**

NL UNI HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E UNI Métrique, TiN  
 ES Macho máquina HSS-E UNI Métrica, TiN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiN



**NIEUW NOUVEAU NUEVO NEU**

+6.6 ( M 60° TiN DIN 376 3xD Form B 4-5 ISO 2 6H UNI

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² M 21 INOX ≤850N/mm² M 22 INOX >850N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu S 71 Ni/Co S 72 Ti

15-20 10-20 6-10 7-10 4-8 10-15 10-15 25-35 10-20 15-35 2-8 2-8

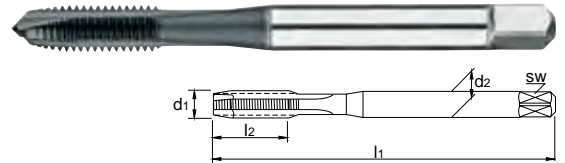
Ref.	d1	P	l1	l2	d2	sw
22.231.0300	M3	0.5	56	11	2.2	
22.231.0400	M4	0.7	63	13	2.8	2.1
22.231.0500	M5	0.8	70	16	3.5	2.7
22.231.0600	M6	1	80	19	4.5	3.4
22.231.0700	M7	1	80	19	5.5	4.3
22.231.0800	M8	1.25	90	22	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.231.0900	M9	1.25	90	22	7	5.5
22.231.1000	M10	1.5	100	24	7	5.5
22.231.1200	M12	1.75	110	28	9	7
22.231.1400	M14	2	110	30	11	9
22.231.1600	M16	2	110	32	12	9
22.231.1800	M18	2.5	125	34	14	11

Ref.	d1	P	l1	l2	d2	sw
22.231.2000	M20	2.5	140	34	16	12
22.231.2200	M22	2.5	140	34	18	14.5
22.231.2400	M24	3	160	38	18	14.5
22.231.2700	M27	3	160	38	20	16
22.231.3000	M30	3.5	180	45	22	18

## > 22.240 Phantom

NL UNI HSS-E Machinetap Metrisch, TiCN  
 FR Taraud machine HSS-E UNI Métrique, TiCN  
 ES Macho máquina HSS-E UNI Métrica, TiCN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiCN



+6 (	M	60°	TiCN	DIN 371	3xD	Form B	4-5	ISO 2 6H	UNI
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P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	S 71 Ni/Co	S 72 Ti
15-20	10-20	6-10	7-10	4-8	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
22.240.0200	M2	0.4	45	8	2.8	2.1
22.240.0250	M2,5	0.45	50	9	2.8	2.1
22.240.0300	M3	0.5	56	11	3.5	2.7
22.240.0400	M4	0.7	63	13	4.5	3.4
22.240.0500	M5	0.8	70	16	6	4.9
22.240.0600	M6	1	80	19	6	4.9
22.240.0700	M7	1	80	19	7	5.5
22.240.0800	M8	1.25	90	22	8	6.2

Ref.	d1	P	l1	l2	d2	sw
22.240.0900	M9	1.25	90	22	9	7
22.240.1000	M10	1.5	100	24	10	8

## > 22.241 Phantom

NL UNI HSS-E Machinetap Metrisch, TiCN  
 FR Taraud machine HSS-E UNI Métrique, TiCN  
 ES Macho máquina HSS-E UNI Métrica, TiCN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiCN



+6 (	M	60°	TiCN	DIN 376	3xD	Form B	4-5	ISO 2 6H	UNI
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P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	S 71 Ni/Co	S 72 Ti
15-20	10-20	6-10	7-10	4-8	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
22.241.0300	M3	0.5	56	11	2.2	
22.241.0400	M4	0.7	63	13	2.8	2.1
22.241.0500	M5	0.8	70	16	3.5	2.7
22.241.0600	M6	1	80	19	4.5	3.4
22.241.0800	M8	1.25	90	22	6	4.9
22.241.1000	M10	1.5	100	24	7	5.5
22.241.1200	M12	1.75	110	28	9	7
22.241.1400	M14	2	110	30	11	9
22.241.1600	M16	2	110	32	12	9
22.241.1800	M18	2.5	125	34	14	11

Ref.	d1	P	l1	l2	d2	sw
22.241.2000	M20	2.5	140	34	16	12
22.241.2200	M22	2.5	140	34	18	14.5
22.241.2400	M24	3	160	38	18	14.5
22.241.2700	M27	3	160	38	20	16
22.241.3000	M30	3.5	180	45	22	18

## > 22.252 Phantom

NL HSS-E PM Synchro Machinetap Metrisch, TiCN  
 FR Taraud Machine Synchro HSS-E PM Métrique, TiCN  
 ES Macho Máquina Sincronizado HSS-E PM Métrica, TiCN  
 DE HSS-E PM Synchron-Maschinengewindebohrer Metrisch, TiCN



HSS-E PM	M	60°	TiCN	DIN 371	3xD	Form B	4-5	6HX
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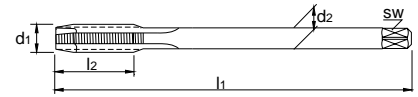
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	S 71 Ni/Co	S 72 Ti
30-45	20-40	12-20	14-25	8-16	32-60	15-30	25-35	15-35	6-18	6-18

Ref.	d1	P	l1	l2	d2	sw
22.252.0300	M3	0.5	56	11	3.5	2.7
22.252.0400	M4	0.7	63	13	4.5	3.4
22.252.0500	M5	0.8	70	16	6	4.9
22.252.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.252.0800	M8	1.25	90	22	8	6.2
22.252.1000	M10	1.5	100	24	10	8

› **22.253 Phantom**

NL HSS-E PM Synchro Machinetap Metrisch, TiCN  
 FR Taraud Machine Synchro HSS-E PM Métrique, TiCN  
 ES Macho Máquina Sincronizado HSS-E PM Métrica, TiCN  
 DE HSS-E PM Synchron-Maschinengewindebohrer Metrisch, TiCN

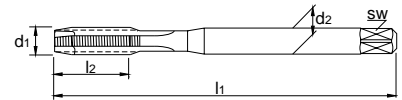


HSS-E PM	M	60°	TiCN	DIN 376	3xD	Form B	4-5	6HX		
P 11	P 12	P 13	K 31	K 32	N 41	N 42	N 43	N 51	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	Ni/Co	Ti
30-45	20-40	12-20	14-25	8-16	32-60	15-30	25-35	15-35	6-18	6-18

Ref.	d1	P	l1	l2	d2	sw
22.253.1200	M12	1.75	110	28	9	7
22.253.1600	M16	2	110	32	12	9
22.253.2000	M20	2.5	140	34	16	12

› **22.268 Phantom**

NL HP2 UNI HSS-E PM Machinetap Metrisch, HARDLUBE  
 FR Taraud machine HSS-E PM HP2 UNI Métrique, HARDLUBE  
 ES Macho máquina HSS-E PM HP2 UNI Métrica, HARDLUBE  
 DE HP2 UNI HSS-E PM Maschinengewindebohrer Metrisch, HARDLUBE

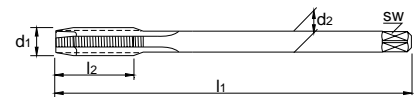


HSS-E PM	M	60°	HARD LUBE	DIN 371	3xD	Form B	4-5	ISO 2 6H	HP2 UNI		
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Ni/Co	Ti
15-20	15-20	8-15	8-15	8-15	8-15	20-25	20-25	20-25	20-25	5-12	5-12

Ref.	d1	P	l1	l2	d2	sw
22.268.0300	M3	0.5	56	11	3.5	2.7
22.268.0400	M4	0.7	63	13	4.5	3.4
22.268.0500	M5	0.8	70	16	6	4.9
22.268.0600	M6	1	80	19	6	4.9
22.268.0800	M8	1.25	90	22	8	6.2
22.268.1000	M10	1.5	100	24	10	8

› **22.269 Phantom**

NL HP2 UNI HSS-E PM Machinetap Metrisch, HARDLUBE  
 FR Taraud machine HSS-E PM HP2 UNI Métrique, HARDLUBE  
 ES Macho máquina HSS-E PM HP2 UNI Métrica, HARDLUBE  
 DE HP2 UNI HSS-E PM Maschinengewindebohrer Metrisch, HARDLUBE

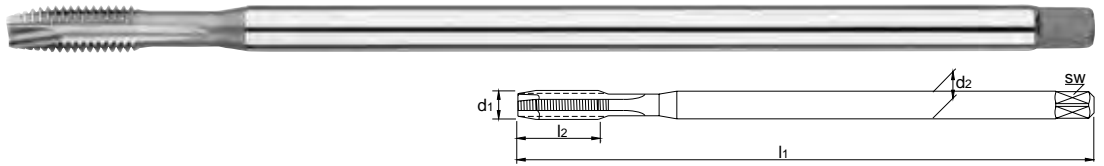


HSS-E PM	M	60°	HARD LUBE	DIN 376	3xD	Form B	4-5	ISO 2 6H	HP2 UNI		
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Ni/Co	Ti
15-20	15-20	8-15	8-15	8-15	8-15	20-25	20-25	20-25	20-25	5-12	5-12

Ref.	d1	P	l1	l2	d2	sw
22.269.1200	M12	1.75	110	28	9	7
22.269.1400	M14	2	110	30	11	9
22.269.1600	M16	2	110	32	12	9
22.269.2000	M20	2.5	140	34	16	12

## > 22.350 Phantom

NL UNI HSS-E Machinetap Metrisch, lang  
FR Taraud machine HSS-E UNI Métrique, version longue  
ES Macho máquina HSS-E UNI Métrica, larga  
DE UNI HSS-E Maschinengewindebohrer Metrisch, lang



+6	6	M	60°	NORM	3xD	Form B	4-5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.350.0400	M4	0.7	126	13	4.5	3.4	22.350.0600	M6	1	160	17	6	4.9							
22.350.0500	M5	0.8	140	15	6	4.9	22.350.0800	M8	1.25	180	20	8	6.2							

## > 22.351 Phantom

NL UNI HSS-E Machinetap Metrisch, lang  
FR Taraud machine HSS-E UNI Métrique, version longue  
ES Macho máquina HSS-E UNI Métrica, larga  
DE UNI HSS-E Maschinengewindebohrer Metrisch, lang



+6	6	M	60°	NORM	3xD	Form B	4-5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	8-15	2-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.351.0800	M8	1.25	180	20	6	4.9	22.351.1200	M12	1.75	220	24	9	7	22.351.2000	M20	2.5	280	32	16	12
22.351.1000	M10	1.5	200	22	7	5.5	22.351.1600	M16	2	220	32	12	9	22.351.2400	M24	3	320	34	18	14.5

## > 22.500 Phantom

NL HSS-E PM Machinetap Metrisch, 1400 N/mm<sup>2</sup>, stoomontlaten  
FR Taraud machine HSS-E PM Métrique, 1400 N/mm<sup>2</sup>, vaporisée  
ES Macho máquina HSS-E PM Métrica, 1400 N/mm<sup>2</sup>, vaporizada  
DE HSS-E PM Maschinengewindebohrer Metrisch, 1400 N/mm<sup>2</sup>, dampfangelassen

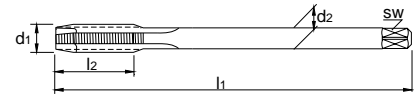


HSS-E PM	M	60°	OX.	DIN 371	3xD	Form B	4-5	ISO 2 6H
P 13	P 14	M 22						
≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>						
10-15	6-10	4-6						

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.500.0300	M3	0.5	56	11	3.5	2.7	22.500.0500	M5	0.8	70	16	6	4.9	22.500.0800	M8	1.25	90	22	8	6.2
22.500.0400	M4	0.7	63	13	4.5	3.4	22.500.0600	M6	1	80	19	6	4.9	22.500.1000	M10	1.5	100	24	10	8

> **22.501 Phantom**

NL HSS-E PM Machinetap Metrisch, 1400 N/mm<sup>2</sup>, stoomontlaten  
 FR Taraud machine HSS-E PM Métrique, 1400 N/mm<sup>2</sup>, vaporisée  
 ES Macho máquina HSS-E PM Métrica, 1400 N/mm<sup>2</sup>, vaporizada  
 DE HSS-E PM Maschinengewindebohrer Metrisch, 1400 N/mm<sup>2</sup>, dampfangelassen



HSS-E PM M OX. DIN 376 3xD Form B ISO 2 6H

**P 13** ≤1000 N/mm<sup>2</sup> **P 14** ≤1400 N/mm<sup>2</sup> **M 22** INOX >850N/mm<sup>2</sup>

10-15 6-10 4-6

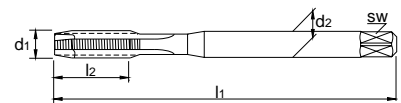
Ref.	d1	P	l1	l2	d2	sw
22.501.0800	M8	1.25	90	22	6	4.9
22.501.1000	M10	1.5	100	24	7	5.5
22.501.1200	M12	1.75	110	28	9	7
22.501.1400	M14	2	110	30	11	9

Ref.	d1	P	l1	l2	d2	sw
22.501.1600	M16	2	110	32	12	9
22.501.1800	M18	2.5	125	34	14	11
22.501.2000	M20	2.5	140	34	16	12
22.501.2200	M22	2.5	140	34	18	14.5

Ref.	d1	P	l1	l2	d2	sw
22.501.2400	M24	3	160	38	18	14.5
22.501.2700	M27	3	160	38	20	16
22.501.3000	M30	3.5	180	45	22	18

> **22.504 Phantom**

NL HSS-E PM Machinetap Metrisch, 1400 N/mm<sup>2</sup>, TiCN  
 FR Taraud machine HSS-E PM Métrique, 1400 N/mm<sup>2</sup>, TiCN  
 ES Macho máquina HSS-E PM Métrica, 1400 N/mm<sup>2</sup>, TiCN  
 DE HSS-E PM Maschinengewindebohrer Metrisch, 1400 N/mm<sup>2</sup>, TiCN



HSS-E PM M TiCN DIN 371 3xD Form B ISO 2 6H

**P 13** ≤1000 N/mm<sup>2</sup> **P 14** ≤1400 N/mm<sup>2</sup> **M 22** INOX >850N/mm<sup>2</sup>

10-15 6-10 4-6

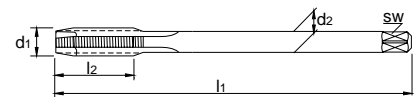
Ref.	d1	P	l1	l2	d2	sw
22.504.0300	M3	0.5	56	11	3.5	2.7
22.504.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.504.0500	M5	0.8	70	16	6	4.9
22.504.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.504.0800	M8	1.25	90	22	8	6.2
22.504.1000	M10	1.5	100	24	10	8

> **22.505 Phantom**

NL HSS-E PM Machinetap Metrisch, 1400 N/mm<sup>2</sup>, TiCN  
 FR Taraud machine HSS-E PM Métrique, 1400 N/mm<sup>2</sup>, TiCN  
 ES Macho máquina HSS-E PM Métrica, 1400 N/mm<sup>2</sup>, TiCN  
 DE HSS-E PM Maschinengewindebohrer Metrisch, 1400 N/mm<sup>2</sup>, TiCN



HSS-E PM M TiCN DIN 376 3xD Form B ISO 2 6H

**P 13** ≤1000 N/mm<sup>2</sup> **P 14** ≤1400 N/mm<sup>2</sup> **M 22** INOX >850N/mm<sup>2</sup>

10-15 6-10 4-6

Ref.	d1	P	l1	l2	d2	sw
22.505.1200	M12	1.75	110	28	9	7

Ref.	d1	P	l1	l2	d2	sw
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Ref.	d1	P	l1	l2	d2	sw
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## > 22.530 Phantom

- NL HSS-E PM Machinetap Metrisch, Titanium- en Nikkellegeringen, stoomontlaten  
 FR Taraud machine HSS-E PM Métrique, alliage de Titane et Nickel, vaporisée  
 ES Macho máquina HSS-E PM Métrica, aleados de Titano y Niquel, vaporizada  
 DE HSS-E PM Maschinengewindebohrer Metrisch, Titanium- und Nickellegierungen, dampfangelassen

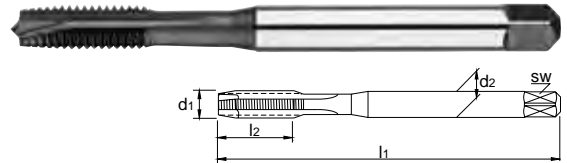


6-10	3-5	3-5	2-15	4-15
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Ref.	d1	P	l1	l2	d2	sw
22.530.0300	M3	0.5	56	11	3.5	2.7
22.530.0400	M4	0.7	63	13	4.5	3.4

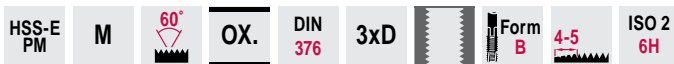
Ref.	d1	P	l1	l2	d2	sw
22.530.0500	M5	0.8	70	16	6	4.9
22.530.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.530.0800	M8	1.25	90	22	8	6.2
22.530.1000	M10	1.5	100	24	10	8



## > 22.531 Phantom

- NL HSS-E PM Machinetap Metrisch, Titanium- en Nikkellegeringen, stoomontlaten  
 FR Taraud machine HSS-E PM Métrique, alliage de Titane et Nickel, vaporisée  
 ES Macho máquina HSS-E PM Métrica, aleados de Titano y Niquel, vaporizada  
 DE HSS-E PM Maschinengewindebohrer Metrisch, Titanium- und Nickellegierungen, dampfangelassen

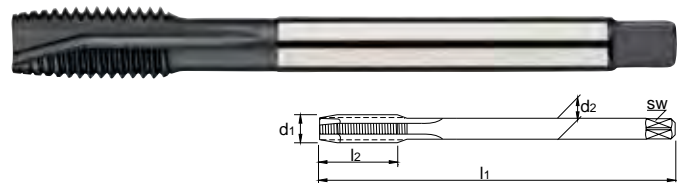


6-10	3-5	3-5	2-15	4-15
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Ref.	d1	P	l1	l2	d2	sw
22.531.1200	M12	1.75	110	28	9	7

Ref.	d1	P	l1	l2	d2	sw

Ref.	d1	P	l1	l2	d2	sw



## > 22.550 Phantom

- NL HSS-E Machinetap Metrisch, Messing  
 FR Taraud machine HSS-E Métrique, Laiton  
 ES Macho máquina HSS-E Métrica, Latón  
 DE HSS-E Maschinengewindebohrer Metrisch, Messing

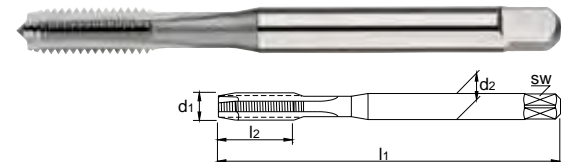


15-35	3-5
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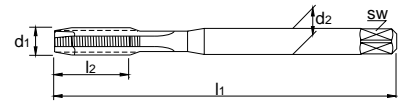
Ref.	d1	P	l1	l2	d2	sw
22.550.0300	M3	0.5	56	11	3.5	2.7
22.550.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.550.0500	M5	0.8	70	16	6	4.9
22.550.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.550.0800	M8	1.25	90	22	8	6.2
22.550.1000	M10	1.5	100	24	10	8



> **22.595** **INTERNATIONAL TOOLS**



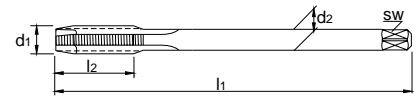
- NL ECO PRO HSS-E Machinetap Metrisch, stoomontlaten, roestvaststaal
- FR Taraud machine HSS-E ECO PRO Métrique, vaporisée, Inox
- ES Macho máquina HSS-E ECO PRO Métrica, vaporizada, acero inoxidable
- DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl

+6 6 ( M 60° OX. DIN 371 3xD Form B 4-6 ISO 2 6H INOX ECO PRO

**P 11** ≤600 N/mm<sup>2</sup> 15-20  
**M 21** INOX ≤850N/mm<sup>2</sup> 7-10

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.595.0300	M3	0.5	56	11	3.5	2.7	22.595.0500	M5	0.8	70	16	6	4.9	22.595.0800	M8	1.25	90	22	8	6.2
22.595.0400	M4	0.7	63	13	4.5	3.4	22.595.0600	M6	1	80	19	6	4.9	22.595.1000	M10	1.5	100	24	10	8

> **22.596** **INTERNATIONAL TOOLS**



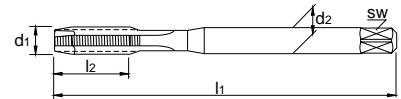
- NL ECO PRO HSS-E Machinetap Metrisch, stoomontlaten, roestvaststaal
- FR Taraud machine HSS-E ECO PRO Métrique, vaporisée, Inox
- ES Macho máquina HSS-E ECO PRO Métrica, vaporizada, acero inoxidable
- DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl

+6 6 ( M 60° OX. DIN 376 3xD Form B 4-6 ISO 2 6H INOX ECO PRO

**P 11** ≤600 N/mm<sup>2</sup> 15-20  
**M 21** INOX ≤850N/mm<sup>2</sup> 7-10

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.596.1200	M12	1.75	110	28	9	7														

> **22.600** **Phantom**



- NL HSS-E PM Machinetap Metrisch, stoomontlaten, roestvaststaal
- FR Taraud machine HSS-E PM Métrique, vaporisée, Inox
- ES Macho máquina HSS-E PM Métrica, vaporizada, acero inoxidable
- DE HSS-E PM Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl

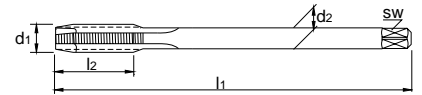
HSS-E PM M 60° OX. DIN 371 3xD Form B 4-5 ISO 2 6H INOX

**P 11** ≤600 N/mm<sup>2</sup> 15-20  
**M 21** INOX ≤850N/mm<sup>2</sup> 7-10  
**M 22** INOX >850N/mm<sup>2</sup> 5-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.600.0300	M3	0.5	56	11	3.5	2.7	22.600.0500	M5	0.8	70	16	6	4.9	22.600.0800	M8	1.25	90	22	8	6.2
22.600.0400	M4	0.7	63	13	4.5	3.4	22.600.0600	M6	1	80	19	6	4.9	22.600.1000	M10	1.5	100	24	10	8

## > 22.601 Phantom

NL HSS-E PM Machinetap Metrisch, stoomontlaten, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, vaporisée, Inox  
 ES Macho máquina HSS-E PM Métrica, vaporizada, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl



HSS-E PM	M	60°	OX.	DIN 376	3xD	Form B	4-5	ISO 2 6H	INOX
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P 11 ≤600 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>
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15-20	7-10	5-8
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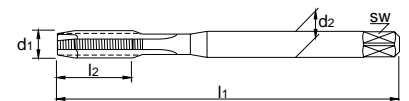
Ref.	d1	P	l1	l2	d2	sw
22.601.0800	M8	1.25	90	22	6	4.9
22.601.1000	M10	1.5	100	24	7	5.5
22.601.1200	M12	1.75	110	28	9	7
22.601.1400	M14	2	110	30	11	9

Ref.	d1	P	l1	l2	d2	sw
22.601.1600	M16	2	110	32	12	9
22.601.1800	M18	2.5	125	34	14	11
22.601.2000	M20	2.5	140	34	16	12
22.601.2200	M22	2.5	140	34	18	14.5

Ref.	d1	P	l1	l2	d2	sw
22.601.2400	M24	3	160	38	18	14.5
22.601.2700	M27	3	160	38	20	16
22.601.3000	M30	3.5	180	45	22	18

## > 22.604 Phantom

NL HSS-E PM Machinetap Metrisch, TiCN, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, TiCN, Inox  
 ES Macho máquina HSS-E PM Métrica, TiCN, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, TiCN, rostfreien Stahl



HSS-E PM	M	60°	TiCN	DIN 371	3xD	Form B	4-5	ISO 2 6H	INOX
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P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤650 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>
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15-20	15-20	7-10	4-8
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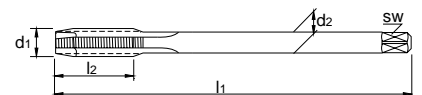
Ref.	d1	P	l1	l2	d2	sw
22.604.0200	M2	0.4	45	8	2.8	2.1
22.604.0250	M2,5	0.45	50	9	2.8	2.1
22.604.0300	M3	0.5	56	11	3.5	2.7

Ref.	d1	P	l1	l2	d2	sw
22.604.0400	M4	0.7	63	13	4.5	3.4
22.604.0500	M5	0.8	70	16	6	4.9
22.604.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.604.0800	M8	1.25	90	22	8	6.2
22.604.1000	M10	1.5	100	24	10	8

## > 22.605 Phantom

NL HSS-E PM Machinetap Metrisch, TiCN, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, TiCN, Inox  
 ES Macho máquina HSS-E PM Métrica, TiCN, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, TiCN, rostfreien Stahl



HSS-E PM	M	60°	TiCN	DIN 376	3xD	Form B	4-5	ISO 2 6H	INOX
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P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤650 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>
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15-20	15-20	7-10	4-8
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Ref.	d1	P	l1	l2	d2	sw
22.605.1200	M12	1.75	110	28	9	7
22.605.1400	M14	2	110	30	11	9

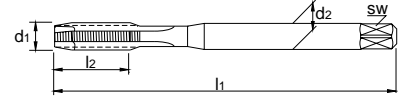
Ref.	d1	P	l1	l2	d2	sw
22.605.1600	M16	2	110	32	12	9
22.605.2000	M20	2.5	140	34	16	12

Ref.	d1	P	l1	l2	d2	sw

» **22.610 Phantom**



NL HSS-E PM Machinetap Metrisch, TiCN, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, TiCN, Inox  
 ES Macho máquina HSS-E PM Métrica, TiCN, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, TiCN, rostfreien Stahl



HSS-E PM M 60° TiCN DIN 371 3xD Form B 4-5 ISO 2 6H INOX

P 11 P 12 M 21 M 22 S 71 S 72  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> Ni/Co Ti

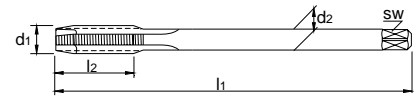
15-20 15-20 7-10 4-10 4-12 4-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.610.0200	M2	0.4	45	8	2.8	2.1	22.610.0400	M4	0.7	63	13	4.5	3.4	22.610.0800	M8	1.25	90	22	8	6.2
22.610.0250	M2,5	0.45	50	9	2.8	2.1	22.610.0500	M5	0.8	70	16	6	4.9	22.610.1000	M10	1.5	100	24	10	8
22.610.0300	M3	0.5	56	11	3.5	2.7	22.610.0600	M6	1	80	19	6	4.9							

» **22.611 Phantom**



NL HSS-E PM Machinetap Metrisch, TiCN, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, TiCN, Inox  
 ES Macho máquina HSS-E PM Métrica, TiCN, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, TiCN, rostfreien Stahl



HSS-E PM M 60° TiCN DIN 376 3xD Form B 4,5 ISO 2 6H INOX

P 11 P 12 M 21 M 22 S 71 S 72  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> Ni/Co Ti

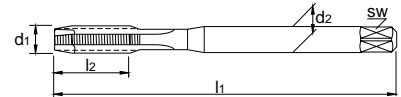
15-20 15-20 7-10 4-10 4-12 4-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.611.1200	M12	1.75	110	28	9	7	22.611.1600	M16	2	110	32	12	9	22.611.2000	M20	2.5	140	34	16	12

» **22.650 Phantom**



NL HSS-E Machinetap Metrisch, genitreerd, gietijzer  
 FR Taraud machine HSS-E Métrique, nitruré, Fonte  
 ES Macho máquina HSS-E Métrica, nitrurada, fundición  
 DE HSS-E Maschinengewindebohrer Metrisch, nitriert, Gusseisen



+6 6( M 60° NIT. DIN 371 2xD 2,5 6HX GG GGG

K 31 K 32  
 GG GGG GTS-GTW

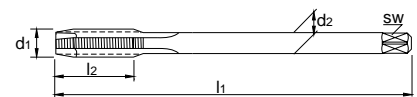
10-15 5-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.650.0300	M3	0.5	56	11	3.5	2.7	22.650.0500	M5	0.8	70	16	6	4.9	22.650.0800	M8	1.25	90	22	8	6.2
22.650.0400	M4	0.7	63	13	4.5	3.4	22.650.0600	M6	1	80	19	6	4.9	22.650.1000	M10	1.5	100	24	10	8

» **22.651 Phantom**



NL HSS-E Machinetap Metrisch, genitreerd, gietijzer  
 FR Taraud machine HSS-E Métrique, nitruré, Fonte  
 ES Macho máquina HSS-E Métrica, nitrurada, fundición  
 DE HSS-E Maschinengewindebohrer Metrisch, nitriert, Gusseisen



+6 6( M 60° NIT. DIN 376 2xD 2,5 6HX GG GGG

K 31 K 32  
 GG GGG GTS-GTW

10-15 5-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.651.0800	M8	1.25	90	22	6	4.9	22.651.1400	M14	2	110	30	11	9	22.651.2000	M20	2.5	140	34	16	12
22.651.1000	M10	1.5	100	24	7	5.5	22.651.1600	M16	2	110	32	12	9							
22.651.1200	M12	1.75	110	28	9	7	22.651.1800	M18	2.5	125	34	14	11							

## > 22.700 Phantom

NL HSS-E Machinetap Metrisch, Aluminium  
 FR Taraud machine HSS-E Métrique, Aluminium  
 ES Macho máquina HSS-E Métrica, Aluminio  
 DE HSS-E Maschinengewindebohrer Metrisch, Aluminium

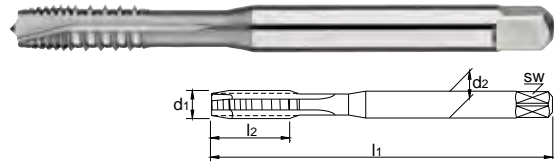
+6 ( M 60° DIN 371 3xD Form B 4-5 ISO 2 6H ALU

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 51</b> Cu
15-20	10-35	8-12

Ref.	d1	P	l1	l2	d2	sw
22.700.0300	M3	0.5	56	11	3.5	2.7
22.700.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
22.700.0500	M5	0.8	70	16	6	4.9
22.700.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.700.0800	M8	1.25	90	22	8	6.2
22.700.1000	M10	1.5	100	24	10	8



## > 22.701 Phantom

NL HSS-E Machinetap Metrisch, Aluminium  
 FR Taraud machine HSS-E Métrique, Aluminium  
 ES Macho máquina HSS-E Métrica, Aluminio  
 DE HSS-E Maschinengewindebohrer Metrisch, Aluminium

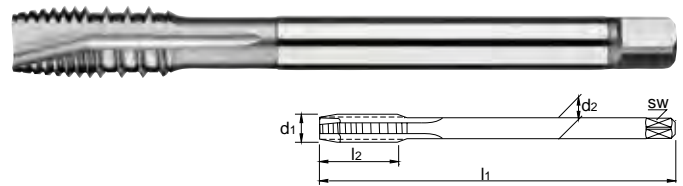
+6 ( M 60° DIN 371 3xD Form B 4-5 ISO 2 6H ALU

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 51</b> Cu
15-20	10-35	8-12

Ref.	d1	P	l1	l2	d2	sw
22.701.0800	M8	1.25	90	22	6	4.9

Ref.	d1	P	l1	l2	d2	sw
22.701.1000	M10	1.5	100	24	7	5.5

Ref.	d1	P	l1	l2	d2	sw
22.701.1200	M12	1.75	110	28	9	7



## > 22.705 Phantom

NL HSS Machinetap Metrisch, Aluminium  
 FR Taraud machine HSS Métrique, Aluminium  
 ES Macho máquina HSS Métrica, Aluminio  
 DE HSS Maschinengewindebohrer Metrisch, Aluminium

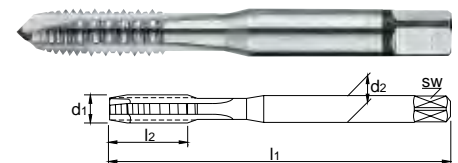
HSS M 60° ISO 529 2xD Form B 5 ISO 2 6H ALU

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 51</b> Cu
12-17	15-20	5-12

Ref.	d1	P	l1	d2	sw
22.705.0200	M2	0.4	41	2.5	2
22.705.0250	M2,5	0.45	44	2.8	2.24
22.705.0300	M3	0.5	48	3.15	2.5
22.705.0400	M4	0.7	53	4.5	3.15
22.705.0500	M5	0.8	58	5	4
22.705.0600	M6	1	66	6.3	5

Ref.	d1	P	l1	d2	sw
22.705.0700	M7	1	66	7.1	5.6
22.705.0800	M8	1.25	72	8	6.3
22.705.1000	M10	1.5	80	10	8
22.705.1200	M12	1.75	89	9	7.1
22.705.1400	M14	2	95	11.2	9
22.705.1600	M16	2	102	12.5	10

Ref.	d1	P	l1	d2	sw
22.705.1800	M18	2.5	112	14	11.2
22.705.2000	M20	2.5	112	14	11.2
22.705.2200	M22	2.5	118	16	12.5
22.705.2400	M24	3	130	18	14
22.705.3000	M30	3.5	138	20	16



> **22.720 Phantom**

NL HSS-E Machinetap Metrisch, genitreerd, Aluminium Si > 10%  
 FR Taraud machine HSS-E Métrique, nitruré, Aluminium Si > 10%  
 ES Macho máquina HSS-E Métrica, nitrurada, Aluminio Si > 10%  
 DE HSS-E Maschinengewindebohrer Metrisch, nitriert, Aluminium

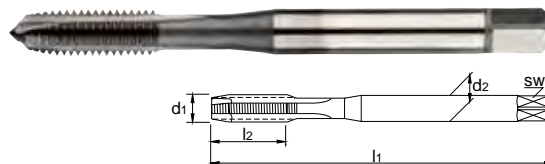
Si > 10%

+6 6 ( M 60° NIT. DIN 371 3xD Form B 5 ISO 2 6H ALU

N 42  
Alu  
Si>10%

10-15

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.720.0300	M3	0.5	56	11	3.5	2.7	22.720.0500	M5	0.8	70	16	6	4.9	22.720.0800	M8	1.25	90	22	8	6.2
22.720.0400	M4	0.7	63	13	4.5	3.4	22.720.0600	M6	1	80	19	6	4.9	22.720.1000	M10	1.5	100	24	10	8



> **22.721 Phantom**

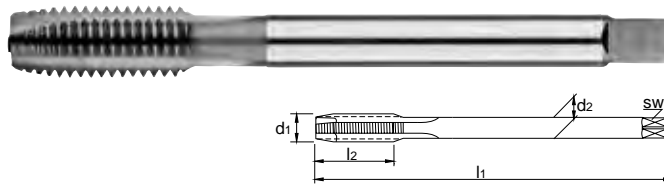
NL HSS-E Machinetap Metrisch, genitreerd, Aluminium Si > 10%  
 FR Taraud machine HSS-E Métrique, nitruré, Aluminium Si > 10%  
 ES Macho máquina HSS-E Métrica, nitrurada, Aluminio Si > 10%  
 DE HSS-E Maschinengewindebohrer Metrisch, nitriert, Aluminium  
 Si > 10%

+6 6 ( M 60° NIT. DIN 376 3xD Form B 5 ISO 2 6H ALU

N 42  
Alu  
Si>10%

10-15

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.721.1200	M12	1.75	110	28	9	7														



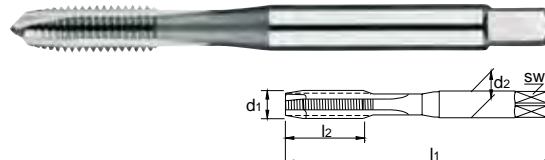
> **22.895 Phantom**

NL HSS Machinetap Metrisch, voor Phan-Coil  
 FR Taraud machine HSS Métrique, pour Phan-Coil  
 ES Macho máquina HSS Métrica, para Phan-Coil  
 DE HSS Maschinengewindebohrer Metrisch, für Phan-Coil

HSS EG M 60° DIN 371 Phan-Coil 2xD Form B 5 ISO 2 6H

P 11 P 12 K 31 K 32 N 41 N 52  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu CuAlFe  
 12-17 10-15 7-12 3-6 15-20 5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.895.0300	M3	3.65	0.5	63	7	4.5	22.895.0500	M5	6.04	0.8	80	10	6	22.895.0800	M8	9.62	1.25	100	15	10
22.895.0400	M4	4.91	0.7	70	8	6	22.895.0600	M6	7.3	1	90	12.5	8							

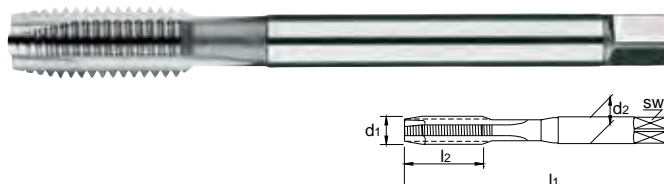


> **22.896 Phantom**

NL HSS Machinetap Metrisch, voor Phan-Coil  
 FR Taraud machine HSS Métrique, pour Phan-Coil  
 ES Macho máquina HSS Métrica, para Phan-Coil  
 DE HSS Maschinengewindebohrer Metrisch, für Phan-Coil

HSS EG M 60° DIN 376 Phan-Coil 2xD Form B 5 ISO 2 6H

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
22.896.1000	M10	11.95	1.5	110	17.5	9	22.896.1400	M14	16.6	2	110	22	12							
22.896.1200	M12	14.27	1.75	110	20	11	22.896.1600	M16	18.6	2	125	25	14							





## > 23.150 Phantom

NL HSS-E Machinetap Metrisch  
FR Taraud machine HSS-E Métrique  
ES Macho máquina HSS-E Métrica  
DE HSS-E Maschinengewindebohrer Metrisch

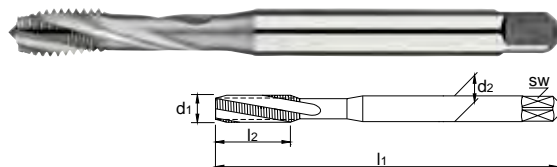
+6 ( M  DIN 371 2,5xD  Form C  ISO 2 6H

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
15-20	10-18	5-15	10-35	10-20	15--20	20-30

Ref.	d1	P	l1	l2	d2	sw
23.150.0300	M3	0.5	56	11	3.5	2.7
23.150.0400	M4	0.7	63	13	4.5	3.4
23.150.0500	M5	0.8	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.150.0600	M6	1	80	19	6	4.9
23.150.0700	M7	1	80	19	7	5.5
23.150.0800	M8	1.25	90	22	8	6.2

Ref.	d1	P	l1	l2	d2	sw
23.150.1000	M10	1.5	100	24	10	8



## > 23.151 Phantom

NL HSS-E Machinetap Metrisch  
FR Taraud machine HSS-E Métrique  
ES Macho máquina HSS-E Métrica  
DE HSS-E Maschinengewindebohrer Metrisch

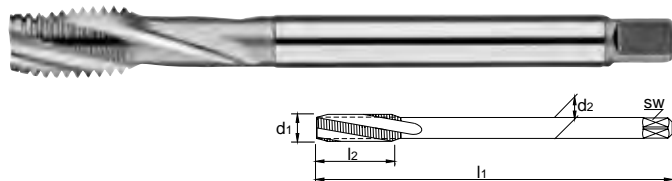
+6 ( M  DIN 376 2,5xD  Form C  ISO 2 6H

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
15-20	10-18	5-15	10-35	10-20	15--20	20-30

Ref.	d1	P	l1	l2	d2	sw
23.151.0600	M6	1	80	19	4.5	3.4
23.151.0800	M8	1.25	90	22	6	4.9
23.151.1000	M10	1.5	100	24	7	5.5
23.151.1200	M12	1.75	110	28	9	7
23.151.1400	M14	2	110	30	11	9

Ref.	d1	P	l1	l2	d2	sw
23.151.1600	M16	2	110	32	12	9
23.151.1800	M18	2.5	125	34	14	11
23.151.2000	M20	2.5	140	34	16	12
23.151.2200	M22	2.5	140	34	18	14.5
23.151.2400	M24	3	160	38	18	14.5

Ref.	d1	P	l1	l2	d2	sw
23.151.2700	M27	3	160	38	20	16
23.151.3000	M30	3.5	180	45	22	18
23.151.3300	M33	3.5	180	50	25	20
23.151.3600	M36	4	200	56	28	22



## > 23.291 INTERNATIONAL TOOLS

NL ECO HSS Machinetap Metrisch  
FR Taraud machine HSS ECO Métrique  
ES Macho máquina HSS ECO Métrica  
DE ECO HSS Maschinengewindebohrer Metrisch

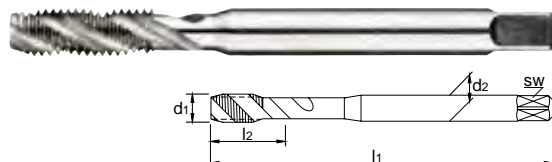
HSS M  DIN 371 2xD  Form C  ISO 2 6H **ECO**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu
12-17	9-15	7-12	20-30

Ref.	d1	P	l1	l2	d2	sw
23.291.0300	M3	0.5	56	11	3.5	2.7
23.291.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
23.291.0500	M5	0.8	70	16	6	4.9
23.291.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.291.0800	M8	1.25	90	22	8	6.2
23.291.1000	M10	1.5	100	24	10	8



## > 23.292 INTERNATIONAL TOOLS

NL ECO HSS Machinetap Metrisch  
FR Taraud machine HSS ECO Métrique  
ES Macho máquina HSS ECO Métrica  
DE ECO HSS Maschinengewindebohrer Metrisch

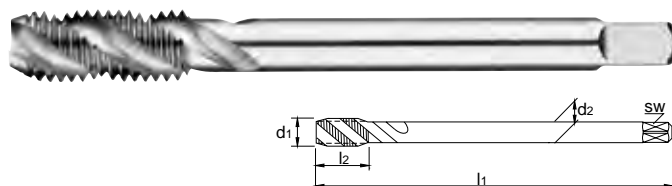
HSS M  DIN 376 2xD  Form C  ISO 2 6H **ECO**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu
12-17	9-15	7-12	20-30

Ref.	d1	P	l1	l2	d2	sw
23.292.1200	M12	1.75	110	28	9	7

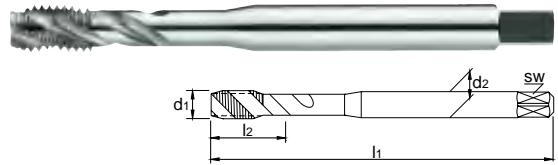
Ref.	d1	P	l1	l2	d2	sw

Ref.	d1	P	l1	l2	d2	sw



> 23.295 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch  
 FR Taraud machine HSS-E ECO PRO Métrique  
 ES Macho máquina HSS-E ECO PRO Métrica  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch



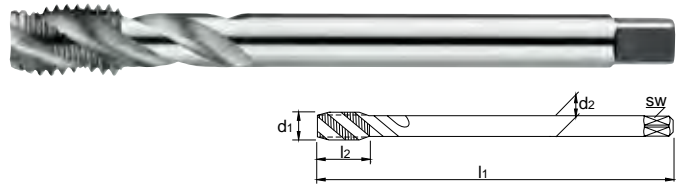
+6 6 ( M 60° DIN 371 2xD 35° Form C 2-3 ISO 2 6H ECO PRO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² K 31 GG N 41 Alu  
 15-20 12-18 10-15 25-35

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.295.0200	M2	0.4	45	8	2.8	2.1	23.295.0500	M5	0.8	70	16	6	4.9	23.295.1000	M10	1.5	100	24	10	8
23.295.0300	M3	0.5	56	11	3.5	2.7	23.295.0600	M6	1	80	19	6	4.9							
23.295.0400	M4	0.7	63	13	4.5	3.4	23.295.0800	M8	1.25	90	22	8	6.2							

> 23.296 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch  
 FR Taraud machine HSS-E ECO PRO Métrique  
 ES Macho máquina HSS-E ECO PRO Métrica  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch



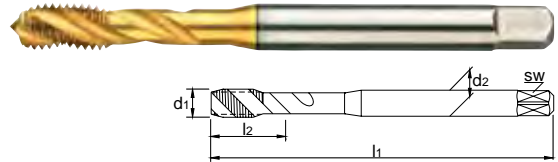
+6 6 ( M 60° DIN 376 2xD 35° Form C 2-3 ISO 2 6H ECO PRO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² K 31 GG N 41 Alu  
 15-20 12-18 10-15 25-35

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.296.1000	M10	1.5	100	24	7	5.5	23.296.1600	M16	2	110	32	12	9	23.296.2400	M24	3	160	38	18	14.5
23.296.1200	M12	1.75	110	28	9	7	23.296.2000	M20	2.5	140	34	16	12	23.296.2700	M27	3	160	38	20	16
23.296.1400	M14	2	110	30	11	9	23.296.2200	M22	2.5	140	34	18	14.5	23.296.3000	M30	3.5	180	45	22	18

> 23.297 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E ECO PRO Métrique, TiN  
 ES Macho máquina HSS-E ECO PRO Métrica, TiN  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, TiN



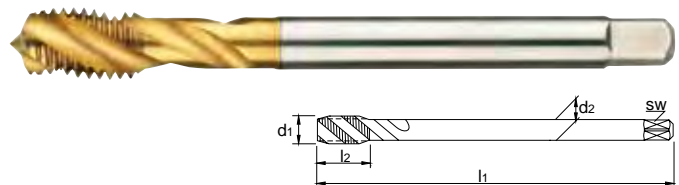
+6 6 ( M 60° TiN DIN 371 2xD 35° Form C 2-3 ISO 2 6H ECO PRO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² M 21 INOX ≤850 N/mm² K 31 GG N 41 Alu N 42 Alu Si>10% N 51 Cu  
 22-30 18-27 7-10 15-22 32-52 15-20 5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.297.0300	M3	0.5	56	11	3.5	2.7	23.297.0500	M5	0.8	70	16	6	4.9	23.297.0800	M8	1.25	90	22	8	6.2
23.297.0400	M4	0.7	63	13	4.5	3.4	23.297.0600	M6	1	80	19	6	4.9	23.297.1000	M10	1.5	100	24	10	8

> 23.298 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E ECO PRO Métrique, TiN  
 ES Macho máquina HSS-E ECO PRO Métrica, TiN  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, TiN



+6 6 ( M 60° TiN DIN 376 2xD 35° Form C 2-3 ISO 2 6H ECO PRO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² M 21 INOX ≤850 N/mm² K 31 GG N 41 Alu N 42 Alu Si>10% N 51 Cu  
 22-30 18-27 7-10 15-22 32-52 15-20 5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.298.1200	M12	1.75	110	28	9	7														

## > 23.300 Phantom

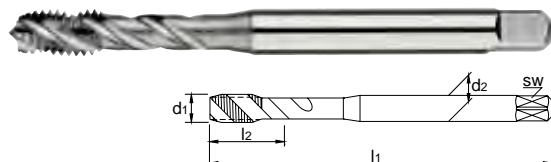
NL UNI HSS-E Machinetap Metrisch  
FR Taraud machine HSS-E UNI Métrique  
ES Macho máquina HSS-E UNI Métrica  
DE UNI HSS-E Maschinengewindebohrer Metrisch

+6 6 (	M	60°	DIN 371	2,5xD	40°	Form C	2,5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
23.300.0200	M2	0.4	45	8	2.8	2.1
23.300.0220	M2,2	0.45	45	9	2.8	2.1
23.300.0230	M2,3	0.4	45	9	2.8	2.1
23.300.0250	M2,5	0.45	50	9	2.8	2.1
23.300.0260	M2,6	0.45	50	9	2.8	2.1

Ref.	d1	P	l1	l2	d2	sw
23.300.0300	M3	0.5	56	11	3.5	2.7
23.300.0350	M3,5	0.6	56	12	4	3
23.300.0400	M4	0.7	63	13	4.5	3.4
23.300.0500	M5	0.8	70	16	6	4.9
23.300.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.300.0700	M7	1	80	19	7	5.5
23.300.0800	M8	1.25	90	22	8	6.2
23.300.1000	M10	1.5	100	24	10	8



## > 23.301 Phantom

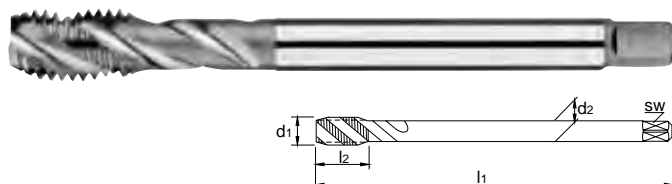
NL UNI HSS-E Machinetap Metrisch  
FR Taraud machine HSS-E UNI Métrique  
ES Macho máquina HSS-E UNI Métrica  
DE UNI HSS-E Maschinengewindebohrer Metrisch

+6 6 (	M	60°	DIN 376	2,5xD	40°	Form C	2,5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
23.301.0600	M6	1	80	19	4.5	3.4
23.301.0800	M8	1.25	90	22	6	4.9
23.301.0900	M9	1.25	90	22	7	5.5
23.301.1000	M10	1.5	100	24	7	5.5
23.301.1200	M12	1.75	110	28	9	7

Ref.	d1	P	l1	l2	d2	sw
23.301.1400	M14	2	110	30	11	9
23.301.1600	M16	2	110	32	12	9
23.301.1800	M18	2.5	125	34	14	11
23.301.2000	M20	2.5	140	34	16	12
23.301.2200	M22	2.5	140	34	18	14.5

Ref.	d1	P	l1	l2	d2	sw
23.301.2400	M24	3	160	38	18	14.5
23.301.2700	M27	3	160	38	20	16
23.301.3000	M30	3.5	180	45	22	18
23.301.3300	M33	3.5	180	50	25	20
23.301.3600	M36	4	200	56	28	22



## > 23.305 Phantom

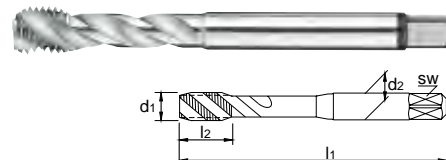
NL HSS Machinetap Metrisch  
FR Taraud machine HSS Métrique  
ES Macho máquina HSS Métrica  
DE HSS Maschinengewindebohrer Metrisch

HSS	M	60°	ISO 529	2xD	40°	Form C	2,5	ISO 2 6H
P 11	P 12	K 31	K 32	N 41	N 52			
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	CuAlFe			
12-17	10-15	7-12	3-6	15-20	5-12			

Ref.	d1	P	l1	l2	d2	sw
23.305.0300	M3	0.5	48	14	3.15	2.5
23.305.0400	M4	0.7	53	7	4	3.15
23.305.0500	M5	0.8	58	8	5	4
23.305.0600	M6	1	66	10	6.3	5
23.305.0800	M8	1.25	72	13	8	6.3

Ref.	d1	P	l1	l2	d2	sw
23.305.1000	M10	1.5	80	15	10	8
23.305.1200	M12	1.75	89	18	9	7.1
23.305.1400	M14	2	95	20	11.2	9
23.305.1600	M16	2	102	20	12.5	10
23.305.1800	M18	2.5	112	25	14	11.2

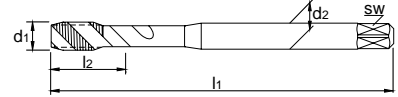
Ref.	d1	P	l1	l2	d2	sw
23.305.2000	M20	2.5	112	25	14	11.2
23.305.2200	M22	2.5	118	25	16	12.5
23.305.2400	M24	3	130	30	18	14
23.305.2700	M27	3	135	30	20	16
23.305.3000	M30	3.5	138	35	20	16



> **23.310 Phantom**



NL HSS-E Machinetap Metrisch, stoomontlaten  
 FR Taraud machine HSS-E Métrique, vaporisée  
 ES Macho máquina HSS-E Métrica, vaporizada  
 DE HSS-E Maschinengewindebohrer Metrisch, dampfangelassen



**NIEUW NOUVEAU NUEVO NEU**

+6 6 ( M 60° OX. DIN 371 2,5xD 40° Form C 2,5 ISO 2 6H

**P 11** ≤800 N/mm<sup>2</sup> 15-20  
**P 12** ≤850 N/mm<sup>2</sup> 10-20  
**K 31** GG 10-15  
**K 32** GGG GTS-GTW 5-8

Ref.	d1	P	l1	l2	d2	sw
23.310.0200	M2	0.4	45	8	2.8	2.1
23.310.0300	M3	0.5	56	11	3.5	2.7
23.310.0400	M4	0.7	63	13	4.5	3.4

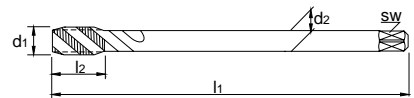
Ref.	d1	P	l1	l2	d2	sw
23.310.0500	M5	0.8	70	16	6	4.9
23.310.0600	M6	1	80	19	6	4.9
23.310.0800	M8	1.25	90	22	8	6.2

Ref.	d1	P	l1	l2	d2	sw
23.310.1000	M10	1.5	100	24	10	8

> **23.311 Phantom**



NL HSS-E Machinetap Metrisch, stoomontlaten  
 FR Taraud machine HSS-E Métrique, vaporisée  
 ES Macho máquina HSS-E Métrica, vaporizada  
 DE HSS-E Maschinengewindebohrer Metrisch, dampfangelassen



**NIEUW NOUVEAU NUEVO NEU**

+6 6 ( M 60° OX. DIN 376 2,5xD 40° Form C 2,5 ISO 2 6H

**P 11** ≤800 N/mm<sup>2</sup> 15-20  
**P 12** ≤850 N/mm<sup>2</sup> 10-20  
**K 31** GG 10-15  
**K 32** GGG GTS-GTW 5-8

Ref.	d1	P	l1	l2	d2	sw
23.311.1200	M12	1.75	110	28	9	7
23.311.1400	M14	2	110	30	11	9
23.311.1600	M16	2	110	32	12	9

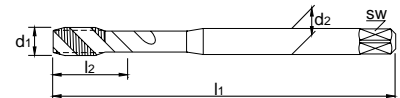
Ref.	d1	P	l1	l2	d2	sw
23.311.1800	M18	2.5	125	34	14	11
23.311.2000	M20	2.5	140	34	16	12
23.311.2200	M22	2.5	140	34	18	14.5

Ref.	d1	P	l1	l2	d2	sw
23.311.2400	M24	3	160	38	18	14.5
23.311.2700	M27	3	160	38	20	16
23.311.3000	M30	3.5	180	45	22	18

> **23.320 Phantom**



NL UNI HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E UNI Métrique, TiN  
 ES Macho máquina HSS-E UNI Métrica, TiN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiN



**NIEUW NOUVEAU NUEVO NEU**

+6 6 ( M 60° TiN DIN 371 2,5xD 40° Form C 2,5 ISO 2 6H UNI

**P 11** ≤800 N/mm<sup>2</sup> 15-20  
**P 12** ≤850 N/mm<sup>2</sup> 10-20  
**P 13** ≤1000 N/mm<sup>2</sup> 6-10  
**M 21** INOX ≤850N/mm<sup>2</sup> 7-10  
**M 22** INOX >850N/mm<sup>2</sup> 4-8  
**K 31** GG 10-15  
**K 32** GGG GTS-GTW 10-15  
**N 41** Alu 25-35  
**N 42** Alu Si>10% 10-20  
**N 51** Cu 15-35  
**S 71** Ni/Co 2-8  
**S 72** Ti 2-8

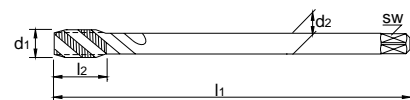
Ref.	d1	P	l1	l2	d2	sw
23.320.0200	M2	0.4	45	8	2.8	2.1
23.320.0250	M2,5	0.45	50	9	2.8	2.1
23.320.0300	M3	0.5	56	11	3.5	2.7

Ref.	d1	P	l1	l2	d2	sw
23.320.0400	M4	0.7	63	13	4.5	3.4
23.320.0500	M5	0.8	70	16	6	4.9
23.320.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.320.0700	M7	1	80	19	7	5.5
23.320.0800	M8	1.25	90	22	8	6.2
23.320.1000	M10	1.5	100	24	10	8

## > 23.321 Phantom

NL UNI HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E UNI Métrique, TiN  
 ES Macho máquina HSS-E UNI Métrica, TiN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiN



**NIEUW NOUVEAU NUEVO NEU**

+6 l	M	60°	TiN	DIN 376	2,5xD	40°	Form C	2,5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	4-8	10-15	10-15	25-35	10-20	15-35	2-8	2-8

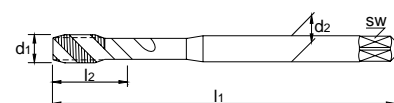
Ref.	d1	P	l1	l2	d2	sw
23.321.0600	M6	1	80	19	4.5	3.4
23.321.0800	M8	1.25	90	22	6	4.9
23.321.1000	M10	1.5	100	24	7	5.5

Ref.	d1	P	l1	l2	d2	sw
23.321.1200	M12	1.75	110	28	9	7
23.321.1400	M14	2	110	30	11	9
23.321.1600	M16	2	110	32	12	9

Ref.	d1	P	l1	l2	d2	sw
23.321.2000	M20	2.5	140	34	16	12
23.321.2400	M24	3	160	38	18	14.5

## > 23.324 Phantom

NL UNI HSS-E Machinetap Metrisch, TiCN  
 FR Taraud machine HSS-E UNI Métrique, TiCN  
 ES Macho máquina HSS-E UNI Métrica, TiCN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiCN



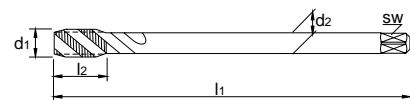
+6 l	M	60°	TiCN	DIN 371	2,5xD	40°	Form C	2,5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	4-8	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
23.324.0300	M3	0.5	56	11	3.5	2.7
23.324.0400	M4	0.7	63	13	4.5	3.4
23.324.0500	M5	0.8	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.324.0600	M6	1	80	19	6	4.9
23.324.0800	M8	1.25	90	22	8	6.2
23.324.1000	M10	1.5	100	24	10	8

## > 23.325 Phantom

NL UNI HSS-E Machinetap Metrisch, TiCN  
 FR Taraud machine HSS-E UNI Métrique, TiCN  
 ES Macho máquina HSS-E UNI Métrica, TiCN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiCN



+6 l	M	60°	TiCN	DIN 376	2,5xD	40°	Form C	2,5	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	4-8	10-15	10-15	25-35	10-20	15-35	2-8	2-8

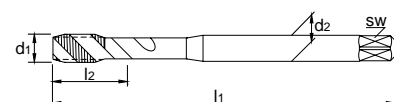
Ref.	d1	P	l1	l2	d2	sw
23.325.0600	M6	1	80	19	4.5	3.4
23.325.0800	M8	1.25	90	22	6	4.9
23.325.1000	M10	1.5	100	24	7	5.5

Ref.	d1	P	l1	l2	d2	sw
23.325.1200	M12	1.75	110	28	9	7
23.325.1400	M14	2	110	30	11	9
23.325.1600	M16	2	110	32	12	9

Ref.	d1	P	l1	l2	d2	sw
23.325.2000	M20	2.5	140	34	16	12

## > 23.352 Phantom

NL HSS-E PM Synchro Machinetap Metrisch, TiCN  
 FR Taraud Machine Synchro HSS-E PM Métrique, TiCN  
 ES Macho Máquina Sincronizado HSS-E PM Métrica, TiCN  
 DE HSS-E PM Synchron-Maschinengewindebohrer Metrisch, TiCN



HSS-E PM	M	60°	TiCN	DIN 371	2,5xD	40°	Form C	2,5	6HX	
P 11	P 12	P 13	K 31	K 32	N 41	N 42	N 43	N 51	S 71	S 72
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	Ni/Co	Ti
30-45	20-40	12-20	14-25	8-16	32-60	15-30	25-35	15-35	6-18	6-18

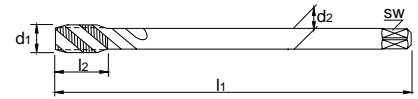
Ref.	d1	P	l1	l2	d2	sw
23.352.0300	M3	0.5	56	11	3.5	2.7
23.352.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
23.352.0500	M5	0.8	70	16	6	4.9
23.352.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.352.0800	M8	1.25	90	22	8	6.2
23.352.1000	M10	1.5	100	24	10	8

> **23.353 Phantom**

NL HSS-E PM Synchro Machinetap Metrisch, TiCN  
 FR Taraud Machine Synchro HSS-E PM Métrique, TiCN  
 ES Macho Máquina Sincronizado HSS-E PM Métrica, TiCN  
 DE HSS-E PM Synchro-Maschinengewindebohrer Metrisch, TiCN

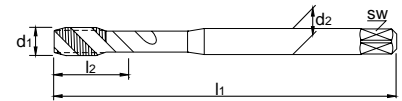


HSS-E PM	M	60°	TiCN	DIN 376	2,5xD	40°	Form C	2,5	6HX	
P 11	P 12	P 13	K 31	K 32	N 41	N 42	N 43	N 51	S 71	S 72
≤800 N/mm²	≤850 N/mm²	≤1000 N/mm²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	Ni/Co	Ti
30-45	20-40	12-20	14-25	8-16	32-60	15-30	25-35	15-35	6-18	6-18

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.353.1200	M12	1.75	110	28	9	7	23.353.1600	M16	2	110	32	12	9	23.353.2000	M20	2.5	140	34	16	12

> **23.368 Phantom**

NL HP2 UNI HSS-E PM Machinetap Metrisch, HARDLUBE  
 FR Taraud machine HSS-E PM HP2 UNI Métrique, HARDLUBE  
 ES Macho máquina HSS-E PM HP2 UNI Métrica, HARDLUBE  
 DE HP2 UNI HSS-E PM Maschinengewindebohrer Metrisch, HARDLUBE

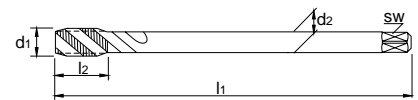


HSS-E PM	M	60°	HARD LUBE	DIN 371	2,5xD	50°	Form C	2-2,5	6HX	HP2 UNI	
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	S 71	S 72
≤800 N/mm²	≤850 N/mm²	≤1000 N/mm²	≤1400 N/mm²	INOX ≤850N/mm²	INOX >850N/mm²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Ni/Co	Ti
15-20	15-20	8-15	8-15	8-15	8-15	20-25	20-25	20-25	20-25	5-12	5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.368.0300	M3	0.5	56	11	3.5	2.7	23.368.0500	M5	0.8	70	16	6	4.9	23.368.0800	M8	1.25	90	22	8	6.2
23.368.0400	M4	0.7	63	13	4.5	3.4	23.368.0600	M6	1	80	19	6	4.9	23.368.1000	M10	1.5	100	24	10	8

> **23.369 Phantom**

NL HP2 UNI HSS-E PM Machinetap Metrisch, HARDLUBE  
 FR Taraud machine HSS-E PM HP2 UNI Métrique, HARDLUBE  
 ES Macho máquina HSS-E PM HP2 UNI Métrica, HARDLUBE  
 DE HP2 UNI HSS-E PM Maschinengewindebohrer Metrisch, HARDLUBE



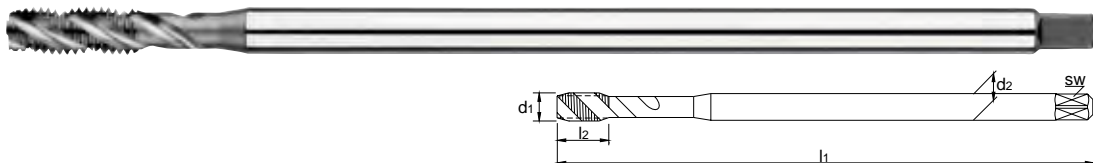
HSS-E PM	M	60°	HARD LUBE	DIN 376	2,5xD	50°	Form C	2-2,5	6HX	HP2 UNI	
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	S 71	S 72
≤800 N/mm²	≤850 N/mm²	≤1000 N/mm²	≤1400 N/mm²	INOX ≤850N/mm²	INOX >850N/mm²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Ni/Co	Ti
15-20	15-20	8-15	8-15	8-15	8-15	20-25	20-25	20-25	20-25	5-12	5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.369.1200	M12	1.75	110	28	9	7	23.369.1600	M16	2	110	32	12	9	23.369.2000	M20	2.5	140	34	16	12
23.369.1400	M14	2	110	30	11	9														



## > 23.370 Phantom

NL UNI HSS-E Machinetap Metrisch, lang  
FR Taraud machine HSS-E UNI Métrique, version longue  
ES Macho máquina HSS-E UNI Métrica, larga  
DE UNI HSS-E Maschinengewindebohrer Metrisch, lang



+6 ( M 60° NORM 2,5xD 40° Form C 2,5 ISO 2 6H UNI

P 11 P 12 P 13 M 21 K 31 K 32 N 41 N 42 N 51 S 71 S 72  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu Ni/Co Ti

15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8
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Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.370.0400	M4	0.7	126	7	4.5	3.4	23.370.0600	M6	1	160	10	6	4.9							
23.370.0500	M5	0.8	140	8	6	4.9	23.370.0800	M8	1.25	180	12.5	8	6.2							

## > 23.371 Phantom

NL UNI HSS-E Machinetap Metrisch, lang  
FR Taraud machine HSS-E UNI Métrique, version longue  
ES Macho máquina HSS-E UNI Métrica, larga  
DE UNI HSS-E Maschinengewindebohrer Metrisch, lang



+6 ( M 60° NORM 2,5xD 40° Form C 2,5 ISO 2 6H UNI

P 11 P 12 P 13 M 21 K 31 K 32 N 41 N 42 N 51 S 71 S 72  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu Ni/Co Ti

15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8
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Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.371.0800	M8	1.25	180	12	6	4.9	23.371.1200	M12	1.75	220	17.5	9	7	23.371.2000	M20	2.5	280	25	16	12
23.371.1000	M10	1.5	200	15	7	5.5	23.371.1600	M16	2	220	20	12	9							

## > 23.400 Phantom

NL HSS-E PM Machinetap Metrisch, 1200 N/mm<sup>2</sup>  
FR Taraud machine HSS-E PM Métrique, 1200 N/mm<sup>2</sup>  
ES Macho máquina HSS-E PM Métrica, 1200 N/mm<sup>2</sup>  
DE HSS-E PM Maschinengewindebohrer Metrisch, 1200 N/mm<sup>2</sup>



HSS-E PM M 60° OX. DIN 371 2,5xD 40° Form C 2,5 ISO 2 6H

P 13 P 14 M 22  
 ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup>

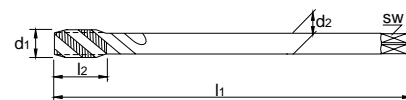
10-15	6-10	4-6
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Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.400.0300	M3	0.5	56	11	3.5	2.7	23.400.0500	M5	0.8	70	16	6	4.9	23.400.0800	M8	1.25	90	22	8	6.2
23.400.0400	M4	0.7	63	13	4.5	3.4	23.400.0600	M6	1	80	19	6	4.9	23.400.1000	M10	1.5	100	24	10	8

› **23.401 Phantom**



NL HSS-E PM Machinetap Metrisch, 1200 N/mm<sup>2</sup>  
 FR Taraud machine HSS-E PM Métrique, 1200 N/mm<sup>2</sup>  
 ES Macho máquina HSS-E PM Métrica, 1200 N/mm<sup>2</sup>  
 DE HSS-E PM Maschinengewindebohrer Metrisch, 1200 N/mm<sup>2</sup>



HSS-E PM M 60° OX. DIN 376 2,5xD 40° Form C 2,5 ISO 2 6H

P 13 ≤1000 N/mm<sup>2</sup> P 14 ≤1400 N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup>

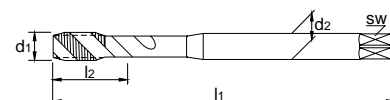
10-15 6-10 4-6

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.401.0800	M8	1.25	90	22	6	4.9	23.401.1600	M16	2	110	32	12	9	23.401.2400	M24	3	160	38	18	14.5
23.401.1000	M10	1.5	100	24	7	5.5	23.401.1800	M18	2.5	125	34	14	11	23.401.2700	M27	3	160	38	20	16
23.401.1200	M12	1.75	110	28	9	7	23.401.2000	M20	2.5	140	34	16	12	23.401.3000	M30	3.5	180	45	22	18
23.401.1400	M14	2	110	30	11	9	23.401.2200	M22	2.5	140	34	18	14.5							

› **23.404 Phantom**



NL HSS-E PM Machinetap Metrisch, 1200 N/mm<sup>2</sup>, TiCN  
 FR Taraud machine HSS-E PM Métrique, 1200 N/mm<sup>2</sup>, TiCN  
 ES Macho máquina HSS-E PM Métrica, 1200 N/mm<sup>2</sup>, TiCN  
 DE HSS-E PM Maschinengewindebohrer Metrisch, 1200 N/mm<sup>2</sup>, TiCN



HSS-E PM M 60° TiCN DIN 371 2,5xD 40° Form C 2,5 ISO 2 6H

P 13 ≤1000 N/mm<sup>2</sup> P 14 ≤1400 N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup>

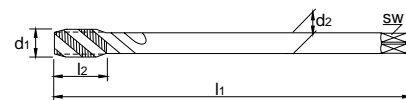
10-15 6-10 4-6

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.404.0300	M3	0.5	56	11	3.5	2.7	23.404.0500	M5	0.8	70	16	6	4.9	23.404.0800	M8	1.25	90	22	8	6.2
23.404.0400	M4	0.7	63	13	4.5	3.4	23.404.0600	M6	1	80	19	6	4.9	23.404.1000	M10	1.5	100	24	10	8

› **23.405 Phantom**



NL HSS-E PM Machinetap Metrisch, 1200 N/mm<sup>2</sup>, TiCN  
 FR Taraud machine HSS-E PM Métrique, 1200 N/mm<sup>2</sup>, TiCN  
 ES Macho máquina HSS-E PM Métrica, 1200 N/mm<sup>2</sup>, TiCN  
 DE HSS-E PM Maschinengewindebohrer Metrisch, 1200 N/mm<sup>2</sup>, TiCN



HSS-E PM M 60° TiCN DIN 376 2,5xD 40° Form C 2,5 ISO 2 6H

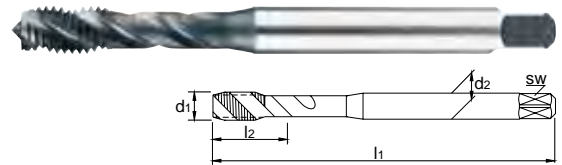
P 13 ≤1000 N/mm<sup>2</sup> P 14 ≤1400 N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup>

10-15 6-10 4-6

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.405.1200	M12	1.75	110	28	9	7														

## > 23.430 Phantom

- NL HSS-E PM Machinetap Metrisch, stoomontlaten, Titanium- en Nikkellegeringen  
 FR Taraud machine HSS-E PM Métrique, vaporisée, alliage de Titane et Nickel  
 ES Macho máquina HSS-E PM Métrica, vaporizada, aleados de Titano y Níquel  
 DE HSS-E PM Maschinengewindebohrer Metrisch, dampfangelassen, Titanium- und Nickellegierungen



HSS-E PM	M	60°	OX.	DIN 371	2,5xD	40°	Form C	3	ISO 2 6H
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P 14 ≤1400 N/mm <sup>2</sup>	N 52 CuAlFe	S 71 Ni/Co	S 72 Ti
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3-5	3-5	2-15	4-15
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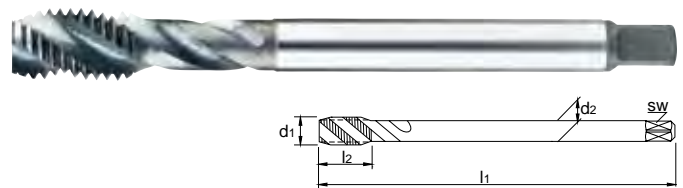
Ref.	d1	P	l1	l2	d2	sw
23.430.0400	M4	0.7	63	13	4.5	3.4
23.430.0500	M5	0.8	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.430.0600	M6	1	80	19	6	4.9
23.430.0800	M8	1.25	90	22	8	6.2

Ref.	d1	P	l1	l2	d2	sw
23.430.1000	M10	1.5	100	24	10	8

## > 23.431 Phantom

- NL HSS-E PM Machinetap Metrisch, stoomontlaten, Titanium- en Nikkellegeringen  
 FR Taraud machine HSS-E PM Métrique, vaporisée, alliage de Titane et Nickel  
 ES Macho máquina HSS-E PM Métrica, vaporizada, aleados de Titano y Níquel  
 DE HSS-E PM Maschinengewindebohrer Metrisch, dampfangelassen, Titanium- und Nickellegierungen



HSS-E PM	M	60°	OX.	DIN 376	2,5xD	40°	Form C	3	ISO 2 6H
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P 14 ≤1400 N/mm <sup>2</sup>	N 52 CuAlFe	S 71 Ni/Co	S 72 Ti
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3-5	3-5	2-15	4-15
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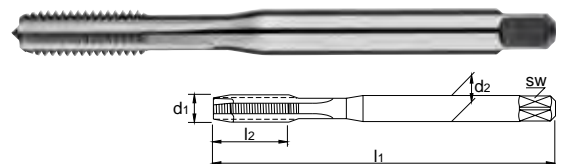
Ref.	d1	P	l1	l2	d2	sw
23.431.1200	M12	1.75	110	28	9	7

Ref.	d1	P	l1	l2	d2	sw

Ref.	d1	P	l1	l2	d2	sw

## > 23.440 Phantom

- NL VHM Machinetap Metrisch, TiCN, 50-60 HRC  
 FR Taraud machine Carbure Métrique, TiCN, 50-60 HRC  
 ES Macho máquina MD Métrica, TiCN, 50-60 HRC  
 DE VHM Maschinengewindebohrer Metrisch, TiCN, 50-60 HRC



MG HM	M	60°	TiCN	DIN 371	2xD	Form C	2,5	6HX
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P 14 ≤1400 N/mm <sup>2</sup>	H 15 HRC	M 22 INOX >850N/mm <sup>2</sup>	N 52 CuAlFe	N 62 GFK/CFK
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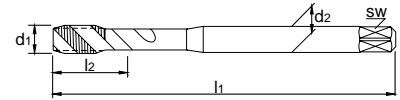
25-40	5-15	30-50	25-30	10-20
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Ref.	d1	P	l1	l2	d2	sw
23.440.0300	M3	0.5	56	11	3.5	2.7
23.440.0400	M4	0.7	63	13	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
23.440.0500	M5	0.8	70	16	6	4.9
23.440.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.440.0800	M8	1.25	90	22	8	6.2
23.440.1000	M10	1.5	100	24	10	8

> **23.445** **INTERNATIONAL TOOLS**



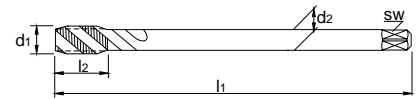
- NL ECO PRO HSS-E Machinetap Metrisch, stoomontlaten, roestvaststaal
- FR Taraud machine HSS-E ECO PRO Métrique, vaporisée, Inox
- ES Macho máquina HSS-E ECO PRO Métrica, vaporizada, acero inoxidable
- DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl

+6 6 ( M 60° OX. DIN 371 2xD 35° Form C 2-3 ISO 2 6H INOX ECO PRO

P 14 ≤1400 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup>  
3-5 7-10

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.445.0300	M3	0.5	56	11	3.5	2.7	23.445.0500	M5	0.8	70	16	6	4.9	23.445.0800	M8	1.25	90	22	8	6.2
23.445.0400	M4	0.7	63	13	4.5	3.4	23.445.0600	M6	1	80	19	6	4.9	23.445.1000	M10	1.5	100	24	10	8

> **23.446** **INTERNATIONAL TOOLS**



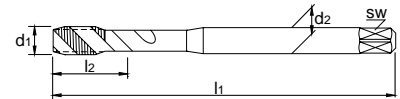
- NL ECO PRO HSS-E Machinetap Metrisch, stoomontlaten, roestvaststaal
- FR Taraud machine HSS-E ECO PRO Métrique, vaporisée, Inox
- ES Macho máquina HSS-E ECO PRO Métrica, vaporizada, acero inoxidable
- DE ECO PRO HSS-E Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl

+6 6 ( M 60° OX. DIN 376 2xD 35° Form C 2-3 ISO 2 6H INOX ECO PRO

P 14 ≤1400 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup>  
3-5 7-10

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.446.1200	M12	1.75	110	28	9	7														

> **23.450** **Phantom**



- NL HSS-E Machinetap Metrisch, stoomontlaten, roestvaststaal
- FR Taraud machine HSS-E Métrique, vaporisée, Inox
- ES Macho máquina HSS-E Métrica, vaporizada, acero inoxidable
- DE HSS-E Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl

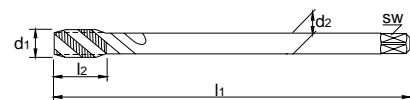
+6 6 ( M 60° OX. DIN 371 2,5xD 45° Form C 2.5 ISO 2 6H INOX

P 14 ≤1400 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup> S 71 Ni/Co  
3-5 7-10 5-8 2-8

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.450.0300	M3	0.5	56	11	3.5	2.7	23.450.0500	M5	0.8	70	16	6	4.9	23.450.0800	M8	1.25	90	22	8	6.2
23.450.0400	M4	0.7	63	13	4.5	3.4	23.450.0600	M6	1	80	19	6	4.9	23.450.1000	M10	1.5	100	24	10	8

## > 23.451 Phantom

NL HSS-E Machinetap Metrisch, stoomontlaten, roestvaststaal  
 FR Taraud machine HSS-E Métrique, vaporisée, Inox  
 ES Macho máquina HSS-E Métrica, vaporizada, acero inoxidable  
 DE HSS-E Maschinengewindebohrer Metrisch, dampfangelassen, rostfreien Stahl



+6 ( M 60° OX. DIN 376 2,5xD 40° Form C 2,5 ISO 2 6H INOX

P 14 M 21 M 22 S 71  
 ≤1400 N/mm<sup>2</sup> INOX ≤850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> Ni/Co

3-5 7-10 5-8 2-8

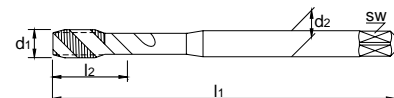
Ref.	d1	P	l1	l2	d2	sw
23.451.0800	M8	1.25	90	22	6	4.9
23.451.1000	M10	1.5	100	24	7	5.5
23.451.1200	M12	1.75	110	28	9	7
23.451.1400	M14	2	110	30	11	9
23.451.1600	M16	2	110	32	12	9
23.451.1800	M18	2.5	125	34	14	11

Ref.	d1	P	l1	l2	d2	sw
23.451.2000	M20	2.5	140	34	16	12
23.451.2200	M22	2.5	140	34	18	14.5
23.451.2400	M24	3	160	38	18	14.5
23.451.2700	M27	3	160	38	20	16
23.451.3000	M30	3.5	180	45	22	18
23.451.3300	M33	3.5	180	50	25	20

Ref.	d1	P	l1	l2	d2	sw
23.451.3600	M36	4	200	56	28	22
23.451.3900	M39	4	200	60	32	24
23.451.4200	M42	4.5	200	60	32	24
23.451.4500	M45	4.5	220	65	36	29
23.451.4800	M48	5	250	70	36	29

## > 23.454 Phantom

NL HSS-E PM Machinetap Metrisch, TiCN, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, TiCN, Inox  
 ES Macho máquina HSS-E PM Métrica, TiCN, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, TiCN, rostfreien Stahl



HSS-E PM M 60° TiCN DIN 371 2,5xD 40° Form C 2,5 ISO 2 6H INOX

P 14 M 21 M 22 S 71  
 ≤1400 N/mm<sup>2</sup> INOX ≤850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> Ni/Co

6-8 7-10 5-8 2-8

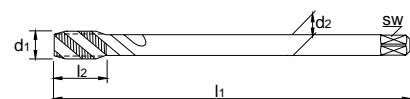
Ref.	d1	P	l1	l2	d2	sw
23.454.0200	M2	0.4	45	8	2.8	2.1
23.454.0250	M2,5	0.45	50	9	2.8	2.1
23.454.0300	M3	0.5	56	11	3.5	2.7

Ref.	d1	P	l1	l2	d2	sw
23.454.0400	M4	0.7	63	13	4.5	3.4
23.454.0500	M5	0.8	70	16	6	4.9
23.454.0600	M6	1	80	19	6	4.9

Ref.	d1	P	l1	l2	d2	sw
23.454.0800	M8	1.25	90	22	8	6.2
23.454.1000	M10	1.5	100	24	10	8

## > 23.455 Phantom

NL HSS-E PM Machinetap Metrisch, TiCN, roestvaststaal  
 FR Taraud machine HSS-E PM Métrique, TiCN, Inox  
 ES Macho máquina HSS-E PM Métrica, TiCN, acero inoxidable  
 DE HSS-E PM Maschinengewindebohrer Metrisch, TiCN, rostfreien Stahl



HSS-E PM M 60° TiCN DIN 376 2,5xD 40° Form C 2,5 ISO 2 6H INOX

P 14 M 21 M 22 S 71  
 ≤1400 N/mm<sup>2</sup> INOX ≤850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> Ni/Co

6-8 7-10 5-8 2-8

Ref.	d1	P	l1	l2	d2	sw
23.455.1200	M12	1.75	110	28	9	7

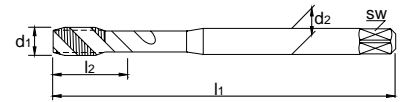
Ref.	d1	P	l1	l2	d2	sw
23.455.1600	M16	2	110	32	12	9

Ref.	d1	P	l1	l2	d2	sw
23.455.2000	M20	2.5	140	34	16	12

> **23.480** **Phantom**



NL HSS-E Machinetap Metrisch, Aluminium  
 FR Taraud machine HSS-E Métrique, Aluminium  
 ES Macho máquina HSS-E Métrica, Aluminio  
 DE HSS-E Maschinengewindebohrer Metrisch, Aluminium



+6 6 ( M 60° DIN 371 2,5xD 45° Form C 2,5 ISO 2 6H ALU

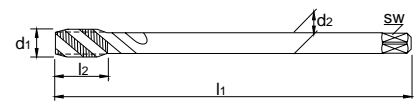
<b>P 11</b> 5800 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-20	10-35	10-15	8-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.480.0300	M3	0.5	56	11	3.5	2.7	23.480.0500	M5	0.8	70	16	6	4.9	23.480.0800	M8	1.25	90	22	8	6.2
23.480.0400	M4	0.7	63	13	4.5	3.4	23.480.0600	M6	1	80	19	6	4.9	23.480.1000	M10	1.5	100	24	10	8

> **23.481** **Phantom**



NL HSS-E Machinetap Metrisch, Aluminium  
 FR Taraud machine HSS-E Métrique, Aluminium  
 ES Macho máquina HSS-E Métrica, Aluminio  
 DE HSS-E Maschinengewindebohrer Metrisch, Aluminium



+6 6 ( M 60° DIN 376 2,5xD 45° Form C 2,5 ISO 2 6H ALU

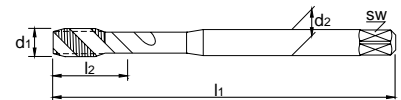
<b>P 11</b> 5800 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-20	10-35	10-15	8-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.481.0800	M8	1.25	90	22	6	4.9	23.481.1200	M12	1.75	110	28	9	7	23.481.1600	M16	2	110	32	12	9
23.481.1000	M10	1.5	100	24	7	5.5	23.481.1400	M14	2	110	30	11	9							

> **23.500** **Phantom**



NL HSS-E Machinetap Metrisch, genitreerd, Aluminium Si > 10%  
 FR Taraud machine HSS-E Métrique, nitruré, Aluminium Si > 10%  
 ES Macho máquina HSS-E Métrica, nitrurada, Aluminio Si > 10%  
 DE HSS-E Maschinengewindebohrer Metrisch, nitriert, Aluminium Si > 10%



+6 6 ( M 60° NIT. DIN 371 2,5xD 45° Form C 2,5 ISO 2 6H ALU

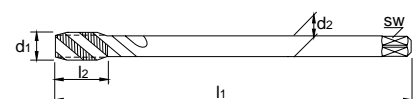
<b>N 42</b> Alu Si>10%
10-15

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.500.0300	M3	0.5	56	11	3.5	2.7	23.500.0500	M5	0.8	70	16	6	4.9	23.500.0800	M8	1.25	90	22	8	6.2
23.500.0400	M4	0.7	63	13	4.5	3.4	23.500.0600	M6	1	80	19	6	4.9	23.500.1000	M10	1.5	100	24	10	8

> **23.501** **Phantom**



NL HSS-E Machinetap Metrisch, genitreerd, Aluminium Si > 10%  
 FR Taraud machine HSS-E Métrique, nitruré, Aluminium Si > 10%  
 ES Macho máquina HSS-E Métrica, nitrurada, Aluminio Si > 10%  
 DE HSS-E Maschinengewindebohrer Metrisch, nitriert, Aluminium Si > 10%



+6 6 ( M 60° NIT. DIN 376 2,5xD 45° Form C 2,5 ISO 2 6H ALU

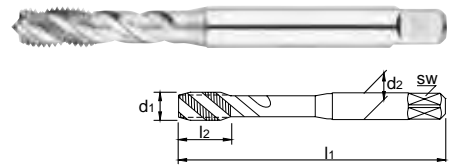
<b>N 42</b> Alu Si>10%
10-15

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.501.1200	M12	1.75	110	28	9	7														



## > 23.585 Phantom

NL HSS-E Machinetap Metrisch, voor Phan-Coil  
 FR Taraud machine HSS-E Métrique, pour Phan-Coil  
 ES Macho máquina HSS-E Métrica, para Phan-Coil  
 DE HSS-E Maschinengewindebohrer Metrisch, für Phan-Coil



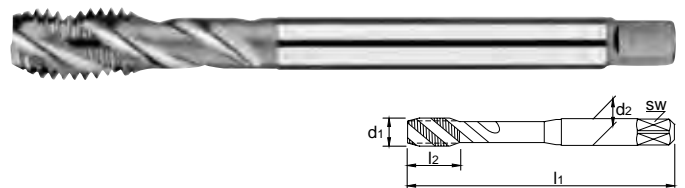
+6 6 (	EG	M	60°	DIN 371	Phan-Coil	2xD	40°	Form C	2,5	ISO 2 6H
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<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 52</b> CuAlFe
12-17	10-15	7-12	3-6	15-20	5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.585.0300	M3	3.65	0.5	63	5	4.5	23.585.0500	M5	6.04	0.8	80	8	6	23.585.0800	M8	9.62	1.25	100	16	10
23.585.0400	M4	4.91	0.7	70	8	6	23.585.0600	M6	7.3	1	90	10	8							

## > 23.586 Phantom

NL HSS-E Machinetap Metrisch, voor Phan-Coil  
 FR Taraud machine HSS-E Métrique, pour Phan-Coil  
 ES Macho máquina HSS-E Métrica, para Phan-Coil  
 DE HSS-E Maschinengewindebohrer Metrisch, für Phan-Coil



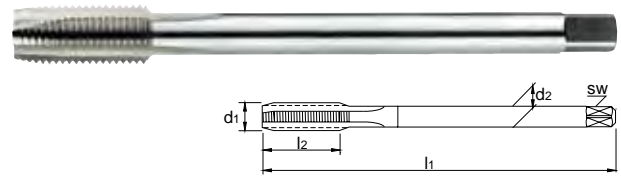
+6 6 (	EG	M	60°	DIN 376	Phan-Coil	2xD	40°	Form C	2,5	ISO 2 6H
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<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 52</b> CuAlFe
12-17	10-15	7-12	3-6	15-20	5-12

Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw	Ref.	d1	P	l1	l2	d2	sw
23.586.1000	M10	11.95	1.5	110	15	9	23.586.1400	M14	16.6	2	110	22	12							
23.586.1200	M12	14.27	1.75	110	20	11	23.586.1600	M16	18.6	2	125	20	14							

> 23.615 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap Metrisch Fijn  
 FR Taraud machine HSS-E ECO PRO Métrique Fin  
 ES Macho máquina HSS-E ECO PRO Métrica Fina  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch Fein



+6 6 ( MF 60° DIN 374 1,5xD Form B 3,5-6 ISO 2 6H ECO PRO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² K 31 GG N 41 Alu

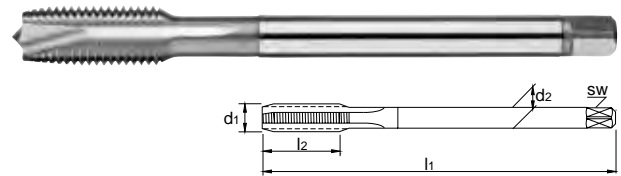
15-20 12-18 10-15 23-35

Ref.	d1	P	l1	l2	d2	sw
23.615.0505	MF5	0.5	70	12	3.5	2.7
23.615.0605	MF6	0.5	80	14	4.5	3.4
23.615.0607	MF6	0.75	80	14	4.5	3.4
23.615.0807	MF8	0.75	80	19	6	4.9
23.615.0810	MF8	1	90	22	6	4.9
23.615.1007	MF10	0.75	90	20	7	5.5
23.615.1010	MF10	1	90	20	7	5.5
23.615.1012	MF10	1.25	100	24	7	5.5
23.615.1210	MF12	1	100	22	9	7
23.615.1212	MF12	1.25	100	22	9	7
23.615.1215	MF12	1.5	100	22	9	7
23.615.1410	MF14	1	100	22	11	9
23.615.1412	MF14	1.25	100	22	11	9

Ref.	d1	P	l1	l2	d2	sw
23.615.1415	MF14	1.5	100	22	11	9
23.615.1610	MF16	1	100	22	12	9
23.615.1615	MF16	1.5	100	22	12	9
23.615.1810	MF18	1	110	25	14	11
23.615.1815	MF18	1.5	110	25	14	11
23.615.2010	MF20	1	125	25	16	12
23.615.2015	MF20	1.5	125	25	16	12
23.615.2020	MF20	2	140	25	16	12
23.615.2215	MF22	1.5	125	25	18	14.5
23.615.2415	MF24	1.5	140	28	18	14.5
23.615.2420	MF24	2	140	28	18	14.5
23.615.2515	MF25	1.5	140	28	18	14.5

> 23.620 Phantom

NL UNI HSS-E Machinetap Metrisch Fijn  
 FR Taraud machine HSS-E UNI Métrique Fin  
 ES Macho máquina HSS-E UNI Métrica Fina  
 DE UNI HSS-E Maschinengewindebohrer Metrisch Fein



+6 6 ( MF 60° DIN 374 3xD Form B 5 ISO 2 6H UNI

P 11 ≤800 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² M 21 INOX ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu S 71 NiCo S 72 Ti

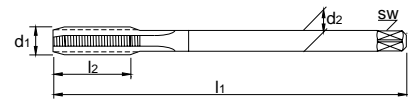
15-20 10-20 6-10 7-10 10-15 10-15 25-35 10-20 15-35 2-8 2-8

Ref.	d1	P	l1	l2	d2	sw
23.620.0303	MF3	0.35	56	8	2.2	
23.620.0405	MF4	0.5	63	10	2.8	2.1
23.620.0505	MF5	0.5	70	11	3.5	2.7
23.620.0605	MF6	0.5	80	13	4.5	3.4
23.620.0607	MF6	0.75	80	13	4.5	3.4
23.620.0705	MF7	0.5	80	13	5.5	4.3
23.620.0707	MF7	0.75	80	13	5.5	4.3
23.620.0805	MF8	0.5	80	13	6	4.9
23.620.0807	MF8	0.75	80	13	6	4.9
23.620.0810	MF8	1	90	20	6	4.9
23.620.0907	MF9	0.75	90	20	7	5.5
23.620.0910	MF9	1	90	20	7	5.5
23.620.1005	MF10	0.5	90	16	7	5.5
23.620.1007	MF10	0.75	90	16	7	5.5
23.620.1010	MF10	1	90	16	7	5.5
23.620.1012	MF10	1.25	100	22	7	5.5
23.620.1110	MF11	1	90	20	8	6.2
23.620.1112	MF11	1.25	90	20	8	6.2
23.620.1205	MF12	0.5	100	22	9	7
23.620.1207	MF12	0.75	100	22	9	7
23.620.1210	MF12	1	100	22	9	7
23.620.1212	MF12	1.25	100	22	9	7
23.620.1215	MF12	1.5	100	22	9	7
23.620.1310	MF13	1	100	22	11	9
23.620.1410	MF14	1	100	22	11	9
23.620.1412	MF14	1.25	100	22	11	9
23.620.1415	MF14	1.5	100	22	11	9
23.620.1510	MF15	1	100	22	12	9
23.620.1515	MF15	1.5	100	22	12	9
23.620.1610	MF16	1	100	22	12	9
23.620.1612	MF16	1.25	100	22	12	9
23.620.1615	MF16	1.5	100	22	12	9
23.620.1810	MF18	1	110	25	14	11
23.620.1815	MF18	1.5	110	25	14	11
23.620.1820	MF18	2	125	30	14	11
23.620.2010	MF20	1	125	25	16	12
23.620.2015	MF20	1.5	125	25	16	12

Ref.	d1	P	l1	l2	d2	sw
23.620.2020	MF20	2	140	32	16	12
23.620.2210	MF22	1	125	25	18	14.5
23.620.2212	MF22	1.25	125	25	18	14.5
23.620.2215	MF22	1.5	125	25	18	14.5
23.620.2220	MF22	2	140	32	18	14.5
23.620.2410	MF24	1	140	28	18	14.5
23.620.2415	MF24	1.5	140	28	18	14.5
23.620.2420	MF24	2	140	28	18	14.5
23.620.2510	MF25	1	140	28	18	14.5
23.620.2515	MF25	1.5	140	28	18	14.5
23.620.2520	MF25	2	140	28	18	14.5
23.620.2615	MF26	1.5	140	28	18	14.5
23.620.2715	MF27	1.5	140	28	20	16
23.620.2720	MF27	2	140	28	20	16
23.620.2815	MF28	1.5	140	28	20	16
23.620.3010	MF30	1	150	28	22	18
23.620.3015	MF30	1.5	150	28	22	18
23.620.3020	MF30	2	150	28	22	18
23.620.3215	MF32	1.5	150	28	22	18
23.620.3315	MF33	1.5	160	30	25	20
23.620.3320	MF33	2	160	30	25	20
23.620.3415	MF34	1.5	170	30	28	22
23.620.3515	MF35	1.5	170	30	28	22
23.620.3615	MF36	1.5	170	30	28	22
23.620.3620	MF36	2	170	30	28	22
23.620.3630	MF36	3	200	50	28	22
23.620.3815	MF38	1.5	170	30	28	22
23.620.4015	MF40	1.5	170	30	32	24
23.620.4215	MF42	1.5	170	30	32	24
23.620.4220	MF42	2	170	30	32	24
23.620.4230	MF42	3	200	45	32	24
23.620.4515	MF45	1.5	180	32	36	29
23.620.4520	MF45	2	180	32	36	29
23.620.4815	MF48	1.5	190	32	36	29
23.620.5015	MF50	1.5	190	32	36	29
23.620.5215	MF52	1.5	190	32	40	32

## > 23.621 Phantom

NL UNI HSS-E Machinetap Metrisch, TiN  
 FR Taraud machine HSS-E UNI Métrique, TiN  
 ES Macho máquina HSS-E UNI Métrica, TiN  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, TiN



**NIEUW / NOUVEAU / NUEVO / NEU**

+6 6 ( MF 60° TiN DIN 374 3xD Form B 5 ISO 2 6H UNI

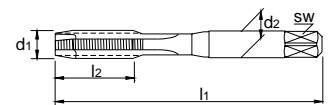
<b>P 11</b> S500 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-20	10-20	6-10	7-10	4-8	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
23.621.0810	MF8	1	90	20	6	4.9
23.621.1010	MF10	1	90	16	7	5.5
23.621.1012	MF10	1.25	100	22	7	5.5
23.621.1210	MF12	1	100	22	9	7
23.621.1212	MF12	1.25	100	22	9	7
23.621.1215	MF12	1.5	100	22	9	7
23.621.1415	MF14	1.5	100	22	11	9
23.621.1615	MF16	1.5	100	22	12	9
23.621.1815	MF18	1.5	110	25	14	11
23.621.2010	MF20	1	125	25	16	12
23.621.2015	MF20	1.5	125	25	16	12

Ref.	d1	P	l1	l2	d2	sw
23.621.2020	MF20	2	140	32	16	12
23.621.2215	MF22	1.5	125	25	18	14.5
23.621.2415	MF24	1.5	140	28	18	14.5
23.621.2420	MF24	2	140	28	18	14.5
23.621.2515	MF25	1.5	140	28	18	14.5
23.621.2720	MF27	2	140	28	20	16
23.621.3015	MF30	1.5	150	28	22	18
23.621.3020	MF30	2	150	28	22	18
23.621.3215	MF32	1.5	150	28	22	18
23.621.3620	MF36	2	170	30	28	22

## > 23.625 Phantom

NL HSS Machinetap Metrisch Fijn  
 FR Taraud machine HSS Métrique Fin  
 ES Macho máquina HSS Métrica Fina  
 DE HSS Maschinengewindebohrer Metrisch Fein



HSS MF 60° ISO 529 2xD Form B 5 ISO 2 6H

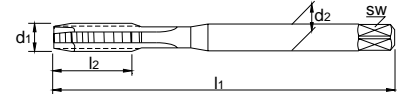
<b>P 11</b> S500 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu
15-20	12-18	10-15	23-35

Ref.	d1	P	l1	l2	d2	sw
23.625.0403	MF4	0.35	53	13	4	3.15
23.625.0405	MF4	0.5	53	13	4	3.15
23.625.0455	MF4.5	0.5	58	16	5	4
23.625.0505	MF5	0.5	58	16	5	4
23.625.0607	MF6	0.75	66	19	6.3	5
23.625.0705	MF7	0.5	66	19	7.1	5.6
23.625.0707	MF7	0.75	66	19	7.1	5.6
23.625.0805	MF8	0.5	72	22	8	6.3
23.625.0807	MF8	0.75	72	22	8	6.3
23.625.0810	MF8	1	72	22	8	6.3
23.625.0907	MF9	0.75	72	22	9	7.1
23.625.0910	MF9	1	72	22	9	7.1
23.625.1005	MF10	0.5	80	24	10	8
23.625.1007	MF10	0.75	80	24	10	8
23.625.1010	MF10	1	80	24	10	8
23.625.1012	MF10	1.25	80	24	10	8
23.625.1110	MF11	1	85	25	8	6.3
23.625.1112	MF11	1.25	85	25	8	6.3
23.625.1205	MF12	0.5	89	29	9	7.1
23.625.1207	MF12	0.75	89	29	9	7.1
23.625.1210	MF12	1	89	29	9	7.1

Ref.	d1	P	l1	l2	d2	sw
23.625.1215	MF12	1.5	89	29	9	7.1
23.625.1307	MF13	0.75	89	29	9	7.1
23.625.1407	MF14	0.75	95	30	11.2	9
23.625.1410	MF14	1	95	30	11.2	9
23.625.1412	MF14	1.25	95	30	11.2	9
23.625.1415	MF14	1.5	95	30	11.2	9
23.625.1417	MF14	1.75	95	30	11.2	9
23.625.1520	MF15	2	95	30	11.2	9
23.625.1607	MF16	0.75	102	32	12.5	10
23.625.1612	MF16	1.25	102	32	12.5	10
23.625.1615	MF16	1.5	102	32	12.5	10
23.625.1715	MF17	1.5	102	32	12.5	10
23.625.1810	MF18	1	112	37	14	11.2
23.625.1815	MF18	1.5	112	37	14	11.2
23.625.1910	MF19	1	112	37	14	11.2
23.625.2212	MF22	1.25	118	38	16	12.5
23.625.2510	MF25	1	120	35	18	14
23.625.2520	MF25	2	120	35	18	14
23.625.3920	MF39	2	149	39	28	22.4
23.625.4820	MF48	2	165	45	31.5	25

> **23.668 Phantom**

NL HP2 UNI HSS-E PM Machinetap Metrisch Fijn, HARDLUBE  
 FR Taraud machine HSS-E PM HP2 UNI Métrique Fin, HARDLUBE  
 ES Macho máquina HSS-E PM HP2 UNI Métrica Fina, HARDLUBE  
 DE HP2 UNI HSS-E PM Maschinengewindebohrer Metrisch Fein, HARDLUBE



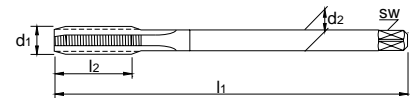
HSS-E PM	MF	60°	HARD LUBE	DIN 374	3xD	Form B	4-5	ISO 2 6H	HP2 UNI		
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Ni/Co	Ti
15-20	15-20	8-15	8-15	8-15	8-15	20-25	20-25	20-25	20-25	5-12	5-12

Ref.	d1	P	l1	l2	d2	sw
23.668.0810	MF8	1	90	20	6	4.9
23.668.1010	MF10	1	90	16	7	5.5
23.668.1012	MF10	1.25	90	16	7	5.5
23.668.1210	MF12	1	100	22	9	7
23.668.1212	MF12	1.25	100	22	9	7
23.668.1215	MF12	1.5	100	22	9	7
23.668.1410	MF14	1	100	22	11	9

Ref.	d1	P	l1	l2	d2	sw
23.668.1415	MF14	1.5	100	22	11	9
23.668.1615	MF16	1.5	100	22	12	9
23.668.1815	MF18	1.5	110	25	14	11
23.668.2015	MF20	1.5	125	25	16	12
23.668.2215	MF22	1.5	125	25	18	14.5
23.668.2415	MF24	1.5	140	28	18	14.5
23.668.2420	MF24	2	140	28	18	14.5

> **23.750 Phantom**

NL HSS-E PM Machinetap Metrisch Fijn, stoomontlaten  
 FR Taraud machine HSS-E PM Métrique Fin, vaporisée  
 ES Macho máquina HSS-E PM Métrica Fina, vaporizada  
 DE HSS-E PM Maschinengewindebohrer Metrisch Fein, dampfangelassen



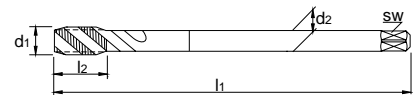
HSS-E PM	MF	60°	OX.	DIN 374	3xD	Form B	5	ISO 2 6H	INOX
P 11	P 12	P 13	M 21	M 22	N 41	N 42	N 51	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	4-8	25-35	10-20	15-35	4-8	4-8

Ref.	d1	P	l1	l2	d2	sw
23.750.0405	MF4	0.5	63	10	2.8	2.1
23.750.0505	MF5	0.5	70	11	3.5	2.7
23.750.0605	MF6	0.5	80	13	4.5	3.4
23.750.0607	MF6	0.75	80	13	4.5	3.4
23.750.0807	MF8	0.75	80	13	6	4.9
23.750.0810	MF8	1	90	20	6	4.9
23.750.1010	MF10	1	90	20	7	5.5
23.750.1012	MF10	1.25	100	22	7	5.5
23.750.1210	MF12	1	100	22	9	7
23.750.1212	MF12	1.25	100	22	9	7
23.750.1215	MF12	1.5	100	22	9	7
23.750.1410	MF14	1	100	22	11	9
23.750.1412	MF14	1.25	100	22	11	9
23.750.1415	MF14	1.5	100	22	11	9
23.750.1610	MF16	1	100	22	12	9

Ref.	d1	P	l1	l2	d2	sw
23.750.1615	MF16	1.5	100	22	12	9
23.750.1810	MF18	1	110	25	14	11
23.750.1815	MF18	1.5	110	25	14	11
23.750.2010	MF20	1	125	25	16	12
23.750.2015	MF20	1.5	125	25	16	12
23.750.2210	MF22	1	125	25	18	14.5
23.750.2215	MF22	1.5	125	25	18	14.5
23.750.2415	MF24	1.5	140	28	18	14.5
23.750.2420	MF24	2	140	28	18	14.5
23.750.2615	MF26	1.5	140	28	18	14.5
23.750.2715	MF27	1.5	140	28	20	16
23.750.2720	MF27	2	140	28	20	16
23.750.2815	MF28	1.5	140	28	20	16
23.750.3015	MF30	1.5	150	28	22	18
23.750.3020	MF30	2	150	28	22	18

> **23.835 INTERNATIONAL TOOLS**

NL ECO PRO HSS-E Machinetap Metrisch Fijn  
 FR Taraud machine HSS-E ECO PRO Métrique Fin  
 ES Macho máquina HSS-E ECO PRO Métrica Fina  
 DE ECO PRO HSS-E Maschinengewindebohrer Metrisch Fein



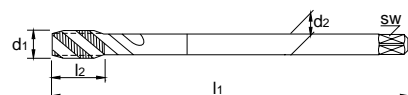
+6 6 (	MF	60°	DIN 374	2xD	35°	Form C	2-3	ISO 2 6H	ECO PRO
P 11	P 12	K 31	N 41						
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	GG	Alu						
15-20	12-18	10-15	23-35						

Ref.	d1	P	l1	l2	d2	sw
23.835.0810	MF8	1	90	10	6	4.9
23.835.1010	MF10	1	90	12	7	5.5
23.835.1012	MF10	1.25	100	12	7	5.5
23.835.1210	MF12	1	100	14	9	7
23.835.1212	MF12	1.25	100	14	9	7

Ref.	d1	P	l1	l2	d2	sw
23.835.1215	MF12	1.5	100	14	9	7
23.835.1415	MF14	1.5	100	16	11	9
23.835.1615	MF16	1.5	100	16	12	9
23.835.1815	MF18	1.5	110	20	14	11
23.835.2015	MF20	1.5	125	20	16	12

## > 23.840 Phantom

NL UNI HSS-E Machinetap Metrisch Fijn  
 FR Taraud machine HSS-E UNI Métrique Fin  
 ES Macho máquina HSS-E UNI Métrica Fina  
 DE UNI HSS-E Maschinengewindebohrer Metrisch Fein



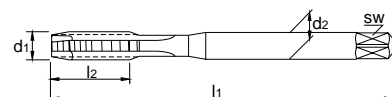
+6 6 (	MF	60°	DIN 374	2,5xD	40°	Form C	2-3	ISO 2 6H	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
23.840.0405	MF4	0.5	63	10	2.8	2.1
23.840.0505	MF5	0.5	70	11	3.5	2.7
23.840.0605	MF6	0.5	80	13	4.5	3.4
23.840.0607	MF6	0.75	80	13	4.5	3.4
23.840.0807	MF8	0.75	80	13	6	4.9
23.840.0810	MF8	1	90	20	6	4.9
23.840.0910	MF9	1	90	20	7	5.5
23.840.1007	MF10	0.75	90	16	7	5.5
23.840.1010	MF10	1	90	16	7	5.5
23.840.1012	MF10	1.25	100	22	7	5.5
23.840.1110	MF11	1	90	20	8	6.2
23.840.1210	MF12	1	100	22	9	7
23.840.1212	MF12	1.25	100	22	9	7
23.840.1215	MF12	1.5	100	22	9	7
23.840.1310	MF13	1	100	22	11	9
23.840.1410	MF14	1	100	22	11	9
23.840.1412	MF14	1.25	100	22	11	9
23.840.1415	MF14	1.5	100	22	11	9
23.840.1510	MF15	1	100	22	12	9
23.840.1515	MF15	1.5	100	22	12	9
23.840.1610	MF16	1	100	22	12	9
23.840.1615	MF16	1.5	100	22	12	9
23.840.1810	MF18	1	110	25	14	11
23.840.1815	MF18	1.5	110	25	14	11
23.840.1820	MF18	2	125	30	14	11

Ref.	d1	P	l1	l2	d2	sw
23.840.2010	MF20	1	125	25	16	12
23.840.2015	MF20	1.5	125	25	16	12
23.840.2020	MF20	2	140	32	16	12
23.840.2210	MF22	1	125	25	18	14.5
23.840.2215	MF22	1.5	125	25	18	14.5
23.840.2220	MF22	2	140	32	18	14.5
23.840.2410	MF24	1	140	28	18	14.5
23.840.2415	MF24	1.5	140	28	18	14.5
23.840.2420	MF24	2	140	28	18	14.5
23.840.2515	MF25	1.5	140	28	18	14.5
23.840.2615	MF26	1.5	140	28	18	14.5
23.840.2715	MF27	1.5	140	28	20	16
23.840.2720	MF27	2	140	28	20	16
23.840.2815	MF28	1.5	140	28	20	16
23.840.3010	MF30	1	150	28	22	18
23.840.3015	MF30	1.5	150	28	22	18
23.840.3020	MF30	2	150	28	22	18
23.840.3215	MF32	1.5	150	28	22	18
23.840.3315	MF33	1.5	160	30	25	20
23.840.3320	MF33	2	160	30	25	20
23.840.3515	MF35	1.5	170	30	28	22
23.840.3615	MF36	1.5	170	30	28	22
23.840.3620	MF36	2	170	30	28	22
23.840.3630	MF36	3	200	50	28	22
23.840.4015	MF40	1.5	170	30	32	24

## > 23.868 Phantom

NL HP2 UNI HSS-E PM Machinetap Metrisch Fijn, HARDLUBE  
 FR Taraud machine HSS-E PM HP2 UNI Métrique Fin, HARDLUBE  
 ES Macho máquina HSS-E PM HP2 UNI Métrica Fina, HARDLUBE  
 DE HP2 UNI HSS-E PM Maschinengewindebohrer Metrisch Fein, HARDLUBE

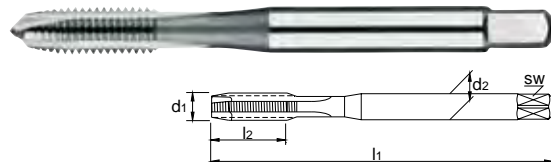


HSS-E PM	MF	60°	HARD LUBE	DIN 374	2,5xD	50°	Form C	2-2,5	ISO 2 6H	HP2 UNI	
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Ni/Co	Ti
15-20	15-20	8-15	8-15	8-15	8-15	20-25	20-25	20-25	20-25	5-12	5-12

Ref.	d1	P	l1	l2	d2	sw
23.868.0810	MF8	1	90	20	6	4.9
23.868.1010	MF10	1	90	16	7	5.5
23.868.1012	MF10	1.25	100	22	7	5.5
23.868.1210	MF12	1	100	22	9	7
23.868.1212	MF12	1.25	100	22	9	7
23.868.1215	MF12	1.5	100	22	9	7
23.868.1412	MF14	1.25	100	22	11	9

Ref.	d1	P	l1	l2	d2	sw
23.868.1415	MF14	1.5	100	22	11	9
23.868.1615	MF16	1.5	100	22	12	9
23.868.1815	MF18	1.5	110	25	14	11
23.868.2015	MF20	1.5	125	25	16	12
23.868.2215	MF22	1.5	125	25	18	14.5
23.868.2415	MF24	1.5	140	28	18	14.5
23.868.2420	MF24	2	140	28	18	14.5

> **24.120** **Phantom**



NL UNI HSS-E Machinetap UNC  
FR Taraud machine HSS-E UNI UNC  
ES Macho máquina HSS-E UNI UNC  
DE UNI HSS-E Maschinengewindebohrer UNC

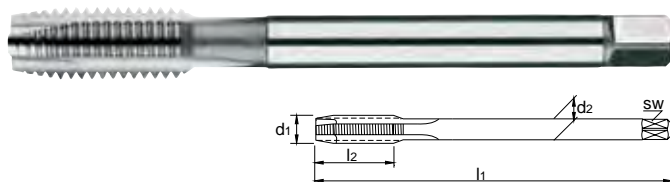
+6 6 ( **UNC** **60°** **DIN 371** **3xD** **Form B** **5** **2B** **UNI**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
24.120.0284	UNC Nr. 4	40	56	11	3.5	2.7
24.120.0317	UNC Nr. 5	40	56	11	3.5	2.7
24.120.0350	UNC Nr. 6	32	56	13	4	3
24.120.0416	UNC Nr. 8	32	63	13	4.5	3.4
24.120.0482	UNC Nr. 10	24	70	15	6	4.9

Ref.	d1	P	l1	l2	d2	sw
24.120.0548	UNC Nr. 12	24	80	19	6	4.9
24.120.0635	UNC 1/4	20	80	19	7	5.5
24.120.0794	UNC 5/16	18	90	22	8	6.2
24.120.0952	UNC 3/8	16	100	22	9	7

> **24.121** **Phantom**



NL UNI HSS-E Machinetap UNC  
FR Taraud machine HSS-E UNI UNC  
ES Macho máquina HSS-E UNI UNC  
DE UNI HSS-E Maschinengewindebohrer UNC

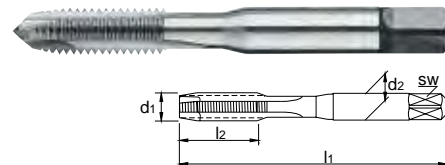
+6 6 ( **UNC** **60°** **DIN 376** **3xD** **Form B** **5** **2B** **UNI**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
24.121.1111	UNC 7/16	14	100	22	8	6.2
24.121.1270	UNC 1/2	13	110	24	9	7
24.121.1429	UNC 9/16	12	110	26	11	9
24.121.1588	UNC 5/8	11	110	27	12	9

Ref.	d1	P	l1	l2	d2	sw
24.121.1905	UNC 3/4	10	125	30	14	11
24.121.2222	UNC 7/8	9	140	32	18	14.5
24.121.2540	UNC 1	8	160	36	18	14.5

> **24.125** **Phantom**



NL HSS Machinetap UNC  
FR Taraud machine HSS UNC  
ES Macho máquina HSS UNC  
DE HSS Maschinengewindebohrer UNC

**HSS** **UNC** **60°** **NFE 66104** **ISO 529** **2,5xD** **Form B** **2,5** **2B**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 52</b> CuAlFe
12-17	10-15	3-6	15-20	5-12

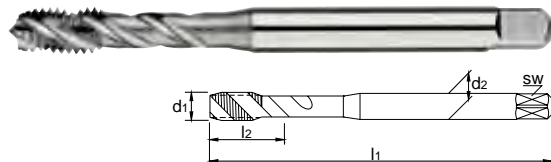
Ref.	d1	P	l1	l2	d2	sw
24.125.0482	UNC Nr. 10	24	58	16	5	4
24.125.0635	UNC 1/4	20	66	19	6.3	5
24.125.0794	UNC 5/16	18	72	22	8	6.3
24.125.0952	UNC 3/8	16	80	24	10	8
24.125.1111	UNC 7/16	14	85	25	8	6.3
24.125.1270	UNC 1/2	13	89	29	9	7.1
24.125.1429	UNC 9/16	12	95	30	11.2	9

Ref.	d1	P	l1	l2	d2	sw
24.125.1588	UNC 5/8	11	102	32	12.5	10
24.125.1905	UNC 3/4	10	112	37	14	11.2
24.125.2222	UNC 7/8	9	118	38	16	12.5
24.125.2540	UNC 1	8	130	45	18	14
24.125.2858	UNC 1.1/8	7	138	48	20	16
24.125.3175	UNC 1.1/4	7	151	51	22.4	18
24.125.3810	UNC 1.1/2	6	170	60	28	22.4



## > 24.340 Phantom

NL UNI HSS-E Machinetap UNC  
FR Taraud machine HSS-E UNI UNC  
ES Macho máquina HSS-E UNI UNC  
DE UNI HSS-E Maschinengewindebohrer UNC



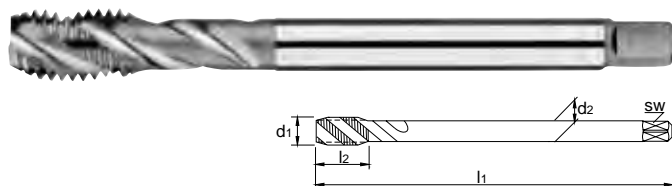
+6 6 (	UNC	60°	DIN 371	2,5xD	40°	Form C	2,5	2B	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
24.340.0285	UNC Nr. 4	40	56	5	3.5	2.7
24.340.0317	UNC Nr. 5	40	56	6	3.5	2.7
24.340.0350	UNC Nr. 6	32	56	6	4	3
24.340.0416	UNC Nr. 8	32	63	7	4.5	3.4
24.340.0482	UNC Nr. 10	24	70	8	6	4.9

Ref.	d1	P	l1	l2	d2	sw
24.340.0548	UNC Nr. 12	24	80	10	6	4.9
24.340.0635	UNC 1/4	20	80	10	7	5.5
24.340.0794	UNC 5/16	18	90	13	8	6.2
24.340.0952	UNC 3/8	16	100	16	9	7

## > 24.341 Phantom

NL UNI HSS-E Machinetap UNC  
FR Taraud machine HSS-E UNI UNC  
ES Macho máquina HSS-E UNI UNC  
DE UNI HSS-E Maschinengewindebohrer UNC



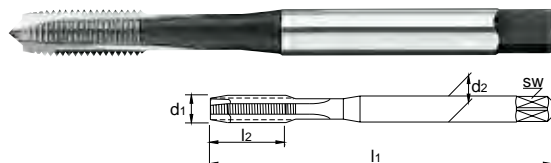
+6 6 (	UNC	60°	DIN 376	2,5xD	40°	Form C	2,5	2B	UNI	
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
24.341.1111	UNC 7/16	14	100	15	8	6.2
24.341.1270	UNC 1/2	13	110	18	9	7
24.341.1429	UNC 9/16	12	110	20	11	9
24.341.1588	UNC 5/8	11	110	20	12	9

Ref.	d1	P	l1	l2	d2	sw
24.341.1905	UNC 3/4	10	125	25	14	11
24.341.2222	UNC 7/8	9	140	28	18	14.5
24.341.2540	UNC 1	8	160	32	18	14.5

## > 24.520 Phantom

NL UNI HSS-E Machinetap UNF  
FR Taraud machine HSS-E UNI UNF  
ES Macho máquina HSS-E UNI UNF  
DE UNI HSS-E Maschinengewindebohrer UNF



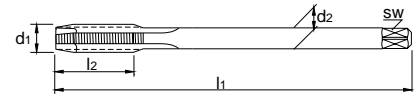
+6 6 (	UNF	60°	DIN 371	3xD	Form B	5	2B	UNI		
P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	S 71	S 72
≤900 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	Ni/Co	Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
24.520.0285	UNF Nr. 4	48	56	11	3.5	2.7
24.520.0317	UNF Nr. 5	44	56	11	3.5	2.7
24.520.0350	UNF Nr. 6	40	56	13	4	3
24.520.0416	UNF Nr. 8	36	63	13	4.5	3.4
24.520.0482	UNF Nr. 10	32	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
24.520.0548	UNF Nr. 12	28	80	19	6	4.9
24.520.0635	UNF 1/4	28	80	19	7	5.5
24.520.0794	UNF 5/16	24	90	22	8	6.2
24.520.0952	UNF 3/8	24	100	18	9	7

> **24.521 Phantom**

NL UNI HSS-E Machinetap UNF  
 FR Taraud machine HSS-E UNI UNF  
 ES Macho máquina HSS-E UNI UNF  
 DE UNI HSS-E Maschinengewindebohrer UNF



+6 6 ( UNF 60° DIN 376 3xD Form B 5 2B UNI

P 11 P 12 P 13 M 21 K 31 K 32 N 41 N 42 N 51 S 71 S 72

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si<10% Cu Ni/Co Ti

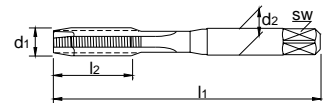
15-20 10-20 6-10 7-10 10-15 10-15 25-35 10-20 15-35 2-8 2-8

Ref.	d1	P	l1	l2	d2	sw
24.521.1111	UNF 7/16	20	100	22	8	6.2
24.521.1270	UNF 1/2	20	110	28	9	7
24.521.1429	UNF 9/16	18	110	32	11	9
24.521.1588	UNF 5/8	18	110	32	12	9

Ref.	d1	P	l1	l2	d2	sw
24.521.1905	UNF 3/4	16	125	34	14	11
24.521.2222	UNF 7/8	14	140	34	18	14.5
24.521.2540	UNF 1	12	160	38	18	14.5

> **24.525 Phantom**

NL HSS Machinetap UNF  
 FR Taraud machine HSS UNF  
 ES Macho máquina HSS UNF  
 DE HSS Maschinengewindebohrer UNF



HSS UNF 60° NFE 66104 ISO 529 2,5xD Form B 5 2B

P 11 P 12 K 32 N 41 N 52

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GGG GTS-GTW Alu CuAlFe

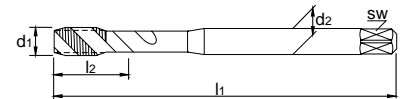
12-17 10-15 3-6 15-20 5-12

Ref.	d1	P	l1	l2	d2	sw
24.525.0482	UNF Nr. 10	32	58	16	5	4
24.525.0635	UNF 1/4	28	66	19	6.3	5
24.525.0794	UNF 5/16	24	72	22	8	6.3
24.525.0952	UNF 3/8	24	80	24	10	8
24.525.1111	UNF 7/16	20	85	25	8	6.3
24.525.1270	UNF 1/2	20	89	29	9	7.1

Ref.	d1	P	l1	l2	d2	sw
24.525.1588	UNF 5/8	18	102	32	12.5	10
24.525.1905	UNF 3/4	16	112	37	14	11.2
24.525.2222	UNF 7/8	14	118	38	16	12.5
24.525.2540	UNF 1	12	120	35	18	14
24.525.2858	UNF 1.1/8	12	127	37	20	16

> **24.740 Phantom**

NL UNI HSS-E Machinetap UNF  
 FR Taraud machine HSS-E UNI UNF  
 ES Macho máquina HSS-E UNI UNF  
 DE UNI HSS-E Maschinengewindebohrer UNF



+6 6 ( UNF 60° DIN 371 2,5xD 40° Form C 2,5 2B UNI

P 11 P 12 P 13 M 21 K 31 K 32 N 41 N 42 N 51 S 71 S 72

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si<10% Cu Ni/Co Ti

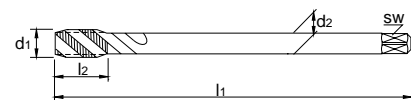
15-20 10-20 6-10 7-10 10-15 10-15 25-35 10-20 15-35 2-8 2-8

Ref.	d1	P	l1	l2	d2	sw
24.740.0285	UNF Nr. 4	48	56	5	3.5	2.7
24.740.0317	UNF Nr. 5	44	56	6	3.5	2.7
24.740.0350	UNF Nr. 6	40	56	6	4	3
24.740.0416	UNF Nr. 8	36	63	7	4.5	3.4
24.740.0482	UNF Nr. 10	32	70	8	6	4.9

Ref.	d1	P	l1	l2	d2	sw
24.740.0548	UNF Nr. 12	28	80	10	6	4.9
24.740.0635	UNF 1/4	28	80	10	7	5.5
24.740.0794	UNF 5/16	24	90	13	8	6.2
24.740.0952	UNF 3/8	24	100	10	9	7

## > 24.741 Phantom

NL UNI HSS-E Machinetap UNF  
FR Taraud machine HSS-E UNI UNF  
ES Macho máquina HSS-E UNI UNF  
DE UNI HSS-E Maschinengewindebohrer UNF



+6 6 ( UNF 60° DIN 376 2,5xD 40° Form C 2,5 2B UNI

P 11 P 12 P 13 M 21 K 31 K 32 N 41 N 42 N 51 S 71 S 72  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu Ni/Co Ti

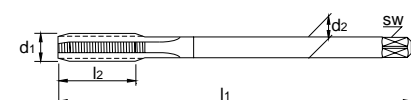
15-20 10-20 6-10 7-10 10-15 10-15 25-35 10-20 15-35 2-8 2-8

Ref.	d1	P	l1	l2	d2	sw
24.741.1111	UNF 7/16	20	100	15	8	6.2
24.741.1270	UNF 1/2	20	110	18	9	7
24.741.1429	UNF 9/16	18	110	20	11	9
24.741.1588	UNF 5/8	18	110	20	12	9

Ref.	d1	P	l1	l2	d2	sw
24.741.1905	UNF 3/4	16	125	25	14	11
24.741.2222	UNF 7/8	14	140	28	18	14.5
24.741.2540	UNF 1	12	160	32	18	14.5

## > 24.991 Phantom

NL HSS-E Machinetap UNEF  
FR Taraud machine HSS-E UNEF  
ES Macho máquina HSS-E UNEF  
DE HSS-E Maschinengewindebohrer UNEF



+6 6 ( UNEF 60° DIN 374 1,5xD Form B 4 2B

P 11 P 12 P 13 M 21 M 22 K 31 N 41  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG Alu

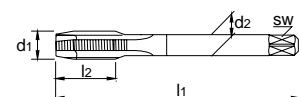
15-20 12-18 10-15 7-10 5-8 10-15 25-35

Ref.	d1	P	l1	l2	d2	sw
24.991.0635	UNEF 1/4	32	80	16	7	5.5
24.991.0794	UNEF 5/16	32	90	18	8	6.2
24.991.0952	UNEF 3/8	32	90	16	7	5.5
24.991.1111	UNEF 7/16	28	100	16	9	7
24.991.1270	UNEF 1/2	28	100	16	9	7

Ref.	d1	P	l1	l2	d2	sw
24.991.1429	UNEF 9/16	24	100	16	11	9
24.991.1588	UNEF 5/8	24	100	16	12	9
24.991.1905	UNEF 3/4	20	110	25	14	11
24.991.2222	UNEF 7/8	20	140	25	18	14.5
24.991.2540	UNEF 1	20	140	28	20	16

## > 25.095 INTERNATIONAL TOOLS

NL ECO PRO HSS-E Machinetap BSP (Gasraad)  
FR Taraud machine HSS-E ECO PRO BSP (pas gaz)  
ES Macho máquina HSS-E ECO PRO BSP (gas)  
DE ECO PRO HSS-E Maschinengewindebohrer BSP (Rohrgewinde)



+6 6 ( BSP G 55° DIN 5156 1,5xD Form B 3,5-6 ECO PRO

P 11 P 12 K 31 N 41  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG Alu

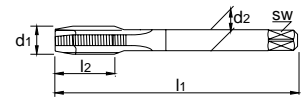
15-20 12-18 10-15 23-35

Ref.	d1	P	l1	l2	d2	sw
25.095.0973	BSP 1/8	28	90	20	7	5.5
25.095.1316	BSP 1/4	19	100	22	11	9
25.095.1666	BSP 3/8	19	100	22	12	9

Ref.	d1	P	l1	l2	d2	sw
25.095.2096	BSP 1/2	14	125	25	16	12
25.095.2644	BSP 3/4	14	140	28	20	16
25.095.3325	BSP 1	11	160	30	25	20

> **25.097 Phantom**

NL UNI HSS-E Machinetap BSP (Gasdraad)  
 FR Taraud machine HSS-E UNI BSP (pas gaz)  
 ES Macho máquina HSS-E UNI BSP (gas)  
 DE UNI HSS-E Maschinengewindebohrer BSP (Rohrgewinde)



**NIEUW NOUVEAU NUEVO NEU**

+6 6 ( **BSP G** **55°** **DIN 5156** **3xD** **Form B** **5** **UNI**

**P 11** ≤800 N/mm<sup>2</sup> **P 12** ≤850 N/mm<sup>2</sup> **P 13** ≤1000 N/mm<sup>2</sup> **M 21** INOX ≤850N/mm<sup>2</sup> **M 22** INOX >850N/mm<sup>2</sup> **K 31** GG **K 32** GGG GTS-GTW **N 41** Alu **N 42** Alu Si>10% **N 51** Cu **S 71** Ni/Co **S 72** Ti

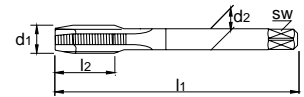
15-20 10-20 6-10 7-10 4-8 10-15 10-15 25-35 10-20 15-35 2-8 2-8

Ref.	d1	P	l1	l2	d2	sw
25.097.0973	BSP 1/8	28	90	20	7	5.5
25.097.1316	BSP 1/4	19	100	22	11	9
25.097.1666	BSP 3/8	19	100	22	12	9
25.097.2096	BSP 1/2	14	125	25	16	12
25.097.2291	BSP 5/8	14	125	25	18	14.5
25.097.2644	BSP 3/4	14	140	28	20	16

Ref.	d1	P	l1	l2	d2	sw
25.097.3020	BSP 7/8	14	150	28	22	18
25.097.3325	BSP 1	11	160	30	25	20
25.097.3790	BSP 1.1/8	11	170	30	28	22
25.097.4191	BSP 1.1/4	11	170	30	32	24
25.097.4780	BSP 1.1/2	11	190	32	36	29

> **25.100 Phantom**

NL HSS-E Machinetap BSP (Gasdraad)  
 FR Taraud machine HSS-E BSP (pas gaz)  
 ES Macho máquina HSS-E BSP (gas)  
 DE HSS-E Maschinengewindebohrer BSP (Rohrgewinde)



+6 6 ( **BSP G** **55°** **DIN 5156** **3xD** **Form B** **5**

**P 11** ≤800 N/mm<sup>2</sup> **P 12** ≤850 N/mm<sup>2</sup> **K 32** GGG GTS-GTW **N 41** Alu **N 42** Alu Si>10% **N 51** Cu **N 61** PVC

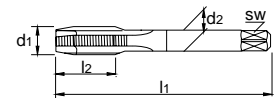
15-20 10-20 5-15 10-35 10-20 8-35 20-30

Ref.	d1	P	l1	l2	d2	sw
25.100.0973	BSP 1/8	28	90	20	7	5.5
25.100.1316	BSP 1/4	19	100	22	11	9
25.100.1666	BSP 3/8	19	100	22	12	9
25.100.2096	BSP 1/2	14	125	25	16	12
25.100.2291	BSP 5/8	14	125	25	18	14.5
25.100.2644	BSP 3/4	14	140	28	20	16

Ref.	d1	P	l1	l2	d2	sw
25.100.3020	BSP 7/8	14	150	28	22	18
25.100.3325	BSP 1	11	160	30	25	20
25.100.3790	BSP 1.1/8	11	170	30	28	22
25.100.4191	BSP 1.1/4	11	170	30	32	24
25.100.4780	BSP 1.1/2	11	190	32	36	29

> **25.105 Phantom**

NL HSS Machinetap BSP (Gasdraad)  
 FR Taraud machine HSS BSP (pas gaz)  
 ES Macho máquina HSS BSP (gas)  
 DE HSS Maschinengewindebohrer BSP (Rohrgewinde)



**HSS** **BSP G** **55°** **NFE 66103** **ISO 529** **2,5xD** **Form B** **5**

**P 11** ≤800 N/mm<sup>2</sup> **P 12** ≤850 N/mm<sup>2</sup> **K 32** GGG GTS-GTW **N 41** Alu

12-17 10-15 3-6 15-20

Ref.	d1	P	l1	l2	d2	sw
25.105.0973	BSP 1/8	28	80	24	10	8
25.105.1316	BSP 1/4	19	89	29	9	7.1
25.105.1666	BSP 3/8	19	102	32	12.5	10
25.105.2096	BSP 1/2	14	112	37	14	11.2
25.105.2291	BSP 5/8	14	118	38	18	14
25.105.2644	BSP 3/4	14	127	37	20	16

Ref.	d1	P	l1	l2	d2	sw
25.105.3020	BSP 7/8	14	137	37	22.4	18
25.105.3325	BSP 1	11	127	37	22.4	18
25.105.4191	BSP 1.1/4	11	149	39	28	22.4
25.105.4780	BSP 1.1/2	11	169	45	31.5	25
25.105.5961	BSP 2	11	193	43	40	31.5

## > 25.160 Phantom

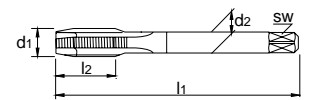
NL HSS-E Machinetap BSP (Gasdraad), stoomontlaten, roestvaststaal  
 FR Taraud machine HSS-E BSP (pas gaz), vaporisée, Inox  
 ES Macho máquina HSS-E BSP (gas), vaporizada, acero inoxidable  
 DE HSS-E Maschinengewindebohrer BSP (Rohrgewinde), dampfangelassen, rostfreien Stahl

+6 6 ( BSP G 55° OX. DIN 5156 2xD Form B 3,5 INOX

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup>

15-20 10-20 7-10 4-8

Ref.	d1	P	l1	l2	d2	sw
25.160.0973	BSP 1/8	28	90	20	7	5.5
25.160.1316	BSP 1/4	19	100	22	11	9



Ref.	d1	P	l1	l2	d2	sw
25.160.1666	BSP 3/8	19	100	22	12	9
25.160.2096	BSP 1/2	14	125	25	16	12

## > 25.295 INTERNATIONAL TOOLS

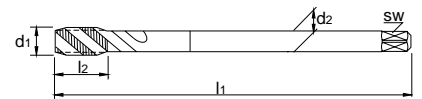
NL ECO PRO HSS-E Machinetap BSP (Gasdraad)  
 FR Taraud machine HSS-E ECO PRO BSP (pas gaz)  
 ES Macho máquina HSS-E ECO PRO BSP (gas)  
 DE ECO PRO HSS-E Maschinengewindebohrer BSP (Rohrgewinde)

+6 6 ( BSP G 55° DIN 5156 2xD 35° Form C 2-3 ECO PRO

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> K 31 GG N 41 Alu

15-20 12-18 10-15 23-35

Ref.	d1	P	l1	l2	d2	sw
25.295.0973	BSP 1/8	28	90	20	7	5.5
25.295.1316	BSP 1/4	19	100	22	11	9
25.295.1666	BSP 3/8	19	100	22	12	9



Ref.	d1	P	l1	l2	d2	sw
25.295.2096	BSP 1/2	14	125	25	16	12
25.295.2644	BSP 3/4	14	140	28	20	16
25.295.3325	BSP 1	11	160	30	25	20

## > 25.297 Phantom

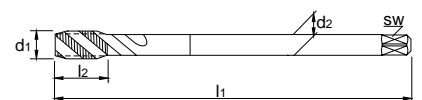
NL UNI HSS-E Machinetap BSP (Gasdraad)  
 FR Taraud machine HSS-E UNI BSP (pas gaz)  
 ES Macho máquina HSS-E UNI BSP (gas)  
 DE UNI HSS-E Maschinengewindebohrer BSP (Rohrgewinde)

+6 6 ( BSP G 55° DIN 5156 2,5xD 40° Form C 2,5 UNI

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu S 71 Ni/Co S 72 Ti

15-20 10-20 6-10 7-10 4-8 10-15 10-15 25-35 10-20 15-35 2-8 2-8

Ref.	d1	P	l1	l2	d2	sw
25.297.0973	BSP 1/8	28	90	20	7	5.5
25.297.1316	BSP 1/4	19	100	22	11	9
25.297.1666	BSP 3/8	19	100	22	12	9
25.297.2096	BSP 1/2	14	125	25	16	12
25.297.2291	BSP 5/8	14	125	25	18	14.5
25.297.2644	BSP 3/4	14	140	28	20	16



**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	d1	P	l1	l2	d2	sw
25.297.3020	BSP 7/8	14	150	28	22	18
25.297.3325	BSP 1	11	160	30	25	20
25.297.3790	BSP 1.1/8	11	170	30	28	22
25.297.4191	BSP 1.1/4	11	170	30	32	24
25.297.4780	BSP 1.1/2	11	190	32	36	29

> **25.300 Phantom**

NL HSS-E Machinetap BSP (Gasdraad)  
 FR Taraud machine HSS-E BSP (pas gaz)  
 ES Macho máquina HSS-E BSP (gas)  
 DE HSS-E Maschinengewindebohrer BSP (Rohrgewinde)



+6 6 ( **BSP G** **55°** **DIN 5156** **2,5xD** **40°** **Form C** **2,5**

**P 11** **P 12** **K 32** **N 41** **N 42** **N 51** **N 61**  
 ≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GGG GTS-GTW Alu Alu Si>10% Cu PVC

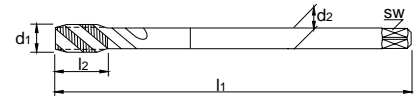
15-20 10-20 5-15 10-35 10-20 8-35 20-30

Ref.	d1	P	l1	l2	d2	sw
25.300.0973	BSP 1/8	28	90	20	7	5.5
25.300.1316	BSP 1/4	19	100	22	11	9
25.300.1666	BSP 3/8	19	100	22	12	9
25.300.2096	BSP 1/2	14	125	25	16	12
25.300.2291	BSP 5/8	14	125	25	18	14.5
25.300.2644	BSP 3/4	14	140	28	20	16

Ref.	d1	P	l1	l2	d2	sw
25.300.3020	BSP 7/8	14	150	28	22	18
25.300.3325	BSP 1	11	160	30	25	20
25.300.3790	BSP 1.1/8	11	170	30	28	22
25.300.4191	BSP 1.1/4	11	170	30	32	24
25.300.4780	BSP 1.1/2	11	190	32	36	29

> **25.360 Phantom**

NL HSS-E Machinetap BSP (Gasdraad), stoomontlaten, roestvaststaal  
 FR Taraud machine HSS-E BSP (pas gaz), vaporisée, Inox  
 ES Macho máquina HSS-E BSP (gas), vaporizada, acero inoxidable  
 DE HSS-E Maschinengewindebohrer BSP (Rohrgewinde), dampfangelassen, rostfreien Stahl



+6 6 ( **BSP G** **55°** **OX.** **DIN 5156** **2,5xD** **40°** **Form C** **2,5** **INOX**

**P 11** **P 12** **M 21** **M 22**  
 ≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup>

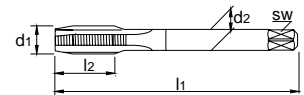
15-20 10-20 7-10 4-8

Ref.	d1	P	l1	l2	d2	sw
25.360.0973	BSP 1/8	28	90	20	7	5.5
25.360.1316	BSP 1/4	19	100	22	11	9

Ref.	d1	P	l1	l2	d2	sw
25.360.1666	BSP 3/8	19	100	22	12	9
25.360.2096	BSP 1/2	14	125	25	16	12

> **25.480 Phantom**

NL HSS-E Machinetap BSPT (Rc)  
 FR Taraud machine HSS-E BSPT (Rc)  
 ES Macho máquina HSS-E BSPT (Rc)  
 DE HSS-E Maschinengewindebohrer BSPT (Rc)



+6 6 ( **BSPT Rc** **55°** **DIN 5156** **Form C** **2,5**

**P 11** **P 12** **P 13** **M 21** **M 22** **K 31** **N 41**  
 ≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG Alu

15-20 12-18 10-15 7-10 5-8 10-15 25-35

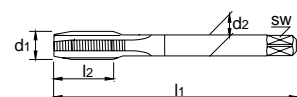
Ref.	d1	P	l1	l2	d2	sw
25.480.0973	BSPT 1/8	28	90	20	7	5.5
25.480.1316	BSPT 1/4	19	100	22	11	9
25.480.1666	BSPT 3/8	19	100	22	12	9

Ref.	d1	P	l1	l2	d2	sw
25.480.2096	BSPT 1/2	14	125	25	16	12
25.480.2644	BSPT 3/4	14	140	28	20	16
25.480.3325	BSPT 1	11	160	30	25	20



## > 25.500 Phantom

NL HSS-E Machinetap BSPP (Rp)  
 FR Taraud machine HSS-E BSPP (Rp)  
 ES Macho máquina HSS-E BSPP (Rp)  
 DE HSS-E Maschinengewindebohrer BSPP (Rp)



+6 ( BSPP Rp 55° DIN 5156 ISO 228-1 2xD 1,5xD Form C 2,5

P 11 P 12 P 13 M 21 M 22 K 31 N 41  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> INOX s850N/mm<sup>2</sup> INOX >s850N/mm<sup>2</sup> GG Alu

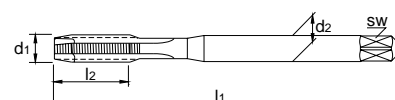
15-20 12-18 10-15 7-10 5-8 10-15 25-35

Ref.	d1	P	l1	l2	d2	sw
25.500.0973	BSPP 1/8	28	90	20	7	5.5
25.500.1316	BSPP 1/4	19	100	22	11	9
25.500.1666	BSPP 3/8	19	100	22	12	9

Ref.	d1	P	l1	l2	d2	sw
25.500.2096	BSPP 1/2	14	125	25	16	12
25.500.2644	BSPP 3/4	14	140	28	20	16
25.500.3325	BSPP 1	11	160	30	25	20

## > 25.520 Phantom

NL HSS-E Machinetap BSW (Whitworth)  
 FR Taraud machine HSS-E BSW (Whitworth)  
 ES Macho máquina HSS-E BSW (Whitworth)  
 DE HSS-E Maschinengewindebohrer BSW (Whitworth)



+6 ( BSW 55° DIN 2182 3xD Form B 5

P 11 P 12 K 32 N 41 N 51  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> GGG GTS-GTW Alu Cu

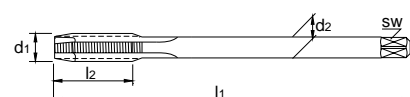
15-20 10-20 5-15 10-35 15-35

Ref.	d1	P	l1	l2	d2	sw
25.520.0317	BSW 1/8	40	56	11	3.5	2.7
25.520.0397	BSW 5/32	32	63	13	4.5	3.4
25.520.0476	BSW 3/16	24	70	15	6	4.9
25.520.0556	BSW 7/32	24	80	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
25.520.0635	BSW 1/4	20	80	17	7	5.5
25.520.0794	BSW 5/16	18	90	20	8	6.2
25.520.0952	BSW 3/8	16	100	24	9	7

## > 25.521 Phantom

NL HSS-E Machinetap BSW (Whitworth)  
 FR Taraud machine HSS-E BSW (Whitworth)  
 ES Macho máquina HSS-E BSW (Whitworth)  
 DE HSS-E Maschinengewindebohrer BSW (Whitworth)



+6 ( BSW 55° DIN 2183 3xD Form B 5

P 11 P 12 K 32 N 41 N 51  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> GGG GTS-GTW Alu Cu

15-20 10-20 5-15 10-35 15-35

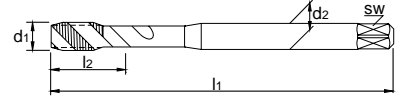
Ref.	d1	P	l1	l2	d2	sw
25.521.1111	BSW 7/16	14	100	22	8	6.2
25.521.1270	BSW 1/2	12	110	24	9	7
25.521.1429	BSW 9/16	12	110	26	11	9
25.521.1588	BSW 5/8	11	110	27	12	9

Ref.	d1	P	l1	l2	d2	sw
25.521.1905	BSW 3/4	10	125	30	14	11
25.521.2222	BSW 7/8	9	140	32	18	14.5
25.521.2540	BSW 1	8	160	36	20	16

> **25.640** **Phantom**



NL HSS-E Machinetap BSW (Whitworth)  
 FR Taraud machine HSS-E BSW (Whitworth)  
 ES Macho máquina HSS-E BSW (Whitworth)  
 DE HSS-E Maschinengewindebohrer BSW (Whitworth)



+6 6 ( BSW 55° DIN 2182 2,5xD 40° Form C 2,5

P 11 ≤800 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> K 32 GGG GTS-GTW N 41 Alu N 51 Cu  
 15-20 10-20 5-15 10-35 15-35

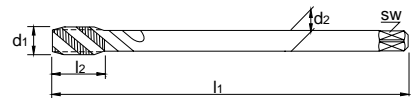
Ref.	d1	P	l1	l2	d2	sw
25.640.0317	BSW 1/8	40	56	5	3.5	2.7
25.640.0397	BSW 5/32	32	63	7	4.5	3.4
25.640.0476	BSW 3/16	24	70	8	6	4.9

Ref.	d1	P	l1	l2	d2	sw
25.640.0635	BSW 1/4	20	80	10	7	5.5
25.640.0794	BSW 5/16	18	90	12	8	6.2
25.640.0952	BSW 3/8	16	100	16	9	7

> **25.641** **Phantom**



NL HSS-E Machinetap BSW (Whitworth)  
 FR Taraud machine HSS-E BSW (Whitworth)  
 ES Macho máquina HSS-E BSW (Whitworth)  
 DE HSS-E Maschinengewindebohrer BSW (Whitworth)



+6 6 ( BSW 55° DIN 2183 2,5xD 40° Form C 2,5

P 11 ≤800 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> K 32 GGG GTS-GTW N 41 Alu N 51 Cu  
 15-20 10-20 5-15 10-35 15-35

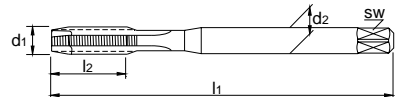
Ref.	d1	P	l1	l2	d2	sw
25.641.1111	BSW 7/16	14	100	14	8	6.2
25.641.1270	BSW 1/2	12	110	16	9	7
25.641.1429	BSW 9/16	12	110	20	11	9
25.641.1588	BSW 5/8	11	110	20	12	9

Ref.	d1	P	l1	l2	d2	sw
25.641.1905	BSW 3/4	10	125	25	14	11
25.641.2222	BSW 7/8	9	140	28	18	14.5
25.641.2540	BSW 1	8	160	30	20	16

> **25.720** **Phantom**



NL HSS-E Machinetap BSF  
 FR Taraud machine HSS-E BSF  
 ES Macho máquina HSS-E BSF  
 DE HSS-E Maschinengewindebohrer BSF



+6 6 ( BSF 55° DIN 371 2 xD 1,5 xD Form C 2,5

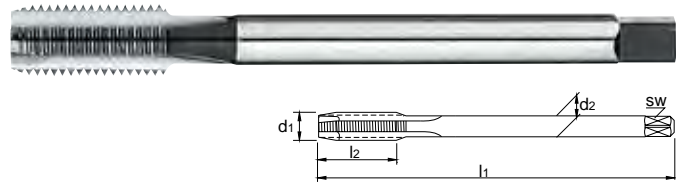
P 11 ≤800 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> K 32 GGG GTS-GTW N 41 Alu N 51 Cu  
 15-20 10-20 5-15 10-35 15-35

Ref.	d1	P	l1	l2	d2	sw
25.720.0635	BSF 1/4	26	80	17	7	5.5

Ref.	d1	P	l1	l2	d2	sw
25.720.0794	BSF 5/16	22	90	20	8	6.2

## > 25.721 Phantom

NL HSS-E Machinetap BSF  
FR Taraud machine HSS-E BSF  
ES Macho máquina HSS-E BSF  
DE HSS-E Maschinengewindebohrer BSF



+6 6 ( BSF 55° DIN 376 2 xD 1,5 xD Form C 2,5

P 11 P 12 K 32 N 41 N 51  
S800 N/mm<sup>2</sup> S850 N/mm<sup>2</sup> GGG GTS-GTW Alu Cu

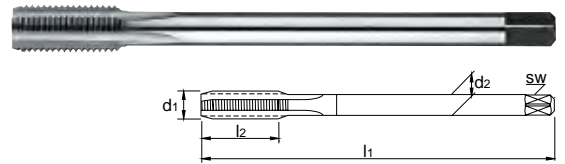
15-20 10-20 5-15 10-35 15-35

Ref.	d1	P	l1	l2	d2	sw
25.721.0952	BSF 3/8	20	100	22	7	5.5
25.721.1111	BSF 7/16	18	100	22	8	6.2
25.721.1270	BSF 1/2	16	110	24	9	7
25.721.1588	BSF 5/8	14	110	27	12	9

Ref.	d1	P	l1	l2	d2	sw
25.721.1905	BSF 3/4	12	125	30	14	11
25.721.2222	BSF 7/8	11	140	32	18	14.5
25.721.2540	BSF 1	10	160	36	18	14.5

## > 25.760 Phantom

NL HSS-E Machinetap BSC, FG (Rijwieldraad)  
FR Taraud machine HSS-E BSC, FG (filetage bicyclette)  
ES Macho máquina HSS-E BSC, FG (rosca bicicleta)  
DE HSS-E Maschinengewindebohrer BSC, FG (Fahradgewinde)



+6 6 ( BSC FG 60° DIN 79012 2 xD 1,5 xD Form C 2-3

P 11 P 12 K 32 N 41 N 51  
S800 N/mm<sup>2</sup> S850 N/mm<sup>2</sup> GGG GTS-GTW Alu Cu

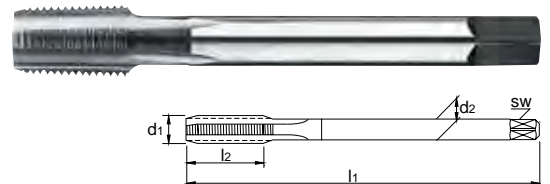
15-20 10-20 5-15 10-35 15-35

Ref.	d1	P	l1	l2	d2	sw
25.760.0635	BSC 1/4	26	80	16	6	4.9
25.760.0790	BSC 5/16	26	90	16	8	6.2
25.760.0950	BSC 3/8	26	90	16	7	5.5

Ref.	d1	P	l1	l2	d2	sw
25.760.1430	BSC 9/16	20	100	11	11	9
25.760.2540	BSC 1	24	140	18	18	14.5

## > 25.820 Phantom

NL HSS-E Machinetap NPT  
FR Taraud machine HSS-E NPT  
ES Macho máquina HSS-E NPT  
DE HSS-E Maschinengewindebohrer NPT



+6 6 ( NPT 60° DIN 374 1:16 Form C 2,5

P 11 P 12 K 32 N 41 N 51  
S800 N/mm<sup>2</sup> S850 N/mm<sup>2</sup> GGG GTS-GTW Alu Cu

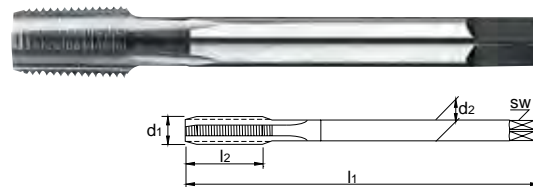
15-20 10-20 5-15 10-35 15-35

Ref.	d1	P	l1	l2	d2	sw
25.820.0794	NPT 1/16	27	90	14	6	4.9
25.820.1029	NPT 1/8	27	90	20	7	5.5
25.820.1372	NPT 1/4	18	100	22	11	9
25.820.1715	NPT 3/8	18	110	22	12	9
25.820.2134	NPT 1/2	14	140	25	16	12

Ref.	d1	P	l1	l2	d2	sw
25.820.2667	NPT 3/4	14	140	28	20	16
25.820.3340	NPT 1	11.5	160	30	25	20
25.820.4216	NPT 1.1/4	11.5	170	33	32	24
25.820.4826	NPT 1.1/2	11.5	190	33	36	29
25.820.6033	NPT 2	11.5	225	33	45	35

> **25.840** **Phantom**

NL HSS-E Machinetap NPTF  
 FR Taraud machine HSS-E NPTF  
 ES Macho máquina HSS-E NPTF  
 DE HSS-E Maschinengewindebohrer NPTF



+6 6 ( NPTF 60° DIN 374 1:16 Form C 2,5

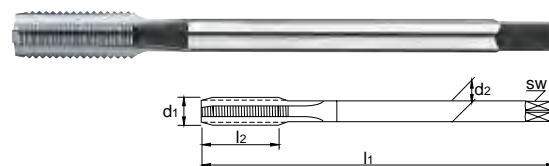
<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
15-20	10-20	5-15	10-35	15-35

Ref.	d1	P	l1	l2	d2	sw
25.840.0794	NPTF 1/16	27	90	14	6	4.9
25.840.1029	NPTF 1/8	27	90	20	7	5.5
25.840.1372	NPTF 1/4	18	100	22	11	9
25.840.1715	NPTF 3/8	18	110	22	12	9

Ref.	d1	P	l1	l2	d2	sw
25.840.2134	NPTF 1/2	14	140	25	16	12
25.840.2667	NPTF 3/4	14	140	28	20	16
25.840.3340	NPTF 1	11.5	160	30	25	20

> **25.900** **Phantom**

NL HSS-E Machinetap PG  
 FR Taraud machine HSS-E PG  
 ES Macho máquina HSS-E PG  
 DE HSS-E Maschinengewindebohrer PG



+6 6 ( PG 80° DIN 40433 Form C 2,5

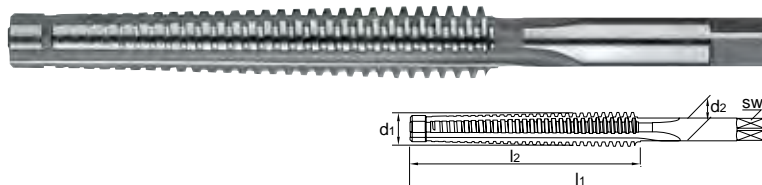
<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
15-20	10-20	5-15	10-35	15-35

Ref.	d1	P	l1	l2	d2	sw
25.900.0700	PG 7	20	100	22	9	7
25.900.0900	PG 9	18	100	22	12	9
25.900.1100	PG 11	18	110	25	14	11
25.900.1350	PG 13.5	18	125	25	16	12

Ref.	d1	P	l1	l2	d2	sw
25.900.1600	PG 16	18	125	25	18	14.5
25.900.2100	PG 21	16	150	28	22	18
25.900.2900	PG 29	16	170	30	28	22
25.900.3600	PG 36	16	190	32	36	29

> **25.950** **Phantom**

NL HSS-E Machinetap Trapezium  
 FR Taraud machine HSS-E Trapézoidal  
 ES Macho máquina HSS-E Trapezoidal  
 DE HSS-E Maschinengewindebohrer Trapezgewinde (Regel)



+6 6 ( Tr 30° DIN 103 2xD 7H

<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
15-20	10-20	5-15	10-35	15-35

Ref.	d1	P	l1	l2	d2	sw
25.950.1203	Tr 12	3	165	115	8	6.2
25.950.1403	Tr 14	3	170	115	10	8
25.950.1404	Tr 14	4	200	135	10	8
25.950.1604	Tr 16	4	210	135	11	9
25.950.1804	Tr 18	4	220	135	13	10

Ref.	d1	P	l1	l2	d2	sw
25.950.2004	Tr 20	4	225	140	15	12
25.950.2205	Tr 22	5	260	170	16	12
25.950.2405	Tr 24	5	270	170	18	14.5
25.950.2605	Tr 26	5	250	155	20	16
25.950.2805	Tr 28	5	290	190	22	18

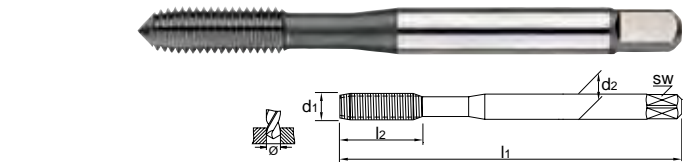
## > 26.100 Phantom

NL HSS-E Roltap Metrisch, genitreed  
FR Taraud à refouler HSS-E Métrique, nitruré  
ES Macho de laminación HSS-E Métrica, nitrurada  
DE HSS-E Gewindeformer Metrisch, nitriert

+6 [ M 60° NIT. DIN 371 3xD Form C 3 6HX

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-25	10-20	10-35	10-20	15-35

Ref.	d1	P	l1	l2	d2	sw
26.100.0200	M2	0.4	45	8	2.8	2.1
26.100.0250	M2,5	0.45	50	9	2.8	2.1
26.100.0300	M3	0.5	56	11	3.5	2.7
26.100.0400	M4	0.7	63	13	4.5	3.4



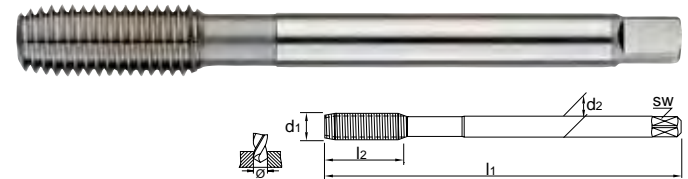
## > 26.101 Phantom

NL HSS-E Roltap Metrisch, genitreed  
FR Taraud à refouler HSS-E Métrique, nitruré  
ES Macho de laminación HSS-E Métrica, nitrurada  
DE HSS-E Gewindeformer Metrisch, nitriert

+6 [ M 60° NIT. DIN 376 3xD Form C 3 6HX

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-25	10-20	10-35	10-20	15-35

Ref.	d1	P	l1	l2	d2	sw
26.101.1200	M12	1.75	110	29	9	7



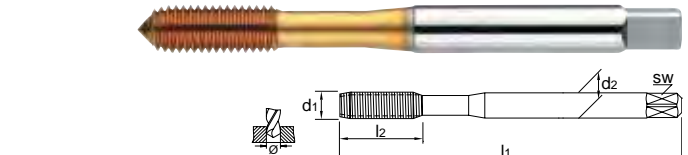
## > 26.110 Phantom

NL HSS-E Roltap Metrisch, TiN  
FR Taraud à refouler HSS-E Métrique, TiN  
ES Macho de laminación HSS-E Métrica, TiN  
DE HSS-E Gewindeformer Metrisch, TiN

+6 [ M 60° TiN DIN 371 3xD Form C 3 6HX

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-25	10-20	7-10	10-35	10-20	15-35

Ref.	d1	P	l1	l2	d2	sw
26.110.0200	M2	0.4	45	8	2.8	2.1
26.110.0250	M2,5	0.45	50	9	2.8	2.1
26.110.0300	M3	0.5	56	11	3.5	2.7
26.110.0400	M4	0.7	63	13	4.5	3.4



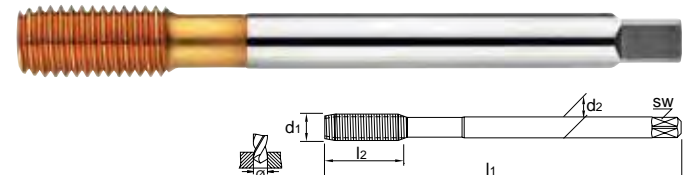
## > 26.111 Phantom

NL HSS-E Roltap Metrisch, TiN  
FR Taraud à refouler HSS-E Métrique, TiN  
ES Macho de laminación HSS-E Métrica, TiN  
DE HSS-E Gewindeformer Metrisch, TiN

+6 [ M 60° TiN DIN 376 3xD Form C 3 6HX

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-25	10-20	7-10	10-35	10-20	15-35

Ref.	d1	P	l1	l2	d2	sw
26.111.1200	M12	1.75	110	29	9	7



Ref.	d1	P	l1	l2	d2	sw
26.100.0500	M5	0.8	70	16	6	4.9
26.100.0600	M6	1	80	19	6	4.9
26.100.0800	M8	1.25	90	22	8	6.2
26.100.1000	M10	1.5	100	24	10	8

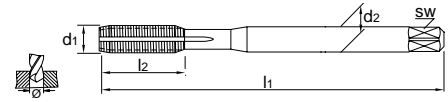
Ref.	d1	P	l1	l2	d2	sw
26.110.0500	M5	0.8	70	16	6	4.9
26.110.0600	M6	1	80	19	6	4.9
26.110.0800	M8	1.25	90	22	8	6.2
26.110.1000	M10	1.5	100	24	10	8

Ref.	d1	P	l1	l2	d2	sw
26.111.1200	M12	1.75	110	29	9	7

> **26.160** **Phantom**



NL HSS-E Roltap met smeergroef, Metrisch, TiCN  
 FR Taraud à refouler HSS-E rainures de lubrification, Métrique, TiCN  
 ES Macho de laminación HSS-E con ranura de refrigeración, Métrica, TiCN  
 DE HSS-E Gewindeformer mit Schmiernut, Metrisch, TiCN



+6 6 ( M 60° TiCN DIN 371 3xD Form C 3 6HX

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-25	10-20	7-10	4-8	10-35	10-20	15-35

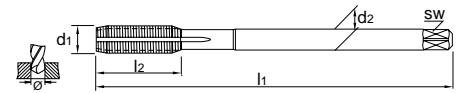
Ref.	d1	P	l1	l2	d2	sw
26.160.0300	M3	0.5	56	11	3.5	2.7
26.160.0400	M4	0.7	63	13	4.5	3.4
26.160.0500	M5	0.8	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
26.160.0600	M6	1	80	19	6	4.9
26.160.0800	M8	1.25	90	22	8	6.2
26.160.1000	M10	1.5	100	24	10	8

> **26.161** **Phantom**



NL HSS-E Roltap met smeergroef, Metrisch, TiCN  
 FR Taraud à refouler HSS-E rainures de lubrification, Métrique, TiCN  
 ES Macho de laminación HSS-E con ranura de refrigeración, Métrica, TiCN  
 DE HSS-E Gewindeformer mit Schmiernut, Metrisch, TiCN



+6 6 ( M 60° TiCN DIN 376 3xD Form C 3 6HX

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-25	10-20	7-10	4-8	10-35	10-20	15-35

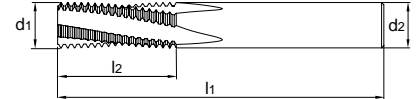
Ref.	d1	P	l1	l2	d2	sw
26.161.1200	M12	1.75	110	29	9	7
26.161.1400	M14	2	110	26	11	9
26.161.1600	M16	2	110	26	12	9

Ref.	d1	P	l1	l2	d2	sw
26.161.1800	M18	2.5	125	30	14	11
26.161.2000	M20	2.5	140	32	16	12

> **26.310** **Phantom**



NL VHM Draadrees 2xD  
 FR Fraise à fileter Carbone 2xD  
 ES Fresa de roscado MD 2xD  
 DE VHM Gewindefräser 2xD



MG HM M 60° 2xD DIN 6535-HA

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 61</b> PVC
60-80 D	60-80 D	80-90 D	60-70 C	50-60 C	40-50 C	100-110 D	110-120 E	220-240 F	200-230 F	120-140 E	200-300 E

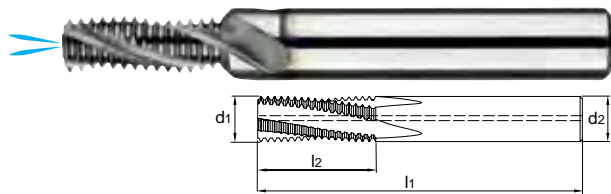
Ref.	d1	P	l1	l2	d2	Ø mm
26.310.0600	M6	1	4.8	54	13.5	6
26.310.0800	M8	1.25	6.4	62	18.1	8
26.310.1000	M10	1.5	7.95	74	21.8	10
26.310.1200	M12	1.75	9.95	74	25.4	10

Ref.	d1	P	l1	l2	d2	Ø mm
26.310.1400	M14	2	11.2	90	31	12
26.310.1600	M16	2	12.8	90	35	14
26.310.2000	M20	2.5	14.95	102	41.3	16



## > 26.316 Phantom

NL VHM Draadrees 2xD met koelkanaal  
 FR Fraise à fileter Carbone 2xD à trou d'huile  
 ES Fresa de roscado MD 2xD con canal de refrigeración  
 DE VHM Gewindefräser 2xD mit Innenkühlung



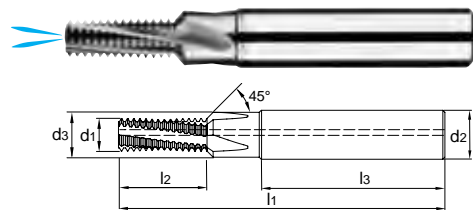
80-110 D	100-120 D	80-100 D	90-100 C	20-30 A	55-65 C	50-60 C	100-120 D	110-130 E	220-260 F	240-250 F	130-150 E	30-40 A	40-50 A	40-50 A
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Ref.	d1	P	l1	l2	d2	Ø mm
26.316.0600	M6	1	4.8	54	13.5	6
26.316.0800	M8	1.25	6.4	62	18.1	8
26.316.1000	M10	1.5	7.95	74	21.8	10
26.316.1200	M12	1.75	9.95	74	25.4	10

Ref.	d1	P	l1	l2	d2	Ø mm
26.316.1400	M14	2	11.2	90	31	12
26.316.1600	M16	2	12.8	90	35	14
26.316.2000	M20	2.5	14.95	102	41.3	16

## > 26.384 Phantom

NL VHM Draadrees 2xD met koelkanaal, met fase  
 FR Fraise à fileter Carbone 2xD à trou d'huile, avec chanfrein  
 ES Fresa de roscado MD 2xD con canal de refrigeración, con escalonado de avellanar  
 DE VHM Gewindefräser 2xD mit Innenkühlung, mit Fase



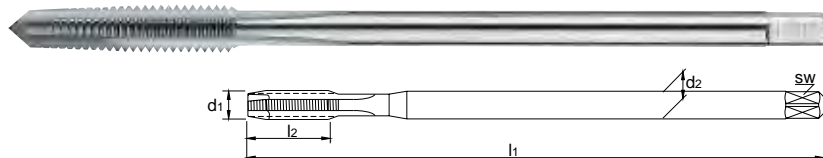
80-110 D	100-120 D	80-100 D	90-100 C	20-30 A	55-65 C	50-60 C	100-120 D	110-130 E	220-260 F	240-250 F	130-150 E	30-40 A
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Ref.	d1	P	l1	l2	l3	d2	d3	Ø mm
26.384.0300	M3	0.5	2.3	48	6.8	36	6	3.4
26.384.0400	M4	0.7	3	48	8.8	36	6	4.5
26.384.0500	M5	0.8	4	54	10.8	36	6	5.5
26.384.0600	M6	1	4.8	62	13.5	36	8	6.6

Ref.	d1	P	l1	l2	l3	d2	d3	Ø mm
26.384.0800	M8	1.25	6.4	74	18.1	40	10	6.8
26.384.1000	M10	1.5	7.95	80	21.8	45	12	8.5
26.384.1200	M12	1.75	9.95	90	25.4	45	14	10.2
26.384.1600	M16	2	12.8	102	35	48	18	14

## > 26.500 Phantom

NL HSS Machinemoertap Metrisch  
 FR Taraud à enfilade HSS Métrique  
 ES Macho para tuercas HSS Métrica  
 DE HSS Maschinen Muttergewindebohrer Metrisch

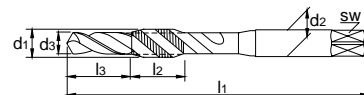


12-17	10-15	7-12	3-6	15-20	5-12
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Ref.	d1	P	l1	l2	d2	sw
26.500.0400	M4	0.7	90	25	2.8	2.1
26.500.0500	M5	0.8	100	28	3.5	2.7
26.500.0600	M6	1	110	32	4.5	3.4

Ref.	d1	P	l1	l2	d2	sw
26.500.0800	M8	1.25	125	40	6	4.9
26.500.1000	M10	1.5	140	45	7	5.5

> **26.700** **Phantom**



NL HSS Combi-boortap Metrisch  
 FR Foret taraudeur HSS Métrique  
 ES Broca-Macho HSS Métrica  
 DE HSS Kombi-Gewindebohrer Metrisch

HSS M ISO 2 6H

**P 11** **N 41** **N 42**

12-20 15-25 18-25

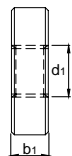
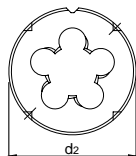
Ref.	d1	P	l1	l2	l3	d2	d3
26.700.0300	M3	0.5	56	11	12	3	2.5
26.700.0400	M4	0.7	63	14	15	4	3.3
26.700.0500	M5	0.8	71	18	15	5	4.2
26.700.0600	M6	1	80	22	15	6	5

Ref.	d1	P	l1	l2	l3	d2	d3
26.700.0800	M8	1.25	95	25	20	8	6.8
26.700.1000	M10	1.5	106	31	25	10	8.5
26.700.1200	M12	1.75	115	35	30	12	10.2



## > 27.100 INTERNATIONAL TOOLS

NL ECO PRO HSS Ronde Snijplaat Metrisch  
FR Filière ronde HSS ECO PRO Métrique  
ES Terraja esférica HSS ECO PRO Métrica  
DE ECO PRO HSS Runde Schneideisen Metrisch



HSS M 60° DIN EN 22568 6g ECO PRO

P 11 P 12 K 31 K 32 N 41 N 42  
S500 N/mm<sup>2</sup> S850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si<10%

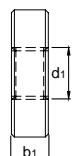
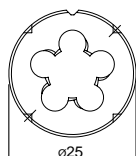
Ref.	d1	P	d2	b1
27.100.0200	M2	0.4	16	5
27.100.0250	M2,5	0.45	16	5
27.100.0300	M3	0.5	20	5
27.100.0400	M4	0.7	20	5
27.100.0500	M5	0.8	20	7
27.100.0600	M6	1	20	7
27.100.0700	M7	1	25	9

Ref.	d1	P	d2	b1
27.100.0800	M8	1.25	25	9
27.100.1000	M10	1.5	30	11
27.100.1200	M12	1.75	38	14
27.100.1400	M14	2	38	14
27.100.1600	M16	2	45	18
27.100.1800	M18	2.5	45	18
27.100.2000	M20	2.5	45	18

Ref.	d1	P	d2	b1
27.100.2200	M22	2.5	55	22
27.100.2400	M24	3	55	22
27.100.2700	M27	3	65	25
27.100.3000	M30	3.5	65	25
27.100.3300	M33	3.5	65	25
27.100.3600	M36	4	65	25

## > 27.110 INTERNATIONAL TOOLS

NL ECO PRO HSS Ronde Snijplaat Metrisch, 25 mm  
FR Filière ronde HSS ECO PRO Métrique, 25 mm  
ES Terraja esférica HSS ECO PRO Métrica, 25 mm  
DE ECO PRO HSS Runde Schneideisen Metrisch, 25 mm



HSS M 60° DIN EN 22568 6g ECO PRO

P 11 P 12 K 31 K 32 N 41 N 42  
S500 N/mm<sup>2</sup> S850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si<10%

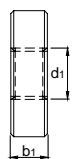
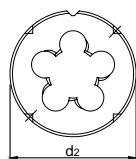
Ref.	d1	P	d2	b1
27.110.0300	M3	0.5	25	9
27.110.0400	M4	0.7	25	9
27.110.0500	M5	0.8	25	9

Ref.	d1	P	d2	b1
27.110.0600	M6	1	25	9
27.110.0800	M8	1.25	25	9
27.110.1000	M10	1.5	25	9

Ref.	d1	P	d2	b1
27.110.1200	M12	1.75	25	9

## > 27.120 Phantom

NL HSS Ronde Snijplaat Metrisch, schilaansnijding  
FR Filière ronde HSS Métrique, coupe gun  
ES Terraja esférica HSS Métrica, entrada corregida (gun)  
DE HSS Runde Schneideisen Metrisch, Schälanschnitt



HSS M 60° DIN EN 22568 M3 6g

P 11 P 12 P 13 M 21 N 41  
S500 N/mm<sup>2</sup> S850 N/mm<sup>2</sup> S1000 N/mm<sup>2</sup> INOX S850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

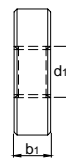
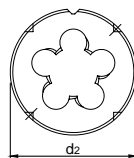
Ref.	d1	P	d2	b1
27.120.0100	M1	0.25	16	5
27.120.0120	M1,2	0.25	16	5
27.120.0140	M1,4	0.3	16	5
27.120.0160	M1,6	0.35	16	5
27.120.0180	M1,8	0.35	16	5
27.120.0200	M2	0.4	16	5
27.120.0220	M2,2	0.45	16	5
27.120.0230	M2,3	0.4	16	5
27.120.0250	M2,5	0.45	16	5
27.120.0260	M2,6	0.45	16	5
27.120.0300	M3	0.5	20	5
27.120.0350	M3,5	0.6	20	5

Ref.	d1	P	d2	b1
27.120.0400	M4	0.7	20	5
27.120.0500	M5	0.8	20	7
27.120.0600	M6	1	20	7
27.120.0700	M7	1	25	9
27.120.0800	M8	1.25	25	9
27.120.0900	M9	1.25	25	9
27.120.1000	M10	1.5	30	11
27.120.1100	M11	1.5	30	11
27.120.1200	M12	1.75	38	14
27.120.1400	M14	2	38	14
27.120.1600	M16	2	45	18
27.120.1800	M18	2.5	45	18

Ref.	d1	P	d2	b1
27.120.2000	M20	2.5	45	18
27.120.2200	M22	2.5	55	22
27.120.2400	M24	3	55	22
27.120.2700	M27	3	65	25
27.120.3000	M30	3.5	65	25
27.120.3300	M33	3.5	65	25
27.120.3600	M36	4	65	25
27.120.3900	M39	4	75	30
27.120.4200	M42	4.5	75	30
27.120.4500	M45	4.5	90	36
27.120.4800	M48	5	90	36
27.120.5200	M52	5	90	36

> **27.150 Phantom**

NL HSS-E PM Ronde Snijplaat Metrisch, schilaansnijding, gelept, roestvaststaal  
 FR Filière ronde HSS-E PM Métrique, coupe gun, filets rodés, Inox  
 ES Terraja esférica HSS-E PM Métrica, entrada corregida (gun), lapeada, acero inoxidable  
 DE HSS-E PM Runde Schneideisen Metrisch, Schälanschnitt, geläppt, rostfreien Stahl



HSS-E PM M 60° DIN EN 22568 6g

P 11 ≤800 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² P 14 ≤1400 N/mm² M 21 INOX ≤850N/mm² M 22 INOX >850N/mm² N 42 Alu Si>10% S 72 Ti

10-14	6-10	5-8	5-8	4-6	4-6	8-12	5-8
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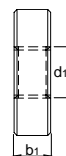
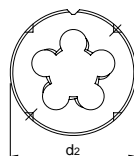
Ref.	d1	P	d2	b1
27.150.0200	M2	0.4	16	5
27.150.0250	M2,5	0.45	16	5
27.150.0300	M3	0.5	20	5
27.150.0350	M3,5	0.6	20	5
27.150.0400	M4	0.7	20	5
27.150.0500	M5	0.8	20	7

Ref.	d1	P	d2	b1
27.150.0600	M6	1	20	7
27.150.0700	M7	1	25	9
27.150.0800	M8	1.25	25	9
27.150.1000	M10	1.5	30	11
27.150.1200	M12	1.75	38	14
27.150.1400	M14	2	38	14

Ref.	d1	P	d2	b1
27.150.1600	M16	2	45	18
27.150.1800	M18	2.5	45	18
27.150.2000	M20	2.5	45	18
27.150.2200	M22	2.5	55	22
27.150.2400	M24	3	55	22

> **27.175 Phantom**

NL HSS Ronde Snijplaat Metrisch, schilaansnijding, gelept, Messing  
 FR Filière ronde HSS Métrique, coupe gun, filets rodés, Laiton  
 ES Terraja esférica HSS Métrica, entrada corregida (gun), lapeada, Latón  
 DE HSS Runde Schneideisen Metrisch, Schälanschnitt, geläppt, Messing



HSS M 60° DIN EN 22568 6g

N 51 Cu N 52 CuAlFe

11-15	5-18
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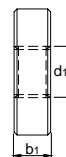
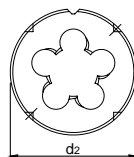
Ref.	d1	P	d2	b1
27.175.0300	M3	0.5	20	5
27.175.0400	M4	0.7	20	5
27.175.0500	M5	0.8	20	7

Ref.	d1	P	d2	b1
27.175.0600	M6	1	20	7
27.175.0800	M8	1.25	25	9
27.175.1000	M10	1.5	30	11

Ref.	d1	P	d2	b1
27.175.1200	M12	1.75	38	14

> **27.200 INTERNATIONAL TOOLS**

NL ECO PRO HSS Ronde Snijplaat Metrisch Fijn  
 FR Filière ronde HSS ECO PRO Métrique Fin  
 ES Terraja esférica HSS ECO PRO Métrica Fina  
 DE ECO PRO HSS Runde Schneideisen Metrisch Fein



HSS MF 60° DIN EN 22568 6g ECO PRO

P 11 ≤800 N/mm² P 12 ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10%

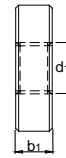
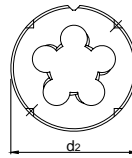
Ref.	d1	P	d2	b1
27.200.0403	MF4	0.35	20	5
27.200.0405	MF4	0.5	20	5
27.200.0505	MF5	0.5	20	5
27.200.0605	MF6	0.5	20	5
27.200.0607	MF6	0.75	20	7
27.200.0707	MF7	0.75	25	9
27.200.0805	MF8	0.5	25	9
27.200.0807	MF8	0.75	25	9
27.200.0810	MF8	1	25	9
27.200.0910	MF9	1	25	9
27.200.1007	MF10	0.75	30	11
27.200.1010	MF10	1	30	11

Ref.	d1	P	d2	b1
27.200.1012	MF10	1.25	30	11
27.200.1210	MF12	1	38	10
27.200.1212	MF12	1.25	38	10
27.200.1215	MF12	1.5	38	10
27.200.1310	MF13	1	38	10
27.200.1410	MF14	1	38	10
27.200.1412	MF14	1.25	38	10
27.200.1415	MF14	1.5	38	10
27.200.1510	MF15	1	38	10
27.200.1610	MF16	1	45	14
27.200.1615	MF16	1.5	45	14
27.200.1810	MF18	1	45	14

Ref.	d1	P	d2	b1
27.200.1815	MF18	1.5	45	14
27.200.2010	MF20	1	45	14
27.200.2015	MF20	1.5	45	14
27.200.2215	MF22	1.5	55	16
27.200.2220	MF22	2	55	16
27.200.2415	MF24	1.5	55	16
27.200.2420	MF24	2	55	16
27.200.2715	MF27	1.5	65	18
27.200.2720	MF27	2	65	18
27.200.3015	MF30	1.5	65	18
27.200.3020	MF30	2	65	18

## > 27.220 Phantom

NL HSS Ronde Snijplaat Metrisch Fijn, schilaansnijding  
 FR Filière ronde HSS Métrique Fin, coupe gun  
 ES Terraja esférica HSS Métrica Fina, entrada corregida (gun)  
 DE HSS Runde Schneideisen Metrisch Fein, Schälanschnitt



**HSS MF**

**P 11**

≤500 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

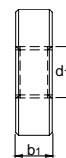
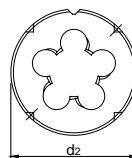
Ref.	d1	P	d2	b1
27.220.0303	MF3	0.35	20	5
27.220.0403	MF4	0.35	20	5
27.220.0405	MF4	0.5	20	5
27.220.0505	MF5	0.5	20	5
27.220.0605	MF6	0.5	20	5
27.220.0607	MF6	0.75	20	7
27.220.0707	MF7	0.75	25	9
27.220.0805	MF8	0.5	25	9
27.220.0807	MF8	0.75	25	9
27.220.0810	MF8	1	25	9
27.220.0907	MF9	0.75	25	9
27.220.0910	MF9	1	25	9
27.220.1005	MF10	0.5	30	11
27.220.1007	MF10	0.75	30	11
27.220.1010	MF10	1	30	11
27.220.1012	MF10	1.25	30	11
27.220.1110	MF11	1	30	11
27.220.1205	MF12	0.5	38	10
27.220.1207	MF12	0.75	38	10
27.220.1210	MF12	1	38	10
27.220.1212	MF12	1.25	38	10
27.220.1215	MF12	1.5	38	10
27.220.1310	MF13	1	38	10
27.220.1405	MF14	0.5	38	10
27.220.1407	MF14	0.75	38	10
27.220.1410	MF14	1	38	10
27.220.1412	MF14	1.25	38	10
27.220.1415	MF14	1.5	38	10

Ref.	d1	P	d2	b1
27.220.1510	MF15	1	38	10
27.220.1515	MF15	1.5	38	10
27.220.1607	MF16	0.75	45	14
27.220.1610	MF16	1	45	14
27.220.1612	MF16	1.25	45	14
27.220.1615	MF16	1.5	45	14
27.220.1810	MF18	1	45	14
27.220.1812	MF18	1.25	45	14
27.220.1815	MF18	1.5	45	14
27.220.1820	MF18	2	45	14
27.220.2010	MF20	1	45	14
27.220.2015	MF20	1.5	45	14
27.220.2020	MF20	2	45	14
27.220.2210	MF22	1	55	16
27.220.2215	MF22	1.5	55	16
27.220.2220	MF22	2	55	16
27.220.2410	MF24	1	55	16
27.220.2415	MF24	1.5	55	16
27.220.2420	MF24	2	55	16
27.220.2510	MF25	1	55	16
27.220.2515	MF25	1.5	55	16
27.220.2520	MF25	2	55	16
27.220.2610	MF26	1	55	16
27.220.2615	MF26	1.5	55	16
27.220.2710	MF27	1	65	18
27.220.2715	MF27	1.5	65	18
27.220.2720	MF27	2	65	18
27.220.2815	MF28	1.5	65	18

Ref.	d1	P	d2	b1
27.220.2820	MF28	2	65	18
27.220.3010	MF30	1	65	19
27.220.3015	MF30	1.5	65	18
27.220.3020	MF30	2	65	18
27.220.3215	MF32	1.5	65	18
27.220.3315	MF33	1.5	65	18
27.220.3320	MF33	2	65	18
27.220.3415	MF34	1.5	65	18
27.220.3515	MF35	1.5	65	18
27.220.3615	MF36	1.5	65	18
27.220.3620	MF36	2	65	18
27.220.3630	MF36	3	65	25
27.220.3815	MF38	1.5	75	20
27.220.3920	MF39	2	75	20
27.220.3930	MF39	3	75	30
27.220.4015	MF40	1.5	75	20
27.220.4020	MF40	2	75	20
27.220.4215	MF42	1.5	75	20
27.220.4220	MF42	2	75	20
27.220.4230	MF42	3	75	30
27.220.4515	MF45	1.5	90	22
27.220.4520	MF45	2	90	22
27.220.4530	MF45	3	90	22
27.220.4815	MF48	1.5	90	22
27.220.4830	MF48	3	90	22
27.220.5015	MF50	1.5	90	22
27.220.5215	MF52	1.5	90	22

## > 27.300 INTERNATIONAL TOOLS

NL ECO PRO HSS Ronde Snijplaat UNC  
 FR Filière ronde HSS ECO PRO UNC  
 ES Terraja esférica HSS ECO PRO UNC  
 DE ECO PRO HSS Runde Schneideisen UNC



**HSS UNC** **ECO PRO**

**P 11**

≤500 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si-10%

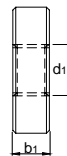
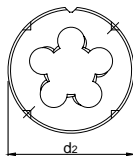
Ref.	d1	P	d2	b1
27.300.0635	UNC 1/4	20	20	7
27.300.0794	UNC 5/16	18	25	9
27.300.0952	UNC 3/8	16	30	11
27.300.1111	UNC 7/16	14	30	11

Ref.	d1	P	d2	b1
27.300.1270	UNC 1/2	13	38	14
27.300.1429	UNC 9/16	12	38	14
27.300.1588	UNC 5/8	11	45	18
27.300.1905	UNC 3/4	10	45	18

Ref.	d1	P	d2	b1
27.300.2222	UNC 7/8	9	55	22
27.300.2540	UNC 1	8	55	22

> 27.320 **Phantom**

NL HSS Ronde Snijplaat schilaansnijding, UNC  
 FR Filière ronde HSS coupe gun, UNC  
 ES Terraja esférica HSS entrada corregida (gun), UNC  
 DE HSS Runde Schneideisen Schälanschnitt, UNC



**HSS** **UNC** **2A**

**P 11** **P 12** **P 13** **M 21** **N 41**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

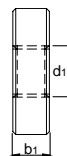
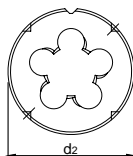
Ref.	d1	P	d2	b1
27.320.0284	UNC Nr. 4	40	16	5
27.320.0317	UNC Nr. 5	40	20	5
27.320.0350	UNC Nr. 6	32	20	7
27.320.0416	UNC Nr. 8	32	20	7
27.320.0482	UNC Nr. 10	24	20	7
27.320.0548	UNC Nr. 12	24	20	7
27.320.0635	UNC 1/4	20	20	7

Ref.	d1	P	d2	b1
27.320.0794	UNC 5/16	18	25	9
27.320.0952	UNC 3/8	16	30	11
27.320.1111	UNC 7/16	14	30	11
27.320.1270	UNC 1/2	13	38	14
27.320.1429	UNC 9/16	12	38	14
27.320.1588	UNC 5/8	11	45	18
27.320.1905	UNC 3/4	10	45	18

Ref.	d1	P	d2	b1
27.320.2222	UNC 7/8	9	55	22
27.320.2540	UNC 1	8	55	22
27.320.2858	UNC 1.1/8	7	65	25
27.320.3175	UNC 1.1/4	7	65	25
27.320.3810	UNC 1.1/2	6	75	30

> 27.400 **INTERNATIONAL TOOLS**

NL ECO PRO HSS Ronde Snijplaat UNF  
 FR Filière ronde HSS ECO PRO UNF  
 ES Terraja esférica HSS ECO PRO UNF  
 DE ECO PRO HSS Runde Schneideisen UNF



**HSS** **UNF** **2A** **ECO PRO**

**P 11** **P 12** **K 31** **K 32** **N 41** **N 42**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si-10%

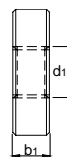
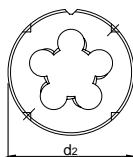
Ref.	d1	P	d2	b1
27.400.0635	UNF 1/4	28	20	7
27.400.0794	UNF 5/16	24	25	9
27.400.0952	UNF 3/8	24	30	11
27.400.1111	UNF 7/16	20	30	11

Ref.	d1	P	d2	b1
27.400.1270	UNF 1/2	20	38	10
27.400.1429	UNF 9/16	18	38	10
27.400.1588	UNF 5/8	18	45	14
27.400.1905	UNF 3/4	16	45	14

Ref.	d1	P	d2	b1
27.400.2222	UNF 7/8	14	55	16
27.400.2540	UNF 1	12	55	16
27.400.2541	UNF 1	14	55	16

> 27.420 **Phantom**

NL HSS Ronde Snijplaat schilaansnijding, UNF  
 FR Filière ronde HSS coupe gun, UNF  
 ES Terraja esférica HSS entrada corregida (gun), UNF  
 DE HSS Runde Schneideisen Schälanschnitt, UNF



**HSS** **UNF** **2A**

**P 11** **P 12** **P 13** **M 21** **N 41**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

Ref.	d1	P	d2	b1
27.420.0185	UNF Nr. 1	72	16	5
27.420.0218	UNF Nr. 2	64	16	5
27.420.0252	UNF Nr. 3	56	16	5
27.420.0284	UNF Nr. 4	48	16	5
27.420.0317	UNF Nr. 5	44	20	5
27.420.0350	UNF Nr. 6	40	20	5
27.420.0416	UNF Nr. 8	36	20	7
27.420.0482	UNF Nr. 10	32	20	7

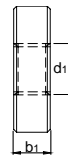
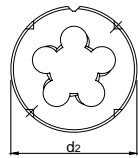
Ref.	d1	P	d2	b1
27.420.0548	UNF Nr. 12	28	20	7
27.420.0635	UNF 1/4	28	20	7
27.420.0794	UNF 5/16	24	25	9
27.420.0952	UNF 3/8	24	30	11
27.420.1111	UNF 7/16	20	30	11
27.420.1270	UNF 1/2	20	38	10
27.420.1429	UNF 9/16	18	38	10
27.420.1588	UNF 5/8	18	45	14

Ref.	d1	P	d2	b1
27.420.1905	UNF 3/4	16	45	14
27.420.2222	UNF 7/8	14	55	16
27.420.2540	UNF 1	12	55	16
27.420.2858	UNF 1.1/8	12	65	18
27.420.3175	UNF 1.1/4	12	65	18
27.420.3493	UNF 1.3/8	12	65	18
27.420.3810	UNF 1.1/2	12	75	20



## > 27.470 Phantom

NL HSS Ronde Snijplaat schilaansnijding, UNEF  
 FR Filière ronde HSS coupe gun, UNEF  
 ES Terraja esférica HSS entrada corregida (gun), UNEF  
 DE HSS Runde Schneideisen Schälanschnitt, UNEF



**HSS** **UNEF** **60°** **DIN EN 22568** **2A**

**P 11** **P 12** **P 13** **M 21** **N 41**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

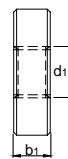
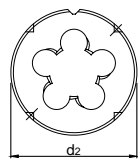
Ref.	d1	P	d2	b1
27.470.0635	UNEF 1/4	32	20	7
27.470.0794	UNEF 5/16	32	25	9
27.470.0952	UNEF 3/8	32	30	11
27.470.1111	UNEF 7/16	28	30	11

Ref.	d1	P	d2	b1
27.470.1270	UNEF 1/2	28	38	10
27.470.1429	UNEF 9/16	24	38	10
27.470.1588	UNEF 5/8	24	45	14
27.470.1905	UNEF 3/4	20	45	14

Ref.	d1	P	d2	b1
27.470.2222	UNEF 7/8	20	55	16
27.470.2540	UNEF 1	20	55	16

## > 27.500 INTERNATIONAL TOOLS

NL ECO PRO HSS Ronde Snijplaat BSP (Gasdraad)  
 FR Filière ronde HSS ECO PRO BSP (pas gaz)  
 ES Terraja esférica HSS ECO PRO BSP (gas)  
 DE ECO PRO HSS Runde Schneideisen BSP (Rohrgewinde)



**HSS** **BSP G** **55°** **DIN EN 24230** **ECO PRO**

**P 11** **P 12** **K 31** **K 32** **N 41** **N 42**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si-10%

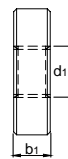
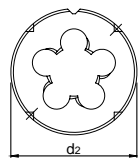
Ref.	d1	P	d2	b1
27.500.0973	BSP 1/8	28	30	11
27.500.1316	BSP 1/4	19	38	10
27.500.1666	BSP 3/8	19	45	14
27.500.2096	BSP 1/2	14	45	14

Ref.	d1	P	d2	b1
27.500.2291	BSP 5/8	14	55	16
27.500.2644	BSP 3/4	14	55	16
27.500.3020	BSP 7/8	14	65	18
27.500.3325	BSP 1	11	65	18

Ref.	d1	P	d2	b1
27.500.4191	BSP 1.1/4	11	75	20
27.500.4780	BSP 1.1/2	11	90	22
27.500.5961	BSP 2	11	105	22

## > 27.520 Phantom

NL HSS Ronde Snijplaat schilaansnijding, BSP (Gasdraad)  
 FR Filière ronde HSS coupe gun, BSP (pas gaz)  
 ES Terraja esférica HSS entrada corregida (gun), BSP (gas)  
 DE HSS Runde Schneideisen Schälanschnitt, BSP (Rohrgewinde)



**HSS** **BSP G** **55°** **DIN EN 24230** **DIN EN 24231**

**P 11** **P 12** **P 13** **M 21** **N 41**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

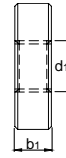
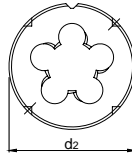
Ref.	d1	P	d2
27.520.0973	BSP 1/8	28	30
27.520.1316	BSP 1/4	19	38
27.520.1666	BSP 3/8	19	45
27.520.2096	BSP 1/2	14	45
27.520.2291	BSP 5/8	14	55

Ref.	d1	P	d2
27.520.2644	BSP 3/4	14	55
27.520.3020	BSP 7/8	14	65
27.520.3325	BSP 1	11	65
27.520.3790	BSP 1.1/8	11	75
27.520.4191	BSP 1.1/4	11	75

Ref.	d1	P	d2
27.520.4432	BSP 1.3/8	11	90
27.520.4780	BSP 1.1/2	11	90
27.520.5375	BSP 1.3/4	11	90
27.520.5961	BSP 2	11	105

> **27.530 Phantom**

NL HSS Ronde Snijplaat schilaansnijding, BSPT (Rc)  
 FR Filière ronde HSS coupe gun, BSPT (Rc)  
 ES Terraja esférica HSS entrada corregida (gun), BSPT (Rc)  
 DE HSS Runde Schneideisen Schälanschnitt, BSPT (Rc)



**HSS** **BSPT Rc** **55°** **DIN EN 24230** **1:16**

**P 11** **P 12** **P 13** **M 21** **N 41**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

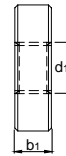
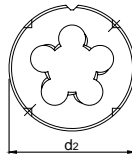
Ref.	d1	P	d2	b1
27.530.0973	BSPT 1/8	28	30	11
27.530.1316	BSPT 1/4	19	38	14

Ref.	d1	P	d2	b1
27.530.1666	BSPT 3/8	19	45	14
27.530.2096	BSPT 1/2	14	45	18

Ref.	d1	P	d2	b1
27.530.2644	BSPT 3/4	14	55	22
27.530.3325	BSPT 1	11	65	25

> **27.550 INTERNATIONAL TOOLS**

NL ECO PRO HSS Ronde Snijplaat BSW (Whitworth)  
 FR Filière ronde HSS ECO PRO BSW (Whitworth)  
 ES Terraja esférica HSS ECO PRO BSW (Whitworth)  
 DE ECO PRO HSS Runde Schneideisen BSW (Whitworth)



**HSS** **BSW** **55°** **DIN EN 22568** **ECO PRO**

**P 11** **P 12** **K 31** **K 32** **N 41** **N 42**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si-10%

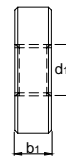
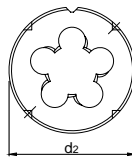
Ref.	d1	P	d2	b1
27.550.0317	BSW 1/8	40	20	5
27.550.0476	BSW 3/16	24	20	7
27.550.0635	BSW 1/4	20	20	7
27.550.0794	BSW 5/16	18	25	9

Ref.	d1	P	d2	b1
27.550.0952	BSW 3/8	16	30	11
27.550.1111	BSW 7/16	14	30	11
27.550.1270	BSW 1/2	12	38	14
27.550.1429	BSW 9/16	12	38	14

Ref.	d1	P	d2	b1
27.550.1588	BSW 5/8	11	45	18
27.550.1905	BSW 3/4	10	45	18
27.550.2222	BSW 7/8	9	55	22
27.550.2540	BSW 1	8	55	22

> **27.560 Phantom**

NL HSS Ronde Snijplaat schilaansnijding, BSW (Whitworth)  
 FR Filière ronde HSS coupe gun, BSW (Whitworth)  
 ES Terraja esférica HSS entrada corregida (gun), BSW (Whitworth)  
 DE HSS Runde Schneideisen Schälanschnitt, BSW (Whitworth)



**HSS** **BSW** **55°** **DIN EN 22568**

**P 11** **P 12** **P 13** **M 21** **N 41**

≤600 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

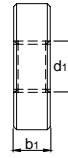
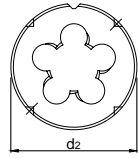
Ref.	d1	P	d2	b1
27.560.0317	BSW 1/8	40	20	5
27.560.0397	BSW 5/32	32	20	5
27.560.0476	BSW 3/16	24	20	7
27.560.0635	BSW 1/4	20	20	7
27.560.0794	BSW 5/16	18	25	9
27.560.0952	BSW 3/8	16	30	11

Ref.	d1	P	d2	b1
27.560.1111	BSW 7/16	14	30	11
27.560.1270	BSW 1/2	12	38	14
27.560.1429	BSW 9/16	12	38	14
27.560.1588	BSW 5/8	11	45	18
27.560.1905	BSW 3/4	10	45	18
27.560.2222	BSW 7/8	9	55	22

Ref.	d1	P	d2	b1
27.560.2540	BSW 1	8	55	22
27.560.3175	BSW 1.1/4	7	65	25
27.560.3493	BSW 1.3/8	6	65	25
27.560.3810	BSW 1.1/2	6	75	30

## > 27.575 Phantom

NL HSS Ronde Snijplaat schilaansnijding, BSF  
 FR Filière ronde HSS coupe gun, BSF  
 ES Terraja esférica HSS entrada corregida (gun), BSF  
 DE HSS Runde Schneideisen Schälanschnitt, BSF



HSS	BSF	55°	DIN EN 22568	
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	N 41 Alu
10-14	6-10	5-8	4-6	15-25

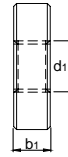
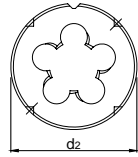
Ref.	d1	P	d2	b1
27.575.0476	BSF 3/16	32	20	7
27.575.0635	BSF 1/4	26	20	7
27.575.0794	BSF 5/16	22	25	9
27.575.0952	BSF 3/8	20	30	11

Ref.	d1	P	d2	b1
27.575.1111	BSF 7/16	18	30	11
27.575.1270	BSF 1/2	16	38	10
27.575.1429	BSF 9/16	16	38	10
27.575.1588	BSF 5/8	14	45	14

Ref.	d1	P	d2	b1
27.575.1905	BSF 3/4	12	45	14
27.575.2222	BSF 7/8	11	55	16
27.575.2540	BSF 1	10	55	16

## > 27.590 Phantom

NL HSS Ronde Snijplaat schilaansnijding, BSC, FG (Rijwielraad)  
 FR Filière ronde HSS coupe gun, BSC, FG (filetage bicyclette)  
 ES Terraja esférica HSS entrada corregida (gun), BSC, FG (rosca bicicleta)  
 DE HSS Runde Schneideisen Schälanschnitt, BSC, FG (Fahradgewinde)



HSS	BSC FG	60°	DIN EN 22568	
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	N 41 Alu
10-14	6-10	5-8	4-6	15-25

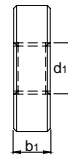
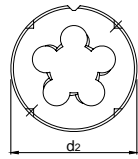
Ref.	d1	P	d2	b1
27.590.0635	BSC 1/4	26	20	7
27.590.0790	BSC 5/16	26	25	9

Ref.	d1	P	d2	b1
27.590.0950	BSC 3/8	26	30	11
27.590.1430	BSC 9/16	20	38	10

Ref.	d1	P	d2	b1
27.590.2540	BSC 1	24	55	16

## > 27.600 Phantom

NL HSS Ronde Snijplaat schilaansnijding, NPT  
 FR Filière ronde HSS coupe gun, NPT  
 ES Terraja esférica HSS entrada corregida (gun), NPT  
 DE HSS Runde Schneideisen Schälanschnitt, NPT



HSS	NPT	60°	1:16	
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	N 41 Alu
10-14	6-10	5-8	4-6	15-25

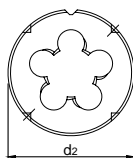
Ref.	d1	P	d2	b1
27.600.0794	NPT 1/16	27	25	9
27.600.1029	NPT 1/8	27	30	11
27.600.1372	NPT 1/4	18	38	14
27.600.1715	NPT 3/8	18	45	14

Ref.	d1	P	d2	b1
27.600.2134	NPT 1/2	14	45	18
27.600.2667	NPT 3/4	14	55	22
27.600.3340	NPT 1	11.5	65	25
27.600.4216	NPT 1.1/4	11.5	75	26

Ref.	d1	P	d2	b1
27.600.4826	NPT 1.1/2	11.5	90	27
27.600.6033	NPT 2	11.5	105	28

> **27.610** **Phantom**

NL HSS Ronde Snijplaat schilaansnijding, NPTF  
 FR Filière ronde HSS coupe gun, NPTF  
 ES Terraja esférica HSS entrada corregida (gun), NPTF  
 DE HSS Runde Schneideisen Schälanschnitt, NPTF



<b>HSS</b>	<b>NPTF</b>	<b>60°</b>	<b>1:16</b>	
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu
10-14	6-10	5-8	4-6	15-25

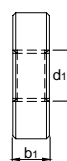
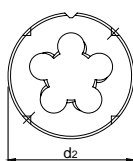
Ref.	d1	P	d2	b1
27.610.0794	NPTF 1/16	27	25	9
27.610.1029	NPTF 1/8	27	30	11
27.610.1372	NPTF 1/4	18	38	14

Ref.	d1	P	d2	b1
27.610.1715	NPTF 3/8	18	45	14
27.610.2134	NPTF 1/2	14	45	18
27.610.2667	NPTF 3/4	14	55	22

Ref.	d1	P	d2	b1
27.610.3340	NPTF 1	11.5	65	25

> **27.650** **Phantom**

NL HSS Ronde Snijplaat schilaansnijding, PG  
 FR Filière ronde HSS coupe gun, PG  
 ES Terraja esférica HSS entrada corregida (gun), PG  
 DE HSS Runde Schneideisen Schälanschnitt, PG



<b>HSS</b>	<b>PG</b>	<b>80°</b>	<b>DIN EN 40434</b>	
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu
10-14	6-10	5-8	4-6	15-25

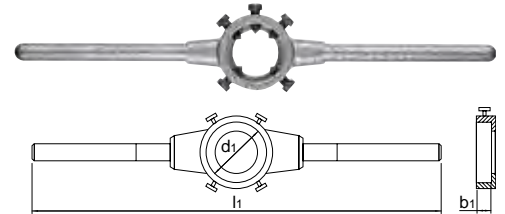
Ref.	d1	P	d2	b1
27.650.0700	PG 7	20	38	10
27.650.0900	PG 9	18	38	10
27.650.1100	PG 11	18	45	14

Ref.	d1	P	d2	b1
27.650.1350	PG 13.5	18	45	14
27.650.1600	PG 16	18	55	16
27.650.2100	PG 21	16	65	18

Ref.	d1	P	d2	b1
27.650.2900	PG 29	16	65	18
27.650.3600	PG 36	16	90	22

## &gt; 81.910

NL Snijplaathouder  
 FR Porte-filières  
 ES Portaterraja  
 DE Schneideisenhalter



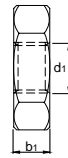
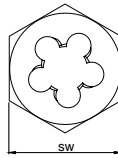
DIN EN 22568	DIN EN 24231	DIN 225	DIN EN 24230
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Ref.	d1	b1	l1
81.910.1605	16	5	160
81.910.2005	20	5	200
81.910.2007	20	7	200
81.910.2509	25	9	224
81.910.3011	30	11	280
81.910.3810	38	10	315
81.910.3814	38	14	315
81.910.4514	45	14	450
81.910.4518	45	18	450
81.910.5516	55	16	560
81.910.5522	55	22	560
81.910.6518	65	18	630
81.910.6525	65	25	630

Ref.	d1	b1	l1
81.910.7520	75	20	800
81.910.7530	75	30	800
81.910.9022	90	22	900
81.910.9036	90	36	900
81.910.9122	105	22	1000
81.910.9136	105	36	1000
81.910.9222	120	22	1100
81.910.9236	120	36	1100
81.910.9322	130	22	1100
81.910.9336	130	36	1100
81.910.9422	140	22	1200
81.910.9522	150	22	1200
81.910.9622	160	22	1300

**> 27.700 INTERNATIONAL TOOLS**

NL ECO PRO HSS Zeskante Snijmoer Metrisch  
 FR Filière hexagonale HSS ECO PRO Métrique  
 ES Terraja hexagonal HSS ECO PRO Métrica  
 DE ECO PRO HSS Sechskant Schneideisen Metrisch



**HSS M** **DIN 382** **6g** **ECO PRO**

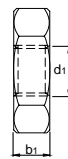
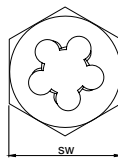
Ref.	d1	P	sw	b1
27.700.0300	M3	0.5	19	5
27.700.0400	M4	0.7	19	5
27.700.0500	M5	0.8	19	7
27.700.0600	M6	1	19	7
27.700.0700	M7	1	22	9
27.700.0800	M8	1.25	22	9
27.700.0900	M9	1.25	22	9
27.700.1000	M10	1.5	27	11

Ref.	d1	P	sw	b1
27.700.1200	M12	1.75	36	14
27.700.1400	M14	2	36	14
27.700.1600	M16	2	41	18
27.700.1800	M18	2.5	41	18
27.700.2000	M20	2.5	41	18
27.700.2200	M22	2.5	50	22
27.700.2400	M24	3	50	22
27.700.2700	M27	3	60	25

Ref.	d1	P	sw	b1
27.700.3000	M30	3.5	60	25
27.700.3300	M33	3.5	60	25
27.700.3600	M36	4	60	25
27.700.3900	M39	4	70	30
27.700.4200	M42	4.5	70	30
27.700.4500	M45	4.5	85	36
27.700.4800	M48	5	85	36
27.700.5200	M52	5	85	36

**> 27.750 INTERNATIONAL TOOLS**

NL ECO PRO HSS Zeskante Snijmoer Metrisch Fijn  
 FR Filière hexagonale HSS ECO PRO Métrique Fin  
 ES Terraja hexagonal HSS ECO PRO Métrica Fina  
 DE ECO PRO HSS Sechskant Schneideisen Metrisch Fein



**HSS MF** **DIN 382** **6g** **ECO PRO**

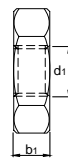
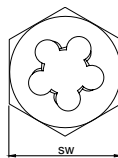
Ref.	d1	P	sw	b1
27.750.0303	MF3	0.35	19	5
27.750.0403	MF4	0.35	19	5
27.750.0505	MF5	0.5	19	5
27.750.0605	MF6	0.5	19	5
27.750.0607	MF6	0.75	19	5
27.750.0805	MF8	0.5	22	9
27.750.0807	MF8	0.75	22	9
27.750.0810	MF8	1	22	9
27.750.1005	MF10	0.5	27	11
27.750.1007	MF10	0.75	27	11
27.750.1010	MF10	1	27	11
27.750.1012	MF10	1.25	27	11
27.750.1207	MF12	0.75	36	10
27.750.1210	MF12	1	36	10
27.750.1212	MF12	1.25	36	10
27.750.1215	MF12	1.5	36	10
27.750.1410	MF14	1	36	10
27.750.1412	MF14	1.25	36	10
27.750.1415	MF14	1.5	36	10
27.750.1610	MF16	1	41	14
27.750.1612	MF16	1.25	41	14
27.750.1615	MF16	1.5	41	14
27.750.1810	MF18	1	41	14
27.750.1812	MF18	1.25	41	14

Ref.	d1	P	sw	b1
27.750.1815	MF18	1.5	41	14
27.750.1820	MF18	2	41	14
27.750.2010	MF20	1	41	14
27.750.2012	MF20	1.25	41	14
27.750.2015	MF20	1.5	41	14
27.750.2020	MF20	2	41	14
27.750.2212	MF22	1.25	50	16
27.750.2215	MF22	1.5	50	16
27.750.2220	MF22	2	50	16
27.750.2415	MF24	1.5	50	16
27.750.2420	MF24	2	50	16
27.750.2515	MF25	1.5	50	16
27.750.2615	MF26	1.5	50	16
27.750.2620	MF26	2	50	16
27.750.2715	MF27	1.5	60	18
27.750.2720	MF27	2	60	18
27.750.2815	MF28	1.5	60	18
27.750.2820	MF28	2	60	18
27.750.3015	MF30	1.5	60	18
27.750.3020	MF30	2	60	18
27.750.3215	MF32	1.5	60	18
27.750.3220	MF32	2	60	18
27.750.3315	MF33	1.5	60	18
27.750.3515	MF35	1.5	60	18

Ref.	d1	P	sw	b1
27.750.3520	MF35	2	60	18
27.750.3615	MF36	1.5	60	18
27.750.3620	MF36	2	60	18
27.750.3630	MF36	3	60	18
27.750.3815	MF38	1.5	70	20
27.750.3820	MF38	2	70	20
27.750.4015	MF40	1.5	70	20
27.750.4020	MF40	2	70	20
27.750.4030	MF40	3	70	20
27.750.4215	MF42	1.5	70	20
27.750.4220	MF42	2	70	20
27.750.4230	MF42	3	70	20
27.750.4515	MF45	1.5	85	22
27.750.4530	MF45	3	85	22
27.750.4615	MF46	1.5	85	22
27.750.4815	MF48	1.5	85	22
27.750.4820	MF48	2	85	22
27.750.4830	MF48	3	85	22
27.750.5015	MF50	1.5	85	22
27.750.5020	MF50	2	85	22
27.750.5215	MF52	1.5	85	22
27.750.5220	MF52	2	85	22
27.750.6020	MF60	2	100	22

**> 27.800 INTERNATIONAL TOOLS**

NL ECO PRO HSS Zeskante Snijmoer UNC  
 FR Filière hexagonale HSS ECO PRO UNC  
 ES Terraja hexagonal HSS ECO PRO UNC  
 DE ECO PRO HSS Sechskant Schneideisen UNC



**HSS UNC** **DIN 382** **2A** **ECO PRO**

Ref.	d1	P	sw	b1
27.800.0635	UNC 1/4	20	19	7
27.800.0794	UNC 5/16	18	22	9
27.800.0952	UNC 3/8	16	27	11
27.800.1111	UNC 7/16	14	27	11
27.800.1270	UNC 1/2	13	36	14

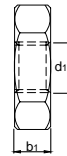
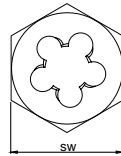
Ref.	d1	P	sw	b1
27.800.1429	UNC 9/16	12	36	14
27.800.1588	UNC 5/8	11	41	18
27.800.1905	UNC 3/4	10	41	18
27.800.2222	UNC 7/8	9	50	22
27.800.2540	UNC 1	8	50	22

Ref.	d1	P	sw	b1
27.800.2858	UNC 1.1/8	7	60	25
27.800.3175	UNC 1.1/4	7	60	25
27.800.3810	UNC 1.1/2	6	70	30



## > 27.840 INTERNATIONAL TOOLS

NL ECO PRO HSS Zeskante Snijmoer UNF  
 FR Filière hexagonale HSS ECO PRO UNF  
 ES Terraja hexagonal HSS ECO PRO UNF  
 DE ECO PRO HSS Sechskant Schneideisen UNF

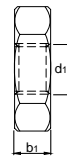
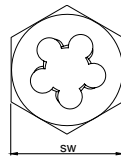


HSS UNF 60° DIN 382 2A ECO PRO

Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1
27.840.0635	UNF 1/4	28	19	7	27.840.1429	UNF 9/16	18	36	10	27.840.2858	UNF 1.1/8	12	60	18
27.840.0794	UNF 5/16	24	22	9	27.840.1588	UNF 5/8	18	41	14	27.840.3175	UNF 1.1/4	12	60	18
27.840.0952	UNF 3/8	24	27	11	27.840.1905	UNF 3/4	16	41	14	27.840.3810	UNF 1.1/2	12	70	20
27.840.1111	UNF 7/16	20	27	11	27.840.2222	UNF 7/8	14	50	16					
27.840.1270	UNF 1/2	20	36	10	27.840.2540	UNF 1	12	50	16					

## > 27.900 INTERNATIONAL TOOLS

NL ECO PRO HSS Zeskante Snijmoer BSP (Gasdraad)  
 FR Filière hexagonale HSS ECO PRO BSP (gas gaz)  
 ES Terraja hexagonal HSS ECO PRO BSP (gas)  
 DE ECO PRO HSS Sechskant Schneideisen BSP (Rohrgewinde)

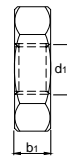
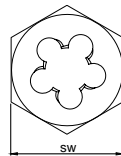


HSS BSP G 55° DIN 382 ECO PRO

Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1
27.900.0973	BSP 1/8	28	27	11	27.900.3020	BSP 7/8	14	60	18	27.900.5375	BSP 1.3/4	11	85	22
27.900.1316	BSP 1/4	19	36	10	27.900.3325	BSP 1	11	60	18	27.900.5961	BSP 2	11	100	22
27.900.1666	BSP 3/8	19	41	14	27.900.3790	BSP 1.1/8	11	70	20	27.900.7518	BSP 2.1/2	11	120	22
27.900.2096	BSP 1/2	14	41	14	27.900.4191	BSP 1.1/4	11	70	20	27.900.8788	BSP 3	11	130	22
27.900.2291	BSP 5/8	14	50	16	27.900.4432	BSP 1.3/8	11	85	22					
27.900.2644	BSP 3/4	14	50	16	27.900.4780	BSP 1.1/2	11	85	22					

## > 27.940 INTERNATIONAL TOOLS

NL ECO PRO HSS Zeskante Snijmoer BSW (Whitworth)  
 FR Filière hexagonale HSS ECO PRO BSW (Whitworth)  
 ES Terraja hexagonal HSS ECO PRO BSW (Whitworth)  
 DE ECO PRO HSS Sechskant Schneideisen BSW (Whitworth)

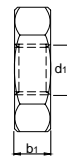
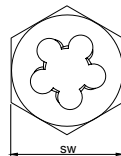


HSS BSW 55° DIN 382 ECO PRO

Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1
27.940.0317	BSW 1/8	40	19	5	27.940.1270	BSW 1/2	12	36	14	27.940.3175	BSW 1.1/4	7	60	25
27.940.0476	BSW 3/16	24	19	7	27.940.1588	BSW 5/8	11	41	18	27.940.3493	BSW 1.3/8	6	60	25
27.940.0635	BSW 1/4	20	19	7	27.940.1905	BSW 3/4	10	41	18	27.940.3810	BSW 1.1/2	6	70	30
27.940.0794	BSW 5/16	18	22	9	27.940.2222	BSW 7/8	9	50	22	27.940.4445	BSW 1.3/4	5	85	36
27.940.0952	BSW 3/8	16	27	11	27.940.2540	BSW 1	8	50	22	27.940.5080	BSW 2	4.5	85	36
27.940.1111	BSW 7/16	14	27	11	27.940.2858	BSW 1.1/8	7	60	25					

## > 27.980 Phantom

NL HSS Zeskante Snijmoer NPT  
 FR Filière hexagonale HSS NPT  
 ES Terraja hexagonal HSS NPT  
 DE HSS Sechskant Schneideisen NPT



HSS NPT 60° DIN 382 1:16

Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1	Ref.	d1	P	sw	b1
27.980.1029	NPT 1/8	27	27	11	27.980.2134	NPT 1/2	14	41	18	27.980.4216	NPT 1.1/4	11.5	70	30
27.980.1372	NPT 1/4	18	36	14	27.980.2667	NPT 3/4	14	60	18	27.980.4826	NPT 1.1/2	11.5	85	27
27.980.1715	NPT 3/8	18	41	14	27.980.3340	NPT 1	11.5	60	25					

> **28.800** **INTERNATIONAL TOOLS**



NL ECO Draadeinduithaler  
 FR Extracteurs de vis, goujons et tubes cassés ECO  
 ES Extractor de tornillos rotos ECO  
 DE ECO Schraubenausdreher

Ref.	Nr.	M	Ø mm
28.800.0100	1	M3-6	2
28.800.0200	2	M6-8	3
28.800.0300	3	M8-11	4
28.800.0400	4	M11-14	6

Ref.	Nr.	M	Ø mm
28.800.0500	5	M14-18	8
28.800.0600	6	M18-24	12
28.800.0700	7	M24-33	15
28.800.0800	8	M33-45	20

> **28.810** **INTERNATIONAL TOOLS**



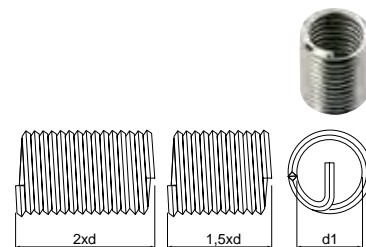
NL ECO Tapeinduithaler  
 FR Extracteur de tarauds ECO  
 ES Extractor de machos rotos ECO  
 DE ECO Gewindekronen

Ref.	M	Ø "	z
28.810.0302	3	1/8	2
28.810.0403	4	5/32	3
28.810.0502	5	3/16	2
28.810.0503	5	3/16	3
28.810.0603	6	1/4	3
28.810.0604	6	1/4	4
28.810.0803	8	5/16	3
28.810.0804	8	5/16	4
28.810.1003	10	3/8	3
28.810.1004	10	3/8	4

Ref.	M	Ø "	z
28.810.1203	12	1/2	3
28.810.1204	12	1/2	4
28.810.1403	14	9/16	3
28.810.1404	14	9/16	4
28.810.1603	16	5/8	3
28.810.1604	16	5/8	4
28.810.2003	20	3/4	3
28.810.2004	20	3/4	4
28.810.2204	22	7/8	4
28.810.2404	24	1	4

## > 28.830 Phantom

NL Phan-Coil RVS Schroefdraad inzetstukken Metrisch  
 FR Phan-Coil Filets rapportés Inox Métrique  
 ES Phan-Coil Insertos roscados acero inoxidable Métrica  
 DE Phan-Coil rostfreien Stahl Gewindeeinsätze Metrisch

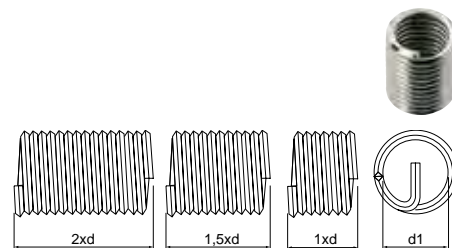


EG M Phan-Coil

Ref.	d1	P	Max. x d1	Ø mm	Packed per
28.830.2030	M3	0.5	1.5	3.15	50
28.830.2040	M4	0.7	1.5	4.2	50
28.830.2050	M5	0.8	1.5	5.25	50
28.830.2060	M6	1	1.5	6.3	50
28.830.2080	M8	1.25	1.5	8.4	50
28.830.2100	M10	1.5	1.5	10.5	25
28.830.2120	M12	1.75	1.5	12.5	15
28.830.2140	M14	2	1.5	14.5	5
28.830.2160	M16	2	1.5	16.5	5
28.830.4030	M3	0.5	2	3.15	50
28.830.4040	M4	0.7	2	4.2	50
28.830.4050	M5	0.8	2	5.25	50
28.830.4060	M6	1	2	6.3	50
28.830.4080	M8	1.25	2	8.4	50
28.830.4100	M10	1.5	2	10.5	25
28.830.4120	M12	1.75	2	12.5	15
28.830.4140	M14	2	2	14.5	5
28.830.4160	M16	2	2	16.5	5

## > 28.831 Phantom

NL Phan-Coil RVS Schroefdraad inzetstukken Metrisch Fijn  
 FR Phan-Coil Filets rapportés Inox Métrique Fin  
 ES Phan-Coil Insertos roscados acero inoxidable Métrica Fina  
 DE Phan-Coil rostfreien Stahl Gewindeeinsätze Metrisch Fein

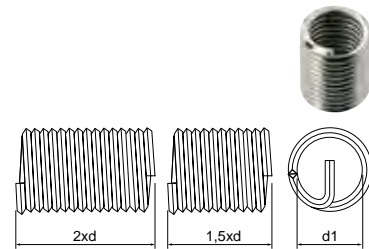


EG MF Phan-Coil

Ref.	d1	P	Max. x d1	Ø mm	Packed per
28.831.0102	MF10	1	1	10.25	25
28.831.0103	MF10	1.25	1	10.4	25
28.831.0124	MF12	1.5	1	12.5	15
28.831.0144	MF14	1.5	1	14.5	5
28.831.0164	MF16	1.5	1	16.5	5
28.831.0184	MF18	1.5	1	18.5	3
28.831.2082	MF8	1	1.5	8.3	50
28.831.2102	MF10	1	1.5	10.25	25
28.831.2103	MF10	1.25	1.5	10.4	25
28.831.2124	MF12	1.5	1.5	12.5	15
28.831.2144	MF14	1.5	1.5	14.5	5
28.831.2164	MF16	1.5	1.5	16.5	5
28.831.2184	MF18	1.5	1.5	18.5	3
28.831.4103	MF10	1.25	2	10.4	25
28.831.4124	MF12	1.5	2	12.5	15
28.831.4144	MF14	1.5	2	14.5	5

> **28.832 Phantom**

NL Phan-Coil RVS Schroefdraad inzetstukken UNC  
 FR Phan-Coil Filets rapportés Inox UNC  
 ES Phan-Coil Insertos roscados acero inoxidable UNC  
 DE Phan-Coil rostfreien Stahl Gewindeeinsätze UNC

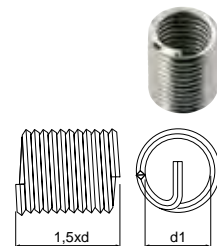


EG UNC Phan-Coil

Ref.	d1	P	Max. x d1	Ø mm	Packed per
28.832.2048	UNC Nr. 10	24	1.5	5.1	50
28.832.2063	UNC 1/4	20	1.5	6.7	25
28.832.2079	UNC 5/16	18	1.5	8.4	20
28.832.2095	UNC 3/8	16	1.5	10	10
28.832.2127	UNC 1/2	13	1.5	13.3	5
28.832.2158	UNC 5/8	11	1.5	16.5	3
28.832.4048	UNC Nr. 10	24	2	5.1	50
28.832.4063	UNC 1/4	20	2	6.7	25
28.832.4079	UNC 5/16	18	2	8.4	20
28.832.4095	UNC 3/8	16	2	10	10
28.832.4127	UNC 1/2	13	2	13.3	5
28.832.4158	UNC 5/8	11	2	16.5	3

> **28.833 Phantom**

NL Phan-Coil RVS Schroefdraad inzetstukken UNF  
 FR Phan-Coil Filets rapportés Inox UNF  
 ES Phan-Coil Insertos roscados acero inoxidable UNF  
 DE Phan-Coil rostfreien Stahl Gewindeeinsätze UNF



EG UNF Phan-Coil

Ref.	d1	P	Max. x d1	Ø mm	Packed per
28.833.2048	UNF Nr. 10	32	1.5	5.1	50
28.833.2063	UNF 1/4	28	1.5	6.6	50
28.833.2079	UNF 5/16	24	1.5	8.2	25
28.833.2095	UNF 3/8	24	1.5	9.8	20
28.833.2127	UNF 1/2	20	1.5	13	5
28.833.2158	UNF 5/8	18	1.5	16.25	5

> **28.860 Phantom**

NL Draadinzetter voor Phan-Coil  
 FR Broche de pose pour Phan-Coil  
 ES Herramienta de inserción para Phan-Coil  
 DE Einbauwerkzeug für Phan-Coil

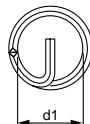


Phan-Coil

Ref.	Nr.	d1	Ref.	Nr.	d1
28.860.0025	25	M4x0,7	28.860.0070	70	M10x1,25 - MF10x1 - MF10x1,25
28.860.0030	30	UNC Nr. 10-24	28.860.0080	80	M12x1,75 - MF12x1,5
28.860.0035	35	M5x0,8	28.860.0085	85	UNC 1/2"-13
28.860.0040	40	M6x1	28.860.0090	90	MF14x1,5
28.860.0045	45	UNC 1/4"-20	28.860.0095	95	M16x2 - MF16x1,5 - UNC 5/8"-11
28.860.0055	55	M8x1,25 - MF8x1 - UNC 5/16"-18	28.860.0100	100	MF18x1,5
28.860.0065	65	UNC 3/8"-16			

## > 28.865 Phantom

NL Draadlipbreker voor Phan-Coil  
 FR Rupteur d'entraîneur pour Phan-Coil  
 ES Rompedor de lengüeta para Phan-Coil  
 DE Zapfenbrecher für Phan-Coil



### Phan-Coil

Ref.	Nr.	d1	Ref.	Nr.	d1
28.865.0025	25	M4x0,7	28.865.0070	70	M10x1,25 - MF10x1 - MF10x1,25
28.865.0030	30	UNC Nr. 10-24	28.865.0080	80	M12x1,75 - MF12x1,5
28.865.0035	35	M5x0,8	28.865.0085	85	UNC 1/2"-13
28.865.0040	40	M6x1	28.865.0090	90	MF14x1,5
28.865.0045	45	UNC 1/4"-20	28.865.0095	95	M16x2 - MF16x1,5 - UNC 5/8"-11
28.865.0055	55	M8x1,25 - MF8x1 - UNC 5/16"-18	28.865.0100	100	MF18x1,5
28.865.0065	65	UNC 3/8"-16			

## > 28.870 Phantom

NL Set Phan-Coils Metrisch  
 FR Jeu de Phan-Coils Métrique  
 ES Juego de Phan-Coils Métrica  
 DE Satz Phan-Coils Metrisch



### EG M Phan-Coil

Ref.	d1	P	1	2	3	4	5
28.870.0040	M4	0.7	11.450.0420	21.812.0400	28.860.0025	28.865.0025	1,5xD (5), 2xD (5)
28.870.0050	M5	0.8	11.450.0525	21.812.0500	28.860.0035	28.865.0035	1,5xD (5), 2xD (5)
28.870.0060	M6	1	11.450.0630	21.812.0600	28.860.0040	28.865.0040	1,5xD (5), 2xD (5)
28.870.0080	M8	1.25	11.450.0840	21.812.0800	28.860.0055	28.865.0055	1,5xD (5), 2xD (5)
28.870.0100	M10	1.5	11.450.1050	21.812.1000	28.860.0070	28.865.0070	1,5xD (5), 2xD (5)
28.870.0120	M12	1.75	11.450.1250	21.812.1200	28.860.0080	28.865.0080	1,5xD (3), 2xD (3)
28.870.0160	M16	2	11.450.1650	21.812.1600	28.860.0095	28.865.0095	1,5xD (2), 2xD (2)

> **28.871** **Phantom**

NL Set Phan-Coils Metrisch Fijn  
 FR Jeu de Phan-Coils Métrique Fin  
 ES Juego de Phan-Coils Métrica Fina  
 DE Satz Phan-Coils Metrisch Fein



**EG MF Phan-Coil**

Ref.	d1	P	1	2	3	4	5
28.871.0082	MF8	1	11.450.0830	21.822.0810	28.860.0055	28.865.0055	1,5xD (5)
28.871.0102	MF10	1	11.450.1030	21.822.1010	28.860.0070	28.865.0070	1,5xD (5)
28.871.0103	MF10	1.25	11.450.1040	21.822.1025	28.860.0070	28.865.0070	1,5xD (5)
28.871.0124	MF12	1.5	11.450.1250	21.822.1215	28.860.0080	28.865.0080	1,5xD (3), 2xD (3)

> **28.872** **Phantom**

NL Set Phan-Coils UNC  
 FR Jeu de Phan-Coils UNC  
 ES Juego de Phan-Coils UNC  
 DE Satz Phan-Coils UNC



**EG UNC Phan-Coil**

Ref.	d1	P	1	2	3	4	5
28.872.0048	UNC Nr. 10	24	11.450.0510	21.832.0482	28.860.0030	28.865.0030	1,5xD (5), 2xD (5)
28.872.0063	UNC 1/4	20	11.450.0670	21.832.0635	28.860.0045	28.865.0045	1,5xD (5), 2xD (5)
28.872.0079	UNC 5/16	18	11.450.0840	21.832.0794	28.860.0055	28.865.0055	1,5xD (5), 2xD (5)
28.872.0095	UNC 3/8	16	11.450.1000	21.832.0952	28.860.0065	28.865.0065	1,5xD (5), 2xD (5)
28.872.0127	UNC 1/2	13	11.450.1330	21.832.1270	28.860.0085	28.865.0085	1,5xD (3), 2xD (3)



## > 28.880 Phantom

NL Set Phan-Coils Metrisch, (combinatie)  
 FR Jeu de Phan-Coils Métrique, (combinaison)  
 ES Juego de Phan-Coils Métrica, (combinación)  
 DE Satz Phan-Coils Metrisch, (Kombination)

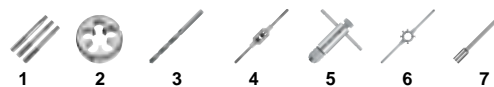


EG M Phan-Coil

Ref.	Contents	1	2	3	4	5
28.880.1000	M5x0,8	11.450.0525	21.812.0500	28.860.0035	28.865.0035	1,5xD (4), 2xD (4)
	M6x1	11.450.0630	21.812.0600	28.860.0040	28.865.0040	1,5xD (4), 2xD (4)
	M8x1,25	11.450.0840	21.812.0800	28.860.0055	28.865.0055	1,5xD (4), 2xD (4)
	M10x1,5	11.450.1050	21.812.1000	28.860.0070	28.865.0070	1,5xD (3), 2xD (3)
	M12x1,75	11.450.1250	21.812.1200	28.860.0080	28.865.0080	1,5xD (3), 2xD (3)

> **29.100** **INTERNATIONAL TOOLS**

NL **ECO PRO Set Draadsnijden, in kunststof koffer**  
 FR **Coffret de tarauds ECO PRO, en coffret plastique**  
 ES **Juego de roscar ECO PRO, en estuche plástico**  
 DE **ECO PRO Satz Gewindeschneiden, in Kunststoff-Etui**



Ref.	1	2	3	4	5	6	7
29.100.1000	M3-4-5-6-8-10-12	M3-4-5-6-8-10-12	2,5-3,3-4,2-5-6,8-8,5-10,2	1 + 2	1 + 2	20x5 + 20x7 + 25x9 + 30/11 + 38/14	2,7-3,4-4,9-5,5-7
29.100.2000	M3-4-5-6-8-10-12	M3-4-5-6-8-10-12	2,5-3,3-4,2-5-6,8-8,5-10,2	1,5	1	25x9	-

> **29.120** **INTERNATIONAL TOOLS**

NL **ECO PRO Set Draadsnijden, in houten cassette**  
 FR **Coffret de tarauds ECO PRO, en coffret bois**  
 ES **Juego de roscar ECO PRO, en estuche de madera**  
 DE **ECO PRO Satz Gewindeschneiden, in Holzkassetten**



Ref.	1	2	3	4
29.120.0001	M3-4-5-6-8-10-12-14	M3-4-5-6-8-10-12-14	Nr. 2	20x5, 20x7, 25x9, 30x11, 38x14
29.120.0002	M3-4-5-6-8-10-12-14-16-18-20-22-24	M3-4-5-6-8-10-12-14-16-18-20-22-24	Nr. 0 + 2 + 4	20x5, 20x7, 25x9, 30x11, 38x14, 45x18, 55x22
29.120.0003	M5-6-8-10-12-14-16-18-20-22-24-27-30	M5-6-8-10-12-14-16-18-20-22-24-27-30	Nr. 1 + 3 + 5	20x7, 25x9, 30x11, 38x14, 45x18, 55x22, 65x25
29.120.0004	UNC 1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1	UNC 1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1	Nr. 0 + 2 + 4	20x7, 25x9, 30x11, 38x14, 45x18, 55x22
29.120.0005	UNF 1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1	UNF 1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1	Nr. 2 + 4	20x7, 25x9, 30x11, 38x10, 45x14, 55x16
29.120.0006	BSP 1/8-1/4-1/2-5/8-3/4-1	BSP 1/8-1/4-1/2-5/8-3/4-1	Nr. 3 + 5	30x11, 38x10, 45x14, 55x16, 65x18
29.120.0007	MF 6x0,75-8x1-10x1-12x1,5-14x1,5-16x1,5-18x1,5-20x1,5	MF 6x0,75-8x1-10x1-12x1,5-14x1,5-16x1,5-18x1,5-20x1,5	Nr. 1 + 3	20x7, 25x9, 30x11, 38x10, 45x14
29.120.0009	NPT 1/4-3/8-1/2-3/4-1	NPT 1/4-3/8-1/2-3/4-1	Nr. 3 + 5	38x14, 45x14, 45x18, 55x22, 65x25
29.120.1320	M3-4-5-6-8-10-12-14-16-18-20	M3-4-5-6-8-10-12-14-16-18-20	Nr. 1 + 3	20x5, 20x7, 25x9, 30x11, 38x14, 45x18
29.120.7225	BSW 1/8-3/16-1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1	BSW 1/8-3/16-1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1	Nr. 0 + 2 + 4	20x5, 20x7, 25x9, 30x11, 38x14, 45x18, 55x22

> **29.130** **INTERNATIONAL TOOLS**

NL **ECO PRO Set Draadsnijden, in stalen cassette**  
 FR **Coffret de tarauds ECO PRO, en coffret métal**  
 ES **Juego de roscar ECO PRO, en estuche metálico**  
 DE **ECO PRO Satz Gewindeschneiden, in Kasette aus Stahl**



Ref.	1	2	3	4
29.130.0200	M3-4-5-6-8-10-12	M3-4-5-6-8-10-12	1.5	25x9

## > 29.180 INTERNATIONAL TOOLS

NL ECO Set Handtappen  
 FR Jeu de Tarauds à main ECO  
 ES Juego de Machos mano ECO  
 DE ECO Satz Handgewindebohrer



**ECO**

Ref.	1	2
29.180.0001	21.140: M3-4-5-6-8-10-12	
29.180.0002	21.140: M3-4-5-6-8-10-12	11.400: 2,5-3,3-4,2-5-6,8-8,5-10,2

## > 29.190 INTERNATIONAL TOOLS

NL ECO Set Draadsnijden (combinatie)  
 FR Coffret de tarauds ECO (combinaison)  
 ES Juego de roscar ECO (combinación)  
 DE ECO Satz Gewindeschneiden (Kombination)



**ECO**

Ref.	1	2	3	A, B
29.190.1000	22.191/22.192: M3-4-5-6-8-10-12			B
29.190.3000	22.190: M4-5-6-8-10	11.416: 3,3-4,2-5-6,8-8,5	42.533: 10,4, 16,5	A
29.190.6000	23.291/23.292: M3-4-5-6-8-10-12			B

> **29.195** **INTERNATIONAL TOOLS**

- NL ECO PRO Set Draadsnijden (combinatie)
- FR Coffret de tarauds ECO PRO (combinaison)
- ES Juego de roscar ECO PRO (combinación)
- DE ECO PRO Satz Gewindeschneiden (Kombination)



**ECO PRO**

Ref.	1	2	3	4	A, B, C
29.195.1000	22.195/22.196: M3-4-5-6-8-10-12				B
29.195.1250	22.197/22.198: M3-4-5-6-8-10-12				B
29.195.1500	22.595/22.596: M3-4-5-6-8-10-12				B
29.195.2000	22.195/22.196: M3-4-5-6-8-10-12	11.420: 2,5-3,3-4,2-5-6,8-8,5-10,2			B
29.195.2250	22.195/22.196: M3-4-5-6-8-10-12	11.420: 2,5-3,3-4,2-5-6,8-8,5-10,2		81.905: Nr. 1,5	B
29.195.2500	22.195/22.196: M3-4-5-6-8-10-12	11.490: 2,5-3,3-4,2-5-6,8-8,5-10,2			B
29.195.3000	22.195: M4-5-6-8-10	11.420: 3,3-4,2-5-6,8-8,5	42.535: 10,4 16,5		A
29.195.3500	22.197: M4-5-6-8-10	11.431: 3,3-4,2-5-6,8-8,5	42.536: 10,4 16,5		A
29.195.4000	22.197/22.198: M3-4-5-6-8-10-12	11.431: 2,5-3,3-4,2-5-6,8-8,5-10,2			B
29.195.5000	22.197/22.198: M3-4-5-6-8-10-12	11.490: 2,5-3,3-4,2-5-6,8-8,5-10,2			B
29.195.6000	23.295/23.296: M3-4-5-6-8-10-12				C

> **29.220** **Phantom**

- NL Set Handtappen
- FR Jeu de Tarauds à main
- ES Juego de Machos mano
- DE Satz Handgewindebohrer



Ref.	1
29.220.0003	21.100: M3-4-5-6-8-10-12

## > 29.240 Phantom

NL Set Draadsnijden leeg  
FR Coffret de tarauds vide  
ES Juego de roscar vacío  
DE Satz Gewindeschneiden Leer



A

B

Ref.	1	2
29.240.0002	DIN 352: M3-4-5-6-8-10-12 X 3	DIN 338: 2,5-3,3-4,2-5-6,8-8,5-10,2
29.240.0003	ISO: M3-4-5-6-8-10-12 X 3	
29.240.0004	DIN 371: M3-4-5-6-8-10 + DIN 376: M12 X 1	
29.240.0006	DIN 376: M3-4-5-6-8-10-12 X 1	
29.240.0007	DIN 376: M3-4-5-6-8-10-12 X 1	DIN 338: 2,5-3,3-4,2-5-6,8-8,5-10,2
29.240.0008	ISO: M3-4-5-6-8-10-12 X 1	
29.240.0013	Phan-Coil: EG M3-4-5-6-8-10-12	

## > 29.250 Phantom

NL Set Draadsnijden  
FR Coffret de tarauds  
ES Juego de roscar  
DE Satz Gewindeschneiden



A

B

1

Ref.	1	A, B
29.250.2000	22.200/22.201: M3-4-5-6-8-10-12	A
29.250.2100	22.201: M3-4-5-6-8-10-12	B
29.250.2120	22.230/22.231: M3-4-5-6-8-10-12	A
29.250.2150	22.205: M3-4-5-6-8-10-12	B
29.250.2500	22.268/22.269: M3-4-5-6-8-10-12	A
29.250.2600	22.600/22.601: M3-4-5-6-8-10-12	A
29.250.3300	23.300/23.301: M3-4-5-6-8-10-12	A
29.250.3450	23.450/23.451: M3-4-5-6-8-10-12	A

> **29.260 Phantom**

NL Set Draadsnijden (combinatie)  
 FR Coffret de tarauds (combinaison)  
 ES Juego de roscar (combinación)  
 DE Satz Gewindeschneiden (Kombination)



Ref.	1	2	3	A, B, C
29.260.1980	22.200/22.201: M3-4-5-6-8-10-12	11.450: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.1990	22.200/22.201: M3-4-5-6-8-10-12	11.451: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.1995	22.200/22.201: M3-4-5-6-8-10-12	11.461: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.2000	22.200/22.201: M3-4-5-6-8-10-12	11.500: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.2100	22.201: M3-4-5-6-8-10-12	11.500: 2,5-3,3-4,2-5-6,8-8,5-10,2		C
29.260.2120	22.230/22.231: M3-4-5-6-8-10-12	11.461: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.2200	22.220/22.221: M3-4-5-6-8-10-12	11.451: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.2240	22.220: M4-5-6-8-10	11.451: 3,3-4,2-5-6,8-8,5	A 42.540: 10,4-16,5	A
29.260.2500	22.268/22.269: M3-4-5-6-8-10-12	11.568: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.2600	22.600/22.601: M3-4-5-6-8-10-12	11.760: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.3340	23.300/23.301: M3-4-5-6-8-10-12	11.450: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.3350	23.300/23.301: M3-4-5-6-8-10-12	11.451: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.3360	23.300/23.301: M3-4-5-6-8-10-12	11.500: 2,5-3,3-4,2-5-6,8-8,5-10,2		B
29.260.3450	23.450/23.451: M3-4-5-6-8-10-12	11.760: 2,5-3,3-4,2-5-6,8-8,5-10,2		B

> **29.280 Phantom**

NL Set Snijplaten  
 FR Jeu de Filières  
 ES Juego de Terraja esférica  
 DE Satz Schneideisen



Ref.	Type	1
29.280.1000	I.T. 27.100	M3-4-5-6-8-10-12-14-16-20
29.280.2000	PHANTOM 27.120	M3-4-5-6-8-10-12-14-16-20

> **29.300 INTERNATIONAL TOOLS**

NL ECO Set Draadeinduithalers  
 FR Jeu d'extracteurs, goujons et tubes cassés ECO  
 ES Juego de extractores de tornillos rotos ECO  
 DE ECO Satz Schraubenausdreher



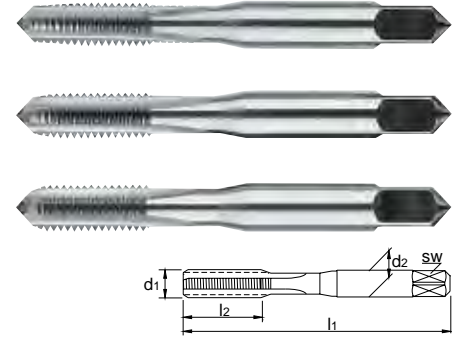
**ECO**

Ref.	1
29.300.0100	28.800 Nr. 1-5
29.300.0200	28.800 Nr. 1-6



## > 29.910 Phantom

NL HSS Handtappen Metrisch, links  
FR Tarauds à main HSS Métrique, à gauche  
ES Machos mano HSS Métrica, izquierda  
DE HSS Handgewindebohrer Metrisch, links

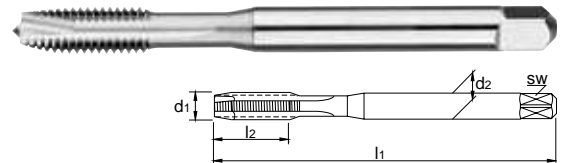


Ref.	d1	P	l1	l2	d2	sw
29.910.0300	M3	0.5	48	11	3.15	2.5
29.910.0400	M4	0.7	53	13	4	3.15
29.910.0500	M5	0.8	58	16	5	4
29.910.0600	M6	1	66	19	6.3	5
29.910.0800	M8	1.25	72	22	8	6.3
29.910.1000	M10	1.5	80	24	10	8

Ref.	d1	P	l1	l2	d2	sw
29.910.1200	M12	1.75	89	29	9	7.1
29.910.1400	M14	2	95	30	11.2	9
29.910.1600	M16	2	102	32	12.5	10
29.910.1800	M18	2.5	112	37	14	11.2
29.910.2000	M20	2.5	112	37	14	11.2
29.910.2400	M24	3	130	45	18	14

## > 29.950 Phantom

NL UNI HSS-E Machinetap Metrisch, links  
FR Taraud machine HSS-E UNI Métrique, à gauche  
ES Macho máquina HSS-E UNI Métrica, a la izquierda  
DE UNI HSS-E Maschinengewindebohrer Metrisch, links



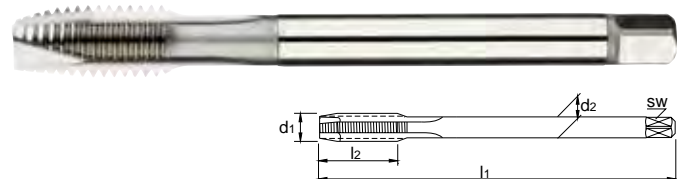
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8
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Ref.	d1	P	l1	l2	d2	sw
29.950.0300	M3	0.5	56	11	3.5	2.7
29.950.0400	M4	0.7	63	13	4.5	3.4
29.950.0500	M5	0.8	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
29.950.0600	M6	1	80	19	6	4.9
29.950.0800	M8	1.25	90	22	8	6.2
29.950.1000	M10	1.5	100	24	10	8

## > 29.951 Phantom

NL UNI HSS-E Machinetap Metrisch, links  
FR Taraud machine HSS-E UNI Métrique, à gauche  
ES Macho máquina HSS-E UNI Métrica, a la izquierda  
DE UNI HSS-E Maschinengewindebohrer Metrisch, links



15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8
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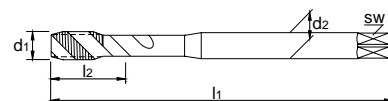
Ref.	d1	P	l1	l2	d2	sw
29.951.1200	M12	1.75	110	28	9	7
29.951.1400	M14	2	110	30	11	9
29.951.1600	M16	2	110	32	12	9
29.951.1800	M18	2.5	125	34	14	11

Ref.	d1	P	l1	l2	d2	sw
29.951.2000	M20	2.5	140	34	16	12
29.951.2200	M22	2.5	140	34	18	14.5
29.951.2400	M24	3	160	38	18	14.5
29.951.3000	M30	3.5	180	45	22	18

> **29.956** **Phantom**



NL UNI HSS-E Machinetap Metrisch, links  
 FR Taraud machine HSS-E UNI Métrique, à gauche  
 ES Macho máquina HSS-E UNI Métrica, izquierda  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, links



+6 6 ( M 60° 371 2,5xD 40° Form C 2,5 ISO 2 6H UNI

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si<10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
29.956.0300	M3	0.5	56	11	3.5	2.7
29.956.0400	M4	0.7	63	13	4.5	3.4
29.956.0500	M5	0.8	70	16	6	4.9

Ref.	d1	P	l1	l2	d2	sw
29.956.0600	M6	1	80	19	6	4.9
29.956.0800	M8	1.25	90	22	8	6.2
29.956.1000	M10	1.5	100	24	10	8

> **29.957** **Phantom**



NL UNI HSS-E Machinetap Metrisch, links  
 FR Taraud machine HSS-E UNI Métrique, à gauche  
 ES Macho máquina HSS-E UNI Métrica, izquierda  
 DE UNI HSS-E Maschinengewindebohrer Metrisch, links



+6 6 ( M 60° 376 2,5xD 40° Form C 2,5 ISO 2 6H UNI

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si<10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

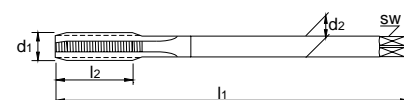
Ref.	d1	P	l1	l2	d2	sw
29.957.1200	M12	1.75	110	28	9	7
29.957.1400	M14	2	110	30	11	9
29.957.1600	M16	2	110	32	12	9

Ref.	d1	P	l1	l2	d2	sw
29.957.2000	M20	2.5	140	34	16	12
29.957.2400	M24	3	160	38	18	14.5
29.957.3000	M30	3.5	180	45	22	18

> **29.960** **Phantom**



NL UNI HSS-E Machinetap Metrisch Fijn, links  
 FR Taraud machine HSS-E UNI Métrique Fin, à gauche  
 ES Macho máquina HSS-E UNI Métrica Fina, a la izquierda  
 DE UNI HSS-E Maschinengewindebohrer Metrisch Fein, links



+6 6 ( MF 60° 374 3xD Form B 5 ISO 2 6H UNI

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si<10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
29.960.0607	MF6	0.75	80	13	4.5	3.4
29.960.0810	MF8	1	90	20	6	4.9
29.960.1010	MF10	1	90	16	7	5.5
29.960.1012	MF10	1.25	100	22	7	5.5
29.960.1210	MF12	1	100	22	9	7
29.960.1212	MF12	1.25	100	22	9	7
29.960.1415	MF14	1.5	100	22	11	9

Ref.	d1	P	l1	l2	d2	sw
29.960.1615	MF16	1.5	100	22	12	9
29.960.1815	MF18	1.5	110	25	14	11
29.960.2015	MF20	1.5	125	25	16	12
29.960.2215	MF22	1.5	125	25	18	14.5
29.960.2415	MF24	1.5	140	28	18	14.5
29.960.2420	MF24	2	140	28	18	14.5
29.960.3015	MF30	1.5	150	28	22	18

## > 29.961 Phantom

NL UNI HSS-E Machinetap Metrisch Fijn, links  
FR Taraud machine HSS-E UNI Métrique Fin, à gauche  
ES Macho máquina HSS-E UNI Métrica Fina, a la izquierda  
DE UNI HSS-E Maschinengewindebohrer Metrisch Fein, links



+6 6 ( MF 60° 40° DIN 374 2,5xD Form C 2-3 ISO 2 6H UNI

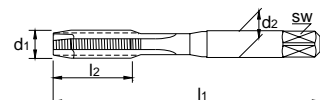
P 11 s900 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	S 71 Ni/Co	S 72 Ti
15-20	10-20	6-10	7-10	10-15	10-15	25-35	10-20	15-35	2-8	2-8

Ref.	d1	P	l1	l2	d2	sw
29.961.0810	MF8	1	90	20	6	4.9
29.961.1010	MF10	1	90	16	7	5.5
29.961.1012	MF10	1.25	100	22	7	5.5
29.961.1210	MF12	1	100	22	9	7
29.961.1212	MF12	1.25	100	22	9	7
29.961.1215	MF12	1.5	100	22	9	7
29.961.1410	MF14	1	100	22	11	9
29.961.1412	MF14	1.25	100	22	11	9
29.961.1415	MF14	1.5	100	22	11	9
29.961.1615	MF16	1.5	100	22	12	9

Ref.	d1	P	l1	l2	d2	sw
29.961.1815	MF18	1.5	110	25	14	11
29.961.2015	MF20	1.5	125	25	16	12
29.961.2215	MF22	1.5	125	25	18	14.5
29.961.2415	MF24	1.5	140	28	18	14.5
29.961.2615	MF26	1.5	140	20	18	14.5
29.961.2715	MF27	1.5	140	20	20	16
29.961.2720	MF27	2	140	20	20	16
29.961.2815	MF28	1.5	140	20	20	16
29.961.3015	MF30	1.5	150	22	22	18
29.961.3020	MF30	2	150	22	22	18

## > 29.969 Phantom

NL HSS Machinetap FG (Rijwioldraad), links  
FR Taraud machine HSS FG (filetage bicyclette), à gauche  
ES Macho máquina HSS FG (rosca bicicleta), izquierda  
DE HSS Maschinengewindebohrer FG (Fahrradgewinde), links



HSS BSC FG 60° 40° DIN 79012 2-3

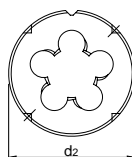
P 11 s900 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu
15-20	10-20	5-15	10-35	15-35

Ref.	d1	P	l1	l2	d2	sw
29.969.1430	FG 9/16	20	100	22	11	9

Ref.	d1	P	l1	l2	d2	sw
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## > 29.970 INTERNATIONAL TOOLS

NL ECO PRO HSS Ronde Snijplaat Metrisch, links  
FR Filière ronde HSS ECO PRO Métrique, à gauche  
ES Terraja esférica HSS ECO PRO Métrica, izquierda  
DE ECO PRO HSS Runde Schneideisen Metrisch, links



HSS M 60° 40° DIN EN 22568 6g ECO PRO

P 11 s900 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%
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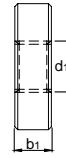
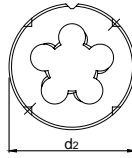
Ref.	d1	P	d2	b1
29.970.0300	M3	0.5	20	5
29.970.0400	M4	0.7	20	5
29.970.0500	M5	0.8	20	7
29.970.0600	M6	1	20	7
29.970.0800	M8	1.25	25	9

Ref.	d1	P	d2	b1
29.970.1000	M10	1.5	30	11
29.970.1200	M12	1.75	38	14
29.970.1400	M14	2	38	14
29.970.1600	M16	2	45	18
29.970.1800	M18	2.5	45	18

Ref.	d1	P	d2	b1
29.970.2000	M20	2.5	45	18
29.970.2200	M22	2.5	55	22
29.970.2400	M24	3	55	22
29.970.2700	M27	3	65	25
29.970.3000	M30	3.5	65	25

> **29.971 Phantom**

NL HSS Ronde Snijplaat Metrisch, schilaansnijding, links  
 FR Filière ronde HSS Métrique, coupe gun, à gauche  
 ES Terraja esférica HSS Métrica, entrada corregida (gun), izquierda  
 DE HSS Runde Schneideisen Metrisch, Schälanschnitt, links



HSS M DIN EN 22568

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu
10-14	6-10	5-8	4-6	15-25

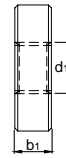
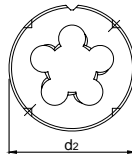
Ref.	d1	d2	b1
29.971.0300	M3	20	5
29.971.0400	M4	20	5
29.971.0500	M5	20	7
29.971.0600	M6	20	7
29.971.0800	M8	25	9

Ref.	d1	d2	b1
29.971.1000	M10	30	11
29.971.1200	M12	38	14
29.971.1400	M14	38	14
29.971.1600	M16	45	18
29.971.1800	M18	45	18

Ref.	d1	d2	b1
29.971.2000	M20	45	18
29.971.2200	M22	55	22
29.971.2400	M24	55	22
29.971.2700	M27	65	25
29.971.3000	M30	65	25

> **29.972 INTERNATIONAL TOOLS**

NL ECO PRO HSS Ronde Snijplaat Metrisch Fijn, links  
 FR Filière ronde HSS ECO PRO Métrique Fin, à gauche  
 ES Terraja esférica HSS ECO PRO Métrica Fina, izquierda  
 DE ECO PRO HSS Runde Schneideisen Metrisch Fein, links



HSS MF DIN EN 22568 **ECO PRO** 6g

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%
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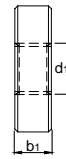
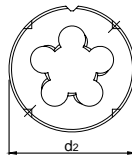
Ref.	d1	P	d2	b1
29.972.0605	MF6	0.5	20	5
29.972.0607	MF6	0.75	20	7
29.972.0807	MF8	0.75	25	9
29.972.0810	MF8	1	25	9
29.972.1010	MF10	1	30	11
29.972.1210	MF12	1	38	10

Ref.	d1	P	d2	b1
29.972.1215	MF12	1.5	38	10
29.972.1410	MF14	1	38	10
29.972.1415	MF14	1.5	38	10
29.972.1610	MF16	1	45	14
29.972.1615	MF16	1.5	45	14
29.972.1815	MF18	1.5	45	14

Ref.	d1	P	d2	b1
29.972.2010	MF20	1	45	14
29.972.2015	MF20	1.5	45	14
29.972.2215	MF22	1.5	55	16
29.972.2415	MF24	1.5	55	16
29.972.3015	MF30	1.5	65	18

> **29.973 Phantom**

NL HSS Ronde Snijplaat Metrisch Fijn, schilaansnijding, links  
 FR Filière ronde HSS Métrique Fin, coupe gun, à gauche  
 ES Terraja esférica HSS Métrica Fina, entrada corregida (gun), izquierda  
 DE HSS Runde Schneideisen Metrisch Fein, Schälanschnitt, links



HSS UNC DIN EN 22568

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu
10-14	6-10	5-8	4-6	15-25

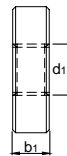
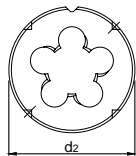
Ref.	d1	P	d2	b1
29.973.0605	MF6	0.5	20	5
29.973.0607	MF6	0.75	20	7
29.973.0807	MF8	0.75	25	9
29.973.0810	MF8	1	25	9
29.973.1010	MF10	1	30	11
29.973.1210	MF12	1	38	10

Ref.	d1	P	d2	b1
29.973.1215	MF12	1.5	38	10
29.973.1410	MF14	1	38	10
29.973.1415	MF14	1.5	38	10
29.973.1610	MF16	1	45	14
29.973.1615	MF16	1.5	45	14
29.973.1815	MF18	1.5	45	14

Ref.	d1	P	d2	b1
29.973.2010	MF20	1	45	14
29.973.2015	MF20	1.5	45	14
29.973.2215	MF22	1.5	55	16
29.973.2415	MF24	1.5	55	16
29.973.3015	MF30	1.5	65	18

## > 29.978 Phantom

NL HSS Ronde Snijplaat schilaansnijding, links, UNF  
 FR Filière ronde HSS coupe gun, à gauche, UNF  
 ES Terraja esférica HSS entrada corregida (gun), izquierda, UNF  
 DE HSS Runde Schneideisen Schälanschnitt, links, UNF



HSS UNF 60° DIN EN 22568 2A

P 11 P 12 P 13 M 21 N 41  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

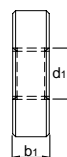
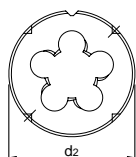
Ref.	d1	P	d2	b1
29.978.0635	UNF 1/4	28	20	7
29.978.0794	UNF 5/16	24	25	9
29.978.0952	UNF 3/8	24	30	11
29.978.1111	UNF 7/16	20	30	11

Ref.	d1	P	d2	b1
29.978.1270	UNF 1/2	20	38	10
29.978.1429	UNF 9/16	18	38	10
29.978.1588	UNF 5/8	18	45	14
29.978.1905	UNF 3/4	16	45	14

Ref.	d1	P	d2	b1
29.978.2222	UNF 7/8	14	55	16
29.978.2540	UNF 1	12	55	16

## > 29.985 INTERNATIONAL TOOLS

NL ECO PRO HSS Ronde Snijplaat BSP (Gasdraad), links  
 FR Filière ronde HSS ECO PRO BSP (pas gaz), à gauche  
 ES Terraja esférica HSS ECO PRO BSP (gas), izquierda  
 DE ECO PRO HSS Runde Schneideisen BSP (Rohrgewinde), links



HSS BSP G 55° DIN EN 24231 ECO PRO

P 11 P 12 K 31 K 32 N 41 N 42  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si-10%

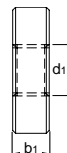
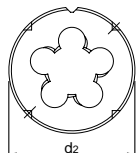
Ref.	d1	P	d2	b1
29.985.0973	BSP 1/8	28	30	11
29.985.1316	BSP 1/4	19	38	10
29.985.1666	BSP 3/8	19	45	14

Ref.	d1	P	d2	b1
29.985.2096	BSP 1/2	14	45	14
29.985.2291	BSP 5/8	14	55	16
29.985.2644	BSP 3/4	14	55	16

Ref.	d1	P	d2	b1
29.985.3020	BSP 7/8	14	65	18
29.985.3325	BSP 1	11	65	18
29.985.4191	BSP 1.1/4	11	75	20

## > 29.989 Phantom

NL HSS Ronde Snijplaat schilaansnijding, links, BSC, FG (Rijwieldraad)  
 FR Filière ronde HSS coupe gun, à gauche, BSC, FG (filetage bicyclette)  
 ES Terraja esférica HSS entrada corregida (gun), izquierda, BSC, FG (rosca bicicleta)  
 DE HSS Runde Schneideisen Schälanschnitt, links, BSC, FG (Fahrradgewinde)



HSS BSC FG 60° DIN 79012 DIN EN 22568

P 11 P 12 P 13 M 21 N 41  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> Alu

10-14 6-10 5-8 4-6 15-25

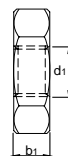
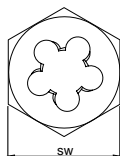
Ref.	d1	P	d2	b1
29.989.1430	FG 9/16	20	38	10

Ref.	d1	P	d2	b1

Ref.	d1	P	d2	b1

> **29.990** **INTERNATIONAL TOOLS**

NL ECO PRO HSS Zeskante Snijmoer Metrisch, links  
 FR Filière hexagonale HSS ECO PRO Métrique, à gauche  
 ES Terraja hexagonal HSS ECO PRO Métrica, izquierda  
 DE ECO PRO HSS Sechskant Schneideisen Metrisch, links



HSS
M
60°
DIN 382
6g
ECO PRO


Ref.	d1	P	sw	b1
29.990.0300	M3	0.5	19	5
29.990.0400	M4	0.7	19	5
29.990.0500	M5	0.8	19	7
29.990.0600	M6	1	19	7
29.990.0800	M8	1.25	22	9


Ref.	d1	P	sw	b1
29.990.1000	M10	1.5	27	11
29.990.1200	M12	1.75	36	14
29.990.1400	M14	2	36	14
29.990.1600	M16	2	41	18
29.990.1800	M18	2.5	41	18


Ref.	d1	P	sw	b1
29.990.2000	M20	2.5	41	18
29.990.2200	M22	2.5	50	22
29.990.2400	M24	3	50	22





**NL Voorboordiametertabel**  
**FR Tableau de diamètres de pré-perçage**  
**ES Tabla de perforación previa**  
**DE Bohrungsdurchmessertabelle**


M		
d1 (mm)	P	 (mm)
1	0,25	0,75
1,2	0,25	0,95
1,4	0,3	1,1
1,5	0,3	1,2
1,6	0,35	1,25
1,7	0,35	1,35
1,8	0,35	1,45
2	0,4	1,6
2,2	0,45	1,75
2,5	0,45	2,05
3	0,5	2,5
3,5	0,6	2,9
4	0,7	3,3
4,5	0,75	3,7
5	0,8	4,2
6	1	5
7	1	6
8	1,25	6,8
9	1,25	7,8
10	1,5	8,5
11	1,5	9,5
12	1,75	10,2
14	2	12
16	2	14
18	2,5	15,5
20	2,5	17,5
22	2,5	19,5
24	3	21
27	3	24
30	3,5	26,5
33	3,5	29,5
36	4	32
39	4	35
42	4,5	37,5
45	4,5	40,5
48	5	43
52	5	47


PG		
d1	P	 (mm)
PG 7	20	11,4
PG 9	18	14
PG 11	18	17,25
PG 13,5	18	19
PG 16	18	21,25
PG 21	16	26,75
PG 29	16	35,5
PG 36	16	45,5
PG 42	16	52,5
PG 48	16	57,75

MF		
d1 (mm)	P	 (mm)
3	0,35	2,65
4	0,5	3,5
5	0,5	4,5
6	0,75	5,2
7	0,75	6,2
8	0,75	7,2
8	1	7
9	1	8
10	0,75	9,2
10	1	9
10	1,25	8,8
11	1	10
12	1	11
12	1,25	10,8
12	1,5	10,5
14	1	13
14	1,25	12,8
14	1,50	12,5
15	1	14
15	1,5	13,5
16	1	15
16	1,5	14,5
18	1	17
18	1,5	16,5
18	2	16
20	1	19
20	1,5	18,5
20	2	18
22	1	21
22	1,5	20,5
22	2	20
24	1	23
24	1,5	22,5
24	2	22
25	1	24
25	1,5	23,5
26	1,5	24,5
27	1,5	25,5
27	2	25
28	1,5	26,5
30	1,5	28,5
30	2	28
32	1,5	30,5
33	2	31
35	1,5	33,5
36	1,5	34,5
36	2	34
36	3	33
38	1,5	36,5
39	3	36
40	1,5	38,5
42	1,5	40,5
45	1,5	43,5
50	1,5	48,5

UNC		
d1 (")	P	 (mm)
nr 1	64	1,5
nr 2	56	1,8
nr 3	48	2
nr 4	40	2,3
nr 5	40	2,6
nr 6	32	2,7
nr 8	32	3,5
nr 10	24	3,8
nr 12	24	4,5
1/4	20	5,1
5/16	18	6,5
3/8	16	7,9
7/16	14	9,3
1/2	13	10,7
9/16	12	12,3
5/8	11	13,5
3/4	10	16,5
7/8	9	19,3
1	8	22,25
1 1/8	7	25
1 1/4	7	28
1 3/8	6	30,75
1 1/2	6	34
1 3/4	5	39,5
2	4 1/2	45

UNF		
d1 (")	P	 (mm)
nr 0	80	1,2
nr 1	72	1,5
nr 2	64	1,8
nr 3	56	2,1
nr 4	48	2,4
nr 5	44	2,6
nr 6	40	2,9
nr 8	36	3,5
nr 10	32	4
nr 12	28	4,6
1/4	28	5,4
5/16	24	5,9
3/8	24	8,4
7/16	20	9,9
1/2	20	11,5
9/16	18	13
5/8	16	14,5
3/4	16	17,5
7/8	14	20,5
1	14	23,5
1	12	23,25
1 1/8	12	26,5
1 1/4	12	29,75
1 3/8	12	33
1 1/2	12	36

BSW		
d1 (")	P	 (mm)
1/16	60	1,15
3/32	48	1,8
1/8	40	2,5
5/32	32	3,2
3/16	24	3,7
7/32	24	4,4
1/4	20	5,1
5/16	18	6,5
3/8	16	7,9
7/16	14	9,2
1/2	12	10,4
9/16	12	12,1
5/8	11	13,4
3/4	10	16,25
7/8	9	19,25
1	8	22,0
1 1/8	7	24,75
1 1/4	7	27,75
1 3/8	6	30,5
1 1/2	6	33,5
1 5/8	5	35,5
1 3/4	5	39,0
1 7/8	4 1/2	41,5
2	4 1/2	44,5

BSP		
d1 (")	P	 (mm)
G 1/16	28	6,7
G 1/8	28	8,7
G 1/4	19	11,6
G 3/8	19	15
G 1/2	14	19
G 5/8	14	20,75
G 3/4	14	24,5
G 7/8	14	28
G 1	11	30,5
G 1 1/8	11	35,1
G 1 1/4	11	39,5
G 1 3/8	11	42
G 1 1/2	11	45
G 1 3/4	11	51
G 2	11	57
G 2 1/4	11	63,1
G 2 1/2	11	72,5
G 2 3/4	11	79,1
G 3	11	85,5
G 3 1/4	11	91,5
G 3 1/2	11	97,7

**P =**

NL: Spoed in mm of gangen per inch

FR: Pas de filetage en mm ou pas par pouce

ES: Paso de rosca en mm o paso por pulgada

DE: Gewindesteigung in mm oder Steigung pro Zoll

Table of standards for pitch-diameter combinations of screw Thread

mm	inch	Description	M	MF	UNC	UNF	UNEF	UN	UNS	Bicycle	BSW	BSF	W	BSB	BA	BSP	NPT	Pg	Vg
1	0,0394	14,BA	0,25	0,2											0,23				
1,1			0,25	0,2															
1,2	0,0472	13,BA	0,25	0,2											0,25				
1,3	0,0512	12,BA		0,25											0,28				
1,4			0,3	0,2/0,25															
1,5	0,0591	11,BA													0,31				
1,524	0,06	Nr. 0				80					60								
1,588	0,0625	1/16																	
1,6			0,35	0,2															
1,7	0,0669	10,BA	0,35	0,2/0,25											0,35				
1,8			0,35	0,2															
1,854	0,073	Nr. 1			64	72													
1,9	0,0748	9,BA													0,39				
2			0,4	0,2/0,25/0,35						56									
2,096		15 SWG																	
2,184	0,086	Nr. 2			56	64													
2,2	0,0866	8,BA	0,45	0,25											0,43				
2,299		14 SWG								56									
2,3			0,4	0,2/0,25/0,35							48								
2,381	0,0937	3/32																	
2,5	0,0984	7,BA	0,45	0,35											0,48				
2,515	0,099	Nr. 3			48	56													
2,6			0,45	0,2/0,25/0,35															
2,604		13 SWG								56									
2,8	0,1102	6,BA													0,53				
2,845	0,112	Nr. 4			40	48													
2,908		12 SWG								56									
3			0,5	0,2/0,25/0,35															
3,175	0,125	1/8 Nr. 5			40	44					40				0,59				
3,2	0,126	5,BA																	
3,279		11 SWG								44									
3,5			0,6	0,2/0,25/0,35/0,5															
3,505	0,138	Nr. 6			32	40									0,66				
3,6	0,1417	4,BA																	
3,614		10 SWG								40									
3,969	0,1562	5/32			32					32	32								
4			0,7	0,2/0,25/0,35/0,5															
4,021		9 SWG								40									
4,1	0,1614	3,BA													0,73				
4,166	0,164	Nr. 8			32	36													
4,5			0,75	0,2/0,25/0,35/0,5															
4,511		8 SWG								32									
4,7	0,185	2,BA													0,81				
4,762	0,1875	3/16			24	32					24	32							
4,826	0,19	Nr. 10			24	32													
5			0,8	0,2/0,25/0,35/0,5/0,75															
5,2		Vq 5																	36
5,28		Vq 5,2																	24
5,3	0,2087	1,BA													0,9				
5,486	0,216	Nr. 12			24	28	32												
5,5			0,9	0,2/0,25/0,35/0,5/0,75															
5,556	0,2188	7/32			24						24	28							
6	0,2362	0,BA	1	0,2/0,25/0,35/0,5/0,75											1,0				32
6,03		Vq 6																	
6,35	0,25	1/4			20	28	32				20	26							
6,5																			
6,747	0,2656	17/64								26									





Table of standards for pitch-diameter combinations of screw Thread

mm	inch	Description	M	MF	UNC	UNF	UNEF	UN	UNS	Bicycle	BSW	BSF	W	BSB	BA	BSP	NPT	Pg	Vg
7	0,2813	9/32	1	0,2/0,25/0,35/0,5/0,75						26		26							
7,144																			
7,5				0,2/0,25/0,35/0,5/0,75/1												28			32
7,723		G 1/16																	30
7,747		Vg 8																	
7,88		Vg 7,8																	
7,938	0,3125	5/16			18	24	32	20/28	27/36/40/48	26	18	22		26					
7,94		1/16 NPT																	27
8			1,25	0,2/0,25/0,35/0,5/0,75/1															
8,5				0,2/0,25/0,35/0,5/0,75/1															
9			1,25	0,2/0,25/0,35/0,5/0,75/1															
9,5				0,2/0,25/0,35/0,5/0,75/1															
9,525	0,375	3/8			16	24	32	20/28	18/27/36/40	26	16	20		26		28			
9,728		G 1/8																	
9,906	0,39								27										
10			1,5	0,2/0,25/0,35/0,5/0,75/1/1,25															27
10,29	0,407	1/8 NPT																	
10,338		Vg 10																	
10,5				0,35/0,5/0,75/1															
11			1,5	0,35/0,5/0,75/1															28
11,13	0,4375	7/16			14	20	28	16/32	18/24/27/32	26	14	18		26					
11,5				0,35/0,5/0,75/1/1,5															
12			1,75	0,35/0,5/0,75/1/1,5															
12,243		Vg 12																	
12,5		Pg 7																	26
12,7	0,5	1/2			13	20	28	12/16/32	12/14/18/24/27	26	12	16		26					
13				0,35/0,5/0,75/1/1,5															
13,157	0,518	G 1/4																	
13,5				0,35/0,5/0,75/1/1,5															
13,72		1/4 NPT																	
14			2	0,35/0,5/0,75/1/1,25/1,5															
14,287	0,5625	9/16			12	18	24	12/16/20/28/32	14/27	20/26	12	16		26					
14,5				0,35/0,5/0,75/1/1,5															
15				0,35/0,5/0,75/1/1,5															
15,2		Pg 9																	
15,875	0,625	5/8																	
16			2	0,35/0,5/0,75/1/1,5/2															
16,662	0,656	G 3/8			11	18	24	12/16/20/28/32		26	11	14		26		19			
17				0,35/0,5/0,75/1/1,5/2															
17,15		3/8 NPT																	
17,462	0,6875	11/16																	
18			2,5	0,35/0,5/0,75/1/1,5/2															
18,6		Pg 11																	
19				0,35/0,5/0,75/1/1,5/2															
19,05	0,75	3/4			10	16	20	12/28/32	14/18/24/27	26	10	12		26					18
19,8		W 19,8																	
20			2,5	0,35/0,5/0,75/1/1,5/2															
20,4	0,8003	Pg 13,5																	
20,638	0,8125	13/16																	
20,955	0,825	G 1/2																	
21				0,35/0,5/0,75/1/1,5/2															
21,34		1/2 NPT																	
21,8		W 21,8																	
22			2,5	0,35/0,5/0,75/1/1,5/2															
22,225	0,875	7/8			9	14	20	12/16/28/32	10/18/24/27	24	9	11		26					
22,5		Pg 16																	
22,911	0,902	G 5/8																	18

Table of standards for pitch-diameter combinations of screw Thread

mm	inch	Description	M	MF	UNC	UNF	UNEF	UN	UNS	Bicycle	BSW	BSF	W	BSB	BA	BSP	NPT	Pg	Vg
23	0,9375	15/16		0,35/0,5/0,75/1/1,5/2															
23,812	0,9375	15/16		0,35/0,5/0,75/1/1,5/2			20	12/16/28/32			9	11							
24			3	0,35/0,5/0,75/1/1,5/2									14						
24,32		W 24,32																	
24,606	0,9688	31/32								30									
25				0,35/0,5/0,75/1/1,5/2															
25,4	1	1		0,35/0,5/0,75/1/1,5/2	8	12/14	20	16/28/32	10/14/18/24/27	24	8	10		26					
26																			
26,441	1,041	G 3/4													14				
26,67		3/4 NPT															14		
26,987	1,0625	1.1/16					18	8/12/16/20/28											
27			3	0,35/0,5/0,75/1/1,5/2															
27,8				0,35/0,5/0,75/1/1,5/2/3															
28,3	Pg,21	1.1/8																	
28,575	1,125	W 28,8			7	12	18	8/16/20/28	10/14/24	26	7	9					16		
28,8													14						
30			3,5	0,35/0,5/0,75/1/1,5/2/3															
30,162	1,1875	1.3/16					18	8/12/16/20/28											
30,201	1,189	G 7/8														14			
31,75	1,25	1.1/4			7	12	18	8/16/20/28	10/14/24		7	9							
32				0,35/0,5/0,75/1/1,5/2/3															
32,766	1,29									24									
33			3,5	0,35/0,5/0,75/1/1,5/2/3															
33,249	1,309	G 1																	
33,337	1,3125	1.5/16					18	8/12/16/20/28								11			
33,4		1 NPT																	
34				0,35/0,5/0,75/1/1,5/2/3													11,5		
34,798	1,37																		
34,925	1,375	1.3/8			6	12	18	8/16/20/28	10/14/24	24	6	8							
35																			
36			4	0,35/0,5/0,75/1/1,5/2/3															
36,512	1,4375	1.7/16					18	6/8/12/16/20/28											
36,83	1,45									26									
37		Pg 29																	
39,897	1,492	G 1.1/8														11			
38				0,35/0,5/0,75/1/1,5/2/3															
38,1	1,5	1.1/2			6	12	18	8/16/20/28	10/14/24		6	8							
39			4	0,35/0,5/0,75/1/1,5/2/3															
39,687	1,5625	1.9/16					18	6/8/12/16/20		24							11,5		
40				0,35/0,5/0,75/1/1,5/2/3/4															
41,275	1,625	1.5/8					18	6/8/12/16/20	10/14/24		5	8							
41,91	1,65	G 1.1/4														11			
42			4,5	0,35/0,5/0,75/1/1,5/2/3/4															
42,16		1.1/4 NPT																	
42,863	1,6875	1.11/16					18	6/8/12/16/20											
44,323	1,745	G 1.3/8														11			
44,45	1,75	1.3/4			5	12	16	6/8/12/16/20	10/14/18		5	7							
45			4,5	0,35/0,5/0,75/1/1,5/2/3/4															
46				0,5/0,75/1/1,5/2/3															
47		Pg 36																	
47,625	1,875	1.7/8																	
47,803	1,882	G 1.1/2									4,5							16	
48			5	0,35/0,5/0,75/1/1,5/2/3/4															
48,26		1.1/2 NPT														11			
50				0,35/0,5/0,75/1/1,5/2/3/4															
50,8	2	2			4,5	12	16	6/8/12/16/20	10/14/18		4,5	7							
52			5	0,75/1/1,5/2/3/4															

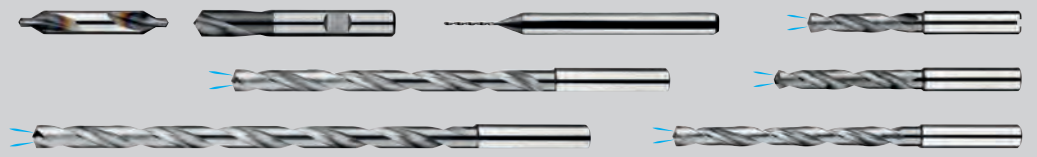




Table of standards for pitch-diameter combinations of screw Thread

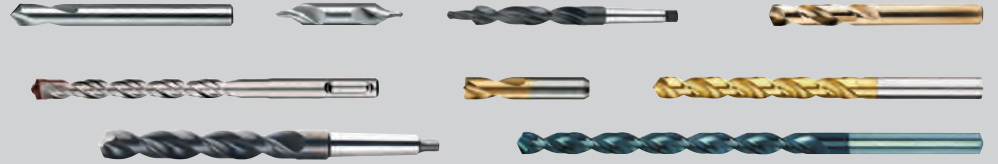
mm	inch	Description	M	MF	UNC	UNF	UNEF	UN	UNS	Bicycle	BSW	BSF	W	BSB	BA	BSP	NPT	PG	VG
52,887	2.0625	2.1/16						16								11			
53,746	2.116	G 1.3/4						6/8/12/16/20										16	
53,975	2.125	2.1/8																	
54		Pg 42																	
55				0,75/1/1,5/2/3/4															
55,562	2.1875	2.3/16						16											
56																			
57,15	2.25	2.1/4	5,5	0,75/1/1,5/2/3/4	4,5	1,2		6/8/12/16/20	10/14/18		4	6							
58																			
58,737	2.3125	2.5/16		0,75/1/1,5/2/3/4				16										16	
59,3		Pg 48																	
59,614	2.347	G 2																	
60			5,5	0,75/1/1,5/2/3/4															
60,235	2.375	2.3/8						6/8/12/16/20									11,5		
60,33		2 NPT																	
61,912	2.4375	2.7/16						16											
62				0,75/1/1,5/2/3/4															
63,5	2.5	2.1/2			4	1,2		6/8/12/16/20	10/14/18		4	6							
64			6	0,75/1/1,5/2/3/4															
65				0,75/1/1,5/2/3/4															
65,71	2.587	G 2.1/4																	
66,675	2.265	2.5/8						4/6/8/12/16/20								11			
68			6																
69,85	2.75	2.3/4		0,75/1/1,5/2/3/4	4			6/8/12/16/20	0/14/18		3,5	6							
70																			
72				0,75/1/1,5/2/3/4/6															
73,025	2.875	2.7/8		0,75/1/1,5/2/3/4/6				4/6/8/12/16/20											
73,03		2.1/2 NPT																	
75				0,75/1/1,5/2/3/4											11				
75,184	2.96	G 2.1/2																	
76				0,75/1/1,5/2/3/4/6															
76,2	3	3			4	1,2		6/8/12/16/20	10/14/18		3,5	5							

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



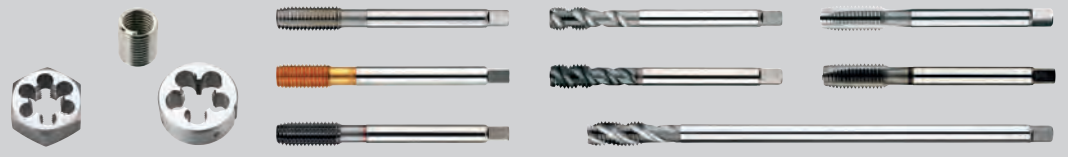
SC 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



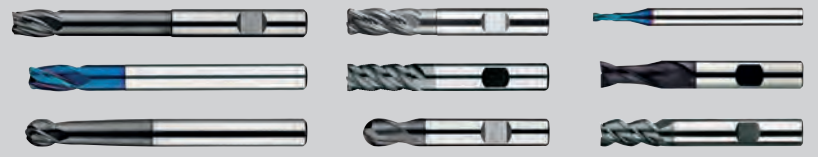
HSS-E 1

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



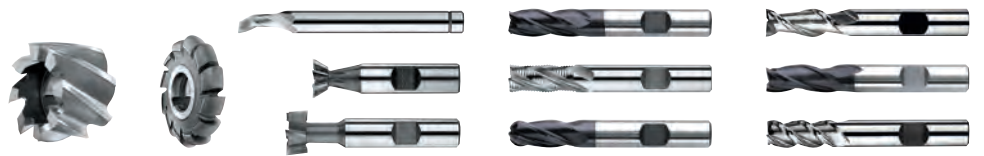
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



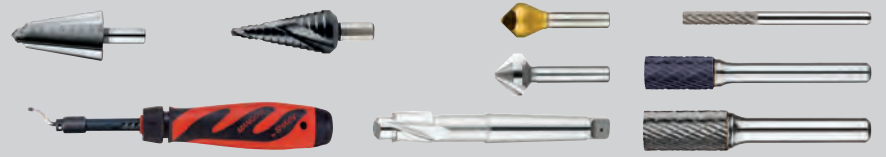
SC 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

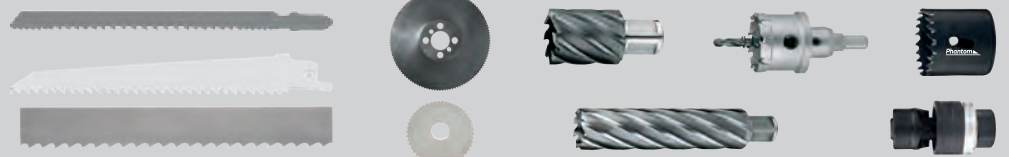
NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



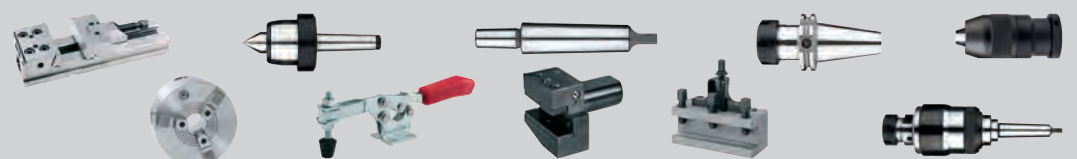
NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



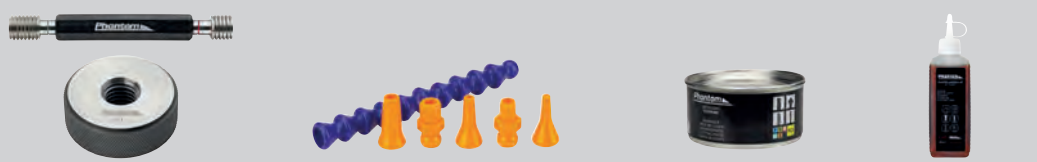
NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





## ICONEN

## ICONES

## ICONOS

## PIKTOGRAMME

	NL	FR	ES	DE
	2 snijkanten, centrumsnijdend	2 dents, coupe au centre	2 dientes, corte con centro	2 Schneiden, Zentrumschneidend
	2 snijkanten, volradius	2 dents, à rayon complet	2 dientes, con radio completo	2 Schneiden, Vollradius
	3 snijkanten, centrumsnijdend	3 dents, coupe au centre	3 dientes, corte con centro	3 Schneiden, Zentrumschneidend
	4 snijkanten, centrumsnijdend	4 dents, coupe au centre	4 dientes, con corte centro	4 Schneiden, Zentrumschneidend
	4 snijkanten, niet centrumsnijdend	4 dents, pas de coupe au centre	4 dientes, corte sin centro	4 Schneiden, Nicht Zentrumschneidend
	4 snijkanten, centrum-snijdend, volradius	4 dents, coupe au centre, à rayon complet	4 dientes, corte al centro, con radio completo	4 Schneiden, Zentrumschneidend
	5 snijkanten, met ongelijke tandverdeling	5 dents, avec denture à pas différentiel	5 dientes, con paso irregular	5 Schneiden, mit ungleicher Zahnteilung
	6 snijkanten, centrumsnijdend	6 dents, coupe au centre	6 dientes, corte con centro	6 Schneiden, Zentrumschneidend
<b>HSS-E 8%</b>	HSS-E (8% Cobalt)	HSS-E (8% Cobalt)	HSS-E (8% Cobalto)	HSS-E (8% Cobalt)
<b>HSS-E PM</b>	PM HSS-E	Acier rapide fritté de haute qualité	Acero rápido pulvimetalúrgico con	PM HSS-E
<b>TiCN</b>	TiCN gecoat	Revêtement TiCN	Recubrimiento TiCN	TiCN Beschichtung
<b>TiAIN</b>	TiAIN gecoat	Revêtement TiAIN	Recubrimiento TiAIN	TiAIN Beschichtung
<b>DIN 844-B</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm

	NL	FR	ES	DE
	Spiraalhoek	Angle d'Hélice	Angulo de hélice	Spiralwinkel
<b>HR</b>	Ronde tand, fijn	Profil rond, pas fin	Perfil redondo, paso fino	Feiner Verzahnung
<b>HRf</b>	Ronde tand, extra fijn	Profil rond, pas extra fin	Perfil redondo, paso extra fino	Extra feiner Verzahnung
<b>NR</b>	Ronde tand, grof (NR)	Runder Verzahnung (NR)	Perfil redondo (NR)	Runder Verzahnung (NR)
	Cilindrische schacht	Queue cylindrique	Mango cilíndrico	Zylinderschaft
<b>h6</b>	Cilindrische schacht h6	Queue cylindrique h6	Mango cilíndrico h6	Zylinderschaft h6
<b>DIN 1835-B</b>	Cilindrische schacht met Weldon vlak	Queue cylindrique avec méplat type Weldon	Mango cilíndrico con plano de arrastre tipo Weldon	Zylinderschaft mit Mitnahmefläche Tyo Weldon
	Cilindrische schacht met aantrekdraad	Queue cylindrique filetée	Mango cilíndrico roscado	Zylinderschaft mit Anzugsgewinde
	Met langsspiebaan	Avec rainure de clavette	Con ranura longitudinal	Mit Längsnut
	Met langs- en dwarsspiebaan	Avec rainure de clavette et tenons	Con ranura longitudinal y transversal	Mit Längs- und Quernut
<b>d1 +0,00 -0,03</b>	Tolerantie diameter	Tolérance diamètre	Tolerancia diámetro	Toleranz Durchmesser
<b>UNI</b>	Universeel	Universel	Universal	Universal

NL VHM Frezen  
FR Fraises Carbure monobloc  
ES Fresas Metal Duro  
DE VHM Fräser

**P K** Bij uitstek geschikt  
Très approprié  
**H N** Muy adecuado  
**M S** Ideal geeignet

**P K** Bepoort geschikt  
Approprié  
**H N** Adecuado  
**M S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

> 32.244	Phantom		DIN 6527	<b>P M K N S</b>			P. 3
> 32.254	Phantom		DIN 6527	<b>P M K N S</b>			P. 3
> 32.256	Phantom		NORM	<b>P M K N S</b>			P. 3
> 32.270	Phantom		NORM	<b>P M K N S</b>			P. 4
> 32.275	Phantom		HSC	<b>P</b>	<b>H</b>		P. 4
> 32.290	Phantom		HSC	<b>P</b>	<b>H</b>		P. 5
> 32.330	Phantom		ALU		<b>N</b>		P. 5
> 32.633	Phantom		ALU		<b>N</b>		P. 6
> 32.750	Phantom			<b>P M K N</b>			P. 6
> 33.244	Phantom		DIN 6527	<b>P M K N S</b>			P. 6
> 33.254	Phantom		DIN 6527	<b>P M K N S</b>			P. 7
> 33.256	Phantom		NORM	<b>P M K N S</b>			P. 7
> 33.544	Phantom		INOX	<b>P M K N S</b>			P. 7
> 33.633	Phantom		ALU		<b>N</b>		P. 8
> 34.244	Phantom		DIN 6527	<b>P M K N S</b>			P. 9
> 34.254	Phantom		DIN 6527	<b>P M K N S</b>			P. 9
> 34.256	Phantom		NORM	<b>P M K N S</b>			P. 9
> 34.302	Phantom		1,5xD HP2 UNI	<b>P M K S</b>			<b>NEW</b> P. 10
> 34.314	Phantom		2xD 3xD HP2 UNI	<b>P M K S</b>			<b>NEW</b> P. 10
> 34.316	Phantom		2xD 3xD HP2 UNI	<b>P M K S</b>			<b>NEW</b> P. 11
> 34.318	Phantom		1,5xD 5xD HP2 UNI	<b>P M K S</b>			<b>NEW</b> P. 11
> 34.330	Phantom		2xD HP2 UNI	<b>P M K S</b>			<b>NEW</b> P. 12
> 34.331	Phantom		3xD HP2 UNI	<b>P M K S</b>			<b>NEW</b> P. 12
> 34.375	Phantom		NORM	<b>P M K N</b>			P. 12
> 34.400	Phantom		HSC	<b>P</b>	<b>H</b>		P. 13
> 34.410	Phantom		HSC	<b>P</b>	<b>H</b>		P. 13
> 34.424	Phantom		HRC	<b>P</b>	<b>H</b>		P. 13
> 34.464	Phantom		HRC	<b>P</b>	<b>H</b>		P. 14
> 34.510	Phantom		HSC	<b>P</b>	<b>H</b>		P. 14
> 34.515	Phantom		HSC	<b>P</b>	<b>H</b>		P. 14
> 35.244	Phantom		+5	<b>P M K</b>			P. 15
> 35.484	Phantom		INOX	<b>P M S</b>			P. 15
> 35.540	Phantom		WR ALU		<b>N</b>		P. 15

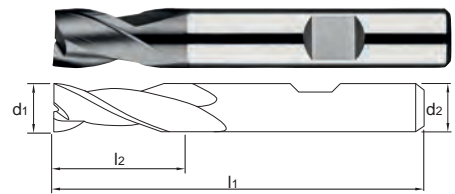
SC 1  
HSS-F 1  
2  
SC 3



> 35.852	Phantom		NORM		N				P. 16		
> 35.860	Phantom		NORM		N				P. 16		
> 35.868	Phantom		NORM		N				P. 16		
> 35.876	Phantom		NORM		N				P. 16		
> 36.130	Phantom		NORM	ALU	N				P. 17		
> 36.140	Phantom		NORM	ALU	N				P. 17		
> 36.164	Phantom		NORM	90°	P	M	N	S		P. 17	
> 36.166	Phantom		NORM	90°	P	M	N	S		P. 18	
> 36.244	Phantom		DIN 6527		P	M	K	N	S		P. 18
> 36.256	Phantom		NORM		P	M	K	N	S		P. 18
> 36.275	Phantom		NORM	HSC	P				H		P. 19
> 36.285	Phantom		NORM	HRC	P				H		P. 19
> 36.345	Phantom		NORM	INOX	P	M	K		S		P. 20
> 36.430	Phantom		NORM		P	M	K				P. 20

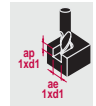
» **32.244 Phantom**

NL VHM Schachtfrees, 2-snijder kort, AITiN-X  
FR Fraise à rainurer 2 dents Carbure version courte, AITiN-X  
ES Fresa de ranurar de 2 labios MD corto, AITiN-X  
DE VHM Langlochfräser (2-Schneider) kurz, AITiN-X



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤560 N/mm <sup>2</sup>	≤550 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ni/Co	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



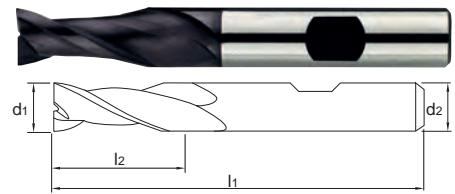
Ref.	d1	d2	l1	l2	z
32.244.0200	2	6	50	3	2
32.244.0300	3	6	50	4	2
32.244.0400	4	6	54	5	2
32.244.0500	5	6	54	6	2

Ref.	d1	d2	l1	l2	z
32.244.0600	6	6	54	7	2
32.244.0800	8	8	58	9	2
32.244.1000	10	10	66	11	2
32.244.1200	12	12	73	12	2

Ref.	d1	d2	l1	l2	z
32.244.1600	16	16	82	16	2
32.244.2000	20	20	92	20	2

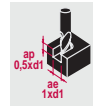
» **32.254 Phantom**

NL VHM Schachtfrees, 2-snijder lang, AITiN-X  
FR Fraise à rainurer 2 dents Carbure version longue, AITiN-X  
ES Fresa de ranurar de 2 labios MD larga, AITiN-X  
DE VHM Langlochfräser (2-Schneider) lang, AITiN-X



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤560 N/mm <sup>2</sup>	≤550 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ni/Co	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



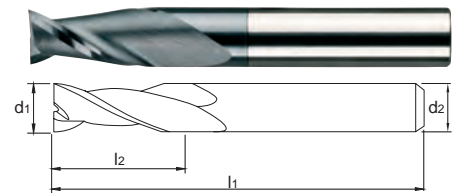
Ref.	d1	d2	l1	l2	z
32.254.0300	3	6	57	7	2
32.254.0400	4	6	57	8	2
32.254.0500	5	6	57	10	2

Ref.	d1	d2	l1	l2	z
32.254.0600	6	6	57	10	2
32.254.0800	8	8	63	16	2
32.254.1000	10	10	72	19	2

Ref.	d1	d2	l1	l2	z
32.254.1200	12	12	83	22	2
32.254.1600	16	16	92	26	2
32.254.2000	20	20	104	32	2

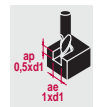
» **32.256 Phantom**

NL VHM Schachtfrees, 2-snijder AITiN-X  
FR Fraise à rainurer 2 dents Carbure AITiN-X  
ES Fresa de ranurar de 2 labios MD AITiN-X  
DE VHM Langlochfräser (2-Schneider) AITiN-X



MG HM AITiN X NORM 30° h6 d1 h10

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤560 N/mm <sup>2</sup>	≤550 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ni/Co	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



Ref.	d1	d2	l1	l2	z
32.256.0100	1	3	39	3	2
32.256.0150	1.5	3	39	5	2
32.256.0200	2	3	39	7	2
32.256.0250	2.5	3	39	7	2
32.256.0300	3	3	39	9	2
32.256.0350	3.5	4	50	12	2
32.256.0400	4	4	51	14	2
32.256.0450	4.5	5	51	14	2

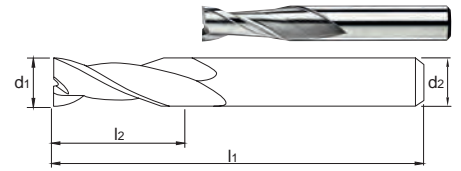
Ref.	d1	d2	l1	l2	z
32.256.0500	5	5	51	16	2
32.256.0600	6	6	64	19	2
32.256.0700	7	8	64	19	2
32.256.0800	8	8	64	19	2
32.256.0900	9	10	70	22	2
32.256.1000	10	10	70	22	2
32.256.1100	11	11	76	25	2
32.256.1200	12	12	76	25	2

Ref.	d1	d2	l1	l2	z
32.256.1400	14	14	89	30	2
32.256.1600	16	16	89	32	2
32.256.1800	18	18	100	36	2
32.256.2000	20	20	102	38	2
32.256.2200	22	25	102	38	2
32.256.2500	25	25	102	38	2

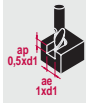


**> 32.270 Phantom**

NL VHM Precisie Schachtfrees, 2-snijder  
 FR Fraise de précision 2 dents Carbure  
 ES Fresa de precisión MD  
 DE VHM Präzision Fräser (2-Schneider)



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC	<b>S 72</b> Ti
60-70 B	55-65 B	50-60 B	35-50 A	42-50 A	25-32 A	60-70 B	80-85 B	145-180 C	70-90 B	100-110 B	30-55 A	40-50 A	18-25 F



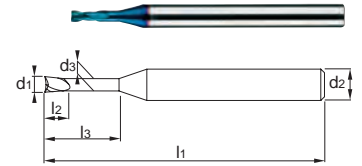
Ref.	d1	d2	l1	l2	z
32.270.0030	0.3	3	39	0.8	2
32.270.0040	0.4	3	39	1	2
32.270.0050	0.5	3	39	1.5	2
32.270.0060	0.6	3	39	1.5	2
32.270.0070	0.7	3	39	2	2
32.270.0080	0.8	3	39	2	2
32.270.0090	0.9	3	39	2.5	2
32.270.0100	1	3	39	3	2
32.270.0110	1.1	3	39	3	2
32.270.0120	1.2	3	39	4	2
32.270.0125	1.25	3	39	4	2

Ref.	d1	d2	l1	l2	z
32.270.0130	1.3	3	39	4	2
32.270.0140	1.4	3	39	4	2
32.270.0150	1.5	3	39	4	2
32.270.0160	1.6	3	39	5	2
32.270.0170	1.7	3	39	5	2
32.270.0180	1.8	3	39	5	2
32.270.0190	1.9	3	39	5	2
32.270.0200	2	3	39	5	2
32.270.0210	2.1	3	39	6	2
32.270.0220	2.2	3	39	6	2
32.270.0230	2.3	3	39	6	2

Ref.	d1	d2	l1	l2	z
32.270.0240	2.4	3	39	6	2
32.270.0250	2.5	3	39	7	2
32.270.0260	2.6	3	39	7	2
32.270.0270	2.7	3	39	7	2
32.270.0280	2.8	3	39	7	2
32.270.0290	2.9	3	39	7	2
32.270.0300	3	4	44	10	2
32.270.0310	3.1	4	44	10	2
32.270.0320	3.2	4	44	10	2
32.270.0330	3.3	4	44	10	2

**> 32.275 Phantom**

NL VHM Precisie HSC Schachtfrees, 2-snijder TiAIN-B, 45-70 HRc  
 FR Fraise de précision UGV 2 dents Carbure TiAIN-B, 45-70 HRc  
 ES Fresa de precisión MAV MD TiAIN-B, 45-70 HRc  
 DE VHM Präzision HSC Fräser (2-Schneider) TiAIN-B, 45-70 HRc



<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC
55-60 E	20-45 D



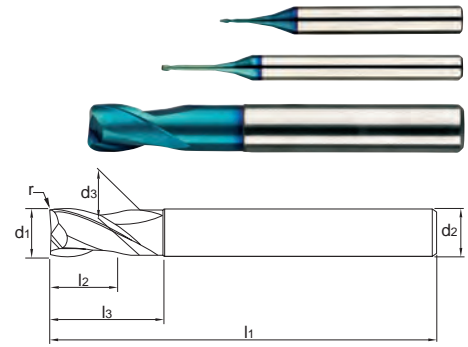
Ref.	d1	d2	d3	l1	l2	l3	z
32.275.0100	0.1	4	0.27	45	0.15	0.3	2
32.275.0101	0.1	4	0.27	45	0.15	0.5	2
32.275.0200	0.2	4	0.27	45	0.3	0.5	2
32.275.0202	0.2	4	0.27	45	0.3	1.5	2
32.275.0300	0.3	4	0.27	45	0.45	1	2
32.275.0302	0.3	4	0.27	45	0.45	1.5	2
32.275.0303	0.3	4	0.27	45	0.45	3	2
32.275.0400	0.4	4	0.37	45	0.6	1	2
32.275.0401	0.4	4	0.37	45	0.6	2	2
32.275.0402	0.4	4	0.37	45	0.6	3	2
32.275.0403	0.4	4	0.37	45	0.6	4	2
32.275.0500	0.5	4	0.45	45	0.7	2	2
32.275.0502	0.5	4	0.45	45	0.7	4	2
32.275.0503	0.5	4	0.45	45	0.7	6	2
32.275.0600	0.6	4	0.55	45	0.9	2	2
32.275.0602	0.6	4	0.55	45	0.9	4	2
32.275.0603	0.6	4	0.55	45	0.9	6	2
32.275.0800	0.8	4	0.75	45	1.2	2	2

Ref.	d1	d2	d3	l1	l2	l3	z
32.275.0801	0.8	4	0.75	45	1.2	4	2
32.275.0802	0.8	4	0.75	45	1.2	6	2
32.275.0803	0.8	4	0.75	45	1.2	8	2
32.275.0804	0.8	4	0.75	45	1.2	12	2
32.275.1000	1	4	0.95	45	1.5	4	2
32.275.1001	1	4	0.95	45	1.5	6	2
32.275.1002	1	4	0.95	45	1.5	8	2
32.275.1003	1	4	0.95	45	1.5	10	2
32.275.1004	1	4	0.95	45	1.5	12	2
32.275.1005	1	4	0.95	50	1.5	16	2
32.275.1006	1	4	0.95	55	1.5	20	2
32.275.1200	1.2	4	1.15	45	1.8	6	2
32.275.1202	1.2	4	1.15	45	1.8	10	2
32.275.1500	1.5	4	1.45	45	2.3	6	2
32.275.1501	1.5	4	1.45	45	2.3	8	2
32.275.1502	1.5	4	1.45	45	2.3	10	2
32.275.1503	1.5	4	1.45	45	2.3	12	2
32.275.1505	1.5	4	1.45	50	2.3	16	2

Ref.	d1	d2	d3	l1	l2	l3	z
32.275.1507	1.5	4	1.45	55	2.3	20	2
32.275.2000	2	4	1.95	45	3	6	2
32.275.2001	2	4	1.95	45	3	8	2
32.275.2002	2	4	1.95	45	3	10	2
32.275.2003	2	4	1.95	45	3	12	2
32.275.2005	2	4	1.95	50	3	16	2
32.275.2007	2	4	1.95	55	3	20	2
32.275.2009	2	4	1.95	70	3	30	2
32.275.3000	3	6	2.85	45	4.5	10	2
32.275.3003	3	6	2.85	55	4.5	16	2
32.275.3006	3	6	2.85	65	4.5	25	2
32.275.3009	3	6	2.85	90	4.5	40	2
32.275.4000	4	6	3.85	50	6	12	2
32.275.4002	4	6	3.85	60	6	20	2
32.275.4004	4	6	3.85	70	6	30	2
32.275.4006	4	6	3.85	90	6	40	2
32.275.4008	4	6	3.85	100	6	50	2

> **32.290 Phantom**

NL VHM HSC Torusfrees, 2-snijder TiAIN-B, 45-70 HRc  
 FR Fraise torique UGV 2 dents Carbure TiAIN-B, 45-70 HRc  
 ES Fresa tórica MAV MD TiAIN-B, 45-70 HRc  
 DE VHM HSC Torusfräser TiAIN-B, 45-70 HRc

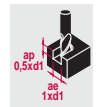
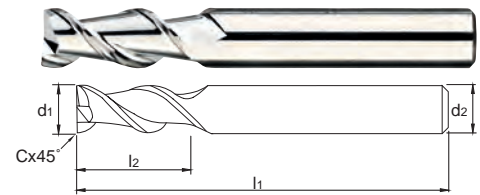


Ref.	d1	d2	d3	l1	l2	l3	r	z
32.290.0111	0.5	4	0.45	45	0.7	1.5	0.05	2
32.290.0112	0.5	4	0.45	45	0.7	2.5	0.05	2
32.290.0113	0.5	4	0.45	45	0.7	4	0.05	2
32.290.0211	0.6	4	0.55	45	0.9	2	0.05	2
32.290.0212	0.6	4	0.55	45	0.9	3	0.05	2
32.290.0213	0.6	4	0.55	45	0.9	4	0.05	2
32.290.0421	0.8	4	0.75	45	1.2	2	0.1	2
32.290.0422	0.8	4	0.75	45	1.2	4	0.1	2
32.290.0423	0.8	4	0.75	45	1.2	6	0.1	2
32.290.0521	1	6	0.95	50	1.5	4	0.1	2
32.290.0522	1	6	0.95	50	1.5	6	0.1	2
32.290.0532	1	6	0.95	50	1.5	6	0.2	2
32.290.0533	1	6	0.95	50	1.5	8	0.2	2
32.290.0631	1.5	6	1.45	50	2.5	4	0.2	2
32.290.0632	1.5	6	1.45	50	2.5	6	0.2	2
32.290.0633	1.5	6	1.45	50	2.5	8	0.2	2
32.290.0634	1.5	6	1.45	50	2.5	10	0.2	2
32.290.0635	1.5	6	1.45	50	2.5	12	0.2	2
32.290.0733	2	6	1.95	50	3	8	0.2	2
32.290.0741	2	6	1.95	50	3	6	0.3	2
32.290.0742	2	6	1.95	50	3	8	0.3	2
32.290.0743	2	6	1.95	55	3	10	0.3	2
32.290.0744	2	6	1.95	55	3	12	0.3	2
32.290.0745	2	6	1.95	55	3	16	0.3	2
32.290.0751	2	6	1.95	55	3	6	0.5	2
32.290.0754	2	6	1.95	55	3	12	0.5	2

Ref.	d1	d2	d3	l1	l2	l3	r	z
32.290.0841	3	6	2.85	55	4	8	0.3	2
32.290.0843	3	6	2.85	55	4	12	0.3	2
32.290.0852	3	6	2.85	55	4	12	0.5	2
32.290.0854	3	6	2.85	55	4	20	0.5	2
32.290.0951	4	6	3.85	55	5	12	0.5	2
32.290.0952	4	6	3.85	55	5	16	0.5	2
32.290.0953	4	6	3.85	55	5	20	0.5	2
32.290.0961	4	6	3.85	55	5	12	1	2
32.290.0963	4	6	3.85	55	5	16	1	2
32.290.1052	6	6	5.85	60	7	20	0.5	2
32.290.1062	6	6	5.85	60	7	20	1	2
32.290.1074	6	6	5.85	60	7	20	1.5	2
32.290.1082	6	6	5.85	60	7	20	2	2
32.290.1152	8	8	7.7	60	9	25	0.5	2
32.290.1162	8	8	7.7	60	9	25	1	2
32.290.1174	8	8	7.7	60	9	25	1.5	2
32.290.1182	8	8	7.7	60	9	25	2	2
32.290.1253	10	10	9.7	70	11	32	0.5	2
32.290.1263	10	10	9.7	70	11	32	1	2
32.290.1273	10	10	9.7	70	11	32	1.5	2
32.290.1285	10	10	9.7	70	11	32	2	2
32.290.1352	12	12	11.7	80	12	38	0.5	2
32.290.1362	12	12	11.7	80	12	38	1	2
32.290.1372	12	12	11.7	80	12	38	1.5	2
32.290.1384	12	12	11.7	80	12	38	2	2

> **32.330 Phantom**

NL VHM Schachtfrees, 2-snijder lang, Aluminium  
 FR Fraise à rainurer 2 dents Carbure version longue, Aluminium  
 ES Fresa de ranurar de 2 labios MD larga, Aluminio  
 DE VHM Langlochfräser (2-Schneider) lang, Aluminium



Ref.	d1	d2	l1	l2	c	z
32.330.0300	3	6	57	8	0,05	2
32.330.0400	4	6	57	11	0,05	2
32.330.0500	5	6	57	13	0,05	2

Ref.	d1	d2	l1	l2	c	z
32.330.0600	6	6	57	13	0,05	2
32.330.0800	8	8	63	19	0,05	2
32.330.1000	10	10	72	22	0,1	2

Ref.	d1	d2	l1	l2	c	z
32.330.1200	12	12	83	26	0,1	2
32.330.1600	16	16	92	32	0,1	2
32.330.2000	20	20	104	38	0,1	2





### > 32.633 Phantom

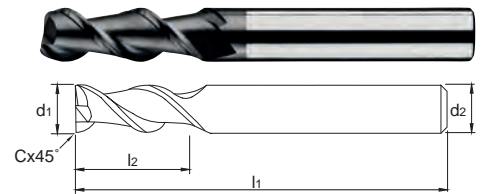
NL VHM Schachtfrees, 2-snijder extra lang, TiCN, Aluminium  
 FR Fraise à rainurer 2 dents Carbure extra longue, TiCN, Aluminium  
 ES Fresa de ranurad de 2 labios MD extra larga, TiCN, Aluminio  
 DE VHM Langlochfräser (2-Schneider) extra lang, TiCN, Aluminium



280-350 P	300-400 P	400-600 P
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Ref.	d1	d2	l1	l2	c	z
32.633.0100	1	6	40	3	0,025	2
32.633.0200	2	6	40	6	0,05	2
32.633.0300	3	6	50	11	0,05	2
32.633.0400	4	6	70	16	0,05	2

Ref.	d1	d2	l1	l2	c	z
32.633.0500	5	6	70	22	0,05	2
32.633.0600	6	6	70	22	0,05	2
32.633.0800	8	8	80	28	0,05	2
32.633.1000	10	10	90	32	0,1	2



### > 32.750 Phantom

NL VHM Schachtfrees, 2-snijder extra lang  
 FR Fraise à rainurer 2 dents Carbure extra longue  
 ES Fresa de ranurad de 2 labios MD extra larga  
 DE VHM Langlochfräser (2-Schneider) extra lang

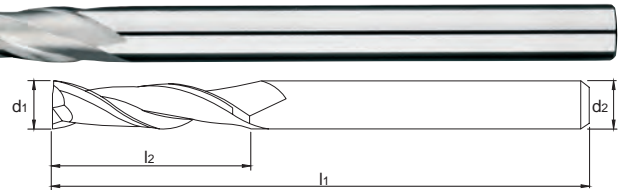


55-65 G	55-65 G	50-60 F	35-50 F	42-50 F	25-32 G	60-70 G	80-85 G	145-180 H	70-90 F	100-110 H	30-55 F	40-50 F
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Ref.	d1	d2	l1	l2	z
32.750.0300	3	3	75	30	2
32.750.0400	4	4	75	30	2
32.750.0500	5	5	100	40	2
32.750.0600	6	6	150	50	2

Ref.	d1	d2	l1	l2	z
32.750.0800	8	8	150	50	2
32.750.1000	10	10	150	60	2
32.750.1200	12	12	150	75	2
32.750.1400	14	14	150	65	2

Ref.	d1	d2	l1	l2	z
32.750.1600	16	16	150	65	2
32.750.1800	18	18	150	65	2
32.750.2000	20	20	150	65	2



### > 33.244 Phantom

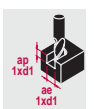
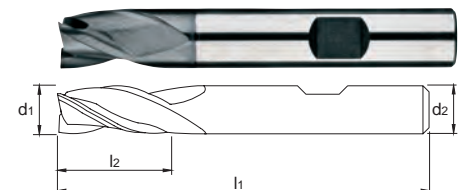
NL VHM Schachtfrees, 3-snijder kort, AlTiN-X  
 FR Fraise universelle 3 dents Carbure version courte, AlTiN-X  
 ES Fresa frontal de 3 labios MD corto, AlTiN-X  
 DE VHM Universalfräser kurz, AlTiN-X



100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G
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Ref.	d1	d2	l1	l2	z
33.244.0200	2	6	50	3	3
33.244.0300	3	6	50	4	3
33.244.0350	3.5	6	50	4	3
33.244.0400	4	6	54	5	3
33.244.0450	4.5	6	54	5	3
33.244.0500	5	6	54	6	3

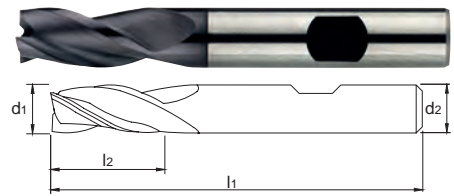
Ref.	d1	d2	l1	l2	z
33.244.0600	6	6	54	7	3
33.244.0700	7	8	58	8	3
33.244.0800	8	8	58	9	3
33.244.0900	9	10	66	10	3
33.244.1000	10	10	66	11	3
33.244.1200	12	12	73	12	3



Ref.	d1	d2	l1	l2	z
33.244.1400	14	14	75	14	3
33.244.1600	16	16	82	16	3
33.244.1800	18	18	84	18	3
33.244.2000	20	20	92	20	3

> **33.254 Phantom**

NL VHM Schachtfrees, 3-snijder lang, AITiN-X  
FR Fraise universelle 3 dents Carbure version longue, AITiN-X  
ES Fresa frontal de 3 labios MD larga, AITiN-X  
DE VHM Universalfräser lang, AITiN-X



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G

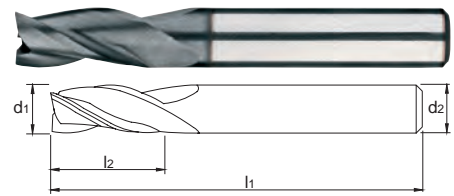


Ref.	d1	d2	l1	l2	z
33.254.0300	3	6	57	7	3
33.254.0400	4	6	57	8	3
33.254.0500	5	6	57	10	3
33.254.0600	6	6	57	10	3
33.254.0800	8	8	63	16	3

Ref.	d1	d2	l1	l2	z
33.254.1000	10	10	72	19	3
33.254.1200	12	12	83	22	3
33.254.1600	16	16	92	26	3
33.254.2000	20	20	104	32	3

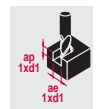
> **33.256 Phantom**

NL VHM Schachtfrees, 3-snijder AITiN-X  
FR Fraise universelle 3 dents Carbure AITiN-X  
ES Fresa frontal de 3 labios MD AITiN-X  
DE VHM Universalfräser AITiN-X



MG HM AITiN X NORM 30° h6

P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	100-110 K	50-90 I	80-90 G	25-35 H	30-40 G



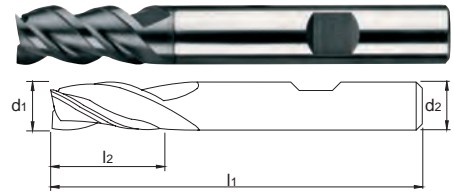
Ref.	d1	d2	l1	l2	z
33.256.0100	1	3	38	3	3
33.256.0150	1.5	3	38	4	3
33.256.0200	2	3	38	6	3
33.256.0250	2.5	3	38	7	3
33.256.0300	3	3	38	7	3
33.256.0350	3.5	3.5	50	7	3
33.256.0400	4	4	50	8	3
33.256.0450	4.5	4.5	50	8	3

Ref.	d1	d2	l1	l2	z
33.256.0500	5	5	50	10	3
33.256.0600	6	6	57	10	3
33.256.0700	7	7	60	13	3
33.256.0800	8	8	63	16	3
33.256.0900	9	9	67	16	3
33.256.1000	10	10	72	19	3
33.256.1100	11	11	83	22	3
33.256.1200	12	12	83	22	3

Ref.	d1	d2	l1	l2	z
33.256.1400	14	14	83	22	3
33.256.1600	16	16	92	26	3
33.256.1800	18	18	92	26	3
33.256.2000	20	20	104	32	3
33.256.2200	22	25	104	38	3
33.256.2500	25	25	104	38	3

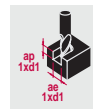
> **33.544 Phantom**

NL VHM Schachtfrees, 3-snijder lang, AITiN-X, roestvaststaal  
FR Fraise universelle 3 dents Carbure version longue, AITiN-X, Inox  
ES Fresa frontal de 3 labios MD larga, AITiN-X, acero inoxidable  
DE VHM Universalfräser lang, AITiN-X, rostfreien Stahl



MG HM AITiN X DIN 6527 45° DIN 6535-HB d1 h10 INOX

P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 52 CuAlFe	N 61 PVC	S 71 Ni/Co	S 72 Ti
80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	170-190 K	70-110 I	50-100 H	80-90 G	31-45 H	42-50 G



Ref.	d1	d2	l1	l2	z
33.544.0300	3	6	57	7	3
33.544.0400	4	6	57	8	3
33.544.0500	5	6	57	10	3

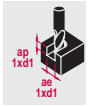
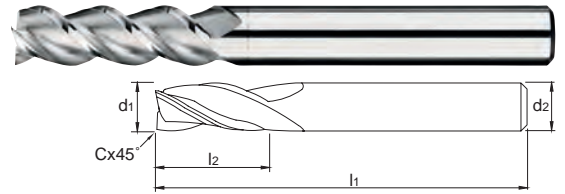
Ref.	d1	d2	l1	l2	z
33.544.0600	6	6	57	10	3
33.544.0800	8	8	63	16	3
33.544.1000	10	10	72	19	3

Ref.	d1	d2	l1	l2	z
33.544.1200	12	12	83	22	3
33.544.1600	16	16	92	26	3
33.544.2000	20	20	104	32	3



## > 33.633 Phantom

NL VHM Schachtfrees, 3-snijder lang, TiCN, Aluminium  
 FR Fraise universelle 3 dents Carbure version longue, TiCN, Aluminium  
 ES Fresa frontal de 3 labios MD larga, TiCN, Aluminio  
 DE VHM Universalfräser lang, TiCN, Aluminium



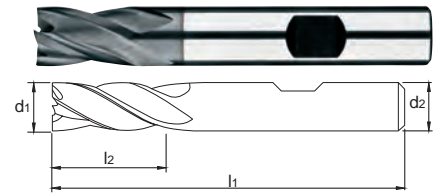
Ref.	d1	d2	l1	l2	c	z
33.633.0300	3	6	65	4	0,05	3
33.633.0400	4	6	65	16	0,05	3
33.633.0500	5	6	70	22	0,05	3

Ref.	d1	d2	l1	l2	c	z
33.633.0600	6	6	70	22	0,05	3
33.633.0800	8	8	80	28	0,05	3
33.633.1000	10	10	90	32	0,1	3

Ref.	d1	d2	l1	l2	c	z
33.633.1200	12	12	95	38	0,1	3
33.633.1600	16	16	110	52	0,1	3
33.633.2000	20	20	110	55	0,1	3

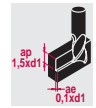
> **34.244 Phantom**

NL VHM Schachtfrees, 4-snijder kort, AITiN-X  
FR Fraise standard 4 dents Carbure version courte, AITiN-X  
ES Fresa frontal de varios labios MD corto, AITiN-X  
DE VHM 4 Schneiden-Schaftfräser kurz, AITiN-X



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



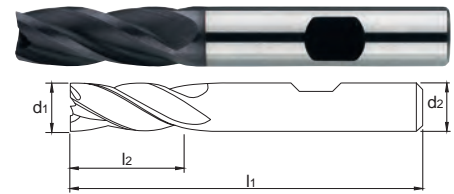
Ref.	d1	d2	l1	l2	z
34.244.0200	2	6	50	4	4
34.244.0300	3	6	50	5	4
34.244.0400	4	6	54	8	4
34.244.0500	5	6	54	9	4

Ref.	d1	d2	l1	l2	z
34.244.0600	6	6	54	10	4
34.244.0700	7	8	58	11	4
34.244.0800	8	8	58	12	4
34.244.0900	9	10	66	13	4

Ref.	d1	d2	l1	l2	z
34.244.1000	10	10	66	14	4
34.244.1200	12	12	73	16	4
34.244.1600	16	16	82	22	4
34.244.2000	20	20	92	26	4

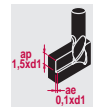
> **34.254 Phantom**

NL VHM Schachtfrees, 4-snijder lang, AITiN-X  
FR Fraise standard 4 dents Carbure version longue, AITiN-X  
ES Fresa frontal de varios labios MD larga, AITiN-X  
DE VHM 4 Schneiden-Schaftfräser lang, AITiN-X



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



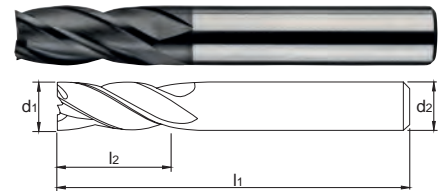
Ref.	d1	d2	l1	l2	z
34.254.0600	6	6	57	13	4
34.254.0800	8	8	63	19	4

Ref.	d1	d2	l1	l2	z
34.254.1000	10	10	72	22	4
34.254.1200	12	12	83	26	4

Ref.	d1	d2	l1	l2	z
34.254.1600	16	16	92	32	4
34.254.2000	20	20	104	38	4

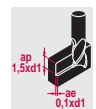
> **34.256 Phantom**

NL VHM Schachtfrees, 4-snijder AITiN-X  
FR Fraise standard 4 dents Carbure AITiN-X  
ES Fresa frontal de varios labios MD AITiN-X  
DE VHM 4 Schneiden-Schaftfräser AITiN-X



MG HM AITiN X NORM 30° h6 d1 h10

P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



Ref.	d1	d2	l1	l2	z
34.256.0100	1	4	40	3	4
34.256.0150	1.5	4	40	4.5	4
34.256.0200	2	2	32	8	4
34.256.0250	2.5	2.5	32	8	4
34.256.0300	3	3	32	12	4
34.256.0350	3.5	3.5	32	12	4
34.256.0400	4	4	40	12	4
34.256.0450	4.5	4.5	50	14	4

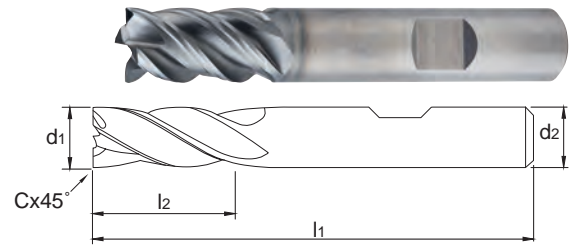
Ref.	d1	d2	l1	l2	z
34.256.0500	5	5	50	14	4
34.256.0600	6	6	50	16	4
34.256.0700	7	7	60	20	4
34.256.0800	8	8	60	20	4
34.256.0900	9	9	60	20	4
34.256.1000	10	10	70	22	4
34.256.1100	11	11	70	22	4
34.256.1200	12	12	70	22	4

Ref.	d1	d2	l1	l2	z
34.256.1400	14	14	75	25	4
34.256.1600	16	16	75	25	4
34.256.1800	18	18	75	25	4
34.256.2000	20	20	100	32	4
34.256.2200	22	25	100	32	4
34.256.2500	25	25	150	45	4



### > 34.302 Phantom

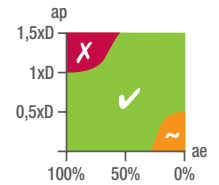
NL HP2 UNI VHM Vari-frees, 4-snijder 1,5xD, AlCrN  
 FR Fraise Vari 4 dents Carbure 1,5xD HP2 UNI, AlCrN  
 ES Fresa Vari MD 1,5xD HP2 UNI, AlCrN  
 DE HP2 UNI VHM Fräser mit ungleicher Teilung 1,5xD, AlCrN



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
180-240 L	160-220 L	150-200 K	100-140 K	80-140 I	60-120 H	120-180 J	80-130 J	40-60 J	60-80 I

Ref.	d1	d2	l1	l2	c	z
34.302.0300	3	6	50	5	0,05	4
34.302.0400	4	6	54	8	0,05	4
34.302.0500	5	6	54	9	0,1	4
34.302.0600	6	6	54	10	0,1	4
34.302.0800	8	8	58	12	0,2	4

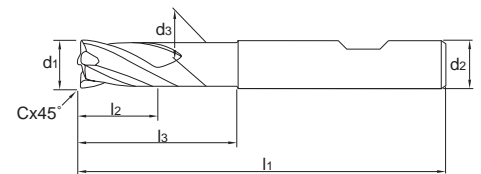
**NIEUW NOUVEAU NUEVO NEU**



Ref.	d1	d2	l1	l2	c	z
34.302.1000	10	10	66	17	0,25	4
34.302.1200	12	12	73	20	0,3	4
34.302.1600	16	16	82	26	0,4	4
34.302.2000	20	20	92	32	0,5	4

### > 34.314 Phantom

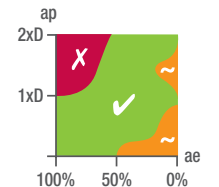
NL HP2 UNI VHM Vari-frees, 4-snijder 2xD/3xD, AlCrN  
 FR Fraise Vari Carbure 2xD/3xD HP2 UNI, AlCrN  
 ES Fresa Vari MD 2xD/3xD HP2 UNI, AlCrN  
 DE HP2 UNI VHM Fräser mit ungleicher Drallsteigung 2xD/3xD, AlCrN



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
180-240 L	160-220 L	150-200 K	100-140 K	80-140 I	60-120 H	120-180 J	80-130 J	40-60 J	60-80 I

Ref.	d1	d2	d3	l1	l2	l3	c	z
34.314.0300	3	6	2.9	57	6	9	0,03	4
34.314.0400	4	6	3.8	57	8	12	0,04	4
34.314.0500	5	6	4.8	57	10	15	0,05	4
34.314.0600	6	6	5.6	57	12	18	0,06	4
34.314.0800	8	8	7.6	63	16	24	0,08	4
34.314.1000	10	10	9.5	72	20	30	0,1	4

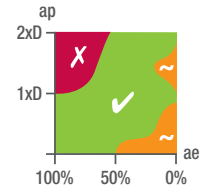
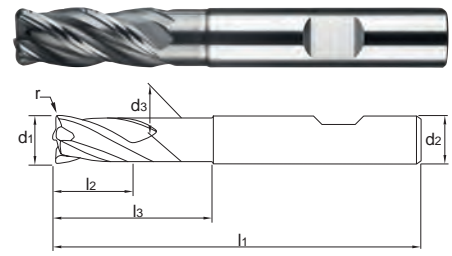
**NIEUW NOUVEAU NUEVO NEU**



Ref.	d1	d2	d3	l1	l2	l3	c	z
34.314.1200	12	12	11.5	83	24	36	0,12	4
34.314.1400	14	14	13.5	93	28	42	0,15	4
34.314.1600	16	16	15.3	108	32	48	0,16	4
34.314.1800	18	18	17.5	108	36	54	0,2	4
34.314.2000	20	20	19.3	126	40	60	0,2	4

» **34.316 Phantom**

NL HP2 UNI VHM Vari-frees, 4-snijder 2xD/3xD, AlCrN, snijkantradius  
 FR Fraise Vari Carbure 2xD/3xD HP2 UNI, AlCrN, à rayon  
 ES Fresa Vari MD 2xD/3xD HP2 UNI, AlCrN, radio de corte  
 DE HP2 UNI VHM Fräser mit ungleicher Drallsteigung 2xD/3xD, AlCrN, Radius an der Schneidenecke



**NIEUW / NOUVEAU / NUEVO / NEU**

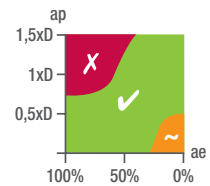
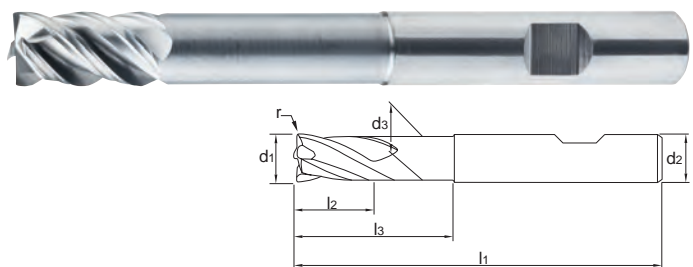
**P 11** **P 12** **P 13** **P 14** **M 21** **M 22** **K 31** **K 32** **S 71** **S 72**
  
 s500 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> INOX s850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Ni/Co Ti

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.316.0303	3	6	2.9	57	6	9	0.25	4
34.316.0305	3	6	2.9	57	6	9	0.5	4
34.316.0310	3	6	2.9	57	6	9	1	4
34.316.0403	4	6	3.8	57	8	12	0.25	4
34.316.0405	4	6	3.8	57	8	12	0.5	4
34.316.0410	4	6	3.8	57	8	12	1	4
34.316.0415	4	6	3.8	57	8	12	1.5	4
34.316.0503	5	6	4.8	57	10	15	0.25	4
34.316.0505	5	6	4.8	57	10	15	0.5	4
34.316.0510	5	6	4.8	57	10	15	1	4
34.316.0603	6	6	5.6	57	12	18	0.25	4
34.316.0605	6	6	5.6	57	12	18	0.5	4
34.316.0608	6	6	5.6	57	12	18	0.8	4
34.316.0610	6	6	5.6	57	12	18	1	4
34.316.0615	6	6	5.6	57	12	18	1.5	4
34.316.0620	6	6	5.6	57	12	18	2	4
34.316.0803	8	8	7.6	63	16	24	0.25	4
34.316.0805	8	8	7.6	63	16	24	0.5	4
34.316.0808	8	8	7.6	63	16	24	0.8	4
34.316.0810	8	8	7.6	63	16	24	1	4
34.316.0815	8	8	7.6	63	16	24	1.5	4
34.316.0820	8	8	7.6	63	16	24	2	4
34.316.0830	8	8	7.6	63	16	24	3	4
34.316.1003	10	10	9.5	72	20	30	0.25	4
34.316.1005	10	10	9.5	72	20	30	0.5	4
34.316.1008	10	10	9.5	72	20	30	0.8	4
34.316.1010	10	10	9.5	72	20	30	1	4
34.316.1013	10	10	9.5	72	20	30	1.25	4
34.316.1015	10	10	9.5	72	20	30	1.5	4
34.316.1020	10	10	9.5	72	20	30	2	4
34.316.1025	10	10	9.5	72	20	30	2.5	4
34.316.1030	10	10	9.5	72	20	30	3	4
34.316.1203	12	12	11.5	83	24	36	0.25	4

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.316.1205	12	12	11.5	83	24	36	0.5	4
34.316.1208	12	12	11.5	83	24	36	0.8	4
34.316.1210	12	12	11.5	83	24	36	1	4
34.316.1213	12	12	11.5	83	24	36	1.25	4
34.316.1215	12	12	11.5	83	24	36	1.5	4
34.316.1220	12	12	11.5	83	24	36	2	4
34.316.1225	12	12	11.5	83	24	36	2.5	4
34.316.1230	12	12	11.5	83	24	36	3	4
34.316.1235	12	12	11.5	83	24	36	3.5	4
34.316.1240	12	12	11.5	83	24	36	4	4
34.316.1250	12	12	11.5	83	24	36	5	4
34.316.1605	16	16	15.3	108	32	48	0.5	4
34.316.1608	16	16	15.3	108	32	48	0.8	4
34.316.1610	16	16	15.3	108	32	48	1	4
34.316.1615	16	16	15.3	108	32	48	1.5	4
34.316.1620	16	16	15.3	108	32	48	2	4
34.316.1625	16	16	15.3	108	32	48	2.5	4
34.316.1630	16	16	15.3	108	32	48	3	4
34.316.1635	16	16	15.3	108	32	48	3.5	4
34.316.1640	16	16	15.3	108	32	48	4	4
34.316.1645	16	16	15.3	108	32	48	4.5	4
34.316.1650	16	16	15.3	108	32	48	5	4
34.316.2005	20	20	19.3	126	40	60	0.5	4
34.316.2008	20	20	19.3	126	40	60	0.8	4
34.316.2010	20	20	19.3	126	40	60	1	4
34.316.2015	20	20	19.3	126	40	60	1.5	4
34.316.2020	20	20	19.3	126	40	60	2	4
34.316.2025	20	20	19.3	126	40	60	2.5	4
34.316.2030	20	20	19.3	126	40	60	3	4
34.316.2035	20	20	19.3	126	40	60	3.5	4
34.316.2040	20	20	19.3	126	40	60	4	4
34.316.2045	20	20	19.3	126	40	60	4.5	4
34.316.2050	20	20	19.3	126	40	60	5	4

» **34.318 Phantom**

NL HP2 UNI VHM Vari-frees, 4-snijder 1,5xD/5xD, AlCrN  
 FR Fraise Vari 4 dents Carbure 1,5xD/5xD HP2 UNI, AlCrN  
 ES Fresa Vari MD 1,5xD/5xD HP2 UNI, AlCrN  
 DE HP2 UNI VHM Fräser mit ungleicher Teilung 1,5xD/5xD, AlCrN



**NIEUW / NOUVEAU / NUEVO / NEU**

**P 11** **P 12** **P 13** **P 14** **M 21** **M 22** **K 31** **K 32** **S 71** **S 72**
  
 s600 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> INOX s850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Ni/Co Ti

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.318.0300	3	6	2.8	57	5	15	0.1	4
34.318.0400	4	6	3.8	62	8	20	0.1	4
34.318.0500	5	6	4.8	70	9	25	0.1	4
34.318.0600	6	6	5.7	70	10	30	0.1	4

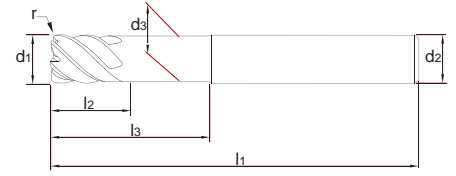
Ref.	d1	d2	d3	l1	l2	l3	r	z
34.318.0800	8	8	7.6	80	12	40	0.2	4
34.318.1000	10	10	9.5	90	17	50	0.2	4
34.318.1200	12	12	11.5	110	20	60	0.25	4
34.318.1600	16	16	15.5	130	26	80	0.5	4





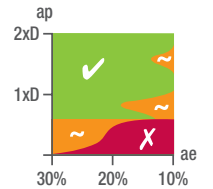
> 34.330 **Phantom**

NL HP2 UNI VHM Trochoïdaal-frees 2xD, AlCrN  
 FR Fraise-trochoïdale Carbure 2xD HP2 UNI, AlCrN  
 ES Fresa trocoidal MD 2xD HP2 UNI, AlCrN  
 DE HP2 UNI VHM Trochoidaler-Schaftfräser 2xD, AlCrN



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
180-240 L	160-220 L	150-200 K	100-140 K	80-140 I	60-120 H	120-180 J	80-130 J	40-60 J	60-80 I

**NIEUW NOUVEAU NUEVO NEU**

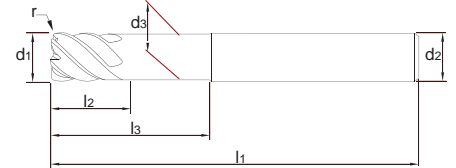


Ref.	d1	d2	d3	l1	l2	l3	r	z
34.330.0301	3	6	2.8	57	6	14		6
34.330.0401	4	6	3.8	57	8	16		6
34.330.0501	5	6	4.8	57	10	18		6
34.330.0601	6	6	5.7	57	12	19	0.1	6

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.330.0802	8	8	7.6	63	16	25	0.2	6
34.330.1002	10	10	9.5	72	20	30	0.2	6
34.330.1203	12	12	11.5	83	24	36	0.25	6
34.330.1605	16	16	15.5	92	32	42	0.5	6

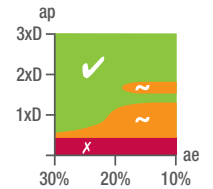
> 34.331 **Phantom**

NL HP2 UNI VHM Trochoïdaal-frees 3xD, AlCrN  
 FR Fraise-trochoïdale Carbure 3xD HP2 UNI, AlCrN  
 ES Fresa trocoidal MD 3xD HP2 UNI, AlCrN  
 DE HP2 UNI VHM Trochoidaler-Schaftfräser 3xD, AlCrN



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
180-240 L	160-220 L	150-200 K	100-140 K	80-140 I	60-120 H	120-180 J	80-130 J	40-60 J	60-80 I

**NIEUW NOUVEAU NUEVO NEU**

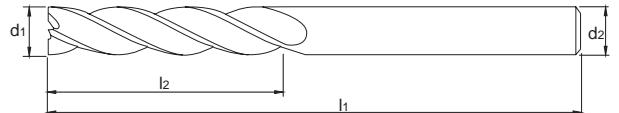


Ref.	d1	d2	d3	l1	l2	l3	r	z
34.331.0301	3	6	2.8	62	9	14		6
34.331.0401	4	6	3.8	62	12	18		6
34.331.0501	5	6	4.8	62	15	21		6
34.331.0601	6	6	5.7	62	18	24	0.1	6

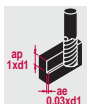
Ref.	d1	d2	d3	l1	l2	l3	r	z
34.331.0802	8	8	7.6	68	24	30	0.2	6
34.331.1002	10	10	9.5	80	30	38	0.2	6
34.331.1203	12	12	11.5	93	36	46	0.25	6
34.331.1605	16	16	15.5	108	48	58	0.5	6

> 34.375 **Phantom**

NL VHM Schachtfrees, 4-snijder extra lang  
 FR Fraise standard 4 dents Carbure extra longue  
 ES Fresa frontal de varios labios MD extra larga  
 DE VHM 4 Schneiden-Schaftfräser extra lang



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
55-65 G	55-65 G	50-60 F	35-50 F	42-50 F	25-32 G	60-70 G	80-85 G	145-180 H	70-90 F	100-110 H	30-55 F	40-50 F



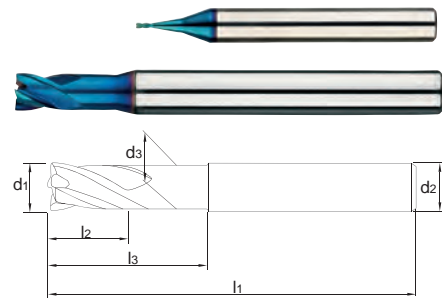
Ref.	d1	d2	l1	l2	z
34.375.0300	3	3	75	30	4
34.375.0400	4	4	75	30	4
34.375.0500	5	5	100	40	4
34.375.0600	6	6	150	50	4

Ref.	d1	d2	l1	l2	z
34.375.0800	8	8	150	50	4
34.375.1000	10	10	150	60	4
34.375.1200	12	12	150	75	4
34.375.1400	14	14	150	65	4

Ref.	d1	d2	l1	l2	z
34.375.1600	16	16	150	65	4
34.375.1800	18	18	150	65	4
34.375.2000	20	20	150	65	4

> **34.400 Phantom**

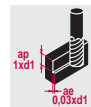
- NL VHM HSC Schachtfrees, 4-snijder TiAlN-B, verjongde schacht (nek), 45-70 HRc
- FR Fraise UGV 4 dents Carbure TiAlN-B, queue détalonnée, 45-70 HRc
- ES Fresa integral MAV MD TiAlN-B, mango rebajado (cuello), 45-70 HRc
- DE VHM HSC High-Speed Schafffräser TiAlN-B, abgesetztem Schaft, 45-70 HRc



NG HM TiAlN B NORM 30° h6 HSC

P 14 H 15  
S1400 N/mm<sup>2</sup> HRC

150-210 K 80-120 F

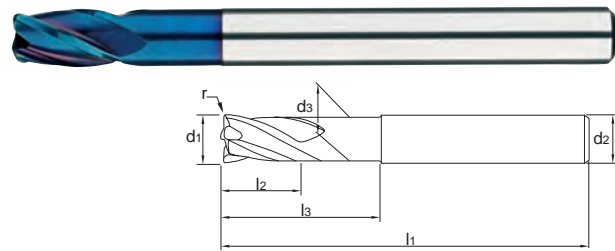


Ref.	d1	d2	d3	l1	l2	l3	z
34.400.0100	1	6	0.95	50	1.5	3	4
34.400.0200	2	6	1.95	50	2	5	4
34.400.0300	3	6	2.85	55	3	8	4
34.400.0400	4	6	3.85	55	4	10	4
34.400.0500	5	6	4.85	55	5	13	4
34.400.0600	6	6	5.85	55	6	15	4

Ref.	d1	d2	d3	l1	l2	l3	z
34.400.0800	8	8	7.7	65	8	20	4
34.400.1000	10	10	9.7	75	10	25	4
34.400.1200	12	12	11.7	85	12	28	4
34.400.1600	16	16	15.7	90	16	32	4
34.400.2000	20	20	19.7	105	20	40	4

> **34.410 Phantom**

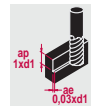
- NL VHM HSC Torusfrees, 4-snijder verjongde schacht (nek), TiAlN-B, 45-70 HRc
- FR Fraise torique UGV 4 dents Carbure queue détalonnée, TiAlN-B, 45-70 HRc
- ES Fresa tórica MAV MD mango rebajado (cuello), TiAlN-B, 45-70 HRc
- DE VHM HSC Torusfräser abgesetztem Schaft, TiAlN-B, 45-70 HRc



NG HM TiAlN B NORM r 30° h6 HSC

P 14 H 15  
S1400 N/mm<sup>2</sup> HRC

150-210 K 80-120 F

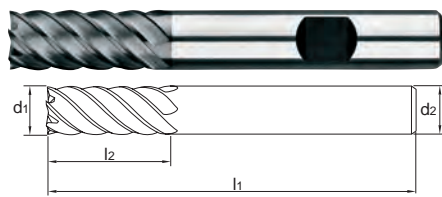


Ref.	d1	d2	d3	l1	l2	l3	r	z
34.410.0605	6	6	5.85	90	9	20	0.5	4
34.410.0610	6	6	5.85	90	9	20	1	4
34.410.0805	8	8	7.7	100	12	25	0.5	4
34.410.0810	8	8	7.7	100	12	25	1	4
34.410.1005	10	10	9.7	100	15	32	0.5	4

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.410.1010	10	10	9.7	100	15	32	1	4
34.410.1020	10	10	9.7	100	15	32	2	4
34.410.1205	12	12	11.7	110	15	38	0.5	4
34.410.1210	12	12	11.7	110	18	38	1	4
34.410.1220	12	12	11.7	110	18	38	2	4

> **34.424 Phantom**

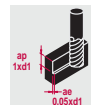
- NL VHM Schachtfrees, meersnijder lang, AlTiN-X, HRC, 30-65 HRc
- FR Fraise standard Carbure version longue, AlTiN-X, HRC, 30-65 HRc
- ES Fresa frontal de varios labios MD larga, AlTiN-X, HRC, 30-65 HRc
- DE VHM Mehrschneiden-Schafffräser lang, AlTiN-X, HRC, 30-65 HRc



MG HM AlTiN X NORM 45° DIN 6535-HB d1 +0.00 -0.03 HRC

P 13 P 14 H 15  
S1000 N/mm<sup>2</sup> S1400 N/mm<sup>2</sup> HRC

105-120 O 85-105 N 20-30 H



Ref.	d1	d2	l1	l2	z
34.424.0600	6	6	57	13	6
34.424.0800	8	8	63	19	6
34.424.1000	10	10	72	22	6

Ref.	d1	d2	l1	l2	z
34.424.1200	12	12	83	26	6
34.424.1400	14	16	83	26	6
34.424.1600	16	16	92	32	6

Ref.	d1	d2	l1	l2	z
34.424.2000	20	20	104	38	8



### > 34.464 Phantom

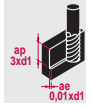
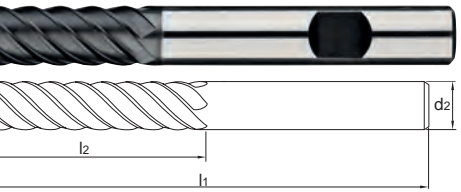
- NL VHM Schachtfrees, meersnijder extra lang, AlTiN-X, HRC, 30-65 HRC  
 FR Fraise standard Carbure extra longue, AlTiN-X, HRC, 30-65 HRC  
 ES Fresa frontal de varios labios MD extra larga, AlTiN-X, HRC, 30-65 HRC  
 DE VHM Mehrschneiden-Schafffräser extra lang, AlTiN-X, HRC, 30-65 HRC



105-120 0	75-85 N	20-30 H
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Ref.	d1	d2	l1	l2	z
34.464.0600	6	6	70	26	6
34.464.0800	8	8	90	36	6
34.464.1000	10	10	100	46	6

Ref.	d1	d2	l1	l2	z
34.464.1200	12	12	110	56	6
34.464.1600	16	16	130	66	6
34.464.2000	20	20	140	76	6



### > 34.510 Phantom

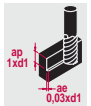
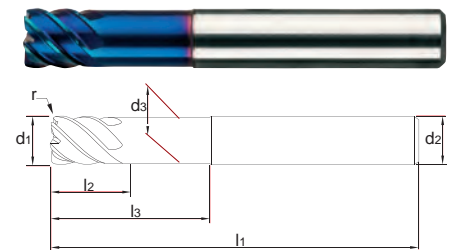
- NL VHM HSC Torusfrees, 6-snijder verjongde schacht (nek), TiAlN-B, 45-70 HRC  
 FR Fraise torique UGV, 6 dents Carbure queue détalonnée, TiAlN-B, 45-70 HRC  
 ES Fresa tórica MAV MD mango rebajado (cuello), TiAlN-B, 45-70 HRC  
 DE VHM HSC Torusfräser abgesetztem Schaft, TiAlN-B, 45-70 HRC



330-475 K	200-330 I
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Ref.	d1	d2	d3	l1	l2	l3	r	z
34.510.0620	6	6	5.85	50	6	14	0.5	6
34.510.0820	8	8	7.7	60	8	24	0.5	6

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.510.1030	10	10	9.7	70	10	30	1	6
34.510.1230	12	12	11.7	75	12	30	1	6



### > 34.515 Phantom

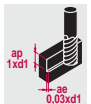
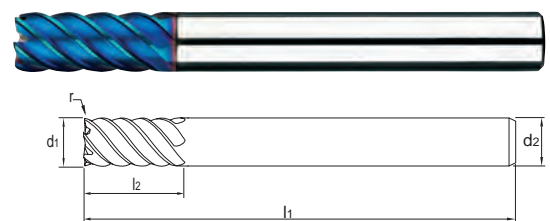
- NL VHM HSC Schachtfrees, 6-snijder TiAlN-B, snijkantradius, 45-70 HRC  
 FR Fraise UGV 6 dents Carbure TiAlN-B, à rayon, 45-70 HRC  
 ES Fresa integral MAV MD TiAlN-B, radio de corte, 45-70 HRC  
 DE VHM HSC High-Speed Schafffräser TiAlN-B, Radius an der Schneidenecke, 45-70 HRC



330-475 K	200-330 I
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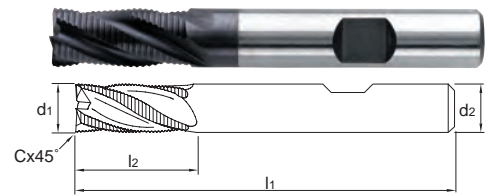
Ref.	d1	d2	l1	l2	r	z
34.515.0621	6	6	70	13	0.5	6
34.515.0622	6	6	70	26	0.5	6
34.515.0821	8	8	90	19	0.5	6
34.515.0822	8	8	90	36	0.5	6
34.515.1021	10	10	100	22	0.5	6
34.515.1032	10	10	100	22	1	6

Ref.	d1	d2	l1	l2	r	z
34.515.1033	10	10	100	46	1	6
34.515.1221	12	12	110	26	0.5	6
34.515.1232	12	12	110	26	1	6
34.515.1233	12	12	110	56	1	6
34.515.1631	16	16	130	32	1	6
34.515.1642	16	16	130	32	1.5	6

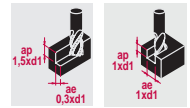


> **35.244 Phantom**

NL VHM Ruwfree TiAIN, fijn, staal  
FR Fraise d'ébauche Carbure TiAIN, pas fin, acier  
ES Fresa de desbaste MD TiAIN, paso fino, acero  
DE VHM Schruppfräser TiAIN, fein, Stahl



<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW
90-110 I	95-110 H	70-80 G	60-80 F	55-60 G	40-50 F	130-140 J	100-130 I



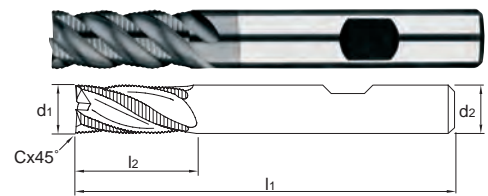
Ref.	d1	d2	l1	l2	c	z
35.244.0400	4	6	57	11	x	3
35.244.0500	5	6	57	13	x	3
35.244.0600	6	6	57	16	0,4	3

Ref.	d1	d2	l1	l2	c	z
35.244.0800	8	8	63	16	0,4	3
35.244.1000	10	10	72	22	0,6	4
35.244.1200	12	12	83	26	0,6	4

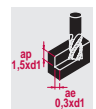
Ref.	d1	d2	l1	l2	c	z
35.244.1400	14	14	83	26	0,6	4
35.244.1600	16	16	92	32	0,6	4
35.244.2000	20	20	104	38	0,6	4

> **35.484 Phantom**

NL VHM Ruwfree TiAIN, fijn, roestvaststaal  
FR Fraise d'ébauche Carbure TiAIN, pas fin, Inox  
ES Fresa de desbaste MD TiAIN, paso fino, acero inoxidable  
DE VHM Schruppfräser TiAIN, fein, rostfreien Stahl



<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
70-80 H	80-100 I	70-100 H	50-80 J	40-60 I	35-40 I	50-65 I



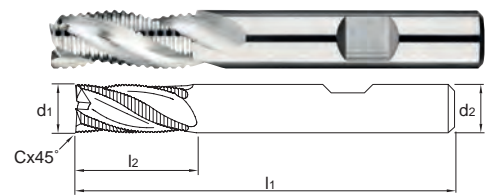
Ref.	d1	d2	l1	l2	c	z
35.484.0400	4	6	57	11	0,1	3
35.484.0500	5	6	57	13	0,15	4
35.484.0600	6	6	57	16	0,15	4

Ref.	d1	d2	l1	l2	c	z
35.484.0800	8	8	63	16	0,2	4
35.484.1000	10	10	72	22	0,2	4
35.484.1200	12	12	83	26	0,2	4

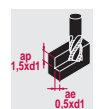
Ref.	d1	d2	l1	l2	c	z
35.484.1400	14	14	83	26	0,2	5
35.484.1600	16	16	92	32	0,2	5
35.484.2000	20	20	104	38	0,2	6

> **35.540 Phantom**

NL VHM Ruwfree rond, Aluminium  
FR Fraise d'ébauche Carbure ronde, Aluminium  
ES Fresa de desbaste MD redondo, Aluminio  
DE VHM Schruppfräser rund, Aluminium



<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
250-270 N	160-180 M	115-130 J	115-130 L	250-270 N



Ref.	d1	d2	l1	l2	c	z
35.540.0600	6	6	57	13	0,6	3
35.540.0800	8	8	63	16	0,6	3

Ref.	d1	d2	l1	l2	c	z
35.540.1000	10	10	72	22	0,6	3
35.540.1200	12	12	83	26	0,6	3

Ref.	d1	d2	l1	l2	c	z
35.540.1600	16	16	92	32	0,9	3
35.540.2000	20	20	104	38	0,9	3



### > 35.852 Phantom

NL VHM Router zonder kopvertanding  
 FR Fraise à contourner Carbure sans denture en bout  
 ES Fresa de contornear MD sin corte al centro  
 DE VHM Router ohne Kopfverzahnung



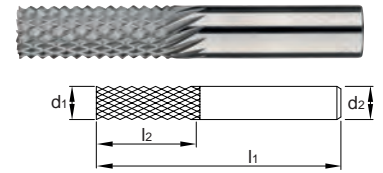
N 62  
 GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.852.0300	3	3	45	13
35.852.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.852.0600	6	6	63	19
35.852.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.852.1000	10	10	63	25
35.852.1200	12	12	75	30



### > 35.860 Phantom

NL VHM Router met kopvertanding  
 FR Fraise à contourner Carbure avec denture en bout  
 ES Fresa de contornear MD con corte al centro  
 DE VHM Router mit Stirnverzahnung



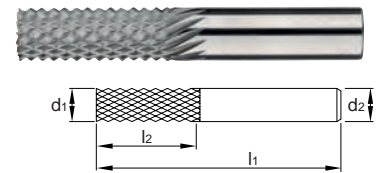
N 62  
 GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.860.0300	3	3	45	13
35.860.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.860.0600	6	6	63	19
35.860.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.860.1000	10	10	63	25
35.860.1200	12	12	75	30



### > 35.868 Phantom

NL VHM Router met boorpunt  
 FR Fraise à contourner Carbure avec pointe de perçage  
 ES Fresa de contornear MD con punta de taladro  
 DE VHM Router mit Bohrspitze



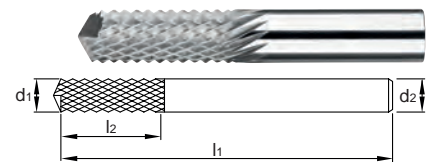
N 62  
 GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.868.0300	3	3	45	13
35.868.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.868.0600	6	6	63	19
35.868.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.868.1000	10	10	63	25
35.868.1200	12	12	75	30



### > 35.876 Phantom

NL VHM Router twee snijkanten, kopvertanding  
 FR Fraise à contourner Carbure à deux taillants, denture en bout  
 ES Fresa de contornear MD con dos labios, corte al centro  
 DE VHM Router zwei Schneiden, Kopfverzahnung



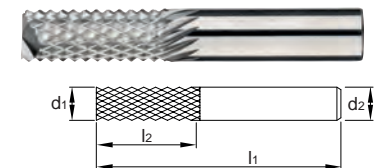
N 62  
 GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.876.0300	3	3	45	13
35.876.0400	4	4	50	16

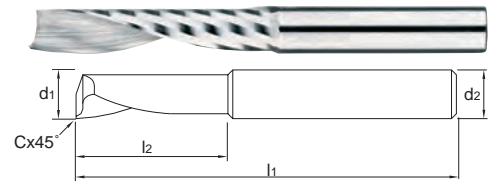
Ref.	d1	d2	l1	l2
35.876.0600	6	6	63	19
35.876.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.876.1000	10	10	63	25
35.876.1200	12	12	75	30



> **36.130 Phantom**

NL VHM Eensnijderfrees Aluminium  
FR Fraise à 1 dent Carbure Aluminium  
ES Fresa frontal de 1 labio MD Aluminio  
DE VHM Einzahnfräser Aluminium



MG HM NORM h6 ALU

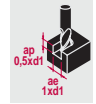
N 41 Alu N 61 PVC

300-450 H 300-450 H

Ref.	d1	d2	l1	l2	z
36.130.0201	2	2	50	8	1
36.130.0202	2	6	64	8	1
36.130.0251	2.5	2.5	50	8	1
36.130.0252	2.5	6	64	8	1
36.130.0301	3	3	50	8	1
36.130.0302	3	6	64	8	1
36.130.0303	3	3	64	12	1
36.130.0304	3	6	64	12	1

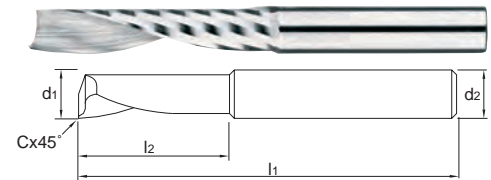
Ref.	d1	d2	l1	l2	z
36.130.0401	4	4	64	8	1
36.130.0402	4	4	64	12	1
36.130.0403	4	4	64	20	1
36.130.0404	4	6	64	20	1
36.130.0405	4	4	64	30	1
36.130.0501	5	5	64	16	1
36.130.0502	5	6	64	16	1
36.130.0503	5	5	64	30	1

Ref.	d1	d2	l1	l2	z
36.130.0602	6	6	64	12	1
36.130.0603	6	6	64	20	1
36.130.0604	6	6	76	30	1
36.130.0605	6	6	76	38	1
36.130.0801	8	8	64	25	1
36.130.0802	8	8	76	38	1
36.130.1001	10	10	76	30	1



> **36.140 Phantom**

NL VHM Eensnijderfrees Aluminium  
FR Fraise à 1 dent Carbure Aluminium  
ES Fresa frontal de 1 labio MD Aluminio  
DE VHM Einzahnfräser Aluminium



MG HM NORM Cx45 h6 ALU

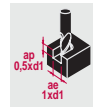
N 41 Alu N 42 Alu Si>10% N 61 PVC

300-450 H 145-220 I 300-450 H

Ref.	d1	d2	l1	l2	c	z
36.140.0200	2	3	50	8	0,05	1
36.140.0250	2.5	3	40	12	0,05	1
36.140.0300	3	3	50	12	0,05	1

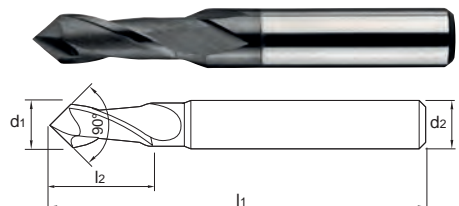
Ref.	d1	d2	l1	l2	c	z
36.140.0400	4	4	60	15	0,1	1
36.140.0500	5	5	60	17	0,1	1
36.140.0600	6	6	65	20	0,1	1

Ref.	d1	d2	l1	l2	c	z
36.140.0800	8	8	65	22	0,15	1
36.140.1000	10	10	75	25	0,15	1
36.140.1200	12	12	80	30	0,15	1



> **36.164 Phantom**

NL VHM Multi-frees AlTiN-X, 90°  
FR Fraise Multi Carbure AlTiN-X, 90°  
ES Fresa para ranuras MD AlTiN-X, 90°  
DE VHM Multifräser AlTiN-X, 90°



MG HM AlTiN X NORM h6

P 11 5800 N/mm² P 12 5850 N/mm² P 13 51900 N/mm² P 14 51400 N/mm² M 21 INOX <850N/mm² M 22 INOX >850N/mm² N 41 Alu N 42 Alu Si>10% N 51 Cu N 61 PVC S 71 Ni/Co S 72 Ti

70-75 S 40-60 S 35-40 S 30-35 Q 30-35 Q 25-30 P 150-180 S 120-150 S 50-120 S 150-180 S 20-25 P 30-35 P

Ref.	d1	d2	l1	l2	z
36.164.0300	3	4	50	6	2
36.164.0400	4	5	50	8	2
36.164.0500	5	6	50	10	2
36.164.0600	6	8	60	12	2

Ref.	d1	d2	l1	l2	z
36.164.0800	8	10	70	16	2
36.164.1000	10	12	70	18	2
36.164.1200	12	12	70	20	2
36.164.1400	14	14	80	24	2

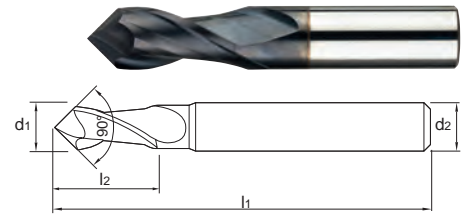
Ref.	d1	d2	l1	l2	z
36.164.1600	16	16	80	26	2
36.164.2000	20	20	100	32	2





**> 36.166 Phantom**

NL VHM Multi-plus frees AITiN-X, 90°  
 FR Fraise Multi PLUS Carbure AITiN-X, 90°  
 ES Fresa Multi PLUS MD AITiN-X, 90°  
 DE VHM Multi-plus fräser AITiN-X, 90°



MG HM AITiN X NORM 30° h6

P 11	P 12	P 13	P 14	M 21	M 22	N 41	N 42	N 51	N 61	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	Alu	Alu Si>10%	Cu	PVC	Ni/Co	Ti
70-75 S	40-60 S	35-40 S	30-35 Q	30-35 Q	25-30 P	150-180 S	120-150 S	50-120 S	150-180 S	20-25 P	30-35 P

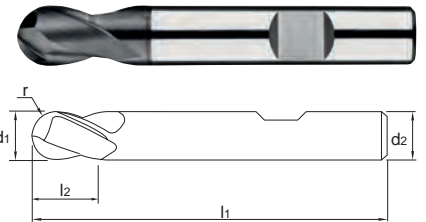
Ref.	d1	d2	l1	l2	z
36.166.0050	0.5	3	39	1	2
36.166.0100	1	3	39	2	2
36.166.0150	1.5	3	39	3	2
36.166.0200	2	3	39	4	2
36.166.0250	2.5	3	39	5	2

Ref.	d1	d2	l1	l2	z
36.166.0300	3	4	50	6	2
36.166.0400	4	5	50	8	2
36.166.0500	5	6	50	10	2
36.166.0600	6	8	60	12	2
36.166.0800	8	10	70	16	2

Ref.	d1	d2	l1	l2	z
36.166.1000	10	12	70	18	2
36.166.1200	12	12	70	20	2
36.166.1600	16	16	80	26	2
36.166.2000	20	20	100	32	2

**> 36.244 Phantom**

NL VHM Radiusfrees, 2-snijder kort, AITiN-X  
 FR Fraise à rayon 2 dents Carbure version courte, AITiN-X  
 ES Fresa de punta esférica MD corto, AITiN-X  
 DE VHM 2 Schneiden Radiusfräser kurz, AITiN-X



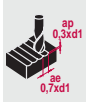
MG HM AITiN X DIN 6527 30° h6 r ±0,02 d1 h10

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ni/Co	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G

Ref.	d1	d2	l1	l2	r	z
36.244.0200	2	6	50	3	1	2
36.244.0300	3	6	50	4	1.5	2
36.244.0400	4	6	54	5	2	2
36.244.0500	5	6	54	6	2.5	2

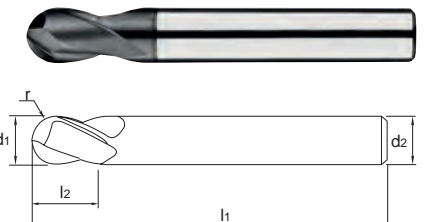
Ref.	d1	d2	l1	l2	r	z
36.244.0600	6	6	54	7	3	2
36.244.0800	8	8	58	9	4	2
36.244.1000	10	10	66	11	5	2
36.244.1200	12	12	73	12	6	2

Ref.	d1	d2	l1	l2	r	z
36.244.1400	14	14	75	14	7	2
36.244.1600	16	16	82	16	8	2
36.244.1800	18	18	84	18	9	2
36.244.2000	20	20	92	20	10	2



**> 36.256 Phantom**

NL VHM Radiusfrees, 2-snijder TiAIN  
 FR Fraise à rayon 2 dents Carbure TiAIN  
 ES Fresa de punta esférica MD TiAIN  
 DE VHM 2 Schneiden Radiusfräser TiAIN



MG HM TiAIN NORM 30° h6 r ±0,02 d1 +0,00 -0,03

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ni/Co	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G

Ref.	d1	d2	l1	l2	r	z
36.256.0100	1	3	39	3	0.5	2
36.256.0150	1.5	3	39	5	0.75	2
36.256.0200	2	3	39	7	1	2
36.256.0250	2.5	3	39	8	1.25	2
36.256.0300	3	3	39	9	1.5	2
36.256.0350	3.5	4	51	12	1.75	2
36.256.0400	4	4	51	14	2	2
36.256.0450	4.5	5	51	14	2.25	2

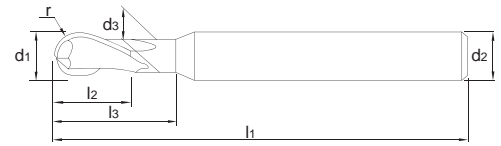
Ref.	d1	d2	l1	l2	r	z
36.256.0500	5	5	51	16	2.5	2
36.256.0600	6	6	64	19	3	2
36.256.0700	7	7	64	19	3.5	2
36.256.0800	8	8	64	21	4	2
36.256.0900	9	10	70	22	4.5	2
36.256.1000	10	10	70	22	5	2
36.256.1100	11	11	70	25	5.5	2
36.256.1200	12	12	76	25	6	2

Ref.	d1	d2	l1	l2	r	z
36.256.1400	14	14	89	30	7	2
36.256.1600	16	16	89	32	8	2
36.256.1800	18	18	102	32	9	2
36.256.2000	20	20	102	38	10	2
36.256.2200	22	22	102	38	11	2
36.256.2500	25	25	102	38	12.5	2



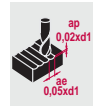
> **36.275 Phantom**

NL VHM Precisie HSC Radiusrees, 2-snijder TiAlN-B, 45-70 HRC  
 FR Fraise à rayon de précision UGV Carbure TiAlN-B, 45-70 HRC  
 ES Fresa de punta esférica de precisión MAV MD TiAlN-B, 45-70 HRC  
 DE VHM Präzisions HSC Radiusfräser (2-Schneider) TiAlN-B, 45-70 HRC



**P 14** **H 15**  
≤1400 N/mm<sup>2</sup> HRC

75-275 **U**    75-160 **T**

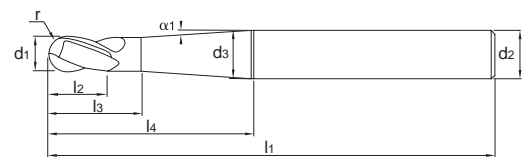


Ref.	d1	d2	d3	l1	l2	l3	r	z
36.275.0030	0.3	4		40	0.5		0.15	2
36.275.0040	0.4	4		40	0.6		0.2	2
36.275.0050	0.5	4		40	0.7		0.25	2
36.275.0060	0.6	4		40	0.9		0.3	2
36.275.0070	0.7	4		40	1.1		0.35	2
36.275.0080	0.8	4		40	1.2		0.4	2
36.275.0090	0.9	4		40	1.4		0.45	2
36.275.0100	1	6	0.95	50	1.5	3	0.5	2
36.275.0150	1.5	6	1.45	50	2	4	0.75	2

Ref.	d1	d2	d3	l1	l2	l3	r	z
36.275.0200	2	6	1.95	50	2.5	5	1	2
36.275.0250	2.5	6	2.4	50	3	7	1.25	2
36.275.0300	3	6	2.85	60	4	10	1.5	2
36.275.0400	4	6	3.85	60	5	10	2	2
36.275.0500	5	6	4.85	60	6	12	2.5	2
36.275.0600	6	6	5.85	60	7	15	3	2
36.275.0800	8	8	7.7	80	9	15	4	2
36.275.1000	10	10	9.7	80	11	25	5	2
36.275.1200	12	12	11.7	80	14	25	6	2

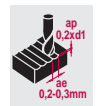
> **36.285 Phantom**

NL VHM Precisie Radiusrees, 2-snijder AlTiN-X, HRC, 30-65 HRC  
 FR Fraise à rayon de précision 2 dents Carbure AlTiN-X, HRC, 30-65 HRC  
 ES Fresa de punta esférica de precisión MD AlTiN-X, HRC, 30-65 HRC  
 DE VHM Präzisions-Radiusfräser (2-Schneider) AlTiN-X, HRC, 30-65 HRC



**P 13** **P 14** **H 15**  
≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> HRC

75-200 **X**    60-110 **W**    80-135 **V**

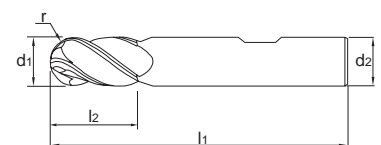


Ref.	d1	d2	d3	l1	l2	l3	l4	r	z	α1
36.285.0111	1	6	2	60	2	4	23	0.5	2	1°30'
36.285.0112	1	6	4.3	60	2	4	23	0.5	2	5°
36.285.0113	1	6	5	80	2	4	42	0.5	2	3°
36.285.0221	2	6	2.9	60	4	6	23	1	2	1°30'
36.285.0222	2	6	5	60	4	6	23	1	2	5°
36.285.0223	2	6	5.7	80	4	6	41	1	2	3°
36.285.0331	3	6	5.3	90	6	8	52	1.5	2	1°30'
36.285.0333	3	6	5.6	70	6	8	32	1.5	2	3°
36.285.0441	4	6	6	90	8	10	49	2	2	1°30'

Ref.	d1	d2	d3	l1	l2	l3	l4	r	z	α1
36.285.0443	4	6	6	70	8	10	28	2	2	3°
36.285.0551	5	8	7	110	10	12	61	2.5	2	1°30'
36.285.0553	5	8	8	90	10	12	41	2.5	2	3°
36.285.0661	6	8	8	110	12	15	53	3	2	1°30'
36.285.0663	6	8	8	90	12	15	34	3	2	3°
36.285.0871	8	10	10	120	14	17	55	4	2	1°30'
36.285.0873	8	10	10	100	14	17	36	4	2	3°
36.285.1081	10	12	12	130	18	21	59	5	2	1°30'
36.285.1083	10	12	12	110	18	21	40	5	2	3°

> **36.345 Phantom**

NL VHM Radiusrees, 4-snijder lang, AlTiN-X, roestvaststaal  
 FR Fraise à rayon 4 dents Carbure version longue, AlTiN-X, Inox  
 ES Fresa de punta esférica MD larga, AlTiN-X, acero inoxidable  
 DE VHM 4 Schneiden Radiusfräser lang, AlTiN-X, rostfreien Stahl



**P 13** **P 14** **M 21** **M 22** **K 31** **K 32** **S 71** **S 72**  
≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Ni/Co TI

125-140 **I**    95-110 **I**    75-96 **I**    65-80 **H**    100-120 **J**    130-140 **J**    25-35 **G**    80-95 **H**



Ref.	d1	d2	l1	l2	r	z
36.345.0300	3	6	57	8	1.5	4
36.345.0400	4	6	57	11	2	4
36.345.0500	5	6	57	13	2.5	4

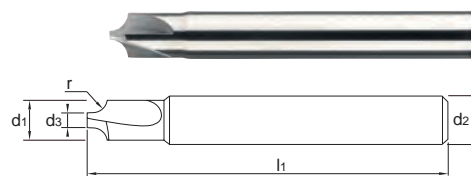
Ref.	d1	d2	l1	l2	r	z
36.345.0600	6	6	57	13	3	4
36.345.0800	8	8	63	19	4	4
36.345.1000	10	10	72	22	5	4

Ref.	d1	d2	l1	l2	r	z
36.345.1200	12	12	83	26	6	4
36.345.1600	16	16	92	32	8	4



## > 36.430 Phantom

NL VHM Radiusfrees, 4-snijder Kwarthol frees  
 FR Fraise à rayon 4 dents Carbure Fraise à 1/4 de cercle concave  
 ES Fresa de punta esférica MD Fresa semicóncava de 1/4 de círculo  
 DE VHM 4 Schneiden Radiusfräser Viertelrund-Profilfräser



Ref.	r	d1	d2	d3	l1	z
36.430.0100	1	2.9	6	0.9	50	4
36.430.0150	1.5	4.5	6	0.9	50	4
36.430.0200	2	5.5	6	0.9	50	4
36.430.0250	2.5	6	8	0.9	60	4

Ref.	r	d1	d2	d3	l1	z
36.430.0300	3	7.5	8	1.9	60	4
36.430.0350	3.5	8.9	10	1.9	60	4
36.430.0400	4	9.9	10	1.9	60	4
36.430.0450	4.5	10.9	12	1.9	70	4

Ref.	r	d1	d2	d3	l1	z
36.430.0500	5	11.9	12	1.9	70	4
36.430.0600	6	15.9	16	3.9	80	4
36.430.0800	8	19.9	20	3.9	80	4

NL Voedingswaarde  
FR Tableau des avances  
ES Tabla de avances  
DE Vorschubtabelle

**P 11** = ISO  
5800 Niemet  
25-35 E Vc = 25-35  
FRC = E

FRC																								
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
<b>d1 (mm)</b>	<b>fz (mm/z)</b>																							
0,3	0,001	0,001	0,001	0,002	0,003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,012	0,015	-	-	-
0,5	0,001	0,001	0,002	0,003	0,006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,019	0,024	-	-	-
0,8	0,002	0,002	0,003	0,005	0,008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,030	0,039	-	-	-
1	0,002	0,006	0,004	0,006	0,009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,037	0,048	0,012	0,008	0,008
1,5	0,003	0,008	0,005	0,009	0,012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,041	0,054	-	-	0,011
2	0,004	0,010	0,007	0,012	0,016	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,011	0,027	-	0,011	0,022	0,035	0,040	0,044	0,057	0,028	0,014	0,026
3	0,006	0,015	0,010	0,016	0,039	0,003	0,004	0,007	0,010	0,010	0,010	0,011	0,027	0,035	-	0,022	0,035	0,040	0,055	0,067	0,091	0,043	0,023	0,026
5	0,008	0,026	0,015	0,026	-	0,009	0,010	0,014	0,020	0,020	0,022	0,027	0,035	0,044	0,048	0,035	0,040	0,055	0,065	0,111	0,156	0,052	0,031	0,045
6	0,010	0,030	0,026	0,032	-	0,011	0,013	0,017	0,024	0,025	0,027	0,035	0,044	0,059	0,059	0,040	0,055	0,065	0,080	0,122	0,174	0,059	0,039	0,060
8	0,015	0,038	0,030	0,040	-	0,016	0,019	0,024	0,032	0,032	0,035	0,044	0,055	0,078	0,067	0,055	0,065	0,080	0,105	0,132	0,189	0,067	0,060	0,090
10	0,026	0,043	0,038	0,045	-	0,021	0,025	0,030	0,038	0,039	0,044	0,055	0,065	0,098	0,071	0,065	0,080	0,105	0,135	0,142	0,199	0,075	0,080	0,120
12	0,030	0,051	0,043	0,060	-	0,026	0,030	0,036	0,046	0,048	0,052	0,065	0,085	0,097	0,078	0,080	0,105	0,135	0,150	0,142	0,212	0,082	0,101	0,150
16	0,032	0,051	0,043	0,060	-	0,032	0,038	0,045	0,054	0,058	0,063	0,085	0,100	0,099	0,117	0,105	0,135	0,150	0,168	-	-	0,092	0,120	0,180
20	0,037	0,051	0,043	0,060	-	0,038	0,045	0,057	0,066	0,073	0,080	0,100	0,135	0,120	-	0,135	0,150	0,168	0,180	-	-	-	-	0,200
22	0,037	0,051	0,043	0,060	-	0,045	0,057	0,066	0,070	0,080	0,100	0,135	0,150	0,128	-	0,150	0,168	0,180	0,200	-	-	-	-	-
25	0,040	0,051	0,043	0,060	-	0,057	0,066	0,070	0,073	0,100	0,135	0,150	0,168	0,135	-	0,168	0,180	0,200	0,220	-	-	-	-	0,109

NL Toerentabel  
FR Tableau des vitesses de rotation  
ES Tabla de número de revoluciones  
DE Drehzahltable

$$n = \frac{Vc \times 1000}{3,14 \times d1} \quad Vc = \frac{n \times 3,14 \times d1}{1000}$$

Vc (m/min)																		
	5	8	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120
<b>d1 (mm)</b>	<b>n = rpm</b>																	
1	1592	2546	3183	3820	4775	6366	7958	9549	11141	12732	15915	19099	22282	25465	28648	31831	35014	38197
1,5	1061	1698	2122	2546	3183	4244	5305	6366	7427	8588	10610	12732	14854	16977	19099	21221	23343	25465
2	796	1273	1592	1910	2387	3183	3937	4775	5570	6366	7958	9549	11141	12732	14324	15915	17507	19099
2,5	637	1019	1273	1528	1910	2546	3183	3820	4456	5093	6366	7639	8913	10186	11459	12732	14006	15279
3	531	849	1061	1273	1592	2122	2653	3183	3714	4244	5305	6366	7427	8488	9549	10610	11671	12732
3,5	455	728	909	1091	1364	1819	2274	2728	3183	3638	4547	5457	6366	7276	8185	9095	10004	10913
4	398	637	796	955	1194	1592	1989	2387	2785	3183	3979	4775	5570	6366	7162	7958	8754	9549
4,5	354	566	707	849	1061	1415	1768	2122	2476	2829	3537	4244	4951	5659	6366	7074	7781	8488
5	318	509	637	764	955	1273	1592	1910	2228	2546	3183	3820	4456	5093	5730	6366	7003	7639
5,5	289	463	579	694	868	1157	1447	1739	2026	2315	2894	3472	4051	4630	5209	5787	6366	6945
6	265	424	531	637	796	1061	1326	1592	1857	2122	2653	3183	3714	4244	4775	5305	5836	6366
7	227	364	455	546	682	909	1137	1364	1592	1819	2274	2728	3183	3638	4093	4547	5002	5457
8	199	318	398	477	597	796	995	1194	1393	1592	1989	2387	2785	3183	3581	3979	4377	4775
9	177	283	354	424	531	707	884	1061	1238	1415	1768	2122	2476	2829	3183	3537	3890	4244
10	159	255	318	382	477	637	796	955	1114	1273	1592	1910	2228	2546	2865	3183	3501	3820
11	145	321	289	347	434	579	723	868	1013	1157	1447	1736	2026	2315	2604	2894	3183	3472
12	133	212	265	318	398	531	663	796	928	1061	1326	1592	1857	2122	2387	2653	2918	3183
13	122	196	245	294	367	490	612	735	857	979	1224	1469	1714	1959	2204	2449	2693	2938
14	114	182	227	273	341	455	568	682	796	909	1137	1364	1592	1819	2046	2274	2501	2728
15	106	170	212	255	318	424	531	637	743	849	1061	1273	1485	1698	1910	2122	2334	2546
16	99	159	199	239	298	398	497	597	696	796	995	1194	1393	1592	1790	1989	2188	2387
18	88	141	177	212	265	354	442	531	619	707	884	1061	1238	1415	1592	1768	1945	2122
20	80	127	159	191	239	318	398	477	557	637	796	955	1114	1273	1432	1592	1751	1910
22	72	116	145	174	217	289	362	434	506	579	723	868	1013	1157	1302	1447	1592	1736
24	66	106	133	159	199	265	332	398	464	531	663	796	928	1061	1194	1326	1459	1592
25	64	102	127	153	191	255	318	382	446	509	637	764	891	1019	1146	1273	1401	1528

<b>FRC</b>	<b>fz (mm/z)</b>	<b>Vc</b>	<b>n=rpm</b>
NL: Voedingscode	NL: Voeding per tand (mm/z)	NL: Snijsnelheid (m/min)	NL: Spiltoerental (omw/min)
FR: Codification vitesse d'avance	FR: Avance par dent (mm/z)	FR: Vitesse de coupe (m/min)	FR: Vitesse de broche (tr/min)
ES: Codificación de velocidad de avance	ES: Avance por diente (mm/z)	ES: Velocidad de corte (m/min)	ES: Velocidad del husillo (rpm)
DE: Vorschubgeschwindigkeit Codierung	DE: Vorschub pro Umdrehung (mm/U)	DE: Schnittgeschwindigkeit (m/min)	DE: Spindeldrehzahl (U/min)



## HP2 UNI VARI

NL Voedingswaarde voor 45° induiken  
 FR Tableau des avances pour une pénétration à 45°  
 ES Tabla de alimentación para inmersión de 45°  
 DE Vorschubgeschwindigkeit beim 45°eintauchen

	Dimensions in mm								
	3	4	5	6	8	10	12	16	20
	fz (mm/z)								
<b>P 11</b> ≤600 N/mm <sup>2</sup>	0,008	0,012	0,018	0,025	0,038	0,045	0,050	0,070	0,090
<b>P 12</b> ≤850 N/mm <sup>2</sup>	0,007	0,012	0,018	0,025	0,036	0,042	0,048	0,068	0,080
<b>P 13</b> ≤1000 N/mm <sup>2</sup>	0,007	0,012	0,018	0,025	0,035	0,040	0,045	0,065	0,075
<b>P 14</b> ≤1400 N/mm <sup>2</sup>	0,005	0,008	0,012	0,020	0,030	0,035	0,040	0,055	0,070
<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	0,004	0,006	0,010	0,015	0,023	0,034	0,045	0,050	0,055
<b>M 22</b> INOX >850 N/mm <sup>2</sup>	0,004	0,006	0,010	0,015	0,020	0,030	0,035	0,045	0,050
<b>K 31</b> GG	0,005	0,008	0,012	0,018	0,025	0,038	0,045	0,060	0,075
<b>K 32</b> GGG GTS-GTW	0,005	0,008	0,012	0,018	0,025	0,038	0,045	0,060	0,075
<b>S 71</b> Ni/Co	0,003	0,006	0,010	0,015	0,020	0,035	0,045	0,050	0,055
<b>S 72</b> Ti	0,003	0,006	0,010	0,015	0,020	0,030	0,035	0,045	0,050

NL: ISO M en ISO S maximaal 10° induiken.  
 FR: ISO M et ISO S pénétration à 10° maximum.  
 ES: ISO M e ISO S con una inmersión máxima de 10°.  
 DE: ISO M und ISO S maximal 10° eintauchen.

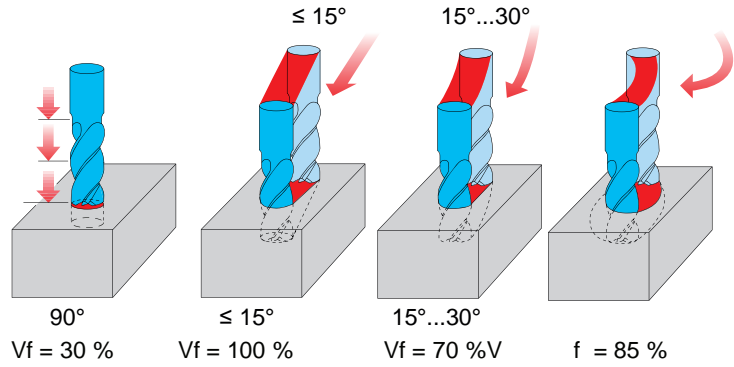
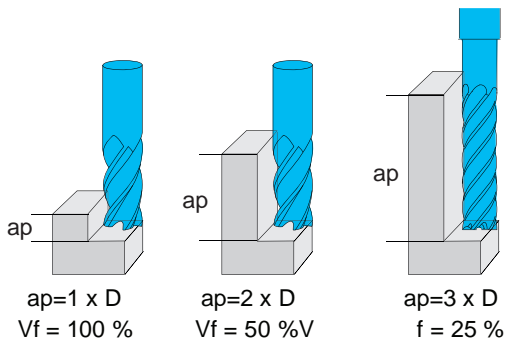
NL Correctiefactor voor hogere voeding bij Ae waarde ≤ 40%  
 FR Facteur de correction pour avance plus élevée pour valeur Ae ≤ 40%  
 ES Factor de corrección para una alimentación más alta en valores Ae ≤ 40%  
 DE Korrektur beim höhere Vorschubgeschwindigkeit wenn Ae Wert ≤ 40%

% Ae of d1	5%	7%	10%	15%	20%	25%	30%	40%
fz x	2,8	2,4	2	1,7	1,5	1,3	1,2	1,1

NL Voedingswaarde voor borende bewerking  
 FR Modification des avances pour une opération de perçage  
 ES Tabla de alimentación para mecanizado con broca  
 DE Vorschubgeschwindigkeit beim Bohren

	Dimensions in mm								
	3	4	5	6	8	10	12	16	20
	fz (mm/z)								
<b>P 11</b> ≤600 N/mm <sup>2</sup>	0,004	0,008	0,012	0,018	0,025	0,030	0,035	0,048	0,060
<b>P 12</b> ≤850 N/mm <sup>2</sup>	0,003	0,006	0,010	0,016	0,024	0,028	0,032	0,045	0,055
<b>P 13</b> ≤1000 N/mm <sup>2</sup>	0,002	0,005	0,008	0,015	0,023	0,028	0,030	0,043	0,050
<b>P 14</b> ≤1400 N/mm <sup>2</sup>	0,002	0,004	0,006	0,013	0,020	0,025	0,025	0,038	0,045
<b>K 31</b> GG	0,002	0,004	0,006	0,013	0,018	0,025	0,030	0,040	0,050
<b>K 32</b> GGG GTS-GTW	0,002	0,004	0,006	0,013	0,018	0,025	0,030	0,040	0,050

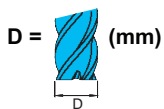
NL Voedingswaarde aanpassing  
 FR Modification des avances  
 ES Modificación de avances  
 DE Vorschubanpassung



NL Formules  
 FR Formules  
 ES Fórmulas  
 DE Formeln

Vc	NL: Snijsnelheid (m/min) FR: Vitesse de coupe (m/min) ES: Velocidad de corte (m/min) DE: Schnittgeschwindigkeit (m/min)		$Vc = \frac{p \times D \times n}{1000}$
n	NL: Toerental (omw/min) FR: Vitesse de tour (tr/min) ES: Número de revoluciones (rpm) DE: Umdrehung (U/min)		$n = \frac{Vc \times 1000}{p \times D}$
fz	NL: Voeding per tand (mm/z) FR: Avance par dent (mm/z) ES: Avance por diente (mm/z) DE: Vorschub pro Zahn (mm/z)		$fz = \frac{vf}{n \times z}$
Vf	NL: Toerental (omw/min) FR: Vitesse de tour (tr/min) ES: Número de revoluciones (rpm) DE: Umdrehung (U/min)		$vf = (n) \times (z) \times (fz)$
D(eff)	NL: Toerental (omw/min) FR: Vitesse de tour (tr/min) ES: Número de revoluciones (rpm) DE: Umdrehung (U/min)		$D(eff) = 2 \times D \times ap - ap^2$

π= 3.14



z = no. of flutes  
 nb. de dents  
 no. de dientes  
 Zähnezahl

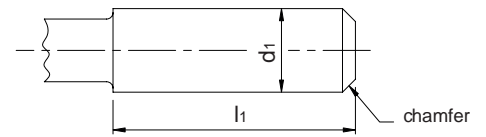






### DIN 6535 HA

NL Cilindrische schacht  
FR Queue cylindrique  
ES Mango cilíndrico  
DE Zylinderschaft



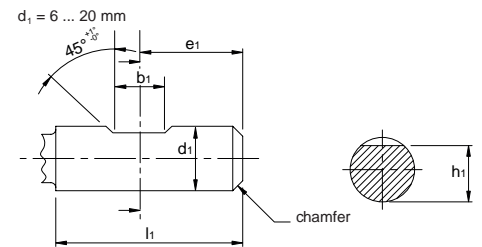
Dimensions in mm	
$d_1$	$l_1$
<b>h6</b>	<b>+2</b>
<b>0</b>	<b>0</b>
3	28
4	28
5	28
6	36
8	36

Dimensions in mm	
$d_1$	$l_1$
<b>h6</b>	<b>+2</b>
<b>0</b>	<b>0</b>
10	40
12	45
16	48
20	50
25	56

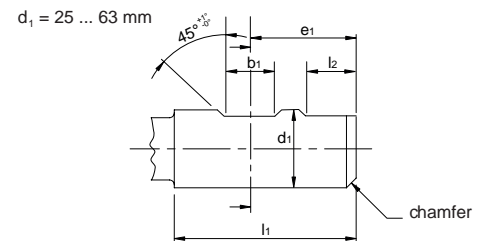
Dimensions in mm	
$d_1$	$l_1$
<b>h6</b>	<b>+2</b>
<b>0</b>	<b>0</b>
32	60
40	70
50	80
63	90

### DIN 6535 HB

NL Cilindrische schacht "Weldon"  
FR Queue cylindrique "Weldon"  
ES Mango cilíndrico "Weldon"  
DE Zylinderschaft "Weldon"



Dimensions in mm					
$d_1$	$b_1$	$e_1$	$h_1$	$l_1$	$l_2$
<b>h6</b>	<b>+0.05</b>	<b>0</b>	<b>h11</b>	<b>+2</b>	<b>+1</b>
<b>0</b>	<b>0</b>	<b>-1</b>	<b>0</b>	<b>0</b>	<b>0</b>
6	4.2	18	4.8	36	-
8	5.5	18	6.6	36	-
10	7	20	8.4	40	-
12	8	22.5	10.4	45	-
16	10	24	14.2	48	-
20	11	25	18.2	50	-



Dimensions in mm					
$d_1$	$b_1$	$e_1$	$h_1$	$l_1$	$l_2$
<b>h6</b>	<b>+0.05</b>	<b>0</b>	<b>h11</b>	<b>+2</b>	<b>+1</b>
<b>0</b>	<b>0</b>	<b>-1</b>	<b>0</b>	<b>0</b>	<b>0</b>
25	12	32	23	56	17
32	14	36	30	60	19
40	14	40	38	70	19
50	18	45	47.8	80	23
63	18	50	60.8	90	23

NL **Vergelijking Hardheid**  
 FR **Comparaison de la dureté**  
 ES **Comparación de dureza**  
 DE **Vergleich der Härte**

Dimensions in mm			
(N/mm <sup>2</sup> )	HRc	HB30	HV10
240		71	75
255		76	80
270		81	85
285		86	90
305		90	95
320		95	100
335		100	105
350		105	110
370		109	115
385		114	120
400		119	125
415		124	130
430		128	135
450		133	140
465		138	145
480		143	150
495		147	155
510		152	160
530		157	165
545		162	170
560		166	175
575		171	180
595		176	185
610		181	190
625		185	195
640		190	200
660		195	205
675		199	210
690		204	215
705		209	220
720		214	225
740		219	230
755		223	235
770		228	240
785		233	245
800	22	238	250
820	23	242	255
835	24	247	260
860	25	255	268
870	26	258	272
900	27	266	280

Dimensions in mm			
(N/mm <sup>2</sup> )	HRc	HB30	HV10
920	28	273	287
940	29	278	293
970	30	287	302
995	31	295	310
1020	32	301	317
1050	33	311	327
1080	34	319	336
1110	35	328	345
1140	36	337	355
1170	37	346	364
1200	38	354	373
1230	39	363	382
1260	40	372	392
1300	41	383	403
1330	42	393	413
1360	43	402	423
1400	44	413	434
1440	45	424	446
1480	46	435	458
1530	47	449	473
1570	48	460	484
1620	49	472	497
1680	50	488	514
1730	51	501	527
1790	52	517	544
1845	53	532	560
1910	54	549	578
1980	55	567	596
2050	56	584	615
2140	57	607	639
2180	58	622	655
	59		675
	60		698
	61		720
	62		745
	63		773
	64		800
	65		829
	66		864
	67		900
	68		940





1 SC



1 HSS (+E)



2

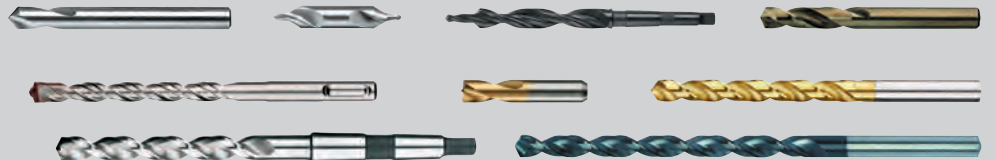


3 SC

NL **VHM Boren**  
 FR **Forets Carbure Monobloc**  
 ES **Brocas Metal Duro**  
 DE **VHM Bohrer**



NL **HSS Boren en HSS-E Boren**  
 FR **Forets HSS et HSS-E**  
 ES **Brocas HSS y HSS-E**  
 DE **HSS-Bohrer und HSS-E Bohrer**



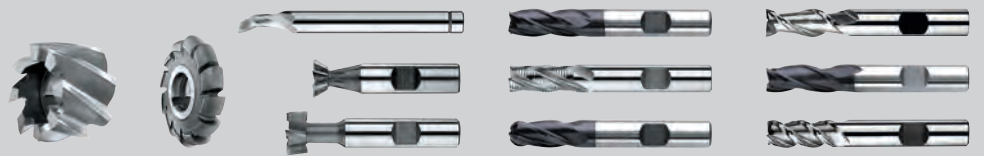
NL **Draadsnijden**  
 FR **Filetage**  
 ES **Roscar**  
 DE **Gewinde Schneiden**



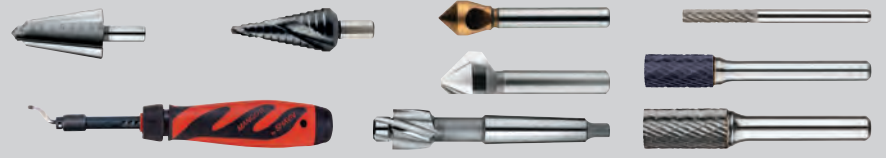
NL **VHM Frezen**  
 FR **Fraises Carbure Monobloc**  
 ES **Fresas Metal Duro**  
 DE **VHM Fräser**



NL **HSS-E Frezen**  
 FR **Fraises HSS-E**  
 ES **Fresas HSS-E**  
 DE **HSS-E Fräser**



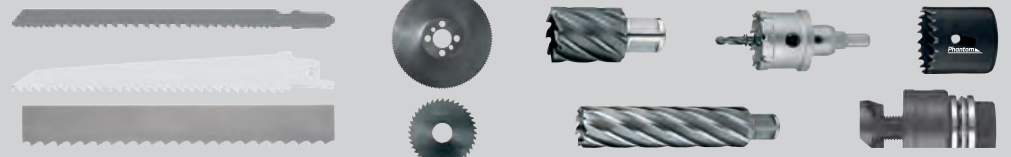
NL **Verzinken en Ontbramen**  
 FR **Chanfreinage et Ebavurage**  
 ES **Avellanar y Desbarbar**  
 DE **Senker und Entgrater**



NL **Ruimen**  
 FR **Alésage**  
 ES **Escarlar**  
 DE **Reibahlen**



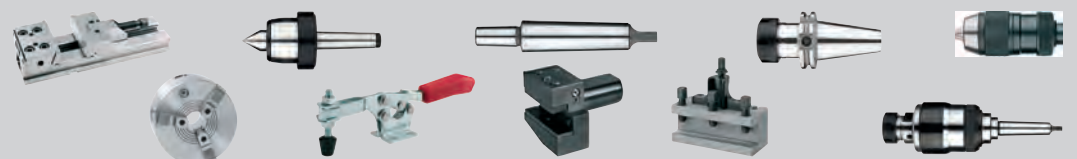
NL **Zagen en Ponsen**  
 FR **Sciage et Poinçonnage**  
 ES **Serrar y Punzonar**  
 DE **Sägen und Blechlocher**



NL **Draaien**  
 FR **Tournage**  
 ES **Tornear**  
 DE **Dreh- und Fräswerkzeuge**



NL **Spannen**  
 FR **Serrage et Bridage**  
 ES **Fijar y Sujetar**  
 DE **Spannwerkzeuge**



NL **Overig**  
 FR **Autres**  
 ES **Otros**  
 DE **Übrig**





## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
	2 snijkanten, centrumsnijdend	2 dents, coupe au centre	2 dientes, corte con centro	2 Schneiden, Zentrumschneidend
	3 snijkanten, centrumsnijdend	3 dents, coupe au centre	3 dientes, corte con centro	3 Schneiden, Zentrumschneidend
	4 snijkanten, centrumsnijdend	4 dents, coupe au centre	4 dientes, con corte centro	4 Schneiden, Zentrumschneidend
	4 snijkanten, niet centrumsnijdend	4 dents, pas de coupe au centre	4 dientes, corte sin centro	4 Schneiden, Nicht Zentrumschneidend
	4 snijkanten, met ongelijke tandverdeling	4 dents, avec denture à pas différentiel	4 dientes, con paso irregular	4 Schneiden, mit ungleicher Zahnteilung
	5 snijkanten, met ongelijke tandverdeling	5 dents, avec denture à pas différentiel	5 dientes, con paso irregular	5 Schneiden, mit ungleicher Zahnteilung
	6 snijkanten, centrumsnijdend	6 dents, coupe au centre	6 dientes, corte con centro	6 Schneiden, Zentrumschneidend
	8 snijkanten, centrumsnijdend	8 dents, coupe au centre	8 dientes, corte con centro	8 Schneiden, Zentrumschneidend
	2 snijkanten, volradius	2 dents, à rayon complet	2 dientes, con radio completo	2 Schneiden, Vollradius
	4 snijkanten, volradius	4 dents, à rayon complet	4 dientes, con radio completo	4 Schneiden, Vollradius
	Routerfrees met 135° boorpunt	Fraise à contourner avec pointe de perçage 135°	Fresa de contornear con punta de taladro 135°	Router mit 135° Bohrspitze
	Routerfrees zonder kopvertanding	Fraise à contourner sans denture en bout	Fresa de contornear sin corte al centro	Router ohne Stirnverzahnung
	Routerfrees met kopvertanding	Fraise à contourner avec denture en bout	Fresa de contornear con corte al centro	Router mit Stirnverzahnung
	Routerfrees 2-snijder	Fraise à contourner 2 dents	Fresa de contornear de 2 labios	Router 2-Schneider
	Ongelijke spiraalhoek	Avec angles d'hélice variables	Con ángulo de hélice desigual	Mit ungleichen Spiralwinkel
<b>VHM SC</b>	Volhardmetaal	Carbure monobloc	Metal duro integral	Vollhartmetall
<b>MG HM</b>	Micro-Grain volhardmetaal	Carbure micrograin	Metal duro micrograno	Micro-Grain Vollhartmetall
<b>NG HM</b>	Nano-Grain volhardmetaal	Carbure Nanograin	Metal duro nanograno	Nano-Grain Vollhartmetall
<b>TiAIN</b>	TiAIN gecoat	Revêtement TiAIN	Recubrimiento TiAIN	TiAIN Beschichtung
<b>TiCN</b>	TiCN gecoat	Revêtement TiCN	Recubrimiento TiCN	TiCN Beschichtung
<b>TiAIN B</b>	TiAIN-B gecoat	Revêtement TiAIN-B	Recubrimiento TiAIN-B	TiAIN-B Beschichtung
<b>AlTiN X</b>	AlTiN-X gecoat	Revêtement AlTiN-X	Recubrimiento AlTiN-X	AlTiN-X Beschichtung
<b>HR</b>	Ronde tand, fijn	Profil rond, pas fin	Perfil redondo, paso fino	Feiner Verzahnung
<b>WR</b>	Ronde tand, grof	Profil rond, pas ébauché	Perfil redondo	Runder Verzahnung

	NL	FR	ES	DE
<b>DIN 6527</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
	Snijkantradius	Rayon de coupe	Radio de corte	Radius am Schneidenecke
	Spiraalhoek	Angle d'hélice	Angulo de hélice	Spiralwinkel
<b>DIN 6535-HB</b>	Cilindrische schacht met Weldon vlak	Queue cylindrique avec méplat type Weldon	Mango cilíndrico con plano de arrastre tipo Weldon	Zylinderschaft mit Mitnahmefläche Tyo Weldon
<b>h6</b>	Cilindrische schacht h6	Queue cylindrique h6	Mango cilíndrico h6	Zylinderschaft h6
<b>r ±0,01</b>	Tolerantie radius	Tolérance rayon	Tolerancia radio	Toleranz Radius
<b>d1 +0,00 -0,03</b>	Tolerantie diameter	Tolérance diamètre	Tolerancia diámetro	Toleranz Durchmesser
<b>d1 h10</b>	Tolerantie h10	Tolérance h10	Tolerancia h10	Toleranz h10
<b>HSC</b>	High Speed Cutting	Usinage à grande vitesse	Mecanizado de alta velocidad	Hochgeschwindigkeitszerspanung
<b>HRC</b>	Frezen voor gehard staal	Fraises pour aciers trempés	Fresas para acero templado	Fräser für gehärtet Stahl
<b>INOX</b>	T.b.v. roestvaststaal	Pour Inox	Para acero inoxidable	Für Rostfreier Stahl
<b>ALU</b>	T.b.v. aluminium	Pour aluminium	Para aluminio	Für Aluminium
	Interpolair frezen	Interpolation	Mecanizado por interpolación	Zirkular Fräsen
	Graveren	Gravure	Grabado	Gravieren
	Mantelfrezen met fasen	Chanfreins longitudinaux	Chaflanes Longitudinales	Konturfasen
	Fase Frezen	Chanfreins longitudinaux	Chaflanes Longitudinales	Konturfasen
	Boren en aanschuinen	Chanfreins directs	Chaflanes Directos	Direkt Fasen
	V-Sleuf frezen	Rainurage en V	Ranura en "V"	"V"-Nuten Fräsen
	Mantelfrezen	Contournage	Contorneado	Konturfräsen
	Centeren	Centrage	Centrado	Zentrieren
	Aanschuinen	Chanfreinage	Chaflanado	Fasen
	Boren	Perçage	Taladrado	Bohren

NL HSS-E Frezen  
FR Fraises HSS-E  
ES Fresas HSS-E  
DE HSS-E Fräser

**P** **K** Bij uitstek geschikt  
Très approprié  
**H** **N** Muy adecuado  
**M** **S** Ideal geeignet

**P** **K** Bepoort geschikt  
Approprié  
**H** **N** Adecuado  
**M** **S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite










> 32.200	Phantom		DIN 327-D	<b>P</b>	<b>N</b>			P. 4
> 32.220	Phantom		DIN 327-B	<b>P</b>	<b>N</b>			P. 4
> 32.224	Phantom		DIN 327-B	<b>P</b> <b>M</b>	<b>N</b>			P. 4
> 32.228	Phantom		DIN 327-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>	<b>N</b>			P. 5
> 32.260	Phantom		NORM	<b>P</b>	<b>N</b>			P. 5
> 32.320	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 6
> 32.520	Phantom		NORM	<b>P</b>	<b>N</b>			P. 6
> 33.200	Phantom		DIN 844-D	<b>P</b>	<b>N</b>			P. 6
> 33.220	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 7
> 33.224	Phantom		DIN 844-B	<b>P</b> <b>M</b>	<b>N</b>			P. 7
> 33.228	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>	<b>N</b>			P. 7
> 33.520	Phantom		DIN 844-B	<b>P</b>				P. 8
> 34.200	Phantom		DIN 844-D	<b>P</b>	<b>N</b>			P. 9
> 34.220	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 9
> 34.224	Phantom		DIN 844-B	<b>P</b> <b>M</b>	<b>N</b>			P. 9
> 34.228	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b>				P. 10
> 34.238	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b>				P. 10
> 34.350	Phantom		DIN 844-D	<b>P</b>	<b>N</b>			P. 10
> 34.355	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 11
> 34.370	Phantom		NORM	<b>P</b>	<b>N</b>			P. 11
> 35.024	Phantom		DIN 327-B	<b>P</b> <b>M</b>				P. 12
> 35.100	Phantom		DIN 844-D	<b>P</b>	<b>N</b>			P. 12
> 35.120	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 12
> 35.124	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 13
> 35.126	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>	<b>N</b>			P. 13
> 35.220	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 13
> 35.224	Phantom		DIN 844-B	<b>P</b> <b>M</b>	<b>N</b>			P. 14
> 35.226	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>	<b>N</b>			P. 14
> 35.228	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>				P. 14
> 35.324	Phantom		DIN 844-B	<b>P</b> <b>M</b>	<b>N</b>			P. 15
> 35.720	Phantom		DIN 844-B	<b>P</b>	<b>N</b>			P. 15
> 35.726	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>	<b>N</b>			P. 15
> 35.766	Phantom		DIN 844-B HSS-E PM	<b>P</b> <b>M</b> <b>K</b>	<b>N</b>			P. 16

SC 1  
HSS-E 1  
2  
SC 3  
HSS-E 3





> 36.100	Phantom	ALU	N		P. 17
> 36.120	Phantom		P N		P. 17
> 36.200	Phantom		P N		P. 17
> 36.220	Phantom		P N		P. 18
> 36.228	Phantom	HSS-E PM	P M K		P. 18
> 36.324	Phantom		P N		P. 18
> 36.410	Phantom		P N		P. 19
> 36.510	Phantom		P N		P. 19
> 36.560	Phantom		P N		P. 20
> 36.620	Phantom		P N		P. 20
> 36.650	Phantom		P N		P. 20
> 36.720	Phantom		P N		P. 21
> 36.750	Phantom		P N		P. 21
> 37.260	Phantom		P M K		P. 22
> 37.270	Phantom		P K		P. 22
> 37.350	Phantom		P N		P. 22
> 37.360	Phantom		P M K		P. 23
> 37.370	Phantom		P K		P. 23
> 37.500	Phantom		P N		P. 23
> 37.600	Phantom		P N		P. 23
> 37.604	Phantom		P		P. 24
> 38.210	Phantom		P M K N		P. 24
> 38.300	Phantom		P M K N		P. 24
> 38.350	Phantom		P M K N		P. 25
> 38.400	Phantom		P M K N		P. 25

> 38.450	<b>Phantom</b>	 DIN 847	<b>P M K N</b>		 P. 25
> 38.500	<b>Phantom</b>	 DIN 3972	<b>P M K N</b>		 P. 26
> 39.100	<b>Phantom</b>				 P. 28
> 39.200	<b>Phantom</b>	 DIN 327-B	<b>P</b>	<b>N</b>	 P. 28
> 39.300	<b>Phantom</b>	 DIN 844-B	<b>P</b>	<b>N</b>	 P. 28
> 39.400	<b>Phantom</b>	 DIN 844-B	<b>P</b>	<b>N</b>	 P. 29



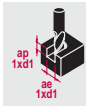
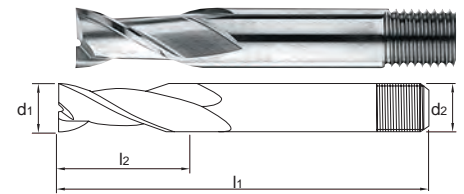
### > 32.200 Phantom

NL HSS-E Schachtfrees, 2-snijder  
FR Fraise à rainurer 2 dents HSS-E  
ES Fresa de ranurar de 2 labios HSS-E  
DE HSS-E Langlochfräser (2-Schneider)



Ref.	d1	d2	l1	l2	z
32.200.0200	2	6	48	4	2
32.200.0300	3	6	49	5	2
32.200.0400	4	6	51	7	2
32.200.0500	5	6	52	8	2
32.200.0600	6	6	52	8	2
32.200.0700	7	10	60	10	2
32.200.0800	8	10	61	11	2
32.200.0900	9	10	61	11	2
32.200.1000	10	10	63	13	2

Ref.	d1	d2	l1	l2	z
32.200.1200	12	12	73	16	2
32.200.1400	14	12	73	16	2
32.200.1500	15	12	73	16	2
32.200.1600	16	16	79	19	2
32.200.1800	18	16	79	19	2
32.200.2000	20	20	82	22	2
32.200.2200	22	20	88	22	2
32.200.2400	24	25	102	26	2
32.200.2500	25	25	102	26	2



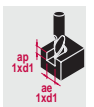
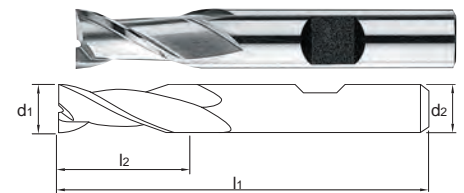
### > 32.220 Phantom

NL HSS-E Schachtfrees, 2-snijder  
FR Fraise à rainurer 2 dents HSS-E  
ES Fresa de ranurar de 2 labios HSS-E  
DE HSS-E Langlochfräser (2-Schneider)



Ref.	d1	d2	l1	l2	z
32.220.0200	2	6	48	4	2
32.220.0250	2.5	6	49	5	2
32.220.0300	3	6	49	5	2
32.220.0350	3.5	6	50	6	2
32.220.0400	4	6	51	7	2
32.220.0450	4.5	6	51	7	2
32.220.0500	5	6	52	8	2
32.220.0550	5.5	6	52	8	2
32.220.0600	6	6	52	8	2
32.220.0650	6.5	10	60	10	2
32.220.0700	7	10	60	10	2
32.220.0750	7.5	10	60	10	2
32.220.0800	8	10	61	11	2
32.220.0850	8.5	10	61	11	2

Ref.	d1	d2	l1	l2	z
32.220.0900	9	10	61	11	2
32.220.0950	9.5	10	61	11	2
32.220.1000	10	10	63	13	2
32.220.1050	10.5	12	70	13	2
32.220.1100	11	12	70	13	2
32.220.1200	12	12	73	16	2
32.220.1250	12.5	12	73	16	2
32.220.1300	13	12	73	16	2
32.220.1400	14	12	73	16	2
32.220.1500	15	12	73	16	2
32.220.1600	16	16	79	19	2
32.220.1700	17	16	79	19	2
32.220.1800	18	16	79	19	2
32.220.1900	19	16	79	19	2



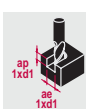
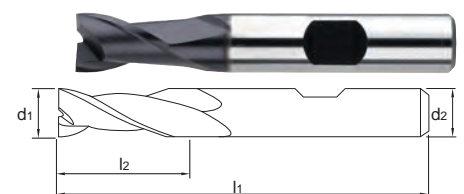
### > 32.224 Phantom

NL HSS-E Schachtfrees, 2-snijder TiAlN  
FR Fraise à rainurer 2 dents HSS-E TiAlN  
ES Fresa de ranurar de 2 labios HSS-E TiAlN  
DE HSS-E Langlochfräser (2-Schneider) TiAlN



Ref.	d1	d2	l1	l2	z
32.224.0200	2	6	48	4	2
32.224.0300	3	6	49	5	2
32.224.0400	4	6	51	7	2
32.224.0500	5	6	52	8	2
32.224.0600	6	6	52	8	2
32.224.0700	7	10	60	10	2

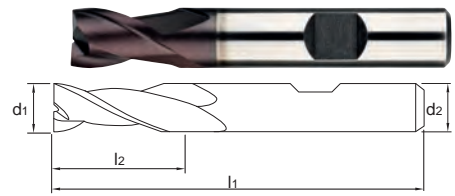
Ref.	d1	d2	l1	l2	z
32.224.0800	8	10	61	11	2
32.224.0900	9	10	61	11	2
32.224.1000	10	10	63	13	2
32.224.1200	12	12	73	16	2
32.224.1400	14	12	73	16	2
32.224.1500	15	12	73	16	2



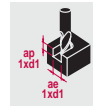
Ref.	d1	d2	l1	l2	z
32.224.1600	16	16	79	19	2
32.224.1800	18	16	79	19	2
32.224.2000	20	20	82	22	2
32.224.2500	25	25	102	26	2
32.224.3000	30	25	102	26	2

» **32.228 Phantom**

NL HSS-E PM Schachtfrees, 2-snijder TiAIN  
FR Fraise à rainurer 2 dents HSS-E PM TiAIN  
ES Fresa de ranurar de 2 labios HSS-E PM TiAIN  
DE HSS-E PM Langlochfräser (2-Schneider) TiAIN



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu
45-70 J	35-50 J	30-40 J	20-30 J	20-25 I	15-20 I	35-45 J	35-45 J	50-70 J



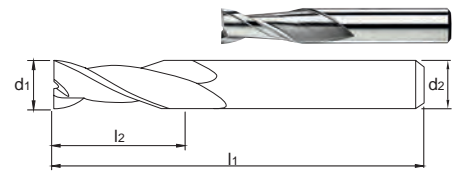
Ref.	d1	d2	l1	l2	z
32.228.0200	2	6	48	4	2
32.228.0300	3	6	49	5	2
32.228.0400	4	6	51	7	2
32.228.0500	5	6	52	8	2
32.228.0600	6	6	52	8	2

Ref.	d1	d2	l1	l2	z
32.228.0800	8	10	61	11	2
32.228.1000	10	10	63	13	2
32.228.1200	12	12	73	16	2
32.228.1400	14	12	73	16	2
32.228.1600	16	16	79	19	2

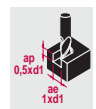
Ref.	d1	d2	l1	l2	z
32.228.1800	18	16	79	19	2
32.228.2000	20	20	82	22	2
32.228.2200	22	20	88	22	2
32.228.2500	25	25	102	26	2

» **32.260 Phantom**

NL HSS-E Precisie Schachtfrees, 2-snijder  
FR Fraise de précision 2 dents HSS-E  
ES Fresa de precisión HSS-E  
DE HSS-E Präzision Fräser (2-Schneider)



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
30-35 B	28-32 A	20-25 B	15-20 A	75-105 C



Ref.	d1	d2	l1	l2	z
32.260.0040	0.4	3	37	1	2
32.260.0050	0.5	3	37	1.5	2
32.260.0060	0.6	3	37	1.5	2
32.260.0070	0.7	4	37	2	2
32.260.0080	0.8	4	37	2	2
32.260.0090	0.9	4	37	2.5	2
32.260.0100	1	4	37	3	2
32.260.0110	1.1	4	37	3	2
32.260.0120	1.2	4	37	4	2
32.260.0130	1.3	4	37	4	2
32.260.0140	1.4	4	37	4	2
32.260.0150	1.5	4	37	4	2
32.260.0160	1.6	4	37	4	2
32.260.0170	1.7	4	37	5	2
32.260.0180	1.8	4	37	5	2
32.260.0190	1.9	4	37	5	2
32.260.0200	2	4	37	5	2
32.260.0210	2.1	4	37	5	2
32.260.0220	2.2	4	37	5	2
32.260.0230	2.3	4	40	7	2
32.260.0240	2.4	4	40	7	2
32.260.0250	2.5	4	40	7	2
32.260.0260	2.6	4	40	7	2
32.260.0270	2.7	4	40	7	2
32.260.0280	2.8	5	44	8	2
32.260.0290	2.9	5	44	8	2
32.260.0300	3	5	44	8	2
32.260.0310	3.1	5	44	8	2
32.260.0320	3.2	5	44	8	2
32.260.0330	3.3	5	44	10	2
32.260.0340	3.4	5	44	10	2
32.260.0350	3.5	5	44	10	2
32.260.0360	3.6	5	44	10	2

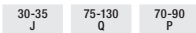
Ref.	d1	d2	l1	l2	z
32.260.0370	3.7	5	44	10	2
32.260.0380	3.8	6	51	12	2
32.260.0390	3.9	6	51	12	2
32.260.0400	4	6	51	12	2
32.260.0410	4.1	6	51	12	2
32.260.0420	4.2	6	51	12	2
32.260.0430	4.3	6	51	12	2
32.260.0440	4.4	6	51	12	2
32.260.0450	4.5	6	51	12	2
32.260.0460	4.6	6	51	12	2
32.260.0470	4.7	6	51	12	2
32.260.0480	4.8	6	52	14	2
32.260.0490	4.9	6	52	14	2
32.260.0500	5	6	52	14	2
32.260.0510	5.1	6	52	14	2
32.260.0520	5.2	6	52	14	2
32.260.0530	5.3	6	52	14	2
32.260.0540	5.4	6	52	14	2
32.260.0550	5.5	6	52	14	2
32.260.0560	5.6	6	52	14	2
32.260.0570	5.7	6	52	14	2
32.260.0580	5.8	8	60	16	2
32.260.0590	5.9	8	60	16	2
32.260.0600	6	8	60	16	2
32.260.0610	6.1	8	60	16	2
32.260.0620	6.2	8	60	16	2
32.260.0630	6.3	8	60	16	2
32.260.0640	6.4	8	60	16	2
32.260.0650	6.5	8	60	16	2
32.260.0660	6.6	8	60	16	2
32.260.0670	6.7	8	60	16	2
32.260.0680	6.8	8	60	16	2
32.260.0690	6.9	8	60	16	2

Ref.	d1	d2	l1	l2	z
32.260.0700	7	8	60	16	2
32.260.0710	7.1	8	60	16	2
32.260.0720	7.2	8	60	16	2
32.260.0730	7.3	8	60	16	2
32.260.0740	7.4	8	60	16	2
32.260.0750	7.5	8	60	16	2
32.260.0760	7.6	8	60	16	2
32.260.0770	7.7	8	60	16	2
32.260.0780	7.8	8	61	18	2
32.260.0790	7.9	8	61	18	2
32.260.0800	8	8	61	18	2
32.260.0810	8.1	10	69	18	2
32.260.0820	8.2	10	69	18	2
32.260.0830	8.3	10	69	18	2
32.260.0840	8.4	10	69	18	2
32.260.0850	8.5	10	69	18	2
32.260.0860	8.6	10	69	18	2
32.260.0870	8.7	10	69	18	2
32.260.0880	8.8	10	69	18	2
32.260.0890	8.9	10	69	18	2
32.260.0900	9	10	69	18	2
32.260.0910	9.1	10	69	18	2
32.260.0920	9.2	10	69	18	2
32.260.0930	9.3	10	69	18	2
32.260.0940	9.4	10	69	18	2
32.260.0950	9.5	10	69	18	2
32.260.0960	9.6	10	69	18	2
32.260.0970	9.7	10	69	18	2
32.260.0980	9.8	10	69	20	2
32.260.0990	9.9	10	69	20	2
32.260.1000	10	10	69	20	2



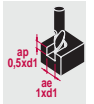
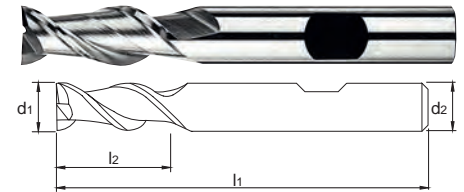
### > 32.320 Phantom

NL HSS-E Schachtfrees, 2-snijder Aluminium  
 FR Fraise à rainurer 2 dents HSS-E Aluminium  
 ES Fresa de ranurar de 2 labios HSS-E Aluminio  
 DE HSS-E Langlochfräser (2-Schneider) Aluminium



Ref.	d1	d2	l1	l2	z
32.320.0200	2	6	51	7	2
32.320.0300	3	6	52	8	2
32.320.0400	4	6	55	11	2
32.320.0500	5	6	57	13	2
32.320.0600	6	6	57	13	2
32.320.0700	7	10	66	16	2

Ref.	d1	d2	l1	l2	z
32.320.0800	8	10	69	19	2
32.320.0900	9	10	69	19	2
32.320.1000	10	10	72	22	2
32.320.1100	11	12	79	22	2
32.320.1200	12	12	83	26	2
32.320.1300	13	12	83	26	2



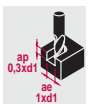
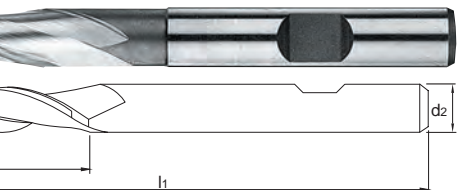
### > 32.520 Phantom

NL HSS-E Schachtfrees, 2-snijder lang  
 FR Fraise à rainurer 2 dents HSS-E version longue  
 ES Fresa de ranurar de 2 labios HSS-E larga  
 DE HSS-E Langlochfräser (2-Schneider) lang



Ref.	d1	d2	l1	l2	z
32.520.0300	3	6	56	8	2
32.520.0400	4	6	63	11	2
32.520.0500	5	6	68	13	2
32.520.0600	6	6	68	13	2
32.520.0800	8	10	88	19	2

Ref.	d1	d2	l1	l2	z
32.520.1000	10	10	95	22	2
32.520.1200	12	12	110	26	2
32.520.1400	14	12	110	26	2
32.520.1600	16	16	123	32	2
32.520.1800	18	16	123	32	2



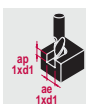
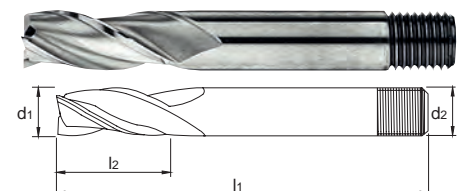
### > 33.200 Phantom

NL HSS-E Schachtfrees, 3-snijder  
 FR Fraise universelle 3 dents HSS-E  
 ES Fresa frontal de 3 labios HSS-E  
 DE HSS-E Universalfräser



Ref.	d1	d2	l1	l2	z
33.200.0400	4	6	55	11	3
33.200.0500	5	6	57	13	3
33.200.0600	6	6	57	13	3
33.200.0700	7	10	66	16	3
33.200.0800	8	10	69	19	3

Ref.	d1	d2	l1	l2	z
33.200.0900	9	10	69	19	3
33.200.1000	10	10	72	22	3
33.200.1200	12	12	83	26	3
33.200.1400	14	12	83	26	3
33.200.1500	15	12	83	26	3



Ref.	d1	d2	l1	l2	z
33.200.1600	16	16	92	32	3
33.200.1800	18	16	92	32	3
33.200.2000	20	20	104	38	3

» **33.220 Phantom**

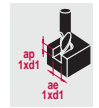
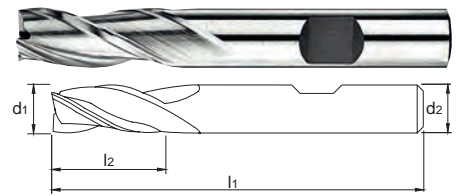
NL HSS-E Schachtfrees, 3-snijder  
 FR Fraise universelle 3 dents HSS-E  
 ES Fresa frontal de 3 labios HSS-E  
 DE HSS-E Universalfräser



30-35 J	28-32 I	20-25 J	15-20 I	75-105 K
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Ref.	d1	d2	l1	l2	z
33.220.0100	1	6	47	3	3
33.220.0150	1.5	6	51	7	3
33.220.0200	2	6	51	7	3
33.220.0250	2.5	6	52	8	3
33.220.0300	3	6	52	8	3
33.220.0350	3.5	6	54	10	3
33.220.0400	4	6	55	11	3
33.220.0450	4.5	6	55	11	3
33.220.0500	5	6	57	13	3

Ref.	d1	d2	l1	l2	z
33.220.0550	5.5	6	57	13	3
33.220.0600	6	6	57	13	3
33.220.0650	6.5	10	66	16	3
33.220.0700	7	10	66	16	3
33.220.0800	8	10	69	19	3
33.220.0900	9	10	69	19	3
33.220.1000	10	10	72	22	3
33.220.1200	12	12	83	26	3
33.220.1400	14	12	83	26	3



Ref.	d1	d2	l1	l2	z
33.220.1500	15	12	83	26	3
33.220.1600	16	16	92	32	3
33.220.1800	18	16	92	32	3
33.220.2000	20	20	104	38	3
33.220.2200	22	20	104	38	3
33.220.2400	24	25	121	45	3
33.220.2500	25	25	121	45	3

» **33.224 Phantom**

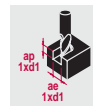
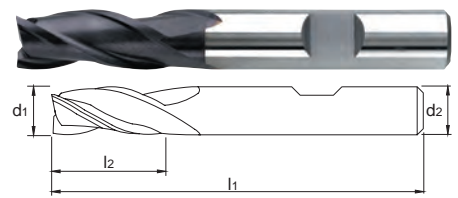
NL HSS-E Schachtfrees, 3-snijder TiAIN  
 FR Fraise universelle 3 dents HSS-E TiAIN  
 ES Fresa frontal de 3 labios HSS-E TiAIN  
 DE HSS-E Universalfräser TiAIN



45-50 J	40-45 I	30-35 J	20-25 I	18-22 I	12-18 I	105-150 K
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Ref.	d1	d2	l1	l2	z
33.224.0150	1.5	6	51	7	3
33.224.0200	2	6	51	7	3
33.224.0250	2.5	6	52	8	3
33.224.0300	3	6	52	8	3
33.224.0400	4	6	55	11	3

Ref.	d1	d2	l1	l2	z
33.224.0500	5	6	57	13	3
33.224.0600	6	6	57	13	3
33.224.0800	8	10	69	19	3
33.224.1000	10	10	72	22	3
33.224.1200	12	12	83	26	3



Ref.	d1	d2	l1	l2	z
33.224.1400	14	12	83	26	3
33.224.1600	16	16	92	32	3
33.224.1800	18	16	92	32	3
33.224.2000	20	20	104	38	3
33.224.2500	25	25	121	45	3

» **33.228 Phantom**

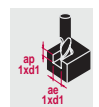
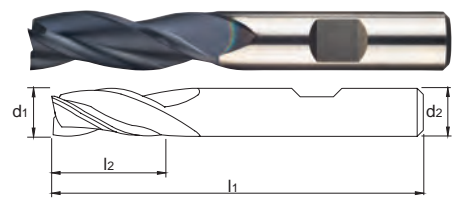
NL HSS-E PM Schachtfrees, 3-snijder AlTiN-X  
 FR Fraise universelle 3 dents HSS-E PM AlTiN-X  
 ES Fresa frontal de 3 labios HSS-E PM AlTiN-X  
 DE HSS-E PM Universalfräser AlTiN-X



45-70 J	35-50 J	30-40 J	20-30 J	20-25 I	15-20 I	35-45 J	35-45 J	50-70 J	15-30 H
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Ref.	d1	d2	l1	l2	z
33.228.0200	2	6	51	7	3
33.228.0300	3	6	52	8	3
33.228.0400	4	6	55	11	3
33.228.0500	5	6	57	13	3

Ref.	d1	d2	l1	l2	z
33.228.0600	6	6	57	13	3
33.228.0800	8	10	69	19	3
33.228.1000	10	10	72	22	3
33.228.1200	12	12	83	26	3



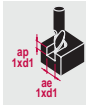
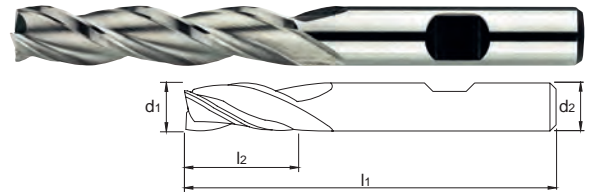
Ref.	d1	d2	l1	l2	z
33.228.1400	14	12	83	26	3
33.228.1600	16	16	92	32	3
33.228.1800	18	16	92	32	3
33.228.2000	20	20	104	38	3





## > 33.520 Phantom

NL HSS-E Schachtfrees, 3-snijder lang  
 FR Fraise universelle 3 dents HSS-E version longue  
 ES Fresa frontal de 3 labios HSS-E larga  
 DE HSS-E Universalfräser lang



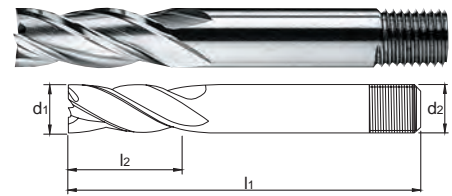
Ref.	d1	d2	l1	l2	z
33.520.0300	3	6	56	12	3
33.520.0400	4	6	63	19	3
33.520.0500	5	6	68	24	3
33.520.0600	6	6	68	24	3
33.520.0700	7	10	80	30	3
33.520.0800	8	10	88	38	3

Ref.	d1	d2	l1	l2	z
33.520.0900	9	10	88	38	3
33.520.1000	10	10	95	45	3
33.520.1100	11	12	102	45	3
33.520.1200	12	12	110	53	3
33.520.1300	13	12	110	53	3
33.520.1400	14	12	110	53	3

Ref.	d1	d2	l1	l2	z
33.520.1500	15	12	110	53	3
33.520.1600	16	16	123	63	3
33.520.1800	18	16	123	63	3
33.520.2000	20	20	141	75	3

› **34.200 Phantom**

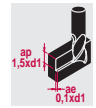
NL HSS-E Schachtfrees, meersnijder  
FR Fraise standard HSS-E  
ES Fresa frontal de varios labios HSS-E  
DE HSS-E Mehrschneiden-Schaftfräser



Ref.	d1	d2	l1	l2	z
34.200.0200	2	6	51	7	4
34.200.0300	3	6	52	8	4
34.200.0400	4	6	55	11	4
34.200.0500	5	6	57	13	4
34.200.0600	6	6	57	13	4
34.200.0700	7	10	66	16	4
34.200.0800	8	10	69	19	4
34.200.0900	9	10	69	19	4
34.200.1000	10	10	72	22	4

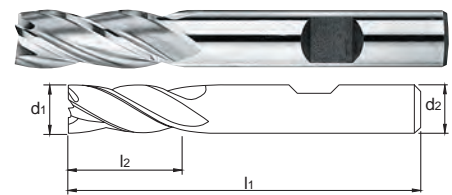
Ref.	d1	d2	l1	l2	z
34.200.1100	11	12	79	22	4
34.200.1200	12	12	83	26	4
34.200.1300	13	12	83	26	4
34.200.1400	14	12	83	26	4
34.200.1500	15	12	83	26	4
34.200.1600	16	16	92	32	4
34.200.1700	17	16	92	32	4
34.200.1800	18	16	92	32	4
34.200.1900	19	16	92	32	4

Ref.	d1	d2	l1	l2	z
34.200.2000	20	20	104	38	4
34.200.2200	22	20	104	38	6
34.200.2300	23	25	104	38	6
34.200.2400	24	25	121	45	6
34.200.2500	25	25	121	45	6
34.200.2600	26	25	121	45	6
34.200.2800	28	25	121	45	6
34.200.3000	30	25	121	45	6
34.200.4000	40	32	143	63	6



› **34.220 Phantom**

NL HSS-E Schachtfrees, meersnijder  
FR Fraise standard HSS-E  
ES Fresa frontal de varios labios HSS-E  
DE HSS-E Mehrschneiden-Schaftfräser



Ref.	d1	d2	l1	l2	z
34.220.0200	2	6	51	7	4
34.220.0300	3	6	52	8	4
34.220.0400	4	6	55	11	4
34.220.0500	5	6	57	13	4
34.220.0600	6	6	57	13	4
34.220.0700	7	10	66	16	4
34.220.0800	8	10	69	19	4
34.220.0900	9	10	69	19	4
34.220.1000	10	10	72	22	4
34.220.1100	11	12	79	22	4
34.220.1200	12	12	83	26	4

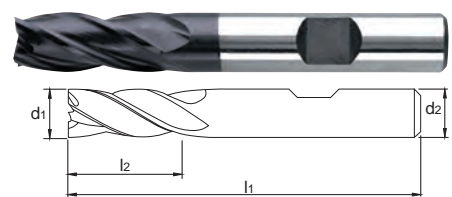
Ref.	d1	d2	l1	l2	z
34.220.1300	13	12	83	26	4
34.220.1400	14	12	83	26	4
34.220.1500	15	12	83	26	4
34.220.1600	16	16	92	32	4
34.220.1700	17	16	92	32	4
34.220.1800	18	16	92	32	4
34.220.1900	19	16	92	32	4
34.220.2000	20	20	104	38	4
34.220.2200	22	20	104	38	6
34.220.2400	24	25	121	45	6
34.220.2500	25	25	121	45	6

Ref.	d1	d2	l1	l2	z
34.220.2600	26	25	121	45	6
34.220.2800	28	25	121	45	6
34.220.3000	30	25	121	45	6
34.220.3200	32	32	133	53	6
34.220.3400	34	32	133	53	6
34.220.3500	35	32	133	53	6
34.220.3600	36	32	133	53	6
34.220.3800	38	32	143	63	6
34.220.4000	40	32	143	63	6



› **34.224 Phantom**

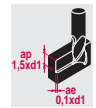
NL HSS-E Schachtfrees, meersnijder TiAIN  
FR Fraise standard HSS-E TiAIN  
ES Fresa frontal de varios labios HSS-E TiAIN  
DE HSS-E Mehrschneiden-Schaftfräser TiAIN



Ref.	d1	d2	l1	l2	z
34.224.0200	2	6	51	7	4
34.224.0300	3	6	52	8	4
34.224.0400	4	6	55	11	4
34.224.0500	5	6	57	13	4
34.224.0600	6	6	57	13	4

Ref.	d1	d2	l1	l2	z
34.224.0800	8	10	69	19	4
34.224.1000	10	10	72	22	4
34.224.1200	12	12	83	26	4
34.224.1400	14	12	83	26	4
34.224.1600	16	16	92	32	4

Ref.	d1	d2	l1	l2	z
34.224.1800	18	16	92	32	4
34.224.2000	20	20	104	38	4
34.224.2500	25	25	121	45	4
34.224.3000	30	25	121	45	6
34.224.3200	32	32	133	53	6





### > 34.228 Phantom

NL HSS-E PM Schachtfrees, meersnijder AITiN-X  
 FR Fraise standard HSS-E PM AITiN-X  
 ES Fresa frontal de varios labios HSS-E PM AITiN-X  
 DE HSS-E PM Mehrschneiden-Schaftfräser AITiN-X

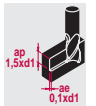
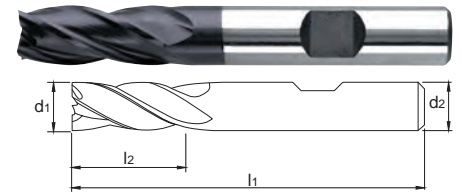


P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	P 14 s1400 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu
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45-70 J	35-50 J	30-40 J	20-30 J	20-25 I	15-20 I	35-45 J	35-45 J	50-70 J	15-30 H
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Ref.	d1	d2	l1	l2	z
34.228.0300	3	6	52	8	4
34.228.0400	4	6	55	11	4
34.228.0500	5	6	57	13	4
34.228.0600	6	6	57	13	4

Ref.	d1	d2	l1	l2	z
34.228.0800	8	10	69	19	4
34.228.1000	10	10	72	22	4
34.228.1200	12	12	83	26	4
34.228.1400	14	12	83	26	4



### > 34.238 Phantom

NL HSS-E PM Vari-frees, 4-snijder AITiN-X  
 FR Fraise Vari HSS-E PM AITiN-X  
 ES Fresa Vari HSS-E PM AITiN-X  
 DE HSS-E PM Fräser mit ungleicher Drallsteigung AITiN-X

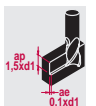
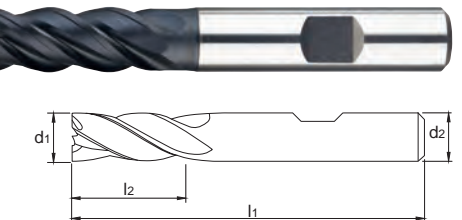


P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	P 14 s1400 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 51 Cu
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45-70 J	35-50 J	30-40 J	20-30 J	20-25 I	15-20 I	35-45 J	35-45 J	50-70 J	15-30 H
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Ref.	d1	d2	l1	l2	z
34.238.0600	6	6	57	13	4
34.238.0800	8	10	69	19	4

Ref.	d1	d2	l1	l2	z
34.238.1000	10	10	72	22	4
34.238.1200	12	12	83	26	4



### > 34.350 Phantom

NL HSS-E Schachtfrees, meersnijder lang  
 FR Fraise standard HSS-E version longue  
 ES Fresa frontal de varios labios HSS-E larga  
 DE HSS-E Mehrschneiden-Schaftfräser lang

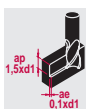
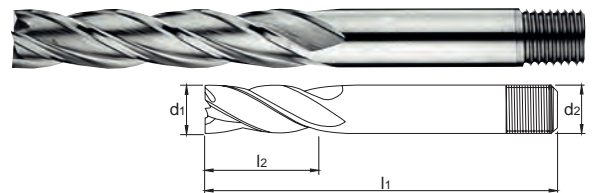


P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	P 14 s1400 N/mm <sup>2</sup>	N 41 Alu
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30-35 G	28-32 F	20-25 G	15-20 G	75-105 I
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Ref.	d1	d2	l1	l2	z
34.350.0300	3	6	56	12	4
34.350.0400	4	6	63	19	4
34.350.0500	5	6	68	24	4
34.350.0600	6	6	68	24	4
34.350.0800	8	10	88	38	4
34.350.1000	10	10	95	45	4
34.350.1200	12	12	110	53	4

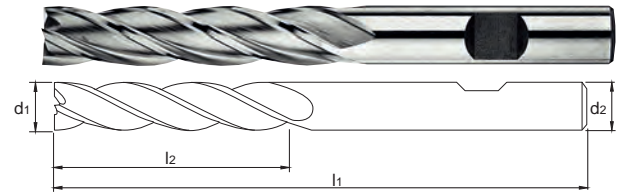
Ref.	d1	d2	l1	l2	z
34.350.1400	14	12	110	53	4
34.350.1500	15	12	110	53	4
34.350.1600	16	16	123	63	4
34.350.1800	18	16	123	63	4
34.350.2000	20	20	141	75	4
34.350.2200	22	20	141	75	6
34.350.2400	24	25	166	90	6



Ref.	d1	d2	l1	l2	z
34.350.2500	25	25	166	90	6
34.350.2600	26	25	166	90	6
34.350.2800	28	25	166	90	6
34.350.3000	30	25	166	90	6
34.350.3200	32	32	186	106	6
34.350.3600	36	32	186	106	6

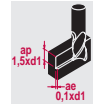
> **34.355 Phantom**

NL HSS-E Schachtfrees, meersnijder lang  
 FR Fraise standard HSS-E version longue  
 ES Fresa frontal de varios labios HSS-E larga  
 DE HSS-E Mehrschneiden-Schaftfräser lang



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
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30-35 G	28-32 F	20-25 G	15-20 G	75-105 I
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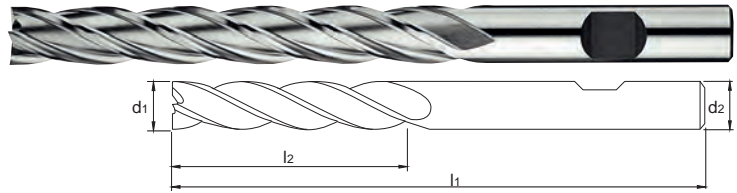
Ref.	d1	d2	l1	l2	z
34.355.0200	2	6	54	10	4
34.355.0300	3	6	56	12	4
34.355.0400	4	6	63	19	4
34.355.0500	5	6	68	24	4
34.355.0600	6	6	68	24	4
34.355.0700	7	10	80	30	4
34.355.0800	8	10	88	38	4
34.355.1000	10	10	95	45	4

Ref.	d1	d2	l1	l2	z
34.355.1100	11	12	102	45	4
34.355.1200	12	12	110	53	4
34.355.1400	14	12	110	53	4
34.355.1500	15	12	110	53	4
34.355.1600	16	16	123	63	4
34.355.1800	18	16	123	63	4
34.355.2000	20	20	141	75	4
34.355.2200	22	20	141	75	6

Ref.	d1	d2	l1	l2	z
34.355.2400	24	25	166	90	6
34.355.2500	25	25	166	90	6
34.355.2600	26	25	166	90	6
34.355.3000	30	25	166	90	6
34.355.3200	32	32	186	106	6
34.355.3600	36	32	186	106	6
34.355.4000	40	40	217	125	6

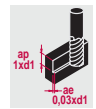
> **34.370 Phantom**

NL HSS-E Schachtfrees, 4-snijder extra lang  
 FR Fraise standard 4 dents HSS-E extra longue  
 ES Fresa frontal de varios labios HSS-E extra larga  
 DE HSS-E 4 Schneiden-Schaftfräser extra lang



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
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30-35 G	28-32 F	20-25 G	15-20 G	75-105 I
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Ref.	d1	d2	l1	l2	z
34.370.0600	6	6	100	56	4
34.370.0800	8	10	113	63	4
34.370.1000	10	10	120	70	4

Ref.	d1	d2	l1	l2	z
34.370.1200	12	12	137	80	4
34.370.1400	14	12	137	80	4
34.370.1600	16	16	150	90	4

Ref.	d1	d2	l1	l2	z
34.370.1800	18	16	160	100	4
34.370.2000	20	20	176	110	4
34.370.2500	25	25	186	110	4



### > 35.024 Phantom

NL HSS-E Ruwfrees kort, TiAIN, fijn  
 FR Fraise d'ébauche HSS-E version courte, TiAIN, pas fin  
 ES Fresa de desbaste HSS-E corto, TiAIN, paso fino  
 DE HSS-E Schruppfräser kurz, TiAIN, fein

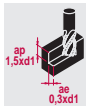
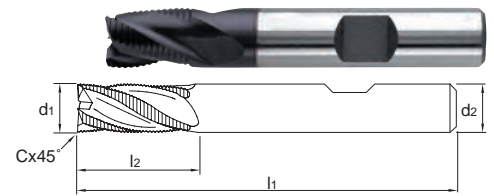


<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>
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45-50 L	35-40 H	30-35 L	18-24 H	22-28 L	18-24 G
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Ref.	d1	d2	l1	l2	c	z
35.024.0600	6	6	52	8	0,2	4
35.024.0800	8	10	61	11	0,2	4

Ref.	d1	d2	l1	l2	c	z
35.024.1000	10	10	63	13	0,2	4
35.024.1200	12	12	73	16	0,2	4



### > 35.100 Phantom

NL HSS-E Ruwfrees rond  
 FR Fraise d'ébauche HSS-E ronde  
 ES Fresa de desbaste HSS-E redondo  
 DE HSS-E Schruppfräser rund

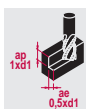
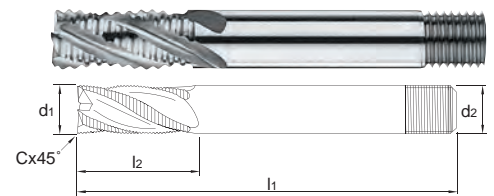


<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
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30-35 L	25-30 K	20-25 L	15-20 J	75-85 L
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Ref.	d1	d2	l1	l2	c	z
35.100.0600	6	6	57	13	0,25	3
35.100.0700	7	10	66	16	0,25	3
35.100.0800	8	10	69	19	0,25	3
35.100.0900	9	10	69	19	0,35	3
35.100.1000	10	10	72	22	0,35	4

Ref.	d1	d2	l1	l2	c	z
35.100.1100	11	12	79	22	0,5	4
35.100.1200	12	12	83	26	0,5	4
35.100.1300	13	12	83	26	0,5	4
35.100.1400	14	12	83	26	0,55	4
35.100.1500	15	12	83	26	0,55	4



### > 35.120 Phantom

NL HSS-E Ruwfrees rond  
 FR Fraise d'ébauche HSS-E ronde  
 ES Fresa de desbaste HSS-E redondo  
 DE HSS-E Schruppfräser rund

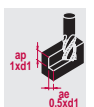
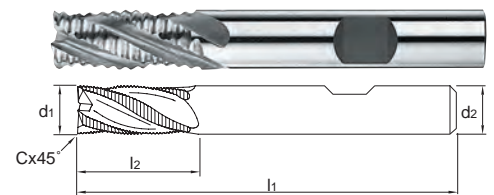


<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
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30-35 L	25-30 K	20-25 L	15-20 J	75-85 L
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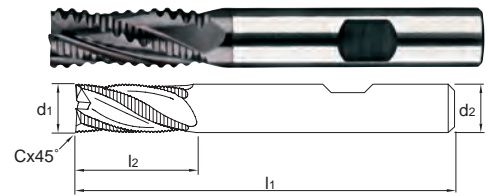
Ref.	d1	d2	l1	l2	c	z
35.120.0600	6	6	57	13	0,25	3
35.120.0700	7	10	66	16	0,25	3
35.120.0800	8	10	69	19	0,25	3
35.120.0900	9	10	69	19	0,35	3
35.120.1000	10	10	72	22	0,35	4
35.120.1100	11	12	79	22	0,5	4
35.120.1200	12	12	83	26	0,5	4

Ref.	d1	d2	l1	l2	c	z
35.120.1300	13	12	83	26	0,5	4
35.120.1400	14	12	83	26	0,55	4
35.120.1500	15	12	83	26	0,55	4
35.120.1600	16	16	92	32	0,55	4
35.120.1800	18	16	92	32	0,55	4
35.120.2000	20	20	104	38	0,55	4
35.120.2200	22	20	104	38	0,55	5



» 35.124 **Phantom**

NL HSS-E Ruwrees TiAIN, rond  
FR Fraise d'ébauche HSS-E TiAIN, ronde  
ES Fresa de desbaste HSS-E TiAIN, redondo  
DE HSS-E Schruppfräser TiAIN, rund

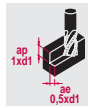


<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
45-50 L	35-40 K	25-30 L	15-20 J	105-120 L

Ref.	d1	d2	l1	l2	c	z
35.124.0600	6	6	57	13	0,25	3
35.124.0800	8	10	69	19	0,25	3
35.124.1000	10	10	72	22	0,35	4
35.124.1200	12	12	83	26	0,5	4
35.124.1400	14	12	83	26	0,55	4

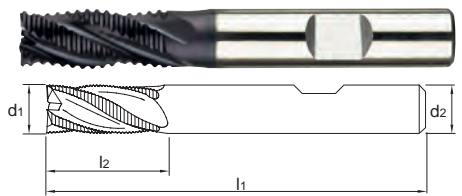
Ref.	d1	d2	l1	l2	c	z
35.124.1600	16	16	92	32	0,55	4
35.124.1800	18	16	92	32	0,55	4
35.124.2000	20	20	104	38	0,55	4
35.124.2500	25	25	121	45	0,55	5
35.124.2800	28	25	121	45	0,7	6

Ref.	d1	d2	l1	l2	c	z
35.124.3000	30	25	121	45	0,7	6
35.124.3600	36	32	133	53	0,7	6
35.124.4000	40	32	143	63	0,9	6



» 35.126 **Phantom**

NL HSS-E PM Ruwrees AlTiN-X, rond  
FR Fraise d'ébauche HSS-E PM AlTiN-X, ronde  
ES Fresa de desbaste HSS-E PM AlTiN-X, redondo  
DE HSS-E PM Schruppfräser AlTiN-X, rund

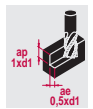


<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
55-60 L	40-50 K	30-35 L	25-30 J	30-35 I	25-30 G	40-45 I	40-50 I	105-120 L

Ref.	d1	d2	l1	l2	z
35.126.0600	6	6	57	13	4
35.126.0800	8	10	69	19	4
35.126.1000	10	10	72	22	4
35.126.1200	12	12	83	26	4
35.126.1400	14	12	83	26	4

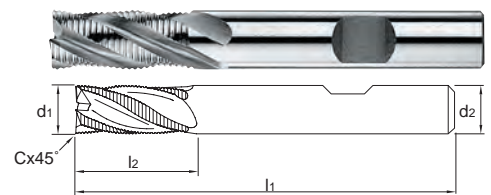
Ref.	d1	d2	l1	l2	z
35.126.1600	16	16	92	32	4
35.126.1800	18	16	92	32	4
35.126.2000	20	20	104	38	4
35.126.2200	22	20	104	38	5
35.126.2500	25	25	121	45	5

Ref.	d1	d2	l1	l2	z
35.126.2800	28	25	121	45	5
35.126.3000	30	25	121	45	5
35.126.3200	32	32	133	53	6



» 35.220 **Phantom**

NL HSS-E Ruwrees fijn  
FR Fraise d'ébauche HSS-E pas fin  
ES Fresa de desbaste HSS-E paso fino  
DE HSS-E Schruppfräser fein

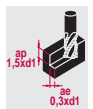


<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
30-35 L	25-30 K	20-25 L	15-20 J	75-85 L

Ref.	d1	d2	l1	l2	c	z
35.220.0600	6	6	57	13	0,2	3
35.220.0700	7	10	66	16	0,2	3
35.220.0800	8	10	69	19	0,2	3

Ref.	d1	d2	l1	l2	c	z
35.220.1000	10	10	72	22	0,2	4
35.220.1200	12	12	83	26	0,2	4
35.220.1400	14	12	83	26	0,25	4

Ref.	d1	d2	l1	l2	c	z
35.220.1600	16	16	92	32	0,25	4
35.220.1800	18	16	92	32	0,25	4
35.220.2000	20	20	104	38	0,25	4





### > 35.224 Phantom

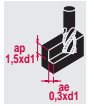
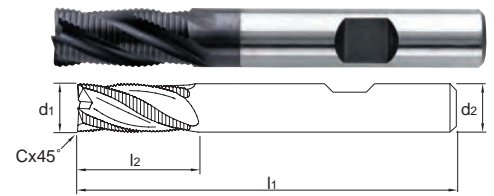
NL HSS-E Ruwfree TiAlN, fijn  
FR Fraise d'ébauche HSS-E TiAlN, pas fin  
ES Fresa de desbaste HSS-E TiAlN, paso fino  
DE HSS-E Schruppfräser TiAlN, fein



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>N 41</b> Alu
45-50 L	35-40 K	25-30 L	15-20 J	22-28 I	18-24 G	105-120 L

Ref.	d1	d2	l1	l2	c	z
35.224.0600	6	6	57	13	0,2	3
35.224.0800	8	10	69	19	0,2	3
35.224.1000	10	10	72	22	0,2	4

Ref.	d1	d2	l1	l2	c	z
35.224.1200	12	12	83	26	0,2	4
35.224.1400	14	12	83	26	0,25	4
35.224.1600	16	16	92	32	0,25	4



### > 35.226 Phantom

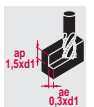
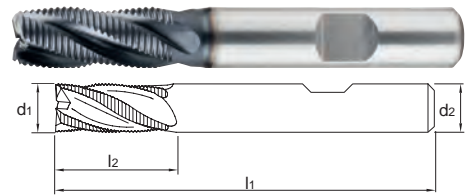
NL HSS-E PM Ruwfree AlTiN-X, fijn  
FR Fraise d'ébauche HSS-E PM AlTiN-X, pas fin  
ES Fresa de desbaste HSS-E PM AlTiN-X, paso fino  
DE HSS-E PM Schruppfräser AlTiN-X, fein



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
55-60 L	40-50 K	30-35 L	25-30 J	30-35 I	25-30 G	40-45 I	40-50 I	105-120 L

Ref.	d1	d2	l1	l2	c	z
35.226.0600	6	6	57	13	0,2	4
35.226.0800	8	10	69	19	0,2	4
35.226.1000	10	10	72	22	0,2	4
35.226.1200	12	12	83	26	0,2	4

Ref.	d1	d2	l1	l2	c	z
35.226.1400	14	12	83	26	0,25	4
35.226.1600	16	16	92	32	0,25	4
35.226.1800	18	16	92	32	0,25	4
35.226.2000	20	20	104	38	0,25	4



### > 35.228 Phantom

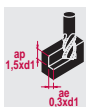
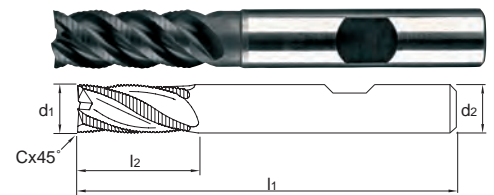
NL HSS-E PM Ruwfree TiAlN, fijn  
FR Fraise d'ébauche HSS-E PM TiAlN, pas fin  
ES Fresa de desbaste HSS-E PM TiAlN, paso fino  
DE HSS-E PM Schruppfräser TiAlN, fein



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW
55-60 J	40-50 J	30-35 I	25-30 J	30-35 H	25-30 H	40-45 I	40-50 I

Ref.	d1	d2	l1	l2	c	z
35.228.0400	4	6	55	11	0,1	3
35.228.0500	5	6	57	13	0,15	4
35.228.0600	6	6	57	13	0,15	4
35.228.0700	7	10	66	16	0,15	4
35.228.0800	8	10	69	19	0,2	4

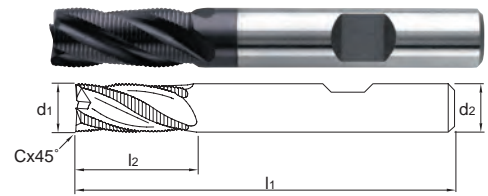
Ref.	d1	d2	l1	l2	c	z
35.228.0900	9	10	69	19	0,2	4
35.228.1000	10	10	72	22	0,2	4
35.228.1200	12	12	83	26	0,2	4
35.228.1400	14	12	83	26	0,2	5
35.228.1600	16	16	92	32	0,2	5





> **35.324 Phantom**

NL HSS-E Ruwfreest TiAlN, extra-fijn  
FR Fraise d'ébauche HSS-E TiAlN, pas extra fin  
ES Fresa de desbaste HSS-E TiAlN, paso extra fino  
DE HSS-E Schruppfräser TiAlN, extra feinen



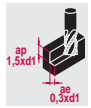
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>N 41</b> Alu
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45-50 L	35-40 K	25-30 L	15-20 J	22-28 I	18-24 G	105-120 L
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Ref.	d1	d2	l1	l2	c	z
35.324.0600	6	6	57	13	0,3	3
35.324.0800	8	10	69	19	0,3	3
35.324.1000	10	10	72	22	0,3	4
35.324.1200	12	12	83	26	0,35	4

Ref.	d1	d2	l1	l2	c	z
35.324.1400	14	12	83	26	0,35	4
35.324.1600	16	16	92	32	0,35	4
35.324.1800	18	16	92	32	0,45	4
35.324.2000	20	20	104	38	0,45	4

Ref.	d1	d2	l1	l2	c	z
35.324.2200	22	20	104	38	0,45	5
35.324.2500	25	25	121	45	0,45	5



> **35.720 Phantom**

NL HSS-E Ruwfreest rond, lang  
FR Fraise d'ébauche HSS-E ronde, version longue  
ES Fresa de desbaste HSS-E redondo, larga  
DE HSS-E Schruppfräser rund, lang



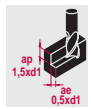
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
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30-35 G	28-32 F	20-25 G	15-20 G	75-105 I
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Ref.	d1	d2	l1	l2	c	z
35.720.0600	6	6	68	24	0,25	3
35.720.0800	8	10	88	38	0,25	3
35.720.1000	10	10	95	45	0,35	4
35.720.1200	12	12	110	53	0,5	4
35.720.1600	16	16	123	63	0,55	4

Ref.	d1	d2	l1	l2	c	z
35.720.1800	18	16	123	63	0,55	4
35.720.2000	20	20	141	75	0,55	4
35.720.2200	22	20	141	75	0,55	5
35.720.2500	25	25	166	90	0,55	5
35.720.2800	28	25	166	90	0,7	6

Ref.	d1	d2	l1	l2	c	z
35.720.3000	30	25	166	90	0,7	6
35.720.3200	32	32	186	106	0,7	6
35.720.3600	36	32	186	106	0,7	6
35.720.4000	40	40	217	125	0,9	6



> **35.726 Phantom**

NL HSS-E PM Ruwfreest AlTiN-X, rond, lang  
FR Fraise d'ébauche HSS-E PM AlTiN-X, ronde, version longue  
ES Fresa de desbaste HSS-E PM AlTiN-X, redondo, larga  
DE HSS-E PM Schruppfräser AlTiN-X, rund, lang



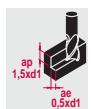
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
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55-60 G	40-50 F	30-35 G	25-30 G	30-35 G	25-30 F	40-45 G	40-50 G	105-120 I
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Ref.	d1	d2	l1	l2	z
35.726.0600	6	6	68	24	4
35.726.0800	8	10	88	38	4
35.726.1000	10	10	95	45	4
35.726.1200	12	12	110	53	4

Ref.	d1	d2	l1	l2	z
35.726.1400	14	12	110	53	4
35.726.1600	16	16	123	63	4
35.726.1800	18	16	123	63	4
35.726.2000	20	20	141	75	4

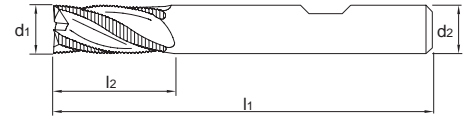
Ref.	d1	d2	l1	l2	z
35.726.2500	25	25	166	90	5
35.726.3200	32	32	186	106	6





### > 35.766 Phantom

NL HSS-E PM Ruwrees AITiN-X, fijn, lang  
 FR Fraise d'ébauche HSS-E PM AITiN-X, pas fin, version longue  
 ES Fresa de desbaste HSS-E PM AITiN-X, paso fino, larga  
 DE HSS-E PM Schruppfräser AITiN-X, fein, lang

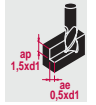


55-60 G	40-50 F	30-35 G	25-30 G	30-35 G	25-30 F	40-45 G	40-50 G	105-120 I
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Ref.	d1	d2	l1	l2	z
35.766.0600	6	6	68	24	4
35.766.0800	8	10	88	38	4
35.766.1000	10	10	95	45	4

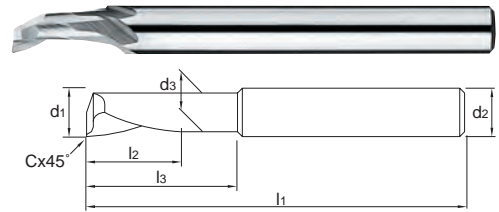
Ref.	d1	d2	l1	l2	z
35.766.1200	12	12	110	53	4
35.766.1400	14	12	110	53	4
35.766.1600	16	16	123	63	4

Ref.	d1	d2	l1	l2	z
35.766.1800	18	16	123	63	4
35.766.2000	20	20	141	75	4

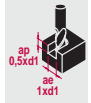


> **36.100 Phantom**

NL HSS-E Eensnijderfrees Aluminium  
FR Fraise à 1 dent HSS-E Aluminium  
ES Fresa frontal de 1 labio HSS-E Aluminio  
DE HSS-E Einzahnfräser Aluminium



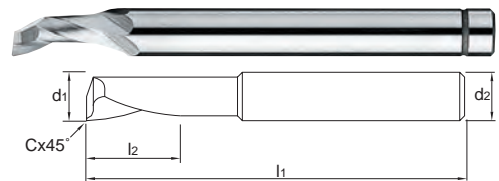
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>N 41</b> Alu
25-35 I	160-220 M



Ref.	d1	d2	d3	l1	l2	l3	c	z	Ref.	d1	d2	d3	l1	l2	l3	c	z
36.100.0300	3	8		60	12		0,15	1	36.100.0700	7	8		60	14		0,15	1
36.100.0400	4	8		60	12		0,15	1	36.100.0800	8	8		80	14		0,25	1
36.100.0500	5	8		60	14		0,15	1	36.100.0801	8	8	7,5	120	14	68	0,25	1
36.100.0501	5	8	4,8	80	18	35	0,15	1	36.100.0900	9	8		80	14		0,25	1
36.100.0502	5	8		100	40		0,15	1	36.100.1000	10	8		80	14		0,25	1
36.100.0600	6	8		60	14		0,15	1									

> **36.120 Phantom**

NL HSS-E Eensnijderfrees staal  
FR Fraise à 1 dent HSS-E acier  
ES Fresa frontal de 1 labio HSS-E acero  
DE HSS-E Einzahnfräser stahl



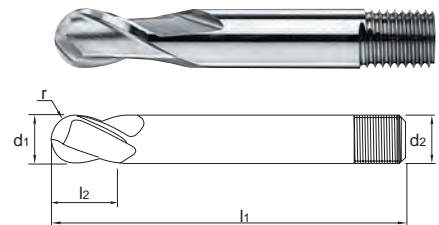
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>N 41</b> Alu
25-35 I	20-30 I	160-220 M



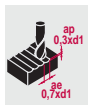
Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z
36.120.0300	3	8	60	12	0,15	1	36.120.0500	5	8	60	12	0,15	1	36.120.0800	8	8	80	14	0,15	1
36.120.0400	4	8	60	12	0,15	1	36.120.0600	6	8	60	14	0,15	1	36.120.1000	10	8	80	14	0,15	1

> **36.200 Phantom**

NL HSS-E Radiusfrees, 2-snijder  
FR Fraise à rayon 2 dents HSS-E  
ES Fresa de punta esférica HSS-E  
DE HSS-E 2 Schneiden Radiusfräser



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
35-40 K	25-30 J	20-25 K	15-20 I	95-105 K



Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z
36.200.0300	3	6	49	5	1,5	2	36.200.0800	8	10	61	11	4	2	36.200.1500	15	12	73	16	7,5	2
36.200.0400	4	6	51	7	2	2	36.200.1000	10	10	63	13	5	2	36.200.1600	16	16	79	19	8	2
36.200.0500	5	6	52	8	2,5	2	36.200.1200	12	12	73	16	6	2	36.200.1800	18	16	79	19	9	2
36.200.0600	6	6	52	8	3	2	36.200.1400	14	12	73	16	7	2	36.200.2000	20	20	88	22	10	2



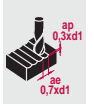
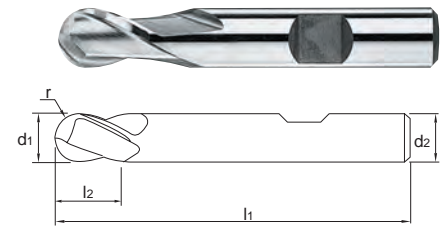
### > 36.220 Phantom

NL HSS-E Radiusrees, 2-snijder  
FR Fraise à rayon 2 dents HSS-E  
ES Fresa de punta esférica HSS-E  
DE HSS-E 2 Schneiden Radiusfräser



Ref.	d1	d2	l1	l2	r	z
36.220.0200	2	6	48	4	1	2
36.220.0300	3	6	49	5	1.5	2
36.220.0400	4	6	51	7	2	2
36.220.0500	5	6	52	8	2.5	2
36.220.0600	6	6	52	8	3	2
36.220.0700	7	10	60	10	3.5	2
36.220.0800	8	10	61	11	4	2

Ref.	d1	d2	l1	l2	r	z
36.220.0900	9	10	61	11	4.5	2
36.220.1000	10	10	63	13	5	2
36.220.1100	11	12	70	13	5.5	2
36.220.1200	12	12	73	16	6	2
36.220.1300	13	12	73	16	6.5	2
36.220.1400	14	12	73	16	7	2
36.220.1500	15	12	73	16	7.5	2



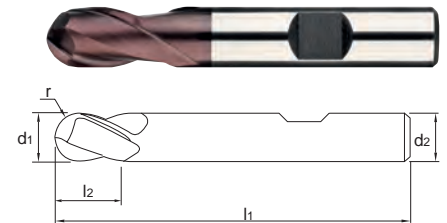
### > 36.228 Phantom

NL HSS-E PM Radiusrees, 2-snijder TiAlN  
FR Fraise à rayon 2 dents HSS-E PM TiAlN  
ES Fresa de punta esférica HSS-E PM TiAlN  
DE HSS-E PM 2 Schneiden Radiusfräser TiAlN



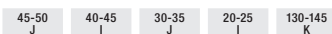
Ref.	d1	d2	l1	l2	r	z
36.228.0300	3	6	49	5	1.5	2
36.228.0400	4	6	51	7	2	2
36.228.0500	5	6	52	8	2.5	2

Ref.	d1	d2	l1	l2	r	z
36.228.0600	6	6	52	8	3	2
36.228.0800	8	10	61	11	4	2
36.228.1000	10	10	63	13	5	2



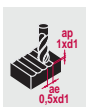
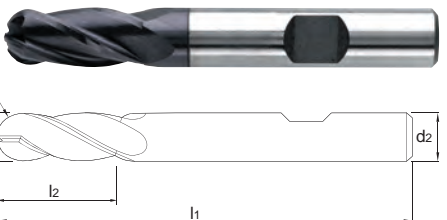
### > 36.324 Phantom

NL HSS-E Radiusrees, 4-snijder TiAlN  
FR Fraise à rayon 4 dents HSS-E TiAlN  
ES Fresa de punta esférica HSS-E TiAlN  
DE HSS-E 4 Schneiden Radiusfräser TiAlN

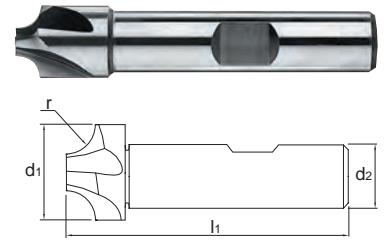


Ref.	d1	d2	l1	l2	r	z
36.324.0600	6	6	57	13	3	4
36.324.0800	8	10	69	19	4	4

Ref.	d1	d2	l1	l2	r	z
36.324.1000	10	10	72	22	5	4
36.324.1200	12	12	83	26	6	4



> **36.410 Phantom**



NL HSS-E Radiusfree Kwarthol frees  
 FR Fraise à rayon HSS-E Fraise à 1/4 de cercle concave  
 ES Fresa de punta esférica HSS-E Fresa semicóncava de 1/4 de círculo  
 DE HSS-E Viertelrund-Profilfräser Viertelrund-Profilfräser

HSS-E 8%  
 DIN 6518-B  
 DIN 1835-B

P 11 5600 N/mm<sup>2</sup>  
 P 12 5850 N/mm<sup>2</sup>  
 P 13 51000 N/mm<sup>2</sup>  
 N 41 Alu

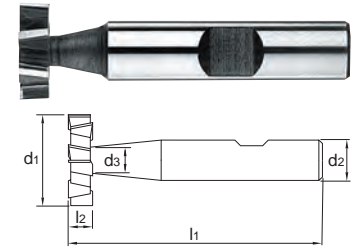
18-24 F  
 15-18 F  
 10-15 F  
 80-90 F

Ref.	r	d1	d2	l1	z
36.410.0100	1	8	10	60	4
36.410.0150	1.5	9	10	60	4
36.410.0200	2	10	10	60	4
36.410.0250	2.5	11	10	60	4
36.410.0300	3	12	12	60	4
36.410.0350	3.5	13	12	60	4
36.410.0400	4	14	12	60	4
36.410.0450	4.5	15	12	60	4
36.410.0500	5	16	12	60	4
36.410.0550	5.5	19	16	67	4

Ref.	r	d1	d2	l1	z
36.410.0600	6	20	16	67	4
36.410.0650	6.5	21	16	71	4
36.410.0700	7	22	16	71	4
36.410.0750	7.5	23	16	71	4
36.410.0800	8	24	16	71	4
36.410.0850	8.5	25	25	85	4
36.410.0900	9	26	25	85	4
36.410.0950	9.5	27	25	85	4
36.410.1000	10	28	25	85	4
36.410.1100	11	32	25	90	4

Ref.	r	d1	d2	l1	z
36.410.1200	12	34	25	90	4
36.410.1250	12.5	41	25	100	4
36.410.1300	13	42	25	100	4
36.410.1400	14	44	25	100	4
36.410.1500	15	46	25	100	4
36.410.1600	16	48	25	100	4
36.410.1800	18	52	32	112	4
36.410.2000	20	56	32	112	4

> **36.510 Phantom**



NL HSS-E Schijfspiefrees (Woodruff-frees) kruisvertand  
 FR Fraise pour logements de clavettes (type Woodruff) HSS-E denture alternée  
 ES Fresa de ranurar (tipo Woodruff) HSS-E diente alternado  
 DE HSS-E Schlitzfräser (Woodruff-Fräser) kreuzverzahnt

+6 6 ( )  
 DIN 850-D  
 DIN 1835-B

P 11 5600 N/mm<sup>2</sup>  
 P 12 5850 N/mm<sup>2</sup>  
 P 13 51000 N/mm<sup>2</sup>  
 P 14 51400 N/mm<sup>2</sup>  
 N 41 Alu

25-30 G  
 20-25 F  
 15-20 F  
 10-15 F  
 90-100 G

Ref.	d1	d2	d3	l1	l2	z
36.510.1020	10.5	6	4	50	2	6
36.510.1025	10.5	6	4	50	2.5	6
36.510.1030	10.5	6	4.2	50	3	6
36.510.1320	13.5	10	4.6	56	2	6
36.510.1330	13.5	10	4.6	56	3	6
36.510.1340	13.5	10	4.6	56	4	6
36.510.1630	16.5	10	4.6	56	3	6
36.510.1640	16.5	10	4.6	56	4	6
36.510.1650	16.5	10	5	56	5	6

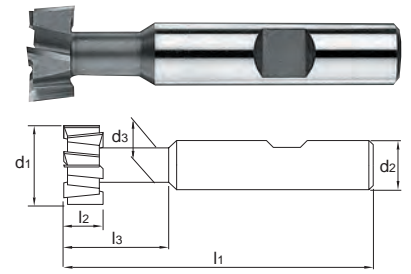
Ref.	d1	d2	d3	l1	l2	z
36.510.1930	19.5	10	5.6	56	3	8
36.510.1940	19.5	10	5.6	56	4	8
36.510.1950	19.5	10	6	56	5	8
36.510.1960	19.5	10	6.5	56	6	8
36.510.2240	22.5	10	6	63	4	8
36.510.2250	22.5	10	6	63	5	8
36.510.2260	22.5	10	6.5	63	6	8
36.510.2280	22.5	10	6.5	63	8	8
36.510.2550	25.5	10	7.5	63	5	10

Ref.	d1	d2	d3	l1	l2	z
36.510.2560	25.5	10	7.5	63	6	10
36.510.2580	25.5	10	7.5	63	8	8
36.510.2860	28.5	12	8.5	63	6	10
36.510.2880	28.5	12	8.5	63	8	10
36.510.2890	28.5	12	9.3	63	10	10
36.510.3260	32.5	12	8.5	63	6	10
36.510.3280	32.5	12	8.5	63	8	10
36.510.3290	32.5	12	9.3	71	10	10
36.510.4590	45.5	12	11.8	71	10	12



### > 36.560 Phantom

NL HSS-E T-Gleuffrees kruisvertand  
 FR Fraise à rainurer en T HSS-E denture alternée  
 ES Fresa para ranurar en T HSS-E diente alternado  
 DE HSS-E T-Nutenfräser kreuzverzahnt



+6 6 ( DIN 851-AB DIN 1835-B

P 11 P 12 P 13 N 41  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> Alu

25-30 G 20-25 F 15-20 F 90-100 G

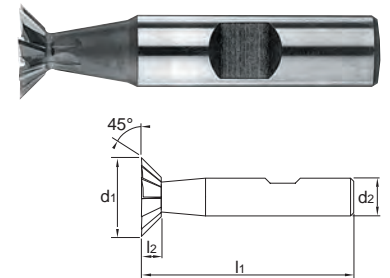
Ref.	d1	d2	d3	l1	l2	l3	z
36.560.1250	12.5	10	5	57	6	13	6
36.560.1600	16	10	7	62	8	18	6
36.560.1900	19	12	8	71	9	25	6

Ref.	d1	d2	d3	l1	l2	l3	z
36.560.2200	22	12	10	75	10	26	6
36.560.2500	25	16	12	82	11	28	6
36.560.2800	28	16	13	83	12	29	6

Ref.	d1	d2	d3	l1	l2	l3	z
36.560.3200	32	20	15	90	14	36	8

### > 36.620 Phantom

NL HSS-E Zwaluwstaartfrees 45°  
 FR Fraise conique à cône renversé HSS-E 45°  
 ES Fresa cónica angular HSS-E 45°  
 DE HSS-E Winkelfräser 45°



+6 6 ( DIN 1833-C DIN 1835-B

P 11 P 12 P 13 P 14 N 41  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> Alu

25-30 A 20-25 A 15-20 A 10-15 A 90-100 A

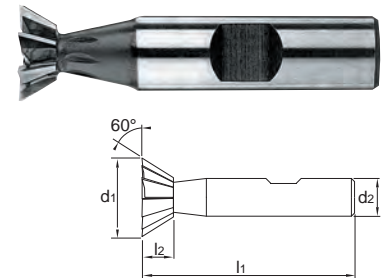
Ref.	d1	d2	l1	l2
36.620.1600	16	12	60	4
36.620.2000	20	12	63	5

Ref.	d1	d2	l1	l2
36.620.2500	25	12	67	6.3
36.620.3200	32	16	71	8

Ref.	d1	d2	l1	l2
36.620.4000	40	16	80	10

### > 36.650 Phantom

NL HSS-E Zwaluwstaartfrees 60°  
 FR Fraise conique à cône renversé HSS-E 60°  
 ES Fresa cónica angular HSS-E 60°  
 DE HSS-E Winkelfräser 60°



+6 6 ( DIN 1833-C DIN 1835-B

P 11 P 12 P 13 P 14 N 41  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> Alu

25-30 A 20-25 A 15-20 A 10-15 A 90-100 A

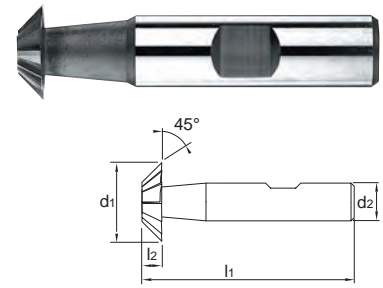
Ref.	d1	d2	l1	l2
36.650.1600	16	12	60	6.3
36.650.2000	20	12	63	8

Ref.	d1	d2	l1	l2
36.650.2500	25	12	67	10
36.650.3200	32	16	71	12.5

Ref.	d1	d2	l1	l2
36.650.4000	40	16	80	16

> **36.720** **Phantom**

NL HSS-E Duivenstaartfrees 45°  
 FR Fraise conique à cône direct HSS-E 45°  
 ES Fresa cónica angular HSS-E 45°  
 DE HSS-E Winkelstirnfräser 45°



+6 6 ( DIN 1833-D DIN 1835-B

**P 11** **P 12** **P 13** **P 14** **N 41**  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> Alu

25-30 A 20-25 A 15-20 A 10-15 A 90-100 A

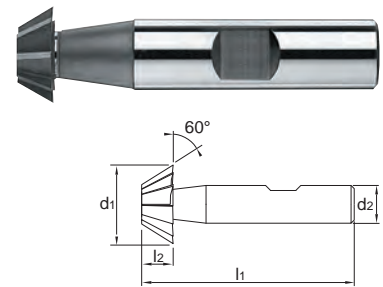
Ref.	d1	d2	l1	l2
36.720.1600	16	12	60	4
36.720.2000	20	12	63	5

Ref.	d1	d2	l1	l2
36.720.2500	25	12	67	6.3
36.720.3200	32	16	71	8

Ref.	d1	d2	l1	l2
36.720.4000	40	16	80	10

> **36.750** **Phantom**

NL HSS-E Duivenstaartfrees 60°  
 FR Fraise conique à cône direct HSS-E 60°  
 ES Fresa cónica angular HSS-E 60°  
 DE HSS-E Winkelstirnfräser 60°



+6 6 ( DIN 1833-D DIN 1835-B

**P 11** **P 12** **P 13** **P 14** **N 41**  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> Alu

25-30 A 20-25 A 15-20 A 10-15 A 90-100 A

Ref.	d1	d2	l1	l2
36.750.1600	16	12	60	6.3
36.750.2000	20	12	63	8

Ref.	d1	d2	l1	l2
36.750.2500	25	12	67	10
36.750.3200	32	16	71	12.5

Ref.	d1	d2	l1	l2
36.750.4000	40	16	80	16

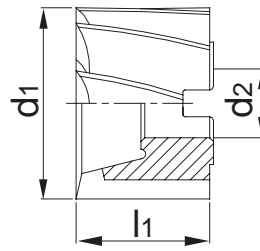
SC 1 HSS-E 1 2 SC 3 HSS-E 3





### > 37.260 Phantom

NL HSS-E Mantelkolfrees type N, grofgetand  
 FR Fraise deux tailles HSS-E type N, denture grosse  
 ES Fresa frontal sin mango HSS-E tipo N, dentado grueso  
 DE HSS-E Walzenstirfräser Typ N, grobverzahnt



+6 6 ( DIN 841 N

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> P 14 ≤1400 N/mm<sup>2</sup> M 21 INOX ≤850N/mm<sup>2</sup> M 22 INOX >850N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW

25-30 H 20-25 G 15-20 G 10-15 F 10-15 G 8-12 F 17-22 G 20-25 H

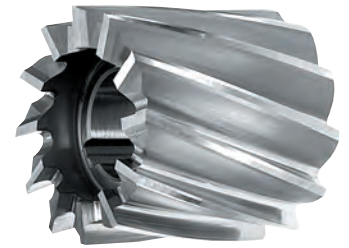
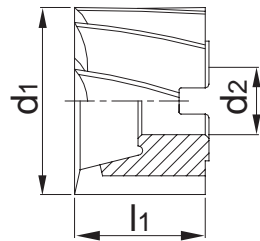
Ref.	d1	d2	l1	z
37.260.0303	30	13	30	6
37.260.0353	35	16	35	6
37.260.0402	40	16	20	8
37.260.0404	40	16	40	8

Ref.	d1	d2	l1	z
37.260.0502	50	22	25	8
37.260.0505	50	22	50	8
37.260.0603	60	27	30	8
37.260.0606	60	27	60	8

Ref.	d1	d2	l1	z
37.260.0753	75	27	35	10
37.260.0757	75	27	75	10
37.260.1103	110	32	35	12

### > 37.270 Phantom

NL HSS-E Mantelkolfrees type H, fijngetand  
 FR Fraise deux tailles HSS-E type H, denture fine  
 ES Fresa frontal sin mango HSS-E tipo H, dentado fino  
 DE HSS-E Walzenstirfräser Typ H, feingezahnt



+6 6 ( DIN 841 H

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> P 13 ≤1000 N/mm<sup>2</sup> P 14 ≤1400 N/mm<sup>2</sup> K 31 GG K 32 GGG GTS-GTW

25-30 H 20-25 G 15-20 G 10-15 F 17-22 G 20-25 H

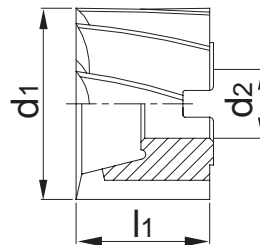
Ref.	d1	d2	l1	z
37.270.0303	30	13	30	8
37.270.0353	35	16	35	10

Ref.	d1	d2	l1	z
37.270.0404	40	16	40	10
37.270.0505	50	22	50	12

Ref.	d1	d2	l1	z
37.270.0606	60	27	60	12
37.270.0757	75	27	75	14

### > 37.350 Phantom

NL HSS-E Mantelkopfrees type W, Aluminium  
 FR Fraise deux tailles HSS-E Type W, Aluminium  
 ES Fresa frontal sin mango HSS-E tipo W, Aluminio  
 DE HSS-E Walzenstirfräser Typ W, Aluminium



+6 6 ( DIN 1880

P 11 ≤600 N/mm<sup>2</sup> P 12 ≤850 N/mm<sup>2</sup> N 41 Alu N 51 Cu

25-30 H 20-25 G 95-105 J 60-100 I

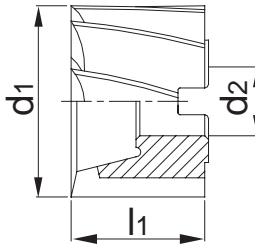
Ref.	d1	d2	l1	z
37.350.0400	40	16	32	4
37.350.0500	50	22	36	4

Ref.	d1	d2	l1	z
37.350.0630	63	27	40	5
37.350.0800	80	27	45	6

Ref.	d1	d2	l1	z
37.350.1000	100	32	50	7

> **37.360 Phantom**

NL HSS-E Mantelkoprfrees type N, grofgetand  
FR Fraise deux tailles HSS-E type N, denture grosse  
ES Fresa frontal sin mango HSS-E tipo N, dentado grueso  
DE HSS-E Walzenstirfräser Typ N, grobverzahnt



HSS-E 8% DIN 1880 N

P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32  
≤500 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW

25-30 H 20-25 G 15-20 G 10-15 F 10-15 G 8-12 F 17-22 G 20-25 H

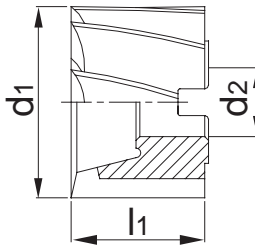
Ref.	d1	d2	l1	z
37.360.0400	40	16	32	8
37.360.0500	50	22	36	8

Ref.	d1	d2	l1	z
37.360.0630	63	27	40	8
37.360.0800	80	27	45	10

Ref.	d1	d2	l1	z
37.360.1000	100	32	50	12
37.360.1250	125	40	56	14

> **37.370 Phantom**

NL HSS-E Mantelkoprfrees type H, fijngetand  
FR Fraise deux tailles HSS-E type H, denture fine  
ES Fresa frontal sin mango HSS-E tipo H, dentado fino  
DE HSS-E Walzenstirfräser Typ H, feingezahnt



+6  $\epsilon$  DIN 1880 H

P 11 P 12 P 13 P 14 K 31 K 32  
≤500 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> GG GGG GTS-GTW

25-30 H 20-25 G 15-20 G 10-15 F 17-22 G 20-25 H

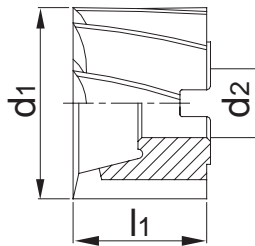
Ref.	d1	d2	l1	z
37.370.0400	40	16	32	10
37.370.0500	50	22	36	12

Ref.	d1	d2	l1	z
37.370.0630	63	27	40	12
37.370.0800	80	27	45	14

Ref.	d1	d2	l1	z
37.370.1000	100	32	50	16
37.370.1250	125	40	56	18

> **37.500 Phantom**

NL HSS-E Mantelkopruwfreees rond  
FR Fraise deux tailles semi-finition HSS-E ronde  
ES Fresa frontal sin mango de desbaste HSS-E redondo  
DE HSS-E Walzenstirnschrupfräser rund



+6  $\epsilon$  15 DIN 841

P 11 P 12 P 13 P 14 N 41  
≤500 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> Alu

25-30 J 20-25 J 15-20 H 10-15 G 95-105 J

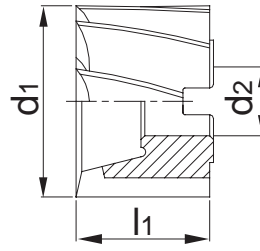
Ref.	d1	d2	l1	z
37.500.0404	40	16	40	6
37.500.0505	50	22	50	6

Ref.	d1	d2	l1	z
37.500.0606	60	27	60	8
37.500.0757	75	27	75	8



### > 37.600 Phantom

NL HSS-E Mantelkopruwfreest rond  
 FR Fraise deux tailles semi-finition HSS-E ronde  
 ES Fresa frontal sin mango de desbaste HSS-E redondo  
 DE HSS-E Walzenstirnschrupfräser rund



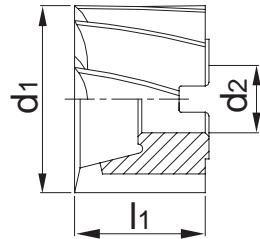
Ref.	d1	d2	l1	z
37.600.0400	40	16	32	6
37.600.0500	50	22	36	6

Ref.	d1	d2	l1	z
37.600.0630	63	27	40	8
37.600.0800	80	27	44.5	8

Ref.	d1	d2	l1	z
37.600.1000	100	32	49.5	10
37.600.1250	125	40	55.5	12

### > 37.604 Phantom

NL HSS-E Mantelkopruwfreest TiAlN, rond  
 FR Fraise deux tailles semi-finition HSS-E TiAlN, ronde  
 ES Fresa frontal sin mango de desbaste HSS-E TiAlN, redondo  
 DE HSS-E Walzenstirnschrupfräser TiAlN, rund



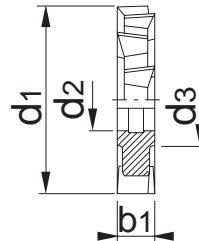
Ref.	d1	d2	l1	z
37.604.0400	40	16	32	6

Ref.	d1	d2	l1	z
37.604.0500	50	22	36	6

Ref.	d1	d2	l1	z
37.604.0630	63	27	40	8

### > 38.210 Phantom

NL HSS-E Schijffrees kruisvertand  
 FR Fraise trois tailles HSS-E denture alternée  
 ES Fresa para ranurar HSS-E diente alternado  
 DE HSS-E Scheibenfräser kreuzverzahnt



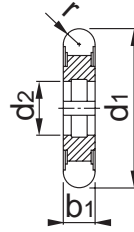
Ref.	d1	b1	d2	d3	z	Ref.	d1	b1	d2	d3	z	Ref.	d1	b1	d2	d3	z
38.210.0503	50	3	16	27	16	38.210.0804	80	4	27	41	20	38.210.1018	100	18	32	47	20
38.210.0504	50	4	16	27	16	38.210.0805	80	5	27	41	20	38.210.1020	100	20	32	47	20
38.210.0505	50	5	16	27	16	38.210.0806	80	6	27	41	20	38.210.1022	100	22	32	47	20
38.210.0506	50	6	16	27	16	38.210.0808	80	8	27	41	20	38.210.1025	100	25	32	47	20
38.210.0508	50	8	16	27	16	38.210.0810	80	10	27	41	18	38.210.1204	125	4	32	47	26
38.210.0510	50	10	16	27	16	38.210.0812	80	12	27	41	18	38.210.1205	125	5	32	47	26
38.210.0603	63	3	22	34	18	38.210.0814	80	14	27	41	18	38.210.1206	125	6	32	47	26
38.210.0604	63	4	22	34	18	38.210.0816	80	16	27	41	18	38.210.1208	125	8	32	47	26
38.210.0605	63	5	22	34	18	38.210.0820	80	20	27	41	18	38.210.1210	125	10	32	47	22
38.210.0606	63	6	22	34	18	38.210.1003	100	3	32	47	20	38.210.1212	125	12	32	47	22
38.210.0608	63	8	22	34	18	38.210.1004	100	4	32	47	20	38.210.1214	125	14	32	47	22
38.210.0610	63	10	22	34	18	38.210.1005	100	5	32	47	20	38.210.1216	125	16	32	47	22
38.210.0612	63	12	22	34	18	38.210.1006	100	6	32	47	20	38.210.1218	125	18	32	47	22
38.210.0614	63	14	22	34	18	38.210.1008	100	8	32	47	20	38.210.1220	125	20	32	47	22
38.210.0616	63	16	22	34	18	38.210.1010	100	10	32	47	20	38.210.1225	125	25	32	47	22
38.210.0618	63	18	22	34	14	38.210.1012	100	12	32	47	20	38.210.1604	160	4	40	55	30
38.210.0620	63	20	22	34	14	38.210.1014	100	14	32	47	20	38.210.1605	160	5	40	55	30
38.210.0803	80	3	27	41	20	38.210.1016	100	16	32	47	20	38.210.1606	160	6	40	55	26

> **38.210** **Phantom**

Ref.	d1	b1	d2	d3	z	Ref.	d1	b1	d2	d3	z	Ref.	d1	b1	d2	d3	z
38.210.1608	160	8	40	55	26	38.210.1614	160	14	40	55	26	38.210.1620	160	20	40	55	26
38.210.1610	160	10	40	55	26	38.210.1616	160	16	40	55	26						
38.210.1612	160	12	40	55	26	38.210.1618	160	18	40	55	26						

> **38.300** **Phantom**

NL HSS-E Convexrees  
 FR Fraise 1/2 cercle convexe HSS-E  
 ES Fresa convexa para ranurar HSS-E  
 DE HSS-E Konvexfräser



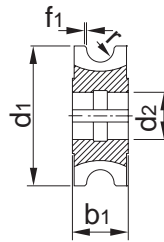
+6 6 { **DIN 856**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
25-30 D	20-25 C	15-20 A	10-15 A	10-15 B	8-12 A	17-22 B	20-25 B	95-105 B

Ref.	r	d1	b1	d2	z	Ref.	r	d1	b1	d2	z	Ref.	r	d1	b1	d2	z
38.300.0100	1	50	2	16	16	38.300.0300	3	63	6	22	12	38.300.0550	5.5	80	11	27	12
38.300.0125	1.25	50	2.5	16	16	38.300.0350	3.5	63	7	22	12	38.300.0600	6	80	12	27	12
38.300.0150	1.5	50	3	16	16	38.300.0400	4	63	8	22	12	38.300.0800	8	80	16	27	12
38.300.0200	2	50	4	16	16	38.300.0450	4.5	63	9	22	12	38.300.1000	10	100	20	32	12
38.300.0250	2.5	63	5	22	12	38.300.0500	5	63	10	22	12	38.300.1200	12	100	24	32	12

> **38.350** **Phantom**

NL HSS-E Concaaffrees  
 FR Fraise 1/2 cercle concave HSS-E  
 ES Fresa cóncava para ranurar HSS-E  
 DE HSS-E Konkavfräser



+6 6 { **DIN 855**

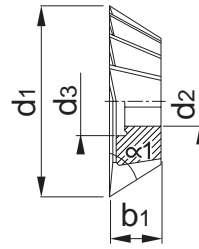
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
25-30 D	20-25 C	15-20 A	10-15 A	10-15 B	8-12 A	17-22 B	20-25 B	95-105 B

Ref.	r	d1	b1	d2	f1	z	Ref.	r	d1	b1	d2	f1	z
38.350.0100	1	50	6	16	0.2	14	38.350.0400	4	63	16	22	0.4	12
38.350.0125	1.25	50	6	16	0.2	14	38.350.0500	5	63	20	22	0.5	10
38.350.0150	1.5	50	8	16	0.2	14	38.350.0600	6	80	24	27	0.6	10
38.350.0200	2	50	9	16	0.25	14	38.350.0800	8	80	32	27	0.8	10
38.350.0250	2.5	63	10	22	0.3	14	38.350.1000	10	100	36	32	1	10
38.350.0300	3	63	12	22	0.3	12	38.350.1200	12	100	40	32	1.2	10



### > 38.400 Phantom

NL HSS-E Hoekkopfrees  
FR Fraise conique 2 tailles HSS-E  
ES Fresa semicircular cónica HSS-E  
DE HSS-E Winkelstirnfräser



+6 6 ( DIN 842

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
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25-30 D	20-25 C	15-20 A	10-15 A	10-15 B	8-12 A	17-22 B	20-25 B	95-105 B
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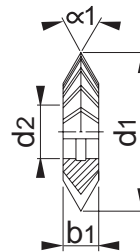
Ref.	d1	d2	d3	b1	1	z
38.400.4504	40	10	15	12	45°	14
38.400.4505	50	13	19	15	45°	16
38.400.4506	63	16	23	18	45°	16
38.400.4508	80	22	30	23	45°	18
38.400.4510	100	27	39	30	45°	20

Ref.	d1	d2	d3	b1	1	z
38.400.5004	40	10	15	13	50°	14
38.400.5005	50	13	19	16	50°	16
38.400.5006	63	16	23	20	50°	16
38.400.5008	80	22	30	25	50°	18
38.400.5010	100	27	39	32	50°	20

Ref.	d1	d2	d3	b1	1	z
38.400.6004	40	10	15	13	60°	14
38.400.6005	50	13	19	16	60°	16
38.400.6006	63	16	23	20	60°	16
38.400.6008	80	22	30	25	60°	18
38.400.6010	100	27	39	32	60°	20

### > 38.450 Phantom

NL HSS-E Prismafrees  
FR Fraise isocèle 2 tailles HSS-E  
ES Fresa semicircular angular HSS-E  
DE HSS-E Prismenfräser



+6 6 ( DIN 847

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
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25-30 D	20-25 C	15-20 A	10-15 A	10-15 B	8-12 A	17-22 B	20-25 B	95-105 B
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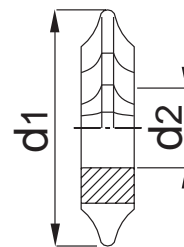
Ref.	d1	d2	b1	1	z
38.450.4505	50	16	8	45°	16
38.450.4506	63	22	10	45°	16
38.450.4508	80	27	12	45°	20
38.450.4510	100	32	18	45°	20

Ref.	d1	d2	b1	1	z
38.450.6005	50	16	10	60°	16
38.450.6006	63	22	14	60°	16
38.450.6008	80	27	18	60°	18
38.450.6010	100	32	25	60°	20

Ref.	d1	d2	b1	1	z
38.450.9005	50	16	14	90°	16
38.450.9006	63	22	20	90°	16
38.450.9008	80	27	22	90°	18
38.450.9010	100	32	32	90°	20

### > 38.500 Phantom

NL HSS Moduulfrees drukhoek 20°  
FR Fraise module HSS angle de pression 20°  
ES Fresa de módulo HSS ángulo de presión 20°  
DE HSS Modulscheibenfräser Eingriffswinkel 20°



HSS DIN 3972

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
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25-30 D	20-25 C	15-20 A	10-15 A	10-15 B	8-12 A	17-22 B	20-25 B	95-105 B
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Ref.	Modul	d1	d2	Nr.	Ref.	Modul	d1	d2	Nr.
38.500.0501	0.5	40	16	1 (12-13z)	38.500.0756	0.75	40	16	6 (35-54z)
38.500.0502	0.5	40	16	2 (14-16z)	38.500.0757	0.75	40	16	7 (55-135z)
38.500.0503	0.5	40	16	3 (17-20z)	38.500.0758	0.75	40	16	8 (>136z)
38.500.0504	0.5	40	16	4 (21-25z)	38.500.1001	1	50	16	1 (12-13z)
38.500.0505	0.5	40	16	5 (26-34z)	38.500.1002	1	50	16	2 (14-16z)
38.500.0506	0.5	40	16	6 (35-54z)	38.500.1003	1	50	16	3 (17-20z)
38.500.0507	0.5	40	16	7 (55-135z)	38.500.1004	1	50	16	4 (21-25z)
38.500.0508	0.5	40	16	8 (>136z)	38.500.1005	1	50	16	5 (26-34z)
38.500.0751	0.75	40	16	1 (12-13z)	38.500.1006	1	50	16	6 (35-54z)
38.500.0752	0.75	40	16	2 (14-16z)	38.500.1007	1	50	16	7 (55-135z)
38.500.0753	0.75	40	16	3 (17-20z)	38.500.1008	1	50	16	8 (>136z)
38.500.0754	0.75	40	16	4 (21-25z)	38.500.1251	1.25	50	16	1 (12-13z)
38.500.0755	0.75	40	16	5 (26-34z)	38.500.1252	1.25	50	16	2 (14-16z)

> **38.500** **Phantom**

Ref.	Modul	d1	d2	Nr.	Ref.	Modul	d1	d2	Nr.
38.500.1253	1.25	50	16	3 (17-20z)	38.500.3006	3	70	27	6 (35-54z)
38.500.1254	1.25	50	16	4 (21-25z)	38.500.3007	3	70	27	7 (55-135z)
38.500.1255	1.25	50	16	5 (26-34z)	38.500.3008	3	70	27	8 (>136z)
38.500.1256	1.25	50	16	6 (35-54z)	38.500.3251	3.25	70	27	1 (12-13z)
38.500.1257	1.25	50	16	7 (55-135z)	38.500.3252	3.25	70	27	2 (14-16z)
38.500.1258	1.25	50	16	8 (>136z)	38.500.3253	3.25	70	27	3 (17-20z)
38.500.1501	1.5	63	22	1 (12-13z)	38.500.3254	3.25	70	27	4 (21-25z)
38.500.1502	1.5	63	22	2 (14-16z)	38.500.3255	3.25	70	27	5 (26-34z)
38.500.1503	1.5	63	22	3 (17-20z)	38.500.3256	3.25	70	27	6 (35-54z)
38.500.1504	1.5	63	22	4 (21-25z)	38.500.3257	3.25	70	27	7 (55-135z)
38.500.1505	1.5	63	22	5 (26-34z)	38.500.3258	3.25	70	27	8 (>136z)
38.500.1506	1.5	63	22	6 (35-54z)	38.500.3501	3.5	80	27	1 (12-13z)
38.500.1507	1.5	63	22	7 (55-135z)	38.500.3502	3.5	80	27	2 (14-16z)
38.500.1508	1.5	63	22	8 (>136z)	38.500.3503	3.5	80	27	3 (17-20z)
38.500.1751	1.75	63	22	1 (12-13z)	38.500.3504	3.5	80	27	4 (21-25z)
38.500.1752	1.75	63	22	2 (14-16z)	38.500.3505	3.5	80	27	5 (26-34z)
38.500.1753	1.75	63	22	3 (17-20z)	38.500.3506	3.5	80	27	6 (35-54z)
38.500.1754	1.75	63	22	4 (21-25z)	38.500.3507	3.5	80	27	7 (55-135z)
38.500.1755	1.75	63	22	5 (26-34z)	38.500.3508	3.5	80	27	8 (>136z)
38.500.1756	1.75	63	22	6 (35-54z)	38.500.3751	3.75	80	27	1 (12-13z)
38.500.1757	1.75	63	22	7 (55-135z)	38.500.3752	3.75	80	27	2 (14-16z)
38.500.1758	1.75	63	22	8 (>136z)	38.500.3753	3.75	80	27	3 (17-20z)
38.500.2001	2	63	22	1 (12-13z)	38.500.3754	3.75	80	27	4 (21-25z)
38.500.2002	2	63	22	2 (14-16z)	38.500.3755	3.75	80	27	5 (26-34z)
38.500.2003	2	63	22	3 (17-20z)	38.500.3756	3.75	80	27	6 (35-54z)
38.500.2004	2	63	22	4 (21-25z)	38.500.3757	3.75	80	27	7 (55-135z)
38.500.2005	2	63	22	5 (26-34z)	38.500.3758	3.75	80	27	8 (>136z)
38.500.2006	2	63	22	6 (35-54z)	38.500.4001	4	80	27	1 (12-13z)
38.500.2007	2	63	22	7 (55-135z)	38.500.4002	4	80	27	2 (14-16z)
38.500.2008	2	63	22	8 (>136z)	38.500.4003	4	80	27	3 (17-20z)
38.500.2251	2.25	63	22	1 (12-13z)	38.500.4004	4	80	27	4 (21-25z)
38.500.2252	2.25	63	22	2 (14-16z)	38.500.4005	4	80	27	5 (26-34z)
38.500.2253	2.25	63	22	3 (17-20z)	38.500.4006	4	80	27	6 (35-54z)
38.500.2254	2.25	63	22	4 (21-25z)	38.500.4007	4	80	27	7 (55-135z)
38.500.2255	2.25	63	22	5 (26-34z)	38.500.4008	4	80	27	8 (>136z)
38.500.2256	2.25	63	22	6 (35-54z)	38.500.4501	4.5	90	27	1 (12-13z)
38.500.2257	2.25	63	22	7 (55-135z)	38.500.4502	4.5	90	27	2 (14-16z)
38.500.2258	2.25	63	22	8 (>136z)	38.500.4503	4.5	90	27	3 (17-20z)
38.500.2501	2.5	63	22	1 (12-13z)	38.500.4504	4.5	90	27	4 (21-25z)
38.500.2502	2.5	63	22	2 (14-16z)	38.500.4505	4.5	90	27	5 (26-34z)
38.500.2503	2.5	63	22	3 (17-20z)	38.500.4506	4.5	90	27	6 (35-54z)
38.500.2504	2.5	63	22	4 (21-25z)	38.500.4507	4.5	90	27	7 (55-135z)
38.500.2505	2.5	63	22	5 (26-34z)	38.500.4508	4.5	90	27	8 (>136z)
38.500.2506	2.5	63	22	6 (35-54z)	38.500.5001	5	90	32	1 (12-13z)
38.500.2507	2.5	63	22	7 (55-135z)	38.500.5002	5	90	32	2 (14-16z)
38.500.2508	2.5	63	22	8 (>136z)	38.500.5003	5	90	32	3 (17-20z)
38.500.2751	2.75	70	27	1 (12-13z)	38.500.5004	5	90	32	4 (21-25z)
38.500.2752	2.75	70	27	2 (14-16z)	38.500.5005	5	90	32	5 (26-34z)
38.500.2753	2.75	70	27	3 (17-20z)	38.500.5006	5	90	32	6 (35-54z)
38.500.2754	2.75	70	27	4 (21-25z)	38.500.5007	5	90	32	7 (55-135z)
38.500.2755	2.75	70	27	5 (26-34z)	38.500.5008	5	90	32	8 (>136z)
38.500.2756	2.75	70	27	6 (35-54z)	38.500.6001	6	100	32	1 (12-13z)
38.500.2757	2.75	70	27	7 (55-135z)	38.500.6002	6	100	32	2 (14-16z)
38.500.2758	2.75	70	27	8 (>136z)	38.500.6003	6	100	32	3 (17-20z)
38.500.3001	3	70	27	1 (12-13z)	38.500.6004	6	100	32	4 (21-25z)
38.500.3002	3	70	27	2 (14-16z)	38.500.6005	6	100	32	5 (26-34z)
38.500.3003	3	70	27	3 (17-20z)	38.500.6006	6	100	32	6 (35-54z)
38.500.3004	3	70	27	4 (21-25z)	38.500.6007	6	100	32	7 (55-135z)
38.500.3005	3	70	27	5 (26-34z)	38.500.6008	6	100	32	8 (>136z)







### > 39.100 Phantom

NL Cassette Frezen leeg  
FR Coffret pour fraises vide  
ES Estuche de fresas vacío  
DE Fräserkassetten leer



Ref.	Type	Ø mm
39.100.1050	32.220	3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20 mm

Ref.	Type	Ø mm
39.100.1200	32.200/32.220/33.200/33.220/ 34.200/34.220	4, 5, 6, 8, 10, 12 mm

### > 39.200 Phantom

NL HSS-E Set Schachtfrezen, 2-snijder  
FR Jeu de Fraises à rainurer HSS-E  
ES Juego de fresas frontales de 2 labios HSS-E  
DE HSS-E Satz Langlochfräser



P 11	P 12	P 13	P 14	N 41
5800 Nimm²	5850 Nimm²	51000 Nimm²	51400 Nimm²	Alu
30-35 J	28-32 I	20-25 J	15-20 I	75-105 K

Ref.	Type	Ø mm
39.200.1050	32.220	3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20 mm

Ref.	Type	Ø mm
39.200.1150	32.220	4, 5, 6, 8, 10, 12 mm

### > 39.300 Phantom

NL HSS-E Set Schachtfrezen, 3-snijder  
FR Jeu de Fraises universelles HSS-E  
ES Juego de Fresas frontales de 3 labios HSS-E  
DE HSS-E Satz Universalfräser



P 11	P 12	P 13	P 14	N 41
5800 Nimm²	5850 Nimm²	51000 Nimm²	51400 Nimm²	Alu
30-35 J	28-32 I	20-25 J	15-20 I	75-105 K

Ref.	Type	Ø mm
39.300.1050	33.220	3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20 mm

Ref.	Type	Ø mm
39.300.1150	33.220	4, 5, 6, 8, 10, 12 mm



> **39.400** **Phantom**

NL HSS-E set Schachtfrezen, meersnijder  
 FR Jeu de Fraises standards HSS-E  
 ES Juego de fresas frontales de varios labios HSS-E  
 DE HSS-E Satz Schafffräser (4 Schneiden)



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu
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30-35 J	28-32 I	20-25 J	15-20 I	75-105 K
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Ref.	Type	Ø mm
39.400.1050	34.220	3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20 mm

Ref.	Type	Ø mm
39.400.1150	34.220	4, 5, 6, 8, 10, 12 mm





NL Voedingswaardentabel  
FR Tableau des avances  
ES Tabla de avances  
DE Vorschubtabelle

FRC																								
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
d1(mm)	fz (mm/z)																							
0,3	0,001	0,001	0,001	0,002	0,003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,012	0,015	-	-	-
0,5	0,001	0,001	0,002	0,003	0,006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,019	0,024	-	-	-
0,8	0,002	0,002	0,003	0,005	0,008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,030	0,039	-	-	-
1	0,002	0,006	0,004	0,006	0,009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,037	0,048	0,012	0,008	0,008
1,5	0,003	0,008	0,005	0,009	0,012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,041	0,054	-	-	0,011
2	0,004	0,010	0,007	0,012	0,016	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,011	0,027	-	0,011	0,022	0,035	0,040	0,044	0,057	0,028	0,014	0,026
3	0,006	0,015	0,010	0,016	0,039	0,003	0,004	0,007	0,010	0,010	0,010	0,011	0,027	0,035	-	0,022	0,035	0,040	0,055	0,067	0,091	0,043	0,023	0,026
5	0,008	0,026	0,015	0,026	-	0,009	0,010	0,014	0,020	0,020	0,022	0,027	0,035	0,044	0,048	0,035	0,040	0,055	0,065	0,111	0,156	0,052	0,031	0,045
6	0,010	0,030	0,026	0,032	-	0,011	0,013	0,017	0,024	0,025	0,027	0,035	0,044	0,059	0,059	0,040	0,055	0,065	0,080	0,122	0,174	0,059	0,039	0,060
8	0,015	0,038	0,030	0,040	-	0,016	0,019	0,024	0,032	0,032	0,035	0,044	0,055	0,078	0,067	0,055	0,065	0,080	0,105	0,132	0,189	0,067	0,060	0,090
10	0,026	0,043	0,038	0,045	-	0,021	0,025	0,030	0,038	0,039	0,044	0,055	0,065	0,098	0,071	0,065	0,080	0,105	0,135	0,142	0,199	0,075	0,080	0,120
12	0,030	0,051	0,043	0,060	-	0,026	0,030	0,036	0,046	0,048	0,052	0,065	0,085	0,097	0,078	0,080	0,105	0,135	0,150	0,142	0,212	0,082	0,101	0,150
16	0,032	0,051	0,043	0,060	-	0,032	0,038	0,045	0,054	0,058	0,063	0,085	0,100	0,099	0,117	0,105	0,135	0,150	0,168	-	-	0,092	0,120	0,180
20	0,037	0,051	0,043	0,060	-	0,038	0,045	0,057	0,066	0,073	0,080	0,100	0,135	0,150	0,168	0,135	0,150	0,168	0,180	0,200	0,220	-	-	0,200
22	0,037	0,051	0,043	0,060	-	0,045	0,057	0,066	0,070	0,080	0,100	0,135	0,150	0,168	-	0,150	0,168	0,180	0,200	-	-	-	-	-
25	0,040	0,051	0,043	0,060	-	0,057	0,066	0,070	0,073	0,100	0,135	0,150	0,168	0,135	-	0,168	0,180	0,200	0,220	-	-	-	-	0,109
32	0,042	0,051	0,043	0,060	-	0,060	0,070	0,080	0,090	0,100	0,135	0,150	-	-	-	-	-	-	-	-	-	-	-	-
40	0,043	0,051	0,043	0,060	-	0,060	0,070	0,080	0,090	0,100	0,135	0,190	-	-	-	-	-	-	-	-	-	-	-	-
63	0,045	0,051	0,051	0,080	-	0,070	0,080	0,090	0,100	0,120	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	0,045	0,051	0,051	0,080	-	0,080	0,090	0,100	0,110	0,110	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	0,045	0,051	0,051	0,080	-	0,090	0,100	0,110	0,120	0,150	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125	0,045	0,051	0,051	0,080	-	0,100	0,110	0,120	0,130	0,160	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160	0,045	0,051	0,051	0,080	-	0,110	0,120	0,130	0,140	0,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NL Toerententabel  
FR Tableau des vitesses de rotation  
ES Tabla de número de revoluciones  
DE Drehzahlentabelle

$$n = \frac{Vc \times 1000}{3,14 \times d1} \quad Vc = \frac{n \times 3,14 \times d1}{1000}$$

Vc (m/min)																		
	5	8	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120
d1 (mm)	n = rpm																	
1	1592	2546	3183	3820	4775	6366	7958	9549	11141	12732	15915	19099	22282	25465	28648	31831	35014	38197
1,5	1061	1698	2122	2546	3183	4244	5305	6366	7427	8588	10610	12732	14854	16977	19099	21221	23343	25465
2	796	1273	1592	1910	2387	3183	3937	4775	5570	6366	7958	9549	11141	12732	14324	15915	17507	19099
2,5	637	1019	1273	1528	1910	2546	3183	3820	4456	5093	6366	7639	8913	10186	11459	12732	14006	15279
3	531	849	1061	1273	1592	2122	2653	3183	3714	4244	5305	6366	7427	8488	9549	10610	11671	12732
3,5	455	728	909	1091	1364	1819	2274	2728	3183	3638	4547	5457	6366	7276	8185	9095	10004	10913
4	398	637	796	955	1194	1592	1989	2387	2785	3183	3979	4775	5570	6366	7162	7958	8754	9549
4,5	354	566	707	849	1061	1415	1768	2122	2476	2829	3537	4244	4951	5659	6366	7074	7781	8488
5	318	509	637	764	955	1273	1592	1910	2228	2546	3183	3820	4456	5093	5730	6366	7003	7639
5,5	289	463	579	694	868	1157	1447	1739	2026	2315	2894	3472	4051	4630	5209	5787	6366	6945
6	265	424	531	637	796	1061	1326	1592	1857	2122	2653	3183	3714	4244	4775	5305	5836	6366
7	227	364	455	546	682	909	1137	1364	1592	1819	2274	2728	3183	3638	4093	4547	5002	5457
8	199	318	398	477	597	796	995	1194	1393	1592	1989	2387	2785	3183	3581	3979	4377	4775
9	177	283	354	424	531	707	884	1061	1238	1415	1768	2122	2476	2829	3183	3537	3890	4244
10	159	255	318	382	477	637	796	955	1114	1273	1592	1910	2228	2546	2865	3183	3501	3820
11	145	321	289	347	434	579	723	868	1013	1157	1447	1736	2026	2315	2604	2894	3183	3472
12	133	212	265	318	398	531	663	796	928	1061	1326	1592	1857	2122	2387	2653	2918	3183
13	122	196	245	294	367	490	612	735	857	979	1224	1469	1714	1959	2204	2449	2693	2938
14	114	182	227	273	341	455	568	682	796	909	1137	1364	1592	1819	2046	2274	2501	2728
15	106	170	212	255	318	424	531	637	743	849	1061	1273	1485	1698	1910	2122	2334	2546
16	99	159	199	239	298	398	497	597	696	796	995	1194	1393	1592	1790	1989	2188	2387
18	88	141	177	212	265	354	442	531	619	707	884	1061	1238	1415	1592	1768	1945	2122
20	80	127	159	191	239	318	398	477	557	637	796	955	1114	1273	1432	1592	1751	1910
22	72	116	145	174	217	289	362	434	506	579	723	868	1013	1157	1302	1447	1592	1736
24	66	106	133	159	199	265	332	398	464	531	663	796	928	1061	1194	1326	1459	1592
25	64	102	127	153	191	255	318	382	446	509	637	764	891	1019	1146	1273	1401	1528
26	61	98	122	147	184	245	306	367	428	490	612	735	857	979	1102	1224	1347	1469
28	57	91	114	136	171	227	284	341	398	455	568	682	796	909	1023	1137	1251	1364
30	53	85	106	127	159	212	265	318	371	424	531	637	743	849	955	1061	1167	1273
35	45	73	91	109	136	182	227	273	318	364	455	546	637	728	819	909	1000	1091
40	40	64	80	95	119	159	199	239	279	318	398	477	557	637	716	796	875	955
45	35	57	71	85	106	141	177	212	248	283	354	424	495	566	637	707	778	849
50	32	51	64	76	95	127	159	191	223	255	318	382	446	509	573	637	700	764
55	29	46	58	69	87	116	145	174	203	231	289	347	405	463	521	579	637	694
60	27	42	53	64	80	106	133	159	186	212	265	318	371	424	477	531	584	637

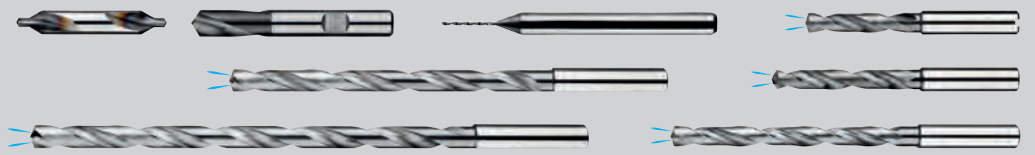
FRC NL: Voedingscode  
FR: Codification vitesse d'avance  
ES: Codificación de velocidad de avance  
DE: Vorschubgeschwindigkeit Codierung

fz (mm/z) NL: Voeding per tand (mm/z)  
FR: Avance par dent (mm/z)  
ES: Avance por diente (mm/z)  
DE: Vorschub pro Zahn (mm/z)

Vc NL: Snijsnelheid (m/min)  
FR: Vitesse de coupe (m/min)  
ES: Velocidad de corte (m/min)  
DE: Schnittgeschwindigkeit (m/min)

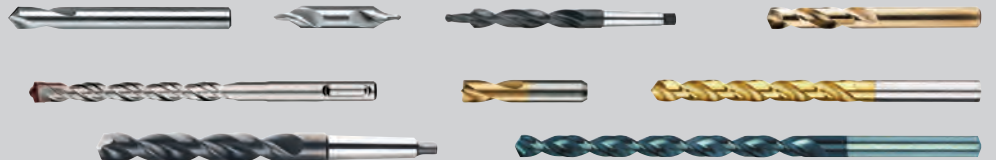
n=rpm NL: Spiltoerental (omw/min)  
FR: Vitesse de broche (tr/min)  
ES: Velocidad del husillo (rpm)  
DE: Spindeldrehzahl (U/min)

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



SC 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



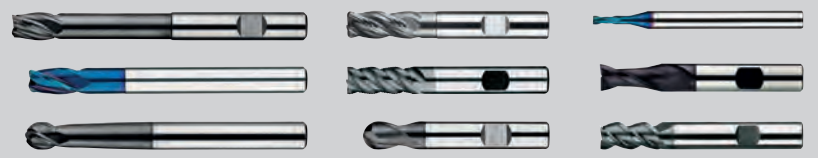
HSS-E 1

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



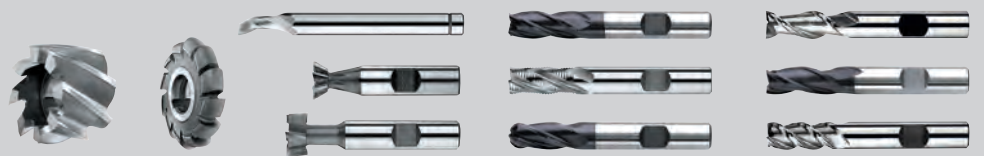
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



SC 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater

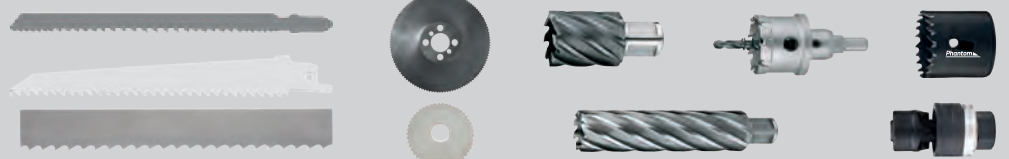


4

NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



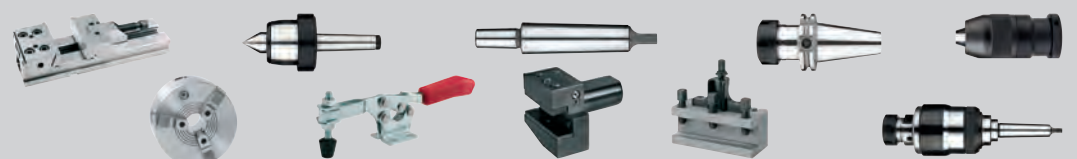
NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
<b>HSS</b>	HSS	HSS	HSS	HSS
<b>HSS-E</b>	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)
<b>HSS-E 8%</b>	HSS-E (8% Cobalt)	HSS-E (8% Cobalt)	HSS-E (8% Cobalt)	HSS-E (8% Cobalt)
<b>HM</b>	Hardmetaal	Carbure monobloc	Metal duro integral	Hartmetall
<b>VHM SC</b>	Volhardmetaal	Carbure monobloc	Metal duro integral	Vollhartmetall
<b>OX.</b>	Stoomontlaten	Vaporisé	Vaporizado	Dampfangelassen
<b>NIT.</b>	Genitreerd	Nitruré	Nitrurado	Nitriert
<b>TiN</b>	TiN gecoat	Revêtement TiN	Recubrimiento TiN	TiN Beschichtung
<b>TiAlN</b>	TiAlN gecoat	Revêtement TiAlN	Recubrimiento TiAlN	TiAlN Beschichtung
<b>AlCrN-X</b>	AlCrN-X gecoat	Revêtement AlCrN-X	Recubrimiento AlCrN-X	AlCrN-X Beschichtung
<b>90°</b>	Hoek 90°	Angle 90°	Ángulo 90°	Winkel 90°
<b>180°</b>	Hoek 180°	Angle 180°	Ángulo 180°	Winkel 180°
<b>DIN 335-C</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
<b>ECO</b>	ECO, basis kwaliteit	ECO, qualité standard	ECO, calidad básica	ECO, grund- legende Qualität
<b>ECO PRO</b>	ECO PRO, industrie kwaliteit	ECO PRO, qualité industrielle	ECO PRO, calidad de la industria	ECO PRO, Industriequalität
	Verzinkrees met schuin gat	Fraise à chanfreiner à trou	Avellanador con agujero	Kegelsenker mit schräger Bohrung
	Verzinkrees met 1 snijkant	Fraise à chanfrei- ner à un dent	Avellanador con 1 diente	Kegelsenker mit 1 Schneide
	Verzinkrees 3 snijkant- ten, frezende bewerking	Fraise à chanfreiner à 3 dents, pour fraisage	Avellanador con 3 dientes, para fresar	Kegelsenker mit 3 Schneiden, für fräsen
	Verzinkrees 3 snijkant- ten, borende bewerking	Fraise à chanfreiner à 3 dents, pour perçage	Avellanador con 3 dientes, para taladar	Kegelsenker mit 3 Schneiden, für Bohren
<b>VARI</b>	Variabele tandsteek	A pas variable	Paso variable	Variabler Verzahnung
<b>90°</b>	Verzinkhoek	Angle de chanfreinage	Ángulo de avellanar	Senkwinkel
	Parabolisch geslepen spaankamer	Goujure parabolique	Labios parabólicos	Parabolisch gesliefen Spanraum
	Recht geslepen spaankamer	Goujure droite	Labios rectos	Gerade gesliefen Spanraum

	NL	FR	ES	DE
	Cilindrische schacht	Queue cylindrique	Mango cilíndrico	Zylinderschaft
	Schacht zeskant	Queue hexagonale	Mango hexagonal	Sechskantschaft
	Schacht met drie platte vlakken	Queue à 3 méplats	Mango con 3 chafianes	Zylinderschaft mit drei platten Flächen
	Bitopname (1/4")	Queue hexagonale 1/4" (6,35 mm)	Mango hexagonal 1/4" (6,35 mm)	Bitaufname (1/4")
<b>DIN 228-B</b>	Morse Konus Opname	Cône morse	Mango cónico	Morsekegel
	Voor handgebruik	Pour usage à la main	Para uso manual	Für Handgebrauch
	Fijnpassing 90°	Ajustement fin 90°	Ajuste fino 90°	Senkung fein 90°
	Middelpassing 90°	Ajustement moyen 90°	Ajuste medio 90°	Senkung mittel 90°
	Fijnpassing voor kerngaten 90°	Ajustement fin pour trous à tarauder 90°	Ajuste fino para agujeros para roscar 90°	Senkung fein für Kernlochsenkung 90°
	Fijnpassing 180°	Ajustement fin 180°	Ajuste fino 180°	Senkung fein 180°
	Middelpassing 180°	Ajustement moyen 180°	Ajuste medio 180°	Senkung mittel 180°
	Middelpassing voor kerngaten 180°	Ajustement moyen pour trous à tarauder 180°	Ajuste medio para agujeros para roscar 180°	Senkung mittel für Kernlochsenkung 180°
	Rechte hoek	Angle droit	Borde recto	Gerade Kante
	Buitenrand buis	Angle extérieur	Borde externo de agujero	Außenbearbeitung Rohre
	Rand achterzijde	Bord arrière de trou	Borde detrás de agujero	Innenbearbeitung Rückseite
	Plat oppervlak	Surface plane	Superficie plana	Ebene Oberfläche
	Rand voorzijde	Angle d'un alésage	Borde de agujero	Innenbearbeitung Vorderseite
	Rand voor- en achterzijde	Trous sécants	Borde de agujero ambos lados	Innenbearbeitung Vorder- und Rückseite
	Oppervlak binnenkant gat	Surface interne d'un trou	Superficie interna de agujero	Innere Oberfläche "Wand"
	Plaatmateriaal	Tôles	Planchas	Bleche

NL Verzinken en Ontbramen  
 FR Chanfreinage et ébavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater

**P** **K** Bij uitstek geschikt  
**H** **N** Très approprié  
**M** **S** Muy adecuado  
**M** **S** Ideal geeignet

**P** **K** Beperkt geschikt  
**H** **N** Approprié  
**M** **S** Adecuado  
**M** **S** Eingeschränkt geeignet

P= pagina  
 P= page  
 P= página  
 P= Seite




















































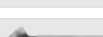


















> 41.410	INTERNATIONAL TOOLS	A	Ø3	Ø6			NEW	P. 7
> 41.420	INTERNATIONAL TOOLS	B	Ø3	Ø6			NEW	P. 7
> 41.430	INTERNATIONAL TOOLS	C	Ø3	Ø6			NEW	P. 7
> 41.440	INTERNATIONAL TOOLS	D	Ø3	Ø6			NEW	P. 7
> 41.450	INTERNATIONAL TOOLS	E	Ø3	Ø6			NEW	P. 7
> 41.460	INTERNATIONAL TOOLS	F	Ø3	Ø6			NEW	P. 8
> 41.470	INTERNATIONAL TOOLS	G	Ø3	Ø6			NEW	P. 8
> 41.480	INTERNATIONAL TOOLS	H	Ø3	Ø6			NEW	P. 8
> 41.486	INTERNATIONAL TOOLS	L	Ø3	Ø6			NEW	P. 8
> 41.488	INTERNATIONAL TOOLS	M	Ø3	Ø6			NEW	P. 8
> 41.510	Phantom	A	Ø6					P. 9
> 41.511	Phantom	A	Ø6		TiAlN			P. 9
> 41.513	Phantom	A	Ø3					P. 9
> 41.518	Phantom	A	Ø8					P. 9
> 41.520	Phantom	B	Ø6					P. 10
> 41.521	Phantom	B	Ø6		TiAlN			P. 10
> 41.523	Phantom	B	Ø3					P. 10
> 41.528	Phantom	B	Ø8					P. 10
> 41.529	Phantom	B	Ø6					P. 10
> 41.530	Phantom	C	Ø6					P. 11
> 41.531	Phantom	C	Ø6		TiAlN			P. 11
> 41.533	Phantom	C	Ø3					P. 11
> 41.538	Phantom	C	Ø8					P. 11
> 41.539	Phantom	C	Ø6					P. 11
> 41.540	Phantom	D	Ø6					P. 12
> 41.543	Phantom	D	Ø3		TiAlN			P. 12
> 41.548	Phantom	D	Ø8					P. 12
> 41.549	Phantom	D	Ø6					P. 12
> 41.550	Phantom	E	Ø6					P. 13
> 41.553	Phantom	E	Ø3		TiAlN			P. 13
> 41.559	Phantom	E	Ø6					P. 13
> 41.560	Phantom	F	Ø6					P. 14
> 41.561	Phantom	F	Ø6		TiAlN			P. 14





> 41.563	Phantom	F	Ø3					P. 14		
> 41.568	Phantom	F	Ø8					P. 14		
> 41.569	Phantom	F	Ø6					P. 14		
> 41.570	Phantom	G	Ø6					P. 15		
> 41.573	Phantom	G	Ø3					P. 15		
> 41.578	Phantom	G	Ø8					P. 15		
> 41.579	Phantom	G	Ø6					P. 15		
> 41.580	Phantom	H	Ø6					P. 16		
> 41.583	Phantom	H	Ø3					P. 16		
> 41.588	Phantom	H	Ø8					P. 16		
> 41.600	Phantom	J	Ø6					P. 17		
> 41.610	Phantom	K	Ø6					P. 17		
> 41.613	Phantom	K	Ø3					P. 17		
> 41.620	Phantom	L	Ø6					P. 18		
> 41.623	Phantom	L	Ø3					P. 18		
> 41.628	Phantom	L	Ø8					P. 18		
> 41.629	Phantom	L	Ø6					P. 18		
> 41.630	Phantom	M	Ø6					P. 19		
> 41.633	Phantom	M	Ø3					P. 19		
> 41.640	Phantom	N	Ø6					P. 20		
> 41.643	Phantom	N	Ø3					P. 20		
> 41.650	Phantom	X	Ø6				<b>NEW</b>	P. 20		
> 41.690	Phantom		Ø6				<b>NEW</b>	P. 20		
> 41.850	Phantom		Ø3					P. 21		
> 41.860	Phantom		Ø6					P. 21		
> 41.865	Phantom		Ø6					P. 21		
> 42.100	Phantom	+6.6 (	1	30°	P	K	N		P. 22	
> 42.200	Phantom	+6.6 (	1	45°	P	K	N		P. 22	
> 42.300	Phantom	+6.6 (	0	60°	P	K	N		P. 22	
> 42.310	Phantom	+6.6 (	0	60°	P	K	N		P. 23	
> 42.320	Phantom	+6.6 (	1	60°	P	K	N		P. 23	
> 42.330	Phantom	+6.6 (	1	60°	P	K	N		P. 23	
> 42.340	Phantom	+6.6 (	3	60°	P	M	K	N		P. 24



> 42.343	Phantom	+6.6 (		60°	P M K N		 <b>NEW</b>	P. 24
> 42.370	Phantom	+6.6 (		60°	P M K N			P. 24
> 42.420	Phantom	+6.6 (		82°	P K N			P. 25
> 42.440	Phantom	+6.6 (		82°	P M K N			P. 25
> 42.500	Phantom	+6.6 (		90°	P K N			P. 25
> 42.501	Phantom	+6.6 (		90°	P K N			P. 26
> 42.510	Phantom	+6.6 (		90°	P K N			P. 26
> 42.520	Phantom	+6.6 (		90°	P K N			P. 26
> 42.530	Phantom	+6.6 (		90°	P K N			P. 27
> 42.533	INTERNATIONAL TOOLS	HSS		90°	P K N			P. 27
> 42.535	INTERNATIONAL TOOLS	HSS		90°	P K N			P. 27
> 42.536	INTERNATIONAL TOOLS	HSS		90°	P M K N			P. 28
> 42.540	Phantom	+6.6 (		90°	P M K N			P. 28
> 42.541	Phantom	+6.6 (		90°	P M K N			P. 28
> 42.543	INTERNATIONAL TOOLS	HSS		90°	P K N			P. 29
> 42.545	Phantom	+6.6 (		90°	P M K N			P. 29
> 42.546	Phantom	+6.6 (		90°	P M K N			P. 29
> 42.550	Phantom	HSS-E 8%		90°	P M K N S			P. 30
> 42.552	Phantom	HSS-E 8%		90°	P M K N S			P. 30
> 42.553	Phantom	+6.6 (		90°	P M K N		 <b>NEW</b>	P. 30
> 42.554	Phantom	+6.6 (		90°	P M K N			P. 31
> 42.555	Phantom	+6.6 (		90°	P M K N		 <b>NEW</b>	P. 31
> 42.556	Phantom	+6.6 (		90°	P M K N		 <b>NEW</b>	P. 31
> 42.560	Phantom	MG HM		90°	P M K N S H			P. 32
> 42.566	Phantom	+6.6 (		90°	P M K N		 <b>NEW</b>	P. 32
> 42.567	Phantom	+6.6 (		90°	P M K N		 <b>NEW</b>	P. 32
> 42.570	Phantom	+6.6 (		90°	P M K N			P. 33
> 42.580	Phantom	+6.6 (		90°				P. 33
> 42.590	INTERNATIONAL TOOLS	HSS		90°	P			P. 33
> 42.640	Phantom	+6.6 (		100°	P M K N			P. 33
> 42.700	Phantom	+6.6 (		120°	P K N			P. 34
> 42.710	Phantom	+6.6 (		120°	P K N			P. 34
> 42.740	Phantom	+6.6 (		120°	P M K N			P. 34
> 43.200	Phantom	+6.6 (		90°	P M K N			P. 35
> 43.210	Phantom	+6.6 (		90°	P M K N			P. 35





















































> 43.240	<b>Phantom</b>	+6.6 (	DIN 1866	90°	P M K N			P. 35
> 43.320	<b>Phantom</b>	+6.6 (	DIN 373	180°	P M K N			P. 36
> 43.330	<b>Phantom</b>	+6.6 (	DIN 373	180°	P M K N			P. 36
> 43.350	<b>Phantom</b>	+6.6 (	DIN 373	180°	P M K N			P. 36
> 43.400	<b>Phantom</b>	+6.6 (	DIN 373	180°	P M K N			P. 37
> 43.410	<b>Phantom</b>	+6.6 (	DIN 373	180°	P M K N			P. 37
> 43.440	<b>Phantom</b>	+6.6 (	DIN 373	180°	P M K N			P. 37
> 44.100	<b>Phantom</b>	HSS	OX.		P M K N			P. 38
> 44.102	<b>Phantom</b>	HSS	NIT.		P M K N			P. 38
> 44.110	<b>Phantom</b>	HSS	OX.		P M K N			P. 38
> 44.120	<b>Phantom</b>	HSS	OX.		P M K N			P. 39
> 44.130	<b>Phantom</b>	HSS	NIT.		P M K N			P. 39
> 44.134	<b>Phantom</b>	HSS	TiAIN		P M K N			P. 39
> 44.150	<b>Phantom</b>	HSS			P M K N			P. 40
> 44.200	<b>Phantom</b>	HSS			P N			P. 40
> 44.210	<b>Phantom</b>	+6.6 (			P M N			P. 40
> 44.220	INTERNATIONAL TOOLS	HSS			P N			P. 41
> 46.100	SHAVIV							P. 42
> 46.120	SHAVIV	B						P. 42
> 46.130	SHAVIV	C						P. 43
> 46.140	SHAVIV	D						P. 43
> 46.155	SHAVIV	B	E					P. 43
> 46.160	SHAVIV	F						P. 43
> 46.180	SHAVIV							P. 44
> 46.300	SHAVIV	E						P. 44
> 46.400	SHAVIV							P. 45
> 49.140	INTERNATIONAL TOOLS	VHM SC	06					P. 46

NEW

> 49.150	<b>Phantom</b>	VHM SC	Ø6						P. 46		
> 49.152	<b>Phantom</b>	VHM SC	Ø6						P. 46		
> 49.230	<b>Phantom</b>	+6.6 (		60°	P		N		P. 47		
> 49.232	<b>Phantom</b>	+6.6 (		60°	P	K	N		P. 47		
> 49.234	<b>Phantom</b>	+6.6 (		60°	P	K	N		P. 48		
> 49.240	INTERNATIONAL TOOLS	HSS		90°	P	K	N		P. 48		
> 49.242	INTERNATIONAL TOOLS	HSS		90°	P	K	N		P. 48		
> 49.244	INTERNATIONAL TOOLS	HSS		90°	P	M	K	N		P. 49	
> 49.248	INTERNATIONAL TOOLS	HSS		90°	P	K	N		P. 49		
> 49.250	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 49	
> 49.252	<b>Phantom</b>	+6.6 (		90°	P	K	N		P. 50		
> 49.254	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 50	
> 49.255	<b>Phantom</b>	HSS-E 8%		90°	P	M	K	N	S		P. 51
> 49.256	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 51	
> 49.259	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 52	
> 49.260	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 52	
> 49.261	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 53	
> 49.262	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 53	
> 49.267	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 54	
> 49.268	<b>Phantom</b>	+6.6 (		90°	P	M	K	N		P. 54	

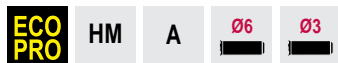




> 49.270	<b>Phantom</b>	+6.6 (	120°	<b>P</b>	<b>K</b>	<b>N</b>		P. 55	
> 49.320	<b>Phantom</b>	+6.6 (	DIN 1866 90°	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>		P. 55
> 49.340	<b>Phantom</b>	+6.6 (	DIN 373 180°	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>		P. 56
> 49.413	<b>Phantom</b>	HSS	<b>NIT.</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>		P. 56
> 49.414	<b>Phantom</b>	HSS	<b>TiAIN</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>		P. 56
> 49.420	<b>Phantom</b>	HSS		<b>P</b>		<b>N</b>		P. 57	
> 49.490	<b>Phantom</b>							P. 57	
> 49.600	<b>SHAVIV</b>							P. 57	

> **41.410** **INTERNATIONAL TOOLS**

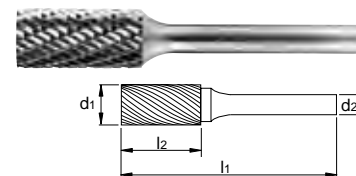
NL ECO PRO HM Stiffrees model A, cilindrisch  
 FR Fraise lime Carbure ECO PRO Forme A, forme cylindrique  
 ES Fresa rotativa MD ECO PRO forma A, cilindrico  
 DE ECO PRO HM Frässtift Form A, Zylinderform



Ref.	Ø	d1	l1	l2	d2	z
41.410.0336	3	3	38	14	3	6-UNI
41.410.0606	6	6	50	18	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.410.0806	8	8	65	20	6	6-UNI
41.410.1006	10	10	65	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.410.1206	12	12	70	25	6	6-UNI
41.410.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

> **41.420** **INTERNATIONAL TOOLS**

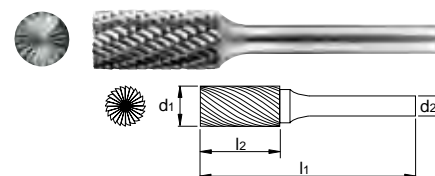
NL ECO PRO HM Stiffrees model B, cilindrisch met kopvertanding  
 FR Fraise lime Carbure ECO PRO Forme B, Forme cylindrique avec denture en bout  
 ES Fresa rotativa MD ECO PRO forma B, cilindrico con corte al centro  
 DE ECO PRO HM Frässtift Form B, Zylinderform mit Stirnverzahnung



Ref.	Ø	d1	l1	l2	d2	z
41.420.0336	3	3	38	14	3	6-UNI
41.420.0606	6	6	50	18	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.420.0806	8	8	65	20	6	6-UNI
41.420.1006	10	10	65	20	6	6-UNI

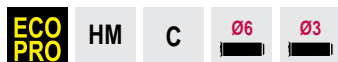
Ref.	Ø	d1	l1	l2	d2	z
41.420.1206	12	12	70	25	6	6-UNI
41.420.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

> **41.430** **INTERNATIONAL TOOLS**

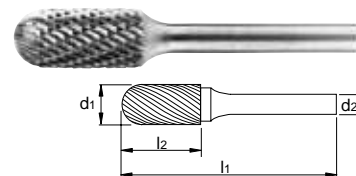
NL ECO PRO HM Stiffrees model C, cilindrisch, ronde kop  
 FR Fraise lime Carbure ECO PRO Forme C, Forme cylindrique à bout arrondi  
 ES Fresa rotativa MD ECO PRO forma C, cilindrico, forma semiesférica  
 DE ECO PRO HM Frässtift Form C, Walzenrundform



Ref.	Ø	d1	l1	l2	d2	z
41.430.0336	3	3	38	14	3	6-UNI
41.430.0606	6	6	50	18	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.430.0806	8	8	65	20	6	6-UNI
41.430.1006	10	10	65	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.430.1206	12	12	70	25	6	6-UNI
41.430.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

> **41.440** **INTERNATIONAL TOOLS**

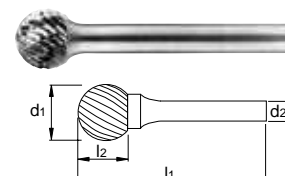
NL ECO PRO HM Stiffrees model D, kogelvorm  
 FR Fraise lime Carbure ECO PRO Forme D, Forme sphérique  
 ES Fresa rotativa MD ECO PRO forma D, modelo esférico  
 DE ECO PRO HM Frässtift Form D, Kugelform



Ref.	Ø	d1	l1	l2	d2	z
41.440.0336	3	3	38	2.5	3	6-UNI
41.440.0606	6	6	50	5	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.440.0806	8	8	52	7	6	6-UNI
41.440.1006	10	10	54	9	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.440.1206	12	12	56	11	6	6-UNI
41.440.1606	16	16	59	14	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

> **41.450** **INTERNATIONAL TOOLS**

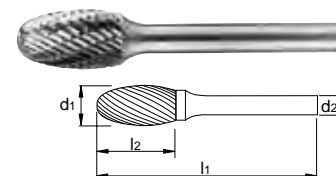
NL ECO PRO HM Stiffrees model E, druppelvorm  
 FR Fraise lime Carbure ECO PRO Forme E, Forme goutte  
 ES Fresa rotativa MD ECO PRO forma E, forma oval  
 DE ECO PRO HM Frässtift Form E, Tropfenform



Ref.	Ø	d1	l1	l2	d2	z
41.450.0336	3	3	38	6	3	6-UNI
41.450.0606	6	6	50	10	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.450.0806	8	8	60	15	6	6-UNI
41.450.1006	10	10	60	15	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.450.1206	12	12	65	20	6	6-UNI
41.450.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**





### > 41.460 INTERNATIONAL TOOLS

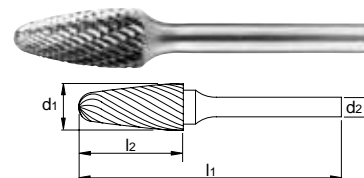
NL ECO PRO HM Stiffrees model F, boomvorm met ronde kop  
 FR Fraise lime Carbure ECO PRO Forme F, Forme ogive à bout arrondi  
 ES Fresa rotativa MD ECO PRO forma F, forma ojival en semiesférica  
 DE ECO PRO HM Frässtift Form F, Rundbogenform



Ref.	Ø	d1	l1	l2	d2	z
41.460.0336	3	3	38	14	3	6-UNI
41.460.0606	6	6	50	18	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.460.0806	8	8	65	20	6	6-UNI
41.460.1006	10	10	65	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.460.1206	12	12	70	25	6	6-UNI
41.460.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

### > 41.470 INTERNATIONAL TOOLS

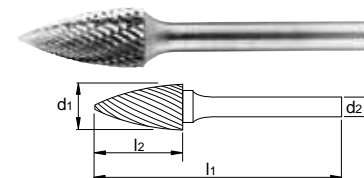
NL ECO PRO HM Stiffrees model G, boomvorm spits  
 FR Fraise lime Carbure ECO PRO Forme G, Forme ogive  
 ES Fresa rotativa MD ECO PRO forma G, forma ojival en punta  
 DE ECO PRO HM Frässtift Form G, Spitzbogenform



Ref.	Ø	d1	l1	l2	d2	z
41.470.0336	3	3	38	14	3	6-UNI
41.470.0606	6	6	50	18	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.470.0806	8	8	65	20	6	6-UNI
41.470.1006	10	10	65	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.470.1206	12	12	70	25	6	6-UNI
41.470.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

### > 41.480 INTERNATIONAL TOOLS

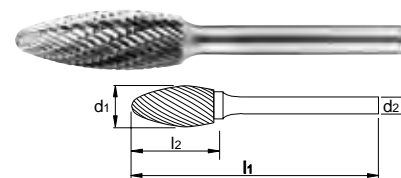
NL ECO PRO HM Stiffrees model H, vlamvorm  
 FR Fraise lime Carbure ECO PRO Forme H, Forme flamme  
 ES Fresa rotativa MD ECO PRO forma H, forma llama  
 DE ECO PRO HM Frässtift Form H, Flammenform



Ref.	Ø	d1	l1	l2	d2	z
41.480.0336	3	3	38	6	3	6-UNI
41.480.0606	6	6	50	14	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.480.0806	8	8	65	20	6	6-UNI
41.480.1006	10	10	65	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.480.1206	12	12	75	30	6	6-UNI
41.480.1606	16	16	80	35	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

### > 41.486 INTERNATIONAL TOOLS

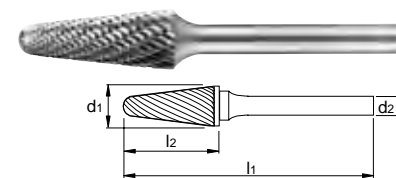
NL ECO PRO HM Stiffrees model L, kegelvorm, met ronde kop  
 FR Fraise lime Carbure ECO PRO Forme L, Forme conique à bout arrondi  
 ES Fresa rotativa MD ECO PRO forma L, forma cónica, con punta redondeada  
 DE ECO PRO HM Frässtift Form L, Rundkegelform



Ref.	Ø	d1	l1	l2	d2	z
41.486.0336	3	3	38	14	3	6-UNI
41.486.0606	6	6	50	18	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.486.0806	8	8	70	25	6	6-UNI
41.486.1006	10	10	65	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.486.1206	12	12	75	30	6	6-UNI
41.486.1606	16	16	78	33	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

### > 41.488 INTERNATIONAL TOOLS

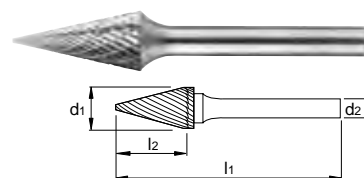
NL ECO PRO HM Stiffrees model M, kegelvorm, spits  
 FR Fraise lime Carbure ECO PRO Forme M, Forme conique à bout pointu  
 ES Fresa rotativa MD ECO PRO forma M, forma cónica, en punta  
 DE ECO PRO HM Frässtift Form M, Spitzkegelform



Ref.	Ø	d1	l1	l2	d2	z
41.488.0336	3	3	38	11	3	6-UNI
41.488.0606	6	6	50	20	6	6-UNI

Ref.	Ø	d1	l1	l2	d2	z
41.488.0806	8	8	65	20	6	6-UNI
41.488.1006	10	10	65	20	6	6-UNI

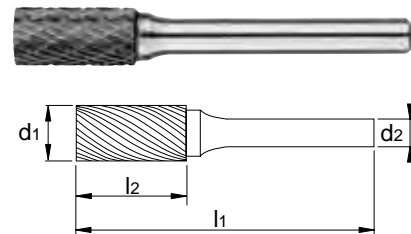
Ref.	Ø	d1	l1	l2	d2	z
41.488.1206	12	12	71	26	6	6-UNI
41.488.1606	16	16	70	25	6	6-UNI



**NIEUW NOUVEAU NUEVO NEU**

> **41.510** **Phantom**

NL HM Stiffrees model A, cilindrisch  
 FR Fraise lime Carbure Forme A, Forme cylindrique  
 ES Fresa rotativa MD forma A, cilíndrico  
 DE HM Frässtift Form A, Zylinderform



1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
<b>N</b>	<b>P H M K S</b>	<b>P M S</b>	<b>P H M K S</b>	<b>P K</b>	<b>M</b>

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18	41.510.0601	41.510.0603	41.510.0604	41.510.0606	41.510.0608	41.510.0609
8	8	6	64	19	41.510.0801	41.510.0803	41.510.0804	41.510.0806	41.510.0808	41.510.0809
10	9,5	6	64	19	41.510.1001	41.510.1003	41.510.1004	41.510.1006	41.510.1008	41.510.1009
12	12,7	6	70	25	41.510.1201	41.510.1203	41.510.1204	41.510.1206	41.510.1208	41.510.1209
16	16	6	70	25	41.510.1601		41.510.1604	41.510.1606		
20	19	6	70	25				41.510.2006		

> **41.511** **Phantom**

NL HM Stiffrees model A, cilindrisch, TiAlN  
 FR Fraise lime Carbure Forme A, Forme cylindrique, TiAlN  
 ES Fresa rotativa MD forma A, cilíndrico, TiAlN  
 DE HM Frässtift Form A, Zylinderform, TiAlN



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18				41.511.0606		
8	8	6	64	19				41.511.0806		
10	9,5	6	64	19				41.511.1006		
12	12,7	6	70	25				41.511.1206		

> **41.513** **Phantom**

NL HM Stiffrees model A, cilindrisch, schacht 3 mm  
 FR Fraise lime Carbure Forme A, Forme cylindrique, queue 3 mm  
 ES Fresa rotativa MD forma A, cilíndrico, mango 3 mm  
 DE HM Frässtift Form A, Zylinderform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
1,5	1,5	3	38	6		41.513.0153	41.513.0154			
2	2	3	38	11				41.513.0206		
3	3	3	38	14	41.513.0301	41.513.0303	41.513.0304	41.513.0306		41.513.0309
6	6,3	3	45	12,7				41.513.0636		41.513.0639

> **41.518** **Phantom**

NL HM Stiffrees model A, cilindrisch, schacht 8 mm  
 FR Fraise lime Carbure Forme A, Forme cylindrique, queue 8 mm  
 ES Fresa rotativa MD forma A, cilíndrico, mango 8 mm  
 DE HM Frässtift Form A, Zylinderform, Schaft 8 mm

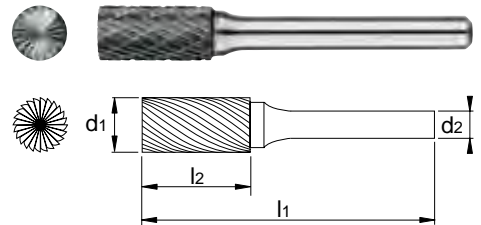


Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	70	25				41.518.1286		
16	16	8	70	25	41.518.1681			41.518.1686		
20	19	8	70	25				41.518.2086		



### > 41.520 Phantom

NL HM Stiftrees model B, cilindrisch met kopvertanding  
 FR Fraise lime Carbure Forme B, Forme cylindrique avec denture en bout  
 ES Fresa rotativa MD forma B, cilíndrico con corte al centro  
 DE HM Frässtift Form B, Zylinderform mit Stirnverzahnung



	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
	<b>N</b>	<b>P H M K S</b>	<b>P M S</b>	<b>P H M K S</b>	<b>P K</b>	<b>M</b>

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18	41.520.0601	41.520.0603	41.520.0604	41.520.0606	41.520.0608	
8	8	6	64	19	41.520.0801	41.520.0803	41.520.0804	41.520.0806	41.520.0808	
10	9,5	6	64	19	41.520.1001	41.520.1003	41.520.1004	41.520.1006	41.520.1008	
12	12,7	6	70	25	41.520.1201	41.520.1203	41.520.1204	41.520.1206	41.520.1208	
16	16	6	70	25		41.520.1603	41.520.1604	41.520.1606		
20	19	8	70	25				41.520.2006		

### > 41.521 Phantom

NL HM Stiftrees model B, cilindrisch met kopvertanding, TiAIN  
 FR Fraise lime Carbure Forme B, Forme cylindrique avec denture en bout, TiAIN  
 ES Fresa rotativa MD forma B, cilíndrico con corte al centro, TiAIN  
 DE HM Frässtift Form B, Zylinderform mit Stirnverzahnung, TiAIN



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18				41.521.0606		
8	8	6	64	19				41.521.0806		
10	9,5	6	64	19				41.521.1006		
12	12,7	6	70	25				41.521.1206		

### > 41.523 Phantom

NL HM Stiftrees model B, cilindrisch met kopvertanding, schacht 3 mm  
 FR Fraise lime Carbure Forme B, Forme cylindrique avec denture en bout, queue 3 mm  
 ES Fresa rotativa MD forma B, cilíndrico con corte al centro, mango 3 mm  
 DE HM Frässtift Form B, Zylinderform mit Stirnverzahnung, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
1,5	1,5	3	38	6		41.523.0153				
2	2	3	38	11				41.523.0206		
3	3	3	38	14	41.523.0301	41.523.0303	41.523.0304	41.523.0306		
5	5	3	38	12,7				41.523.0506		
6	6,3	3	38	12,7				41.523.0636		
16	16	3	70	25				41.523.1686		
20	19	3	70	25				41.523.2086		

### > 41.528 Phantom

NL HM Stiftrees model B, cilindrisch met kopvertanding, schacht 8 mm  
 FR Fraise lime Carbure Forme B, Forme cylindrique avec denture en bout, queue 8 mm  
 ES Fresa rotativa MD forma B, cilíndrico con corte al centro, mango 8 mm  
 DE HM Frässtift Form B, Zylinderform mit Stirnverzahnung, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	70	25				41.528.1286		

### > 41.529 Phantom

NL HM Stiftrees model B, cilindrisch met kopvertanding, lang  
 FR Fraise lime Carbure Forme B, Forme cylindrique avec denture en bout, longue  
 ES Fresa rotativa MD forma B, cilíndrico con corte al centro, larga  
 DE HM Frässtift Form B, Zylinderform mit Stirnverzahnung, lang

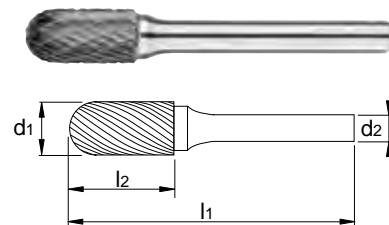




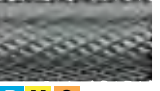



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	162	12,7			41.529.0614			
10	9,5	6	170	19			41.529.1014			
12	12,7	6	175	25			41.529.1214			



> **41.530** **Phantom**

NL HM Stiffrees model C, cilindrisch, ronde kop  
 FR Fraise lime Carbure Forme C, Forme cylindrique à bout arrondi  
 ES Fresa rotativa MD forma C, cilíndrico, forma semiesférica  
 DE HM Frässtift Form C, Walzenrundform



1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
					
<b>N</b>	<b>P H M K S</b>	<b>P M S</b>	<b>P H M K S</b>	<b>P K</b>	<b>M</b>

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	6	60	15				41.530.0306		
4	4	6	60	15				41.530.0406		
6	6	6	50	18	41.530.0601	41.530.0603	41.530.0604	41.530.0606	41.530.0608	41.530.0609
6	6	6	60	18				41.530.0616		
6	6	6	100	18				41.530.0636		
8	8	6	64	19	41.530.0801	41.530.0803	41.530.0804	41.530.0806	41.530.0808	41.530.0809
10	9,5	6	64	19	41.530.1001	41.530.1003	41.530.1004	41.530.1006	41.530.1008	41.530.1009
12	12,7	6	70	25	41.530.1201	41.530.1203	41.530.1204	41.530.1206	41.530.1208	41.530.1209
16	16	6	70	25	41.530.1601	41.530.1603	41.530.1604	41.530.1606		
20	19	6	70	25				41.530.2006		

> **41.531** **Phantom**

NL HM Stiffrees model C, cilindrisch, ronde kop, TiAIN  
 FR Fraise lime Carbure Forme C, Forme cylindrique à bout arrondi, TiAIN  
 ES Fresa rotativa MD forma C, cilíndrico, forma semiesférica, TiAIN  
 DE HM Frässtift Form C, Walzenrundform, TiAIN



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18				41.531.0606		
8	8	6	64	19				41.531.0806		
10	9,5	6	64	19				41.531.1006		
12	12,7	6	70	25				41.531.1206		

> **41.533** **Phantom**

NL HM Stiffrees model C, cilindrisch, ronde kop, schacht 3 mm  
 FR Fraise lime Carbure Forme C, Forme cylindrique à bout arrondi, queue 3 mm  
 ES Fresa rotativa MD forma C, cilíndrico, forma semiesférica, mango 3 mm  
 DE HM Frässtift Form C, Walzenrundform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
2	2	3	38	11				41.533.0206		
3	3	3	38	14	41.533.0301	41.533.0303	41.533.0304	41.533.0306		41.533.0309
6	6,3	3	45	12,7		41.533.0633	41.533.0634	41.533.0636		41.533.0639

> **41.538** **Phantom**

NL HM Stiffrees model C, cilindrisch, ronde kop, schacht 8 mm  
 FR Fraise lime Carbure Forme C, Forme cylindrique à bout arrondi, queue 8 mm  
 ES Fresa rotativa MD forma C, cilíndrico, forma semiesférica, mango 8 mm  
 DE HM Frässtift Form C, Walzenrundform, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	70	25				41.538.1286		
16	16	8	70	25				41.538.1686		
19	19	8	70	25				41.538.2086		

> **41.539** **Phantom**

NL HM Stiffrees model C, cilindrisch, ronde kop, lang  
 FR Fraise lime Carbure Forme C, Forme cylindrique à bout arrondi, longue  
 ES Fresa rotativa MD forma C, cilíndrico, forma semiesférica, larga  
 DE HM Frässtift Form C, Walzenrundform, lang



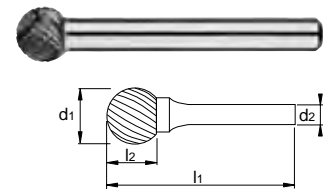
Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	162	12,7			41.539.0614			
10	9,5	6	170	19			41.539.1014			
12	12,7	6	175	25			41.539.1214			





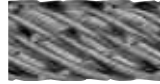





## > 41.540 Phantom

NL HM Stiffrees model D, kogelvorm  
 FR Fraise lime Carbure Forme D, Forme sphérique  
 ES Fresa rotativa MD forma D, modelo esférico  
 DE HM Frässtift Form D, Kugelform



1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
					
N	P H M K S	P M S	P H M K S	P K	M

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	5	41.540.0601	41.540.0603	41.540.0604	41.540.0606	41.540.0608	41.540.0609
8	8	6	50	6,4	41.540.0801	41.540.0803	41.540.0804	41.540.0806	41.540.0808	41.540.0809
10	9,5	6	52	8	41.540.1001	41.540.1003	41.540.1004	41.540.1006	41.540.1008	41.540.1009
12	12,7	6	55	11	41.540.1201	41.540.1203	41.540.1204	41.540.1206	41.540.1208	41.540.1209
16	16	6	58	14	41.540.1601			41.540.1606		
20	19	6	62	16				41.540.2006		

## > 41.543 Phantom

NL HM Stiffrees model D, kogelvorm, schacht 3 mm  
 FR Fraise lime Carbure Forme D, Forme sphérique, queue 3 mm  
 ES Fresa rotativa MD forma D, modelo esférico, mango 3 mm  
 DE HM Frässtift Form D, Kugelform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
2	2	3	38	1,8		41.543.0203		41.543.0206		
3	3	3	38	2,5	41.543.0301	41.543.0303	41.543.0304	41.543.0306		41.543.0309
4	4	3	38	3,4		41.543.0403		41.543.0406		
6	6,3	3	38	5	41.543.0631	41.543.0633		41.543.0636		41.543.0639

## > 41.548 Phantom

NL HM Stiffrees model D, kogelvorm, schacht 8 mm  
 FR Fraise lime Carbure Forme D, Forme sphérique, queue 8 mm  
 ES Fresa rotativa MD forma D, modelo esférico, mango 8 mm  
 DE HM Frässtift Form D, Kugelform, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	56	11				41.548.1286		
16	16	8	59	14				41.548.1686		
20	19	8	62	16,5				41.548.2086		

## > 41.549 Phantom

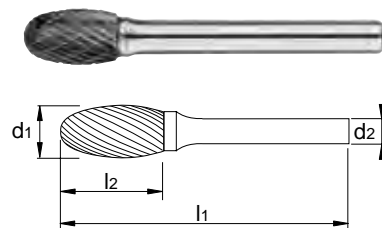
NL HM Stiffrees model D, kogelvorm, lang  
 FR Fraise lime Carbure Forme D, Forme sphérique, longue  
 ES Fresa rotativa MD forma D, modelo esférico, larga  
 DE HM Frässtift Form D, Kugelform, lang



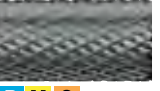





Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
10	9,5	6	158	8			41.549.1014			
12	12,7	6	161	11			41.549.1214			

> **41.550** **Phantom**

NL HM Stiffrees model E, druppelvorm  
 FR Fraise lime Carbure Forme E, Forme goutte  
 ES Fresa rotativa MD forma E, forma oval  
 DE HM Frässtift Form E, Tropfenform



1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
					
<b>N</b>	<b>P H M K S</b>	<b>P M S</b>	<b>P H M K S</b>	<b>P K</b>	<b>M</b>

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	9,5	41.550.0601			41.550.0606		
8	8	6	60	15				41.550.0806		41.550.0809
10	9,5	6	60	16	41.550.1001		41.550.1004	41.550.1006		41.550.1009
12	12,7	6	66	22	41.550.1201		41.550.1204	41.550.1206		41.550.1209
16	16	6	70	25				41.550.1606		

> **41.553** **Phantom**

NL HM Stiffrees model E, druppelvorm, schacht 3 mm  
 FR Fraise lime Carbure Forme E, Forme goutte, queue 3 mm  
 ES Fresa rotativa MD forma E, forma oval, mango 3 mm  
 DE HM Frässtift Form E, Tropfenform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	5,5				41.553.0306		
6	6,3	3	42	9,5				41.553.0636		

> **41.559** **Phantom**

NL HM Stiffrees model E, druppelvorm, lang  
 FR Fraise lime Carbure Forme E, Forme goutte, longue  
 ES Fresa rotativa MD forma E, forma oval, larga  
 DE HM Frässtift Form E, Tropfenform, lang



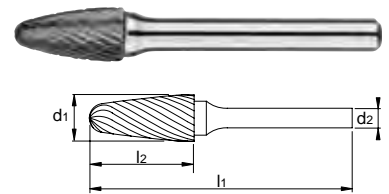
Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
10	9,5	6	166	16			41.559.1014			





### > 41.560 Phantom

NL HM Stiffrees model F, boomvorm met ronde kop  
 FR Fraise lime Carbure Forme F, Forme ogive à bout arrondi  
 ES Fresa rotativa MD forma F, forma ojival en semiesférica  
 DE HM Frässtift Form F, Rundbogenform



	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
	N	P H M K S	P M S	P H M K S	P K	M

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	12,7						
6	6	6	50	18	41.560.0601	41.560.0603	41.560.0604	41.560.0606	41.560.0608	41.560.0609
8	8	6	65	20				41.560.0806	41.560.0808	41.560.0809
10	9,5	6	64	19	41.560.1001	41.560.1003	41.560.1004	41.560.1006	41.560.1008	41.560.1009
12	12,7	6	70	25	41.560.1201	41.560.1203	41.560.1204	41.560.1206	41.560.1208	41.560.1209
16	16	6	70	25	41.560.1601		41.560.1604	41.560.1606		

### > 41.561 Phantom

NL HM Stiffrees model F, boomvorm met ronde kop, TiAlN  
 FR Fraise lime Carbure Forme F, Forme ogive à bout arrondi, TiAlN  
 ES Fresa rotativa MD forma F, forma ojival en semiesférica, TiAlN  
 DE HM Frässtift Form F, Rundbogenform, TiAlN



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18				41.561.0606		
10	9,5	6	64	19				41.561.1006		
12	12,7	6	70	25				41.561.1206		

### > 41.563 Phantom

NL HM Stiffrees model F, boomvorm met ronde kop, schacht 3 mm  
 FR Fraise lime Carbure Forme F, Forme ogive à bout arrondi, queue 3 mm  
 ES Fresa rotativa MD forma F, forma ojival en semiesférica, mango 3 mm  
 DE HM Frässtift Form F, Rundbogenform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	12,7	41.563.0301			41.563.0306		41.563.0309
6	6,3	3	45	12,7	41.563.0631	41.563.0633		41.563.0636		41.563.0639

### > 41.568 Phantom

NL HM Stiffrees model F, boomvorm met ronde kop, schacht 8 mm  
 FR Fraise lime Carbure Forme F, Forme ogive à bout arrondi, queue 8 mm  
 ES Fresa rotativa MD forma F, forma ojival en semiesférica, mango 8 mm  
 DE HM Frässtift Form F, Rundbogenform, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	70	25				41.568.1286		
16	16	8	70	25				41.568.1686		
20	19	8	82	38				41.568.2086		

### > 41.569 Phantom

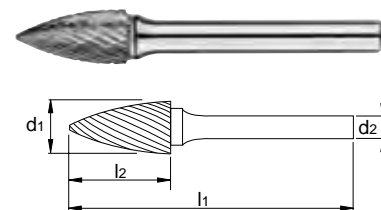
NL HM Stiffrees model F, boomvorm met ronde kop, lang  
 FR Fraise lime Carbure Forme F, Forme ogive à bout arrondi, longue  
 ES Fresa rotativa MD forma F, forma ojival en semiesférica, larga  
 DE HM Frässtift Form F, Rundbogenform, lang



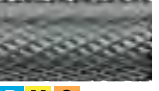





Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	6	175	25			41.569.1214			

> **41.570** **Phantom**

NL HM Stiffrees model G, boomvorm spits  
 FR Fraise lime Carbure Forme G, Forme ogive  
 ES Fresa rotativa MD forma G, forma ojival en punta  
 DE HM Frässtift Form G, Spitzbogenform



1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
 <b>N</b>	 <b>P H M K S</b>	 <b>P M S</b>	 <b>P H M K S</b>	 <b>P K</b>	 <b>M</b>

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	18	41.570.0601	41.570.0603	41.570.0604	41.570.0606	41.570.0608	41.570.0609
8	8	6	64	19	41.570.0801	41.570.0803	41.570.0804	41.570.0806	41.570.0808	41.570.0809
10	9,5	6	64	19	41.570.1001	41.570.1003	41.570.1004	41.570.1006	41.570.1008	41.570.1009
12	12,7	6	70	25	41.570.1201	41.570.1203	41.570.1204	41.570.1206	41.570.1208	41.570.1209
16	16	6	70	25	41.570.1601	41.570.1603	41.570.1604	41.570.1606		

> **41.573** **Phantom**

NL HM Stiffrees model G, boomvorm spits, schacht 3 mm  
 FR Fraise lime Carbure Forme G, Forme ogive, queue 3 mm  
 ES Fresa rotativa MD forma G, forma ojival en punta, mango 3 mm  
 DE HM Frässtift Form G, Spitzbogenform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	10	41.573.0301	41.573.0303	41.573.0304	41.573.0306		
6	6,3	3	45	12,7		41.573.0633		41.573.0636		

> **41.578** **Phantom**

NL HM Stiffrees model G, boomvorm spits, schacht 8 mm  
 FR Fraise lime Carbure Forme G, Forme ogive, queue 8 mm  
 ES Fresa rotativa MD forma G, forma ojival en punta, mango 8 mm  
 DE HM Frässtift Form G, Spitzbogenform, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	70	25				41.578.1286		
16	16	8	70	25				41.578.1686		
20	19	8	83	38				41.578.2086		

> **41.579** **Phantom**

NL HM Stiffrees model G, boomvorm spits, lang  
 FR Fraise lime Carbure Forme G, Forme ogive, longue  
 ES Fresa rotativa MD forma G, forma ojival en punta, larga  
 DE HM Frässtift Form G, Spitzbogenform, lang



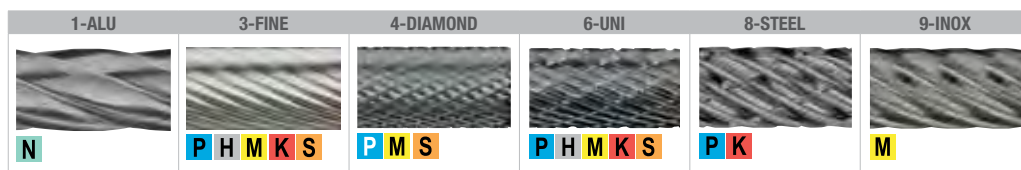
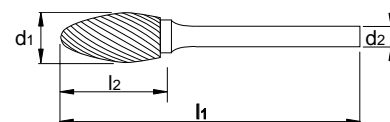
Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	164	12,7			41.579.0614			
10	9,5	6	170	19			41.579.1014			
12	12,7	6	175	25			41.579.1214			





## > 41.580 Phantom

NL HM Stiffrees model H, vlamvorm  
 FR Fraise lime Carbure Forme H, Forme flamme  
 ES Fresa rotativa MD forma H, forma llama  
 DE HM Frässtift Form H, Flammenform



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	9,5				41.580.0606		
8	8	6	64	19	41.580.0801	41.580.0803	41.580.0804	41.580.0806	41.580.0808	41.580.0809
10	9,5	6	65	19				41.580.1006		41.580.1009
12	12,7	6	77	32	41.580.1201	41.580.1203	41.580.1204	41.580.1206	41.580.1208	41.580.1209
16	16	6	80	36				41.580.1606		

## > 41.583 Phantom

NL HM Stiffrees model H, vlamvorm, schacht 3 mm  
 FR Fraise lime Carbure Forme H, Forme flamme, queue 3 mm  
 ES Fresa rotativa MD forma H, forma llama, mango 3 mm  
 DE HM Frässtift Form H, Flammenform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	6,3				41.583.0306		
6	6	3	43	10				41.583.0636		

## > 41.588 Phantom

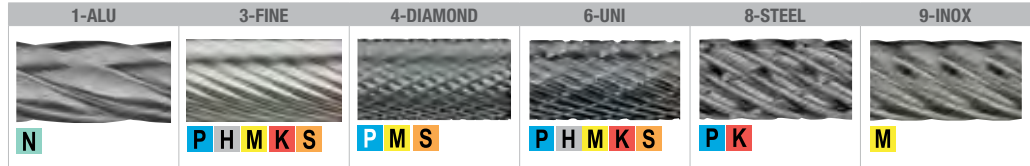
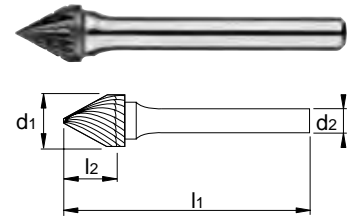
NL HM Stiffrees model H, vlamvorm, schacht 8 mm  
 FR Fraise lime Carbure Forme H, Forme flamme, queue 8 mm  
 ES Fresa rotativa MD forma H, forma llama, mango 8 mm  
 DE HM Frässtift Form H, Flammenform, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	77	32				41.588.1286		
16	16	8	36	81				41.588.1686		
20	19	8	86	41				41.588.2086		

> **41.600 Phantom**

NL HM Stiffrees model J, kegelvorm 60°  
 FR Fraise lime Carbure Forme J, Forme conique pointue 60°  
 ES Fresa rotativa MD forma J, forma cónica 60°  
 DE HM Frässtift Form J, Kegelsenkform 60°



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	4				41.600.0606		
10	9,5	6	55	8		41.600.1003		41.600.1006		
12	12,7	6	58	11				41.600.1206		
16	16	6	61	14,5				41.600.1606		
20	19	6	65	17,5				41.600.2006		

> **41.610 Phantom**

NL HM Stiffrees model K, kegelvorm 90°  
 FR Fraise lime Carbure Forme K, Forme conique pointue 90°  
 ES Fresa rotativa MD forma K, forma cónica 90°  
 DE HM Frässtift Form K, Kegelsenkform 90°



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	6		41.610.0603				
10	9,5	6	52	4,7		41.610.1003				
12	12,7	6	54	6,3		41.610.1203				
16	16	6	57	8		41.610.1603				

> **41.613 Phantom**

NL HM Stiffrees model K, kegelvorm 90°, schacht 3 mm  
 FR Fraise lime Carbure Forme K, Forme conique pointue 90°, queue 3 mm  
 ES Fresa rotativa MD forma K, forma cónica 90°, mango 3 mm  
 DE HM Frässtift Form K, Kegelsenkform 90°, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	1,5		41.613.0303				

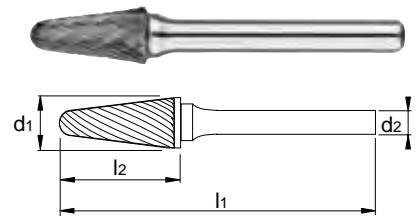












### > 41.620 Phantom

NL HM Stiffrees model L, kegelvorm, met ronde kop  
 FR Fraise lime Carbure Forme L, Forme conique à bout arrondi  
 ES Fresa rotativa MD forma L, forma cónica, con punta redondeada  
 DE HM Frässtift Form L, Rundkegelform



1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
					
N	P H M K S	P M S	P H M K S	P K	M

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	16	41.620.0601	41.620.0603	41.620.0604	41.620.0606		
8	8	6	70	22	41.620.0801			41.620.0806		41.620.0809
10	9,5	6	74	27	41.620.1001			41.620.1006	41.620.1008	41.620.1009
12	12,7	6	76	28	41.620.1201		41.620.1204	41.620.1206	41.620.1208	41.620.1209
16	16	6	77	30				41.620.1606		

### > 41.623 Phantom

NL HM Stiffrees model L, kegelvorm, met ronde kop, schacht 3 mm  
 FR Fraise lime Carbure Forme L, Forme conique à bout arrondi, queue 3 mm  
 ES Fresa rotativa MD forma L, forma cónica, con punta redondeada, mango 3 mm  
 DE HM Frässtift Form L, Rundkegelform, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	12,7	41.623.0301	41.623.0303	41.623.0304	41.623.0306		

### > 41.628 Phantom

NL HM Stiffrees model L, kegelvorm, met ronde kop, schacht 8 mm  
 FR Fraise lime Carbure Forme L, Forme conique à bout arrondi, queue 8 mm  
 ES Fresa rotativa MD forma L, forma cónica, con punta redondeada, mango 8 mm  
 DE HM Frässtift Form L, Rundkegelform, Schaft 8 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	8	77	32				41.628.1286		
16	16	8	78	33				41.628.1686		
20	19	8	86	41				41.628.2086		

### > 41.629 Phantom

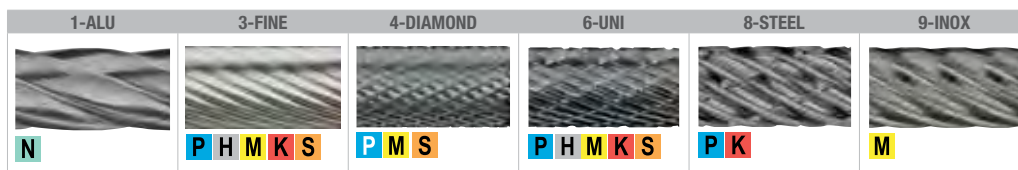
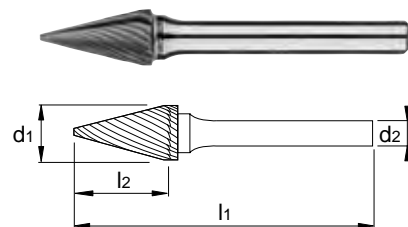
NL HM Stiffrees model L, kegelvorm, met ronde kop, lang  
 FR Fraise lime Carbure Forme L, Forme conique à bout arrondi, longue  
 ES Fresa rotativa MD forma L, forma cónica, con punta redondeada, larga  
 DE HM Frässtift Form L, Rundkegelform, lang



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	6	178	28			41.629.1214			

> **41.630** **Phantom**

NL HM Stiffrees model M, kegelvorm, spits  
 FR Fraise lime Carbure Forme M, Forme conique à bout pointu  
 ES Fresa rotativa MD forma M, forma cónica, en punta  
 DE HM Frässtift Form M, Spitzkegelform



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	12,7	41.630.0601	41.630.0603		41.630.0606		
6	6	6	50	19	41.630.0611	41.630.0613		41.630.0616		
6	6	6	50	25	41.630.0621	41.630.0623		41.630.0626		
8	8	6	63	18				41.630.0806		
10	9,5	6	64	16	41.630.1001	41.630.1003		41.630.1006		
12	12,7	6	70	22	41.630.1201	41.630.1203		41.630.1206		
16	16	6	73	25		41.630.1603		41.630.1606		

> **41.633** **Phantom**

NL HM Stiffrees model M, kegelvorm, spits, schacht 3 mm  
 FR Fraise lime Carbure Forme M, Forme conique à bout pointu, queue 3 mm  
 ES Fresa rotativa MD forma M, forma cónica, en punta, mango 3 mm  
 DE HM Frässtift Form M, Spitzkegelform, Schaft 3 mm



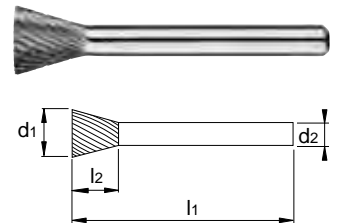
Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	11	41.633.0301	41.633.0303		41.633.0306		





### > 41.640 Phantom

NL HM Stiffrees model N, omgekeerde kegelvorm  
 FR Fraise lime Carbure Forme N, Forme conique inversée  
 ES Fresa rotativa MD forma N, forma de cono invertido  
 DE HM Frässtift Form N, Winkelfrässtifte



	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
	<b>N</b>	<b>P H M K S</b>	<b>P M S</b>	<b>P H M K S</b>	<b>P K</b>	<b>M</b>

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
6	6	6	50	8				41.640.0606		
8	8	6	53	9,5				41.640.0806		
12	12,7	6	57	12,7				41.640.1206		

### > 41.643 Phantom

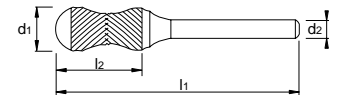
NL HM Stiffrees model N, omgekeerde kegelvorm, schacht 3 mm  
 FR Fraise lime Carbure Forme N, Forme conique inversée, queue 3 mm  
 ES Fresa rotativa MD forma N, forma de cono invertido, mango 3 mm  
 DE HM Frässtift Form N, Winkelfrässtifte, Schaft 3 mm



Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
3	3	3	38	4				41.643.0306		

### > 41.650 Phantom

NL HM Stiffrees model X  
 FR Fraise lime Carbure Forme X  
 ES Fresa rotativa MD forma X  
 DE HM Frässtift Form X

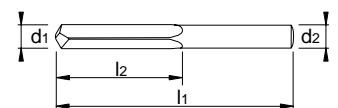


**NIEUW NOUVEAU NUEVO NEU**

Ø	d1	d2	l1	l2	1-ALU	3-FINE	4-DIAMOND	6-UNI	8-STEEL	9-INOX
12	12,7	6	70	25		41.650.1203				

### > 41.690 Phantom

NL HM Cilinderslot breker  
 FR Fraise lime barillet (serruriers) Carbure  
 ES Fresa de cerrajero MD  
 DE HM Zylinderschlossöffner

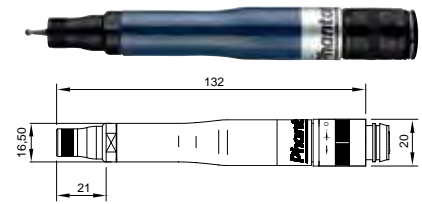


**NIEUW NOUVEAU NUEVO NEU**

Ref.	Ø	d1	l1	l2	d2	Ref.
41.690.4606	4.6	4.6	60	30	6	

> **41.850 Phantom**

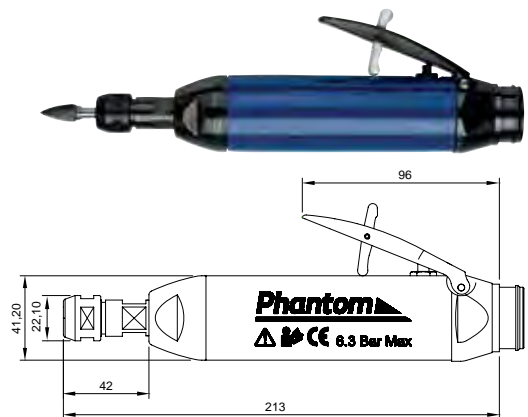
NL Pneumatische rechte slijpmachine, opname 3 mm  
 FR Meuleuse pneumatique droite, pour fraise lime queue de 3 mm  
 ES Amoladora recta neumática, sujeción 3 mm  
 DE Druckluft Geradschleifer, Aufnahme 3 mm



Ref.	RPM
41.850.7500	75000

> **41.860 Phantom**

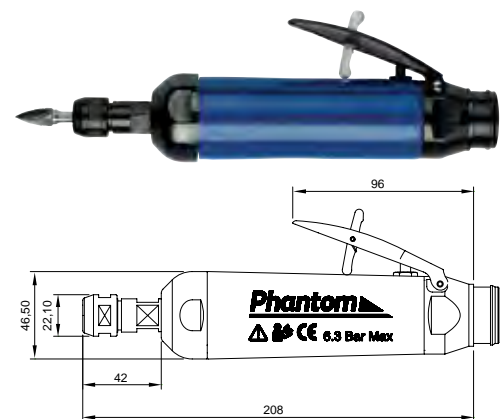
NL Pneumatische rechte slijpmachine, opname 6 mm  
 FR Meuleuse pneumatique droite, pour fraise lime queue de 6 mm  
 ES Amoladora recta neumática, sujeción 6 mm  
 DE Druckluft Geradschleifer, Aufnahme 6 mm



Ref.	RPM
41.860.2500	25000

> **41.865 Phantom**

NL Pneumatische rechte slijpmachine, lage vibratie, opname 6 mm  
 FR Meuleuse pneumatique droite, avec vibrations réduites, pour fraise lime queue de 6 mm  
 ES Amoladora recta neumática, Baja vibración, sujeción 6 mm  
 DE Druckluft Geradschleifer, Vibrationsarm, Aufnahme 6 mm



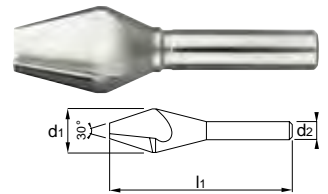
Ref.	RPM
41.865.2500	25000





## > 42.100 Phantom

NL HSS-E Verzinkboor 30°, 1 snijkant  
 FR Fraise à chanfreiner HSS-E 30°, 1 dent  
 ES Avellanador HSS-E 30°, 1 labio  
 DE HSS-E Kegelsenker 30°, 1 Schneide



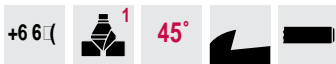
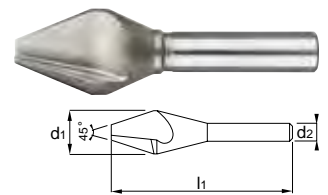
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.100.1000	10	6-10	49	6	42.100.2000	20	12-20	72	10
42.100.1500	15	9-15	61	8	42.100.2500	25	14-25	87	12

Ref.	d1	Min- Max Ø	l1	d2
42.100.3000	30	17-30	94	12

## > 42.200 Phantom

NL HSS-E Verzinkboor 45°, 1 snijkant  
 FR Fraise à chanfreiner HSS-E 45°, 1 dent  
 ES Avellanador HSS-E 45°, 1 labio  
 DE HSS-E Kegelsenker 45°, 1 Schneide



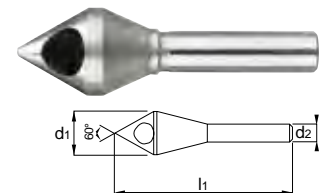
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	30-40 C	20-30 D	55-65 I	30-40 F	20-30 E	30-40 D	5-100 I

Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.200.0600	6	3-6	43	6	42.200.1500	15	5-15	61	8
42.200.1000	10	4-10	49	6	42.200.2000	20	7-20	72	10

Ref.	d1	Min- Max Ø	l1	d2
42.200.2500	25	8-25	87	12
42.200.3000	30	10-30	94	12

## > 42.300 Phantom

NL HSS-E Verzinkboor 60°, schuin gat  
 FR Fraise à chanfreiner HSS-E 60°, à trou  
 ES Avellanador para desbarbar HSS-E 60°, con agujero  
 DE HSS-E Kegelsenker 60°, Querloch



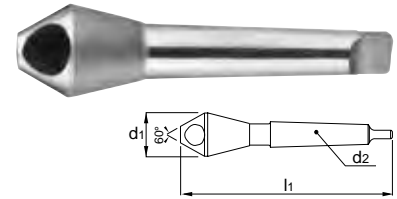
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.300.1000	10	5-9	49	6	42.300.2000	20	10-18	72	10
42.300.1500	15	8-14	60	8	42.300.2500	25	12-23	87	12

Ref.	d1	Min- Max Ø	l1	d2
42.300.3000	30	15-28	93	12

> **42.310 Phantom**

NL HSS-E Verzinkboor 60°, schuin gat, MK  
 FR Fraise à chanfreiner HSS-E 60°, à trou, CM  
 ES Avellanador para desbarbar HSS-E 60°, con agujero, CM  
 DE HSS-E Kegelsenker 60°, Querloch, MK



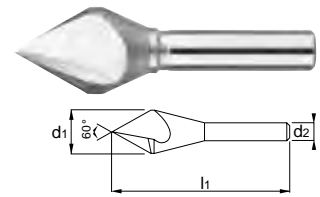
+6 6 (  **60°**  **DIN 228-B**



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.310.2000	20	10-18	104	MK 1	42.310.3002	30	15-28	122	MK 2					
42.310.2500	25	12-23	106	MK 1	42.310.4002	40	20-38	130	MK 2					

> **42.320 Phantom**

NL HSS-E Verzinkboor 60°, 1 snijkant  
 FR Fraise à chanfreiner HSS-E 60°, 1 dent  
 ES Avellanador HSS-E 60°, 1 labio  
 DE HSS-E Kegelsenker 60°, 1 Schneide



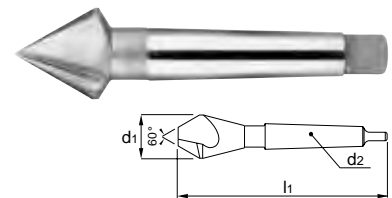
+6 6 (  **60°** 



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.320.0600	6	1-6	43	6	42.320.1500	15	2-15	60	8	42.320.3000	30	3-30	98	12
42.320.1000	10	1-10	49	6	42.320.2000	20	2-20	72	10					
42.320.1200	12	2-12	53	8	42.320.2500	25	3-25	87	12					

> **42.330 Phantom**

NL HSS-E Verzinkboor 60°, 1 snijkant, MK  
 FR Fraise à chanfreiner HSS-E 60°, 1 dent, CM  
 ES Avellanador HSS-E 60°, 1 labio, CM  
 DE HSS-E Kegelsenker 60°, 1 Schneide, MK



+6 6 (  **60°**  **DIN 228-B**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.330.1500	15	2-15	96	MK 1	42.330.3002	30	3-30	125	MK 2	42.330.6300	63	8-63	199	MK 3
42.330.2000	20	2-20	104	MK 1	42.330.4000	40	5-40	158	MK 3					
42.330.2500	25	3-25	106	MK 1	42.330.5003	50	6-50	172	MK 3					





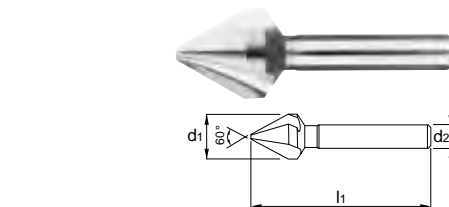
## > 42.340 Phantom

NL HSS-E Verzinkboor 60°, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 60°, 3 taillants  
 ES Avellanador HSS-E 60°, 3 labios  
 DE HSS-E Kegelsenker 60°, 3 Schneiden



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.340.0630	6.3	1,5-6,3	47	5	42.340.1240	12.4	3-12,4	60	8
42.340.0830	8.3	2-8,3	52	6	42.340.1650	16.5	4-16,5	65	10
42.340.1040	10.4	2,5-10,4	53	6	42.340.2050	20.5	4-20,5	69	10



## > 42.343 Phantom

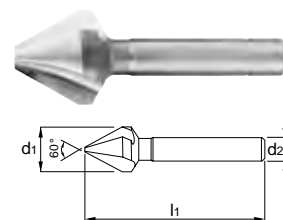
NL HSS-E Vari Verzinkboor 60°, 3 snijkanten  
 FR Fraise à chanfreiner Vari HSS-E 60°, 3 taillants  
 ES Avellanador Vari HSS-E 60°, 3 labios  
 DE HSS-E Kegelsenker ungleichteilung 60°, 3 Schneiden



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

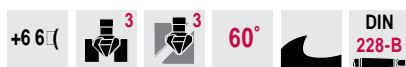
Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.343.0630	6.3	1,7-6,3	45	5	42.343.1250	12.5	2,8-12,5	56	8
42.343.0800	8	2,1-8	50	6	42.343.1600	16	3,2-16	63	10
42.343.1000	10	2,6-10	50	6	42.343.2000	20	3,5-20	67	10

**NIEUW NOUVEAU NUEVO NEU**



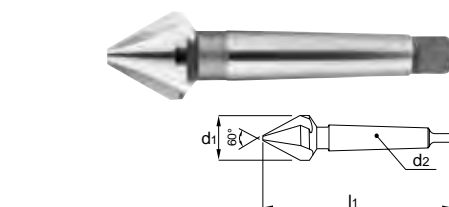
## > 42.370 Phantom

NL HSS-E Verzinkboor 60°, 3 snijkanten, MK  
 FR Fraise à chanfreiner HSS-E 60°, 3 taillants, CM  
 ES Avellanador HSS-E 60°, 3 labios, CM  
 DE HSS-E Kegelsenker 60°, 3 Schneiden, MK



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.370.1650	16.5	4-16,5	94	MK 1	42.370.3100	31	6-31	122	MK 2
42.370.2050	20.5	4-20,5	100	MK 1	42.370.4000	40	8-40	158	MK 3
42.370.2500	25	6-25	112	MK 2	42.370.5000	50	10-50	172	MK 3

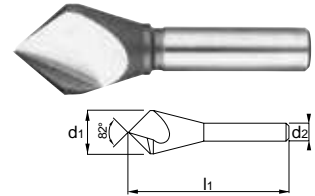


Ref.	d1	Min- Max Ø	l1	d2
42.370.6300	63	10-63	199	MK 3
42.370.8000	80	14-80	239	MK 4



> **42.420** **Phantom**

NL HSS-E Verzinkboor 82°, 1 snijkant  
 FR Fraise à chanfreiner HSS-E 82°, 1 dent  
 ES Avellanador HSS-E 82°, 1 labio  
 DE HSS-E Kegelsenker 82°, 1 Schneide



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

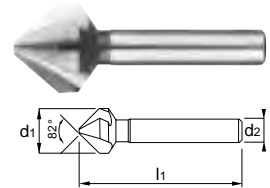
Ref.	d1	Min- Max Ø	l1	d2
42.420.1000	10	1-10	46	6
42.420.1200	12	2-12	50	8

Ref.	d1	Min- Max Ø	l1	d2
42.420.1500	15	2-15	56	8
42.420.2000	20	2-20	65	10

Ref.	d1	Min- Max Ø	l1	d2

> **42.440** **Phantom**

NL HSS-E Verzinkboor 82°, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 82°, 3 taillants  
 ES Avellanador HSS-E 82°, 3 labios  
 DE HSS-E Kegelsenker 82°, 3 Schneiden



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

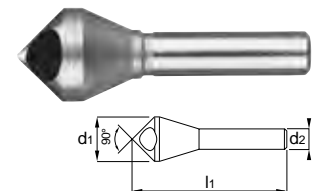
Ref.	d1	Min- Max Ø	l1	d2
42.440.0630	6.3	1,5-6,3	45	5
42.440.0830	8.3	2,5-8,3	50	6
42.440.1040	10.4	2,5-10,4	50	6

Ref.	d1	Min- Max Ø	l1	d2
42.440.1240	12.4	3-12,4	56	8
42.440.1650	16.5	4-16,5	61	10
42.440.2050	20.5	4-20,5	64	10

Ref.	d1	Min- Max Ø	l1	d2
42.440.2500	25	5-25	68	10
42.440.3100	31	6-31	73	12

> **42.500** **Phantom**

NL HSS-E Verzinkboor 90°, schuin gat  
 FR Fraise à chanfreiner HSS-E 90°, à trou  
 ES Avellanador para desbarbar HSS-E 90°, con agujero  
 DE HSS-E Kegelsenker 90°, Querloch



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2
42.500.0500	10	2-5	45	6
42.500.1000	10	4-9	45	6
42.500.1500	15	6-14	55	8
42.500.2000	20	8-18	65	10

Ref.	d1	Min- Max Ø	l1	d2
42.500.2500	25	10-23	78	12
42.500.2800	28	11-26	86	12
42.500.3000	30	12-28	88	12
42.500.3500	35	14-33	116	16

Ref.	d1	Min- Max Ø	l1	d2
42.500.4000	40	16-38	132	16
42.500.5000	50	20-48	136	16





## > 42.501 Phantom

NL HSS-E Verzinkboor 90°, TiN, schuin gat  
 FR Fraise à chanfreiner HSS-E 90°, TiN, à trou  
 ES Avellanador para desbarbar HSS-E 90°, TiN, con agujero  
 DE HSS-E Kegelsenker 90°, TiN, Querloch

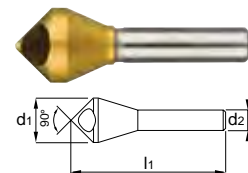


<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2
42.501.0500	10	2-5	45	6
42.501.1000	10	4-9	45	6

Ref.	d1	Min- Max Ø	l1	d2
42.501.1500	15	6-14	55	8
42.501.2000	20	8-18	65	10

Ref.	d1	Min- Max Ø	l1	d2
42.501.2500	25	10-23	78	12
42.501.3000	30	12-28	88	12



## > 42.510 Phantom

NL HSS-E Verzinkboor 90°, schuin gat, MK  
 FR Fraise à chanfreiner HSS-E 90°, à trou, CM  
 ES Avellanador para desbarbar HSS-E 90°, con agujero, CM  
 DE HSS-E Kegelsenker 90°, Querloch, MK

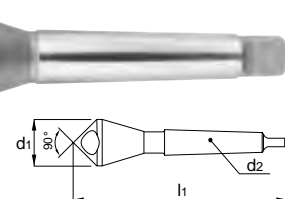


<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2
42.510.1500	15	6-14	91	MK 1
42.510.2000	20	8-18	96	MK 1
42.510.2500	25	10-23	101	MK 1
42.510.3002	30	12-28	120	MK 2

Ref.	d1	Min- Max Ø	l1	d2
42.510.4002	40	16-38	130	MK 2
42.510.4003	40	16-38	153	MK 3
42.510.5002	50	20-48	135	MK 2
42.510.5003	50	20-48	158	MK 3

Ref.	d1	Min- Max Ø	l1	d2
42.510.6000	60	24-58	172	MK 3
42.510.8000	80	32-77	215	MK 4



## > 42.520 Phantom

NL HSS-E Verzinkboor 90°, 1 snijkant  
 FR Fraise à chanfreiner HSS-E 90°, 1 dent  
 ES Avellanador HSS-E 90°, 1 labio  
 DE HSS-E Kegelsenker 90°, 1 Schneide

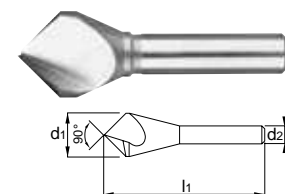


<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2
42.520.0400	4	1-4	40	4
42.520.0500	5	1-5	40	5
42.520.0600	6	1-6	40	6
42.520.0800	8	1-8	40	6

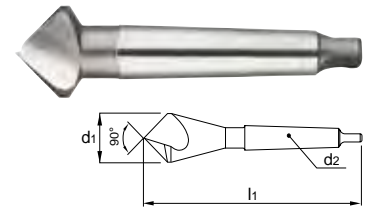
Ref.	d1	Min- Max Ø	l1	d2
42.520.1000	10	1-10	45	6
42.520.1200	12	2-12	50	8
42.520.1500	15	2-15	55	8
42.520.2000	20	2-20	65	10

Ref.	d1	Min- Max Ø	l1	d2
42.520.2500	25	3-25	78	12
42.520.3000	30	3-30	88	12



> **42.530 Phantom**

NL HSS-E Verzinkboor 90°, 1 snijkant, MK  
 FR Fraise à chanfreiner HSS-E 90°, 1 dent, CM  
 ES Avellanador HSS-E 90°, 1 labio, CM  
 DE HSS-E Kegelsenker 90°, 1 Schneide, MK



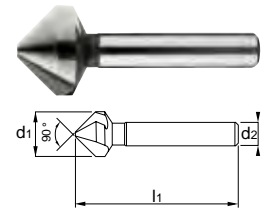
+6 ( **90°** **DIN 228-B**

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.530.1500	15	2-15	91	MK 1	42.530.3002	30	3-30	120	MK 2	42.530.5000	50	12-50	158	MK 3
42.530.2000	20	2-20	96	MK 1	42.530.4002	40	5-40	130	MK 2	42.530.6300	63	12-63	173	MK 3
42.530.2500	25	3-25	101	MK 1	42.530.4003	40	5-40	153	MK 3	42.530.8000	80	12-80	215	MK 4

> **42.533 INTERNATIONAL TOOLS**

NL ECO HSS Verzinkboor 90°, 3 snijkanten  
 FR Fraise à chanfreiner HSS ECO 90°, 3 taillants  
 ES Avellanador HSS ECO 90°, 3 labios  
 DE ECO HSS Kegelsenker 90°, 3 Schneiden



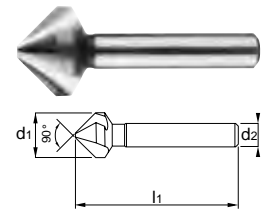
**HSS** **DIN 335-C** **90°**

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
17-22	10-15	15-20	20-25	35-45

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.533.0630	6.3	1,5-6,3	45	5	42.533.1240	12.4	2,8-12,4	56	8	42.533.2050	20.5	3,5-20,5	63	10
42.533.0830	8.3	2-8,3	50	6	42.533.1440	14.4	2,9-14,4	56	8	42.533.2500	25	3,8-25	67	10
42.533.1040	10.4	2,5-10,4	50	6	42.533.1650	16.5	3,2-16,5	60	10	42.533.3100	31	4,2-31	71	12

> **42.535 INTERNATIONAL TOOLS**

NL ECO PRO HSS Verzinkboor 90°, 3 snijkanten  
 FR Fraise à chanfreiner HSS ECO PRO 90°, 3 taillants  
 ES Avellanador HSS ECO PRO 90°, 3 labios  
 DE ECO PRO HSS Kegelsenker 90°, 3 Schneiden



**HSS** **DIN 335-C** **90°**

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-20	8-12	6-10	10-15	15-20	30-40	20-25	15-25

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.535.0630	6.3	1,5-6,3	45	5	42.535.1240	12.4	2,8-12,4	56	8	42.535.2050	20.5	3,5-20,5	63	10
42.535.0830	8.3	2-8,3	50	6	42.535.1440	14.4	2,9-14,4	56	10	42.535.2500	25	3,8-25	67	10
42.535.1040	10.4	2,5-10,4	50	6	42.535.1650	16.5	3,2-16,5	60	10	42.535.3100	31	4,2-31	71	12



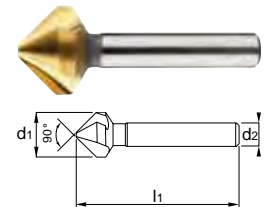
## > 42.536 INTERNATIONAL TOOLS

NL ECO PRO HSS Verzinkboor 90°, TiN, 3 snijkanten  
 FR Fraise à chanfreiner HSS ECO PRO 90°, TiN, 3 taillants  
 ES Avellanador HSS ECO PRO 90°, TiN, 3 labios  
 DE ECO PRO HSS Kegelsenker 90°, TiN, 3 Schneiden

HSS	TiN	DIN 335-C						
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu
15-20	8-12	6-10	5-10	10-15	15-20	30-40	20-25	15-25

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.536.0630	6.3	1,5-6,3	45	5	42.536.1240	12.4	2,8-12,4	56	8
42.536.0830	8.3	2-8,3	50	6	42.536.1440	14.4	2,9-14,4	56	8
42.536.1040	10.4	2,5-10,4	50	6	42.536.1650	16.5	3,2-16,5	60	10

Ref.	d1	Min-Max Ø	l1	d2
42.536.2050	20.5	3,5-20,5	63	10
42.536.2500	25	3,8-25	67	10
42.536.3100	31	4,2-31	71	12



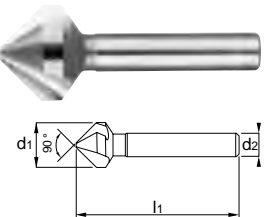
## > 42.540 Phantom

NL HSS-E Verzinkboor 90°, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 90°, 3 taillants  
 ES Avellanador HSS-E 90°, 3 labios  
 DE HSS-E Kegelsenker 90°, 3 Schneiden

+6 E	DIN 335-C											
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe	N 61 PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.540.0430	4.3	1,3-4,3	40	4	42.540.1040	10.4	2,5-10,4	50	6
42.540.0530	5.3	1,5-5,3	40	4	42.540.1240	12.4	2,8-12,4	56	8
42.540.0630	6.3	1,5-6,3	45	5	42.540.1440	14.4	2,9-14,4	56	8
42.540.0730	7.3	1,8-7,3	50	6	42.540.1650	16.5	3,2-16,5	60	10
42.540.0830	8.3	2-8,3	50	6	42.540.2050	20.5	3,5-20,5	63	10
42.540.0940	9.4	2,2-9,4	50	6	42.540.2500	25	3,8-25	67	10

Ref.	d1	Min-Max Ø	l1	d2
42.540.2800	28	4-28	71	12
42.540.3100	31	4-31	71	12
42.540.3500	35	7-35	107	16
42.540.4000	40	8-40	111	16
42.540.5000	50	10-50	120	16



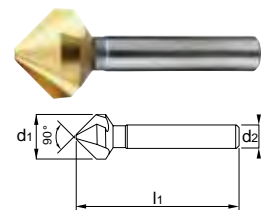
## > 42.541 Phantom

NL HSS-E Verzinkboor 90°, TiN, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 90°, TiN, 3 taillants  
 ES Avellanador HSS-E 90°, TiN, 3 labios  
 DE HSS-E Kegelsenker 90°, TiN, 3 Schneiden

+6 E	TiN	DIN 335-C										
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe	N 61 PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

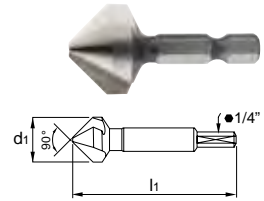
Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.541.0630	6.3	1,5-6,3	45	5	42.541.1240	12.4	2,8-12,4	56	8
42.541.0830	8.3	2-8,3	50	6	42.541.1650	16.5	3,2-16,5	60	10
42.541.1040	10.4	2,5-10,4	50	6	42.541.2050	20.5	3,5-20,5	63	10

Ref.	d1	Min-Max Ø	l1	d2
42.541.2500	25	3,8-25	67	10
42.541.3100	31	4,2-31	71	12



> **42.543** **INTERNATIONAL TOOLS**

- NL ECO HSS Verzinkboor 90°, 3 snijkanten, met 1/4"-zeskant bitopname
- FR Fraise à chanfreiner HSS ECO 90°, 3 taillants, avec queue hexagonale 1/4"
- ES Avellanador HSS ECO 90°, 3 labios, con sujeción 1/4" bit
- DE ECO HSS Kegelsenker 90°, 3 Schneiden, mit 1/4" Hexa-Bitafnahme



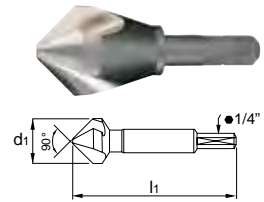
HSS 90° **ECO**

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-20	8-12	6-10	10-15	15-20	30-40	20-25	15-25

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.543.0630	6.3	1,5-6,3	50	6.35	42.543.1040	10.4	2,5-10,4	50	6.35	42.543.1650	16.5	3,2-16,5	50	6.35
42.543.0830	8.3	2-8,3	50	6.35	42.543.1240	12.4	2,8-12,4	50	6.35	42.543.2050	20.5	3,5-20,5	50	6.35

> **42.545** **Phantom**

- NL HSS-E Verzinkboor 90°, 3 snijkanten, met 1/4"-zeskant bitopname
- FR Fraise à chanfreiner HSS-E 90°, 3 taillants, avec queue hexagonale 1/4"
- ES Avellanador HSS-E 90°, 3 labios, con sujeción 1/4" bit
- DE HSS-E Kegelsenker 90°, 3 Schneiden, mit 1/4" Hexa-Bitafnahme



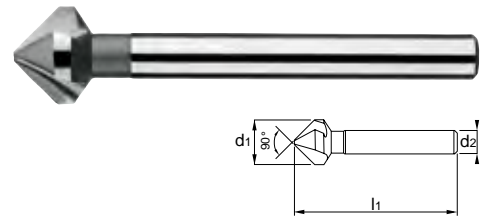
+6 90°

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.545.0630	6.3	1,5-6,3	50	6.35	42.545.1040	10.4	2,5-10,4	50	6.35	42.545.1650	16.5	3,2-16,5	50	6.35
42.545.0830	8.3	2-8,3	50	6.35	42.545.1240	12.4	2,8-12,4	50	6.35	42.545.2050	20.5	3,5-20,5	50	6.35

> **42.546** **Phantom**

- NL HSS-E Verzinkboor 90°, 3 snijkanten, lang
- FR Fraise à chanfreiner HSS-E 90°, 3 taillants, version longue
- ES Avellanador HSS-E 90°, 3 labios, larga
- DE HSS-E Kegelsenker 90°, 3 Schneiden, lang



+6 90°

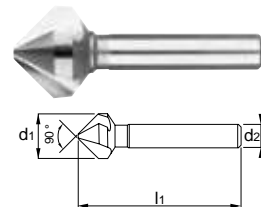
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.546.0630	6.3	1,5-6,3	84	6	42.546.1240	12.4	2,8-12,4	108	10	42.546.2500	25	3,8-25	118	12
42.546.0830	8.3	2-8,3	85	8	42.546.1650	16.5	3,2-16,5	112	12					
42.546.1040	10.4	2,5-10,4	87	10	42.546.2050	20.5	3,5-20,5	115	12					



## > 42.550 Phantom

NL HSS-E 8% Verzinkboor 90°, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 8% 90°, 3 taillants  
 ES Avellanador HSS-E 8% 90°, 3 labios  
 DE HSS-E 8% Kegelsenker 90°, 3 Schneiden



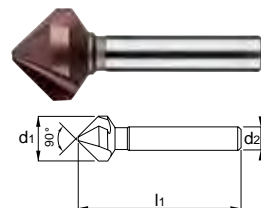
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC	<b>S 71</b> NiCo
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35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-6 A
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Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.550.0630	6.3	1,5-6,3	45	5	42.550.1240	12.4	2,8-12,4	56	8	42.550.2500	25	3,8-25	67	10
42.550.0830	8.3	2-8,3	50	6	42.550.1650	16.5	3,2-16,5	60	10	42.550.3100	31	6-31	71	12
42.550.1040	10.4	2,5-10,4	50	6	42.550.2050	20.5	3,5-20,5	63	10					

## > 42.552 Phantom

NL HSS-E 8% Verzinkboor 90°, 3 snijkanten, AlCrN-X  
 FR Fraise à chanfreiner HSS-E 8% 90°, 3 taillants, AlCrN-X  
 ES Avellanador HSS-E 8% 90°, 3 labios, AlCrN-X  
 DE HSS-E 8% Kegelsenker 90°, 3 Schneiden, AlCrN-X



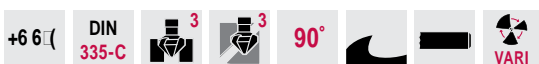
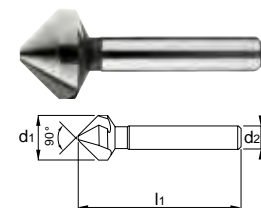
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC	<b>S 71</b> NiCo
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35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-6 A
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Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.552.0630	6.3	1,5-6,3	45	5	42.552.1240	12.4	2,8-12,4	56	8	42.552.2500	25	3,8-25	67	10
42.552.0830	8.3	2-8,3	50	6	42.552.1650	16.5	3,2-16,5	60	10	42.552.3100	31	6-31	71	12
42.552.1040	10.4	2,5-10,4	50	6	42.552.2050	20.5	3,5-20,5	63	10					

## > 42.553 Phantom

NL HSS-E Vari Verzinkboor 90°, 3 snijkanten  
 FR Fraise à chanfreiner Vari HSS-E 90°, 3 taillants  
 ES Avellanador Vari HSS-E 90°, 3 labios  
 DE HSS-E Kegelsenker ungleichteilung 90°, 3 Schneiden



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
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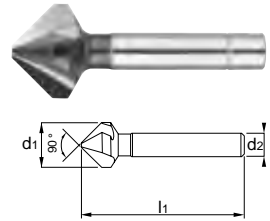
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I
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Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.553.0430	4.3	1,3-4,3	40	4	42.553.1040	10.4	2,5-10,4	50	6	42.553.2050	20.5	3,5-20,5	63	10
42.553.0600	6	1,5-6	45	5	42.553.1150	11.5	2,8-11,5	50	8	42.553.2300	23	3,8-23	67	10
42.553.0630	6.3	1,5-6,3	45	5	42.553.1240	12.4	2,8-12,4	56	8	42.553.2500	25	3,8-25	67	10
42.553.0800	8	2-8	50	6	42.553.1500	15	3,2-15	60	10	42.553.3100	31	6-31	71	12
42.553.0830	8.3	2-8,3	50	6	42.553.1650	16.5	3,2-16,5	60	10					
42.553.1000	10	2,5-10	50	6	42.553.1900	19	3,5-19	63	10					

**NIEUW NOUVEAU NUEVO NEU**

> **42.554 Phantom**

NL HSS-E Vari Verzinkboor 90°, 3 snijkanten, TiAIN  
 FR Fraise à chanfreiner Vari HSS-E 90°, 3 taillants, TiAIN  
 ES Avellanador Vari HSS-E 90°, 3 labios, TiAIN  
 DE HSS-E Kegelsenker ungleichteilung 90°, 3 Schneiden, TiAIN



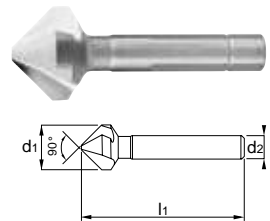
+6 ( TiAIN DIN 335-C 3 3 90° VARI

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52	N 61	S 72
≤600 N/mm²	≤850 N/mm²	≤1000 N/mm²	≤1400 N/mm²	INOX ≤850N/mm²	INOX >850N/mm²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe	PVC	Ti
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-8 A

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.554.0430	4.3	1,3-4,3	40	4	42.554.1040	10.4	2,5-10,4	50	6	42.554.2050	20.5	3,5-20,5	63	10
42.554.0600	6	1,5-6	45	5	42.554.1150	11.5	2,8-11,5	50	8	42.554.2300	23	3,8-23	67	10
42.554.0630	6.3	1,5-6,3	45	5	42.554.1240	12.4	2,8-12,4	56	8	42.554.2500	25	3,8-25	67	10
42.554.0800	8	2-8	50	6	42.554.1500	15	3,2-15	60	10	42.554.3100	31	6-31	71	12
42.554.0830	8.3	2-8,3	50	6	42.554.1650	16.5	3,2-16,5	60	10					
42.554.1000	10	2,5-10	50	6	42.554.1900	19	3,5-19	63	10					

> **42.555 Phantom**

NL HSS-E Vari Verzinkboor 90°, 3 snijkanten, met drie platte vlakken  
 FR Fraise à chanfreiner Vari HSS-E 90°, 3 taillants, à 3 méplats  
 ES Avellanador Vari HSS-E 90°, 3 labios, con 3 chaflanes  
 DE HSS-E Kegelsenker ungleichteilung 90°, 3 Schneiden, mit drei platte Flächen



**NIEUW NOUVEAU NUEVO NEU**

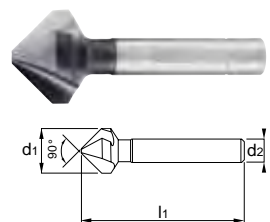
+6 ( DIN 335-C 3 3 90° VARI

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52	N 61
≤600 N/mm²	≤850 N/mm²	≤1000 N/mm²	≤1400 N/mm²	INOX ≤850N/mm²	INOX >850N/mm²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe	PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.555.0430	4.3	1,3-4,3	40	4	42.555.1040	10.4	2,5-10,4	50	6	42.555.2050	20.5	3,5-20,5	63	10
42.555.0600	6	1,5-6	45	5	42.555.1150	11.5	2,8-11,5	50	8	42.555.2300	23	3,8-23	67	10
42.555.0630	6.3	1,5-6,3	45	5	42.555.1240	12.4	2,8-12,4	56	8	42.555.2500	25	3,8-25	67	10
42.555.0800	8	2-8	50	6	42.555.1500	15	3,2-15	60	10	42.555.3100	31	6-31	71	12
42.555.0830	8.3	2-8,3	50	6	42.555.1650	16.5	3,2-16,5	60	10					
42.555.1000	10	2,5-10	50	6	42.555.1900	19	3,5-19	63	10					

> **42.556 Phantom**

NL HSS-E Vari Verzinkboor 90°, 3 snijkanten, TiAIN, met drie platte vlakken  
 FR Fraise à chanfreiner Vari HSS-E 90°, 3 taillants, TiAIN, à 3 méplats  
 ES Avellanador Vari HSS-E 90°, 3 labios, TiAIN, con 3 chaflanes  
 DE HSS-E Kegelsenker ungleichteilung 90°, 3 Schneiden, TiAIN, mit drei platten Flächen



**NIEUW NOUVEAU NUEVO NEU**

+6 ( TiAIN DIN 335-C 3 3 90° VARI

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52	N 61	S 72
≤600 N/mm²	≤850 N/mm²	≤1000 N/mm²	≤1400 N/mm²	INOX ≤850N/mm²	INOX >850N/mm²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe	PVC	Ti
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-8 A

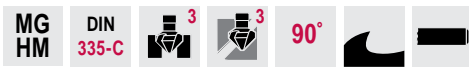
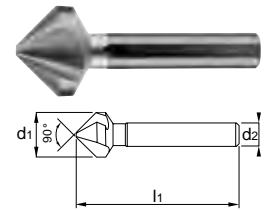
Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2	Ref.	d1	Min-Max Ø	l1	d2
42.556.0430	4.3	1,3-4,3	40	4	42.556.1040	10.4	2,5-10,4	50	6	42.556.2050	20.5	3,5-20,5	63	10
42.556.0600	6	1,5-6	45	5	42.556.1150	11.5	2,8-11,5	50	8	42.556.2300	23	3,8-23	67	10
42.556.0630	6.3	1,5-6,3	45	5	42.556.1240	12.4	2,8-12,4	56	8	42.556.2500	25	3,8-25	67	10
42.556.0800	8	2-8	50	6	42.556.1500	15	3,2-15	60	10	42.556.3100	31	6-31	71	12
42.556.0830	8.3	2-8,3	50	6	42.556.1650	16.5	3,2-16,5	60	10					
42.556.1000	10	2,5-10	50	6	42.556.1900	19	3,5-19	63	10					





## > 42.560 Phantom

NL VHM Verzinkboor 90°, 3 snijkanten  
FR Fraise à chanfreiner Carbure 90°, 3 taillants  
ES Avellanador MD 90°, 3 labios  
DE VHM Kegelsenker 90°, 3 Schneiden



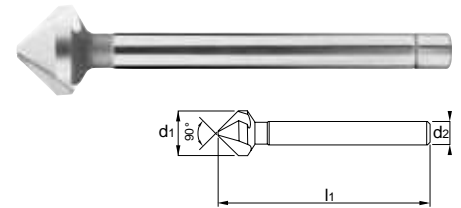
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
40-80 C	30-60 C	20-40 B	20-40 B	8-10 A	20-40 C	15-20 B	40-60 B	50-80 C	40-100 D	40-80 C	50-80 C	10-12 A	10-12 A

Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.560.0630	6.3	2-6,3	50	6	42.560.1240	12.4	3-12,4	56	8
42.560.0830	8.3	2,5-8,3	50	6	42.560.1650	16.5	4-16,5	60	10
42.560.1040	10.4	3-10,4	50	8	42.560.2050	20.5	4-20,5	60	10

Ref.	d1	Min- Max Ø	l1	d2
42.560.2500	25	4-25	67	10
42.560.3100	31	5-31	71	12

## > 42.566 Phantom

NL HSS-E Vari Verzinkboor 90°, 3 snijkanten, lang  
FR Fraise à chanfreiner Vari HSS-E 90°, 3 taillants, version longue  
ES Avellanador Vari HSS-E 90°, 3 labios, larga  
DE HSS-E Kegelsenker ungleichteilung 90°, 3 Schneiden, lang



<b>P 11</b> ≤900 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

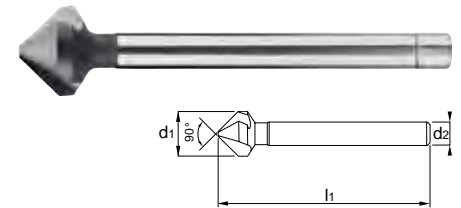
Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.566.0630	6.3	1,5-6,3	104	5	42.566.1240	12.4	2,8-12,4	108	8
42.566.0830	8.3	2-8,3	105	6	42.566.1650	16.5	3,2-16,5	111	10
42.566.1040	10.4	2,5-10,4	107	6	42.566.2050	20.5	3,5-20,5	114	10

Ref.	d1	Min- Max Ø	l1	d2
42.566.2500	25	3,8-25	118	10
42.566.3100	31	6-31	140	12

**NIEUW NOUVEAU NUEVO NEU**

## > 42.567 Phantom

NL HSS-E Vari Verzinkboor 90°, 3 snijkanten, TiAIN, lang  
FR Fraise à chanfreiner Vari HSS-E 90°, 3 taillants, TiAIN, version longue  
ES Avellanador Vari HSS-E 90°, 3 labios, TiAIN, larga  
DE HSS-E Kegelsenker ungleichteilung 90°, 3 Schneiden, TiAIN, lang



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC	<b>S 72</b> Ti
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-8 A






Ref.	d1	Min- Max Ø	l1	d2	Ref.	d1	Min- Max Ø	l1	d2
42.567.0630	6.3	1,5-6,3	104	5	42.567.1240	12.4	2,8-12,4	108	8
42.567.0830	8.3	2-8,3	105	6	42.567.1650	16.5	3,2-16,5	111	10
42.567.1040	10.4	2,5-10,4	107	6	42.567.2050	20.5	3,5-20,5	114	10

Ref.	d1	Min- Max Ø	l1	d2
42.567.2500	25	3,8-25	118	10
42.567.3100	31	6-31	140	12

**NIEUW NOUVEAU NUEVO NEU**

> **42.570 Phantom**

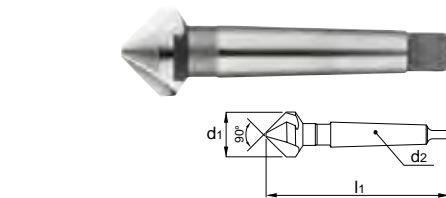
NL HSS-E Verzinkboor 90°, 3 snijkanten, MK  
 FR Fraise à chanfreiner HSS-E 90°, 3 taillants, CM  
 ES Avellanador HSS-E 90°, 3 labios, CM  
 DE HSS-E Kegelsenker 90°, 3 Schneiden, MK

+6 6 (     

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min-Max Ø	l1	d2
42.570.1040	10.4	2,5-10,4	84	MK 1
42.570.1240	12.4	3-12,4	87	MK 1
42.570.1650	16.5	4-16,5	90	MK 1
42.570.2050	20.5	4-20,5	94	MK 1

Ref.	d1	Min-Max Ø	l1	d2
42.570.2500	25	6-25	105	MK 2
42.570.2800	28	6-28	112	MK 2
42.570.3100	31	6-31	117	MK 2
42.570.3500	35	7-35	135	MK 2



> **42.580 Phantom**

NL HSS-E Verzinkboor met handgreep 90°, 3 snijkanten  
 FR Fraise à chanfreiner à poignée HSS-E 90°, 3 taillants  
 ES Avellanador para desbarbar con manejar HSS-E 90°, 3 labios  
 DE HSS-E Kegelsenker mit Griff 90°, 3 Schneiden

+6 6 (    

Ref.	d1
42.580.1240	12.4
42.580.1650	16.5

Ref.	d1
42.580.2050	20.5
42.580.2500	25

Ref.	d1
42.580.3100	31



> **42.590 INTERNATIONAL TOOLS**

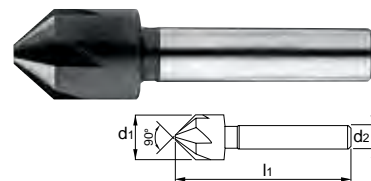
NL ECO HSS Verzinkboor 90°, meersnijder  
 FR Fraise à chanfreiner HSS ECO 90°, multi-dents  
 ES Avellanador HSS ECO 90°, multi labios  
 DE ECO HSS Kegelsenker 90°, Mehrschneiden

HSS     

Ref.	d1	d2	l1	z
42.590.0800	8	8	48	5
42.590.1250	12.5	8	48	5





Ref.	d1	d2	l1	z
42.590.1600	16	10	56	7
42.590.2000	20	10	60	7

Ref.	d1	d2	l1	z



> **42.640 Phantom**

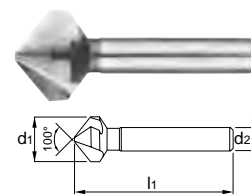
NL HSS-E Verzinkboor 100°, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 100°, 3 taillants  
 ES Avellanador HSS-E 100°, 3 labios  
 DE HSS-E Kegelsenker 100°, 3 Schneiden

+6 6 (    

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min-Max Ø	l1	d2
42.640.1040	10.4	2,5-10,4	49	6
42.640.1650	16.5	4-16,5	59	10

Ref.	d1	Min-Max Ø	l1	d2
42.640.2050	20.5	4-20,5	62	10
42.640.2500	25	5-25	65	10





## > 42.700 Phantom

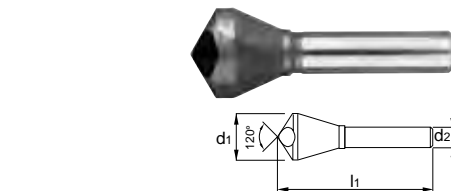
NL HSS-E Verzinkboor 120°, schuin gat  
 FR Fraise à chanfreiner HSS-E 120°, à trou  
 ES Avellanador para desbarbar HSS-E 120°, con agujero  
 DE HSS-E Kegelsenker 120°, Querloch



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2
42.700.1000	10	4-9	43	6
42.700.1500	15	5-14	52	8

Ref.	d1	Min- Max Ø	l1	d2
42.700.2000	20	6-18	61	10
42.700.2500	25	8-23	73	12



## > 42.710 Phantom

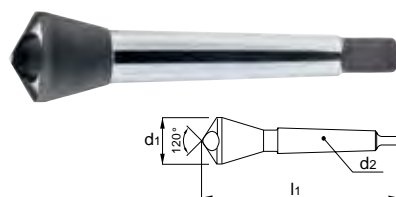
NL HSS-E Verzinkboor 120°, schuin gat, MK  
 FR Fraise à chanfreiner HSS-E 120°, à trou, CM  
 ES Avellanador HSS-E 120°, con agujero, CM  
 DE HSS-E Kegelsenker 120°, Querloch, MK



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	d1	Min- Max Ø	l1	d2
42.710.2000	20	6-18	92	MK 1
42.710.3000	30	10-28	114	MK 2

Ref.	d1	Min- Max Ø	l1	d2
42.710.4000	40	14-38	145	MK 3



## > 42.740 Phantom

NL HSS-E Verzinkboor 120°, 3 snijkanten  
 FR Fraise à chanfreiner HSS-E 120°, 3 taillants  
 ES Avellanador HSS-E 120°, 3 labios  
 DE HSS-E Kegelsenker 120°, 3 Schneiden

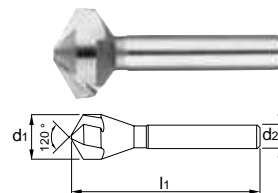


<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	d1	Min- Max Ø	l1	d2
42.740.1040	10.4	2,5-10,4	48	6
42.740.1650	16.5	4-16,5	57	10

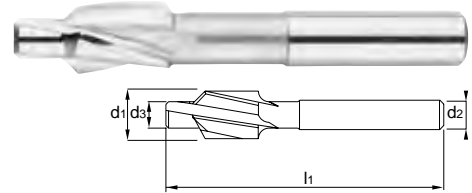
Ref.	d1	Min- Max Ø	l1	d2
42.740.2050	20.5	4-20,5	59	10
42.740.2500	25	5-25	62	10

Ref.	d1	Min- Max Ø	l1	d2
42.740.3100	31	6-31	65	12



▶ **43.200 Phantom**

NL HSS-E Kopverzinkboor 90°, fijnpassing  
 FR Fraise à chambrer HSS-E 90°, ajustement fin  
 ES Avellanador para asientos 'Allen' HSS-E 90°, ajuste fino  
 DE HSS-E Flachsenker 90°, Senkung fein



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

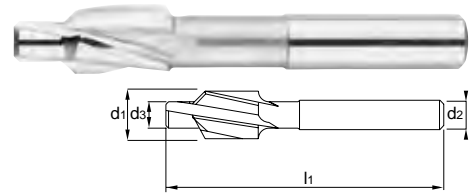
Ref.	M	d1	d3	l1	d2
43.200.0100	1	2	1.1	45	2
43.200.0120	1,2	2.5	1.3	45	2.5
43.200.0140	1,4	2.8	1.5	45	2.8
43.200.0160	1,6	3.3	1.7	56	3.3
43.200.0180	1,8	3.8	1.9	56	3.8

Ref.	M	d1	d3	l1	d2
43.200.0200	2	4.3	2.2	56	4.3
43.200.0250	2,5	5	2.7	56	5
43.200.0300	3	6	3.2	71	6
43.200.0350	3,5	7	3.7	71	7
43.200.0400	4	8	4.3	71	8

Ref.	M	d1	d3	l1	d2
43.200.0500	5	10	5.3	80	10
43.200.0600	6	11.5	6.4	80	11.5
43.200.0800	8	15	8.4	100	12.5
43.200.1000	10	19	10.5	100	12.5

▶ **43.210 Phantom**

NL HSS-E Kopverzinkboor 90°, middelpassing  
 FR Fraise à chambrer HSS-E 90°, ajustement moyen  
 ES Avellanador para asientos 'Allen' HSS-E 90°, ajuste medio  
 DE HSS-E Flachsenker 90°, mittelpassung



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

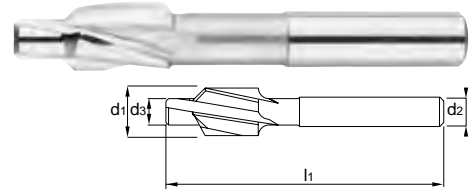
Ref.	M	d1	d3	l1	d2
43.210.0200	2	4.6	2.4	56	4.6
43.210.0250	2,5	5.7	2.9	56	5.7
43.210.0300	3	6.5	3.4	71	6.5

Ref.	M	d1	d3	l1	d2
43.210.0350	3,5	7.6	3.9	71	7.6
43.210.0400	4	8.6	4.5	71	8.6
43.210.0500	5	10.4	5.5	80	10.4

Ref.	M	d1	d3	l1	d2
43.210.0600	6	12.4	6.6	80	12.4
43.210.0800	8	16.4	9	100	12.5
43.210.1000	10	20.4	11	100	12.5

▶ **43.240 Phantom**

NL HSS-E Kopverzinkboor 90°, fijnpassing, kerngaten  
 FR Fraise à chambrer HSS-E 90°, ajustement fin, trous à tarauder  
 ES Avellanador para asientos 'Allen' HSS-E 90°, ajuste fino, agujeros para roscar  
 DE HSS-E Flachsenker 90°, Senkung fein, Kernlochsenkung



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.240.0300	3	6	2.5	71	6
43.240.0350	3,5	7	2.9	71	7
43.240.0400	4	8	3.3	71	8

Ref.	M	d1	d3	l1	d2
43.240.0500	5	10	4.2	80	10
43.240.0600	6	11.5	5	80	11.5
43.240.0800	8	15	6.8	100	12.5

Ref.	M	d1	d3	l1	d2
43.240.1000	10	19	8.5	100	12.5



## > 43.320 Phantom

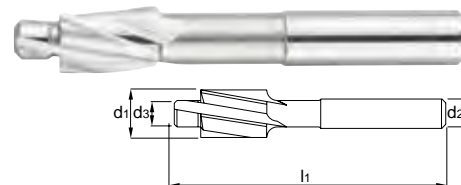
NL HSS-E Kopverzinkboor 180°, fijnpassing  
 FR Fraise à chambrer HSS-E 180°, ajustement fin  
 ES Avellanador para asientos 'Allen' HSS-E 180°, ajuste fino  
 DE HSS-E Flachsenker 180°, Senkung fein



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.320.0100	1	2.2	1.1	45	2.2
43.320.0120	1,2	2.5	1.3	45	2.5
43.320.0140	1,4	2.8	1.5	45	2.8
43.320.0160	1,6	3.3	1.7	56	3.3
43.320.0170	1,7	3.8	1.8	56	3.8
43.320.0200	2	4.3	2.2	56	4.3

Ref.	M	d1	d3	l1	d2
43.320.0230	2,3	5.2	2.5	56	5
43.320.0250	2,5	5	2.7	56	5
43.320.0260	2,6	5.5	2.8	71	5.5
43.320.0300	3	6	3.2	71	6
43.320.0350	3,5	6.5	3.7	71	6.5
43.320.0400	4	8	4.3	71	8



## > 43.330 Phantom

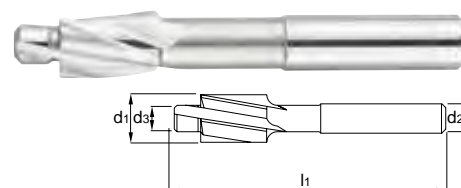
NL HSS-E Kopverzinkboor 180°, middelpassing  
 FR Fraise à chambrer HSS-E 180°, ajustement moyen  
 ES Avellanador para asientos 'Allen' HSS-E 180°, ajuste medio  
 DE HSS-E Flachsenker 180°, mittelpassung



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.330.0200	2	4.3	2.4	56	4.3
43.330.0260	2,6	5.5	3	71	5.5
43.330.0300	3	6	3.4	71	6
43.330.0350	3,5	6.5	3.9	71	6.5

Ref.	M	d1	d3	l1	d2
43.330.0400	4	8	4.5	71	8
43.330.0500	5	10	5.5	80	10
43.330.0600	6	11	6.6	80	11
43.330.0800	8	15	9	100	12.5



## > 43.350 Phantom

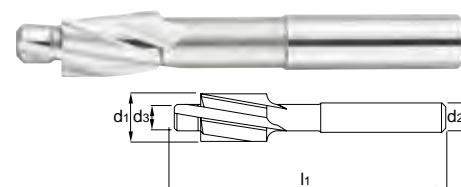
NL HSS-E Kopverzinkboor 180°, middelpassing, kerngaten  
 FR Fraise à chambrer HSS-E 180°, ajustement moyen, trous à tarauder  
 ES Avellanador para asientos 'Allen' HSS-E 180°, ajuste medio, agujeros para roscar  
 DE HSS-E Flachsenker 180°, mittelpassung, Kernlochsenkung



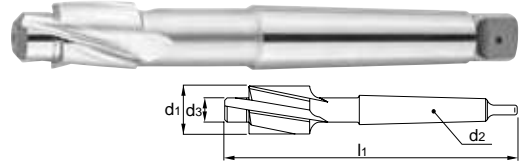
<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.350.0300	3	6	2.5	71	6
43.350.0350	3,5	6.5	2.9	71	6.5
43.350.0400	4	8	3.3	71	8

Ref.	M	d1	d3	l1	d2
43.350.0500	5	10	4.2	80	10
43.350.0600	6	11	5	80	11
43.350.0800	8	15	6.8	100	12.5



> **43.400 Phantom**



NL HSS-E Kopverzinkboor 180°, fijnpassing, MK  
 FR Fraise à chambrer HSS-E 180°, ajustement fin, CM  
 ES Avellanador para asientos 'Allen' HSS-E 180°, ajuste fino, CM  
 DE HSS-E Flachsenker 180°, Senkung fein, MK

+6 6 ( )

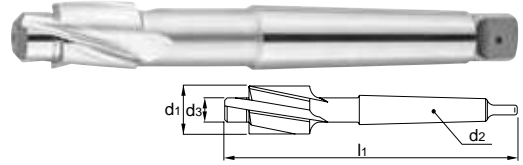
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.400.1000	10	18	10.5	150	MK 2
43.400.1200	12	20	13	150	MK 2
43.400.1400	14	24	15	160	MK 2
43.400.1600	16	26	17	190	MK 3

Ref.	M	d1	d3	l1	d2
43.400.1800	18	30	19	190	MK 3
43.400.2000	20	33	21	190	MK 3
43.400.2200	22	36	23	205	MK 3
43.400.2400	24	40	25	205	MK 3

Ref.	M	d1	d3	l1	d2
43.400.2700	27	43	30	240	MK 4
43.400.3000	30	48	33	240	MK 4

> **43.410 Phantom**



NL HSS-E Kopverzinkboor 180°, middelpassing, MK  
 FR Fraise à chambrer HSS-E 180°, ajustement moyen, CM  
 ES Avellanador para asientos 'Allen' HSS-E 180°, ajuste medio, CM  
 DE HSS-E Flachsenker 180°, mittelpassung, MK

+6 6 ( )

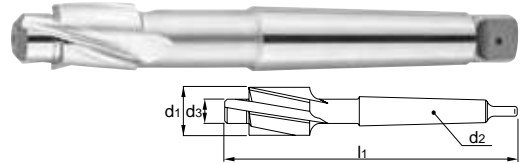
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.410.1000	10	18	11	150	MK 2
43.410.1200	12	20	14	150	MK 2
43.410.1400	14	24	16	160	MK 2

Ref.	M	d1	d3	l1	d2
43.410.1600	16	26	18	190	MK 3
43.410.1800	18	30	20	190	MK 3
43.410.2000	20	33	22	190	MK 3

Ref.	M	d1	d3	l1	d2
43.410.2200	22	36	24	205	MK 3

> **43.440 Phantom**



NL HSS-E Kopverzinkboor 180°, middelpassing, kerngaten, MK  
 FR Fraise à chambrer HSS-E 180°, ajustement moyen, trous à tarauder, CM  
 ES Avellanador para asientos 'Allen' HSS-E 180°, ajuste medio, agujeros para roscar, CM  
 DE HSS-E Flachsenker 180°, mittelpassung, Kernlochsенkung, MK

+6 6 ( )

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	M	d1	d3	l1	d2
43.440.1400	14	24	12	160	MK 2
43.440.1600	16	26	14	190	MK 3

Ref.	M	d1	d3	l1	d2
43.440.1800	18	30	15.5	190	MK 3
43.440.2000	20	33	17.5	190	MK 3

Ref.	M	d1	d3	l1	d2
43.440.2400	24	40	21	205	MK 3



## > 44.100 Phantom

NL HSS Getrapte Plaatboor stoomontlaten  
FR Foret étagé HSS vaporisé  
ES Broca escalonada HSS vaporizada  
DE HSS Stufenbohrer dampfangelassen



Z=2	HSS	OX.						
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	l1	d2
44.100.0100	9	4-5-6-7-8-9-10-11-12	64	10
44.100.0200	11	6-8-10-12-14-16-18-20-22-24-25	77	12
44.100.0300	7	6-8-10-12-14-16-18	59	10
44.100.0400	14	8-10-12-14-16-18-20-22-24-26-28-30-32-34	92	12

## > 44.102 Phantom

NL HSS Getrapte Plaatboor genitreerd  
FR Foret étagé HSS nitruré  
ES Broca escalonada HSS nitrurada  
DE HSS Stufenbohrer nitriert



Z=2	HSS	NIT.						
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	l1	d2
44.102.0412	5	4-6-8-10-12	65	10
44.102.0420	9	4-6-8-10-12-14-16-18-20	69	12
44.102.0630	13	6-8-10-12-14-16-18-20-22-24-26-28-30	88	13
44.102.0638	12	6-9-13-16-19-21-23-26-29-32-35-38	87	13

## > 44.110 Phantom

NL HSS Getrapte Plaatboor voor kabelwartels (MF), stoomontlaten  
FR Foret étagé HSS pour filetages de tubes électriques (MF), vaporisé  
ES Broca escalonada HSS para glándulas de cable (MF), vaporizada  
DE HSS Stufenbohrer für Drüse (MF), dampfangelassen



Z=2	HSS	MF	OX.	DIN EN 60423				
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	l1	d2
44.110.0500	8	8,5-10,5-12,5-16,5-20,5-25,5-32,5-40,5 (M8-M40)	77	12
44.110.0600	7	8,5-10,5-14,5-18,5-23,5-30,5-38,5 (M10-M40)	86	12
44.110.0700	13	8,5-10,5-12,5-14,5-16,5-18,5-20,5-23,5-25,5-30,5-32,5-38,5-40,5 (M10-M40)	97	12



> **44.120** **Phantom**

NL HSS Getrapte Plaatboor stoomontlaten  
 FR Foret étagé HSS vaporisé  
 ES Broca escalonada HSS vaporizada  
 DE HSS Stufenbohrer dampfangelassen



Z=2 HSS OX.

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	Ø "	l1	d2
44.120.0100	13	3,2-4-4,8-5,6-6,4-7,1-7,9-8,7-9,5-10,3-11,1-11,9-12,7	1/8-5/32-3/16-7/32-1/4-9/32-5/16-11/32-3/8-13/32-7/16-15-32-1/2	81	10
44.120.0200	12	6,4-8,3-11,1-12,7-14,3-15,9-17,5-19,1-20,6-22,2-23,8-25,4	1/4-21/64-7/16-1/2-9/16-5/8-11/16-3/4-13/16-7/8-15/16-1	81	12
44.120.0300	9	6,4-7,9-9,5-11,1-12,7-14,3-15,9-17,5-19,1	1/4-5/16-3/8-7/16-1/2-9/16-5/8-11/16-3/4	67	12

> **44.130** **Phantom**

NL HSS Getrapte Plaatboor gepsiraliseerd, genitreerd  
 FR Foret étagé HSS goujure hélicoïdale, nitruré  
 ES Broca escalonada HSS helicoidal, nitrurada  
 DE HSS Stufenbohrer spiralförmig, nitriert



Z=2 HSS NIT.

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	5-8	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	l1	d2
44.130.0100	5	4-6-8-10-12	65	8
44.130.0200	9	4-6-8-10-12-14-16-18-20	75	10
44.130.0300	13	6-8-10-12-14-16-18-20-22-24-26-28-30	98	13

> **44.134** **Phantom**

NL HSS Getrapte Plaatboor gepsiraliseerd, TiAIN  
 FR Foret étagé HSS goujure hélicoïdale, TiAIN  
 ES Broca escalonada HSS helicoidal, TiAIN  
 DE HSS Stufenbohrer spiralförmig, TiAIN



Z=2 HSS TiAIN

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	5-8	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	l1	d2
44.134.0100	5	4-6-8-10-12	65	8
44.134.0200	9	4-6-8-10-12-14-16-18-20	75	10
44.134.0300	13	6-8-10-12-14-16-18-20-22-24-26-28-30	98	13





## > 44.150 Phantom

NL HSS Trappenboor verwisselbare centreerboor  
FR Foret étagé HSS foret de centrage interchangeable  
ES Broca escalonada HSS broca de centrar intercambiable  
DE HSS Stufenbohrer auswechselbaren Anbohrern



44.150.9000

Z=4	HSS							
<b>P 11</b> s500 N/mm <sup>2</sup>	<b>P 12</b> s550 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25-27	22-30	15-20	8-12	15-20	25-30	45-50	25-40	22-28

Ref.	xØ	Ø mm	l1	d2
44.150.0100	11	9-12-15-18-21-24-27-30-33-36-40	87	12
44.150.1000	12	10,5-12,5-14,5-16,5-18,5-20,5-23,5-25,5-30,5-32,5-38,5-40,5 (M10-M40)	92	12
44.150.9000		7	40	4

## > 44.200 Phantom

NL HSS Conische Plaatfrees  
FR Foret conique HSS  
ES Fresa cónica HSS  
DE HSS konische Blechschälbohrer



Z=2	HSS			
<b>P 11</b> s500 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 61</b> PVC
25-27	22-30	50-70	40-60	22-28

Ref.	Min-Max Ø	l1	d2	Ref.	Min-Max Ø	l1	d2
44.200.0100	3-14	62	6	44.200.0500	36-50	78	12
44.200.0200	6-20	70	8	44.200.0600	46-60	78	13
44.200.0300	16-30	75	10	44.200.0700	6-30	95	10
44.200.0400	26-40	78	12	44.200.0800	6-25,4	84	8

## > 44.210 Phantom

NL HSS-E Conische Plaatfrees  
FR Foret conique HSS-E  
ES Fresa cónica HSS-E  
DE HSS-E konische Blechschälbohrer



Z=2	+6 6 (				
<b>P 11</b> s500 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 61</b> PVC
25-27	22-30	8-12	50-70	40-60	22-28

Ref.	Min-Max Ø	l1	d2	Ref.	Min-Max Ø	l1	d2
44.210.0100	3-14	62	6	44.210.0400	26-40	78	12
44.210.0200	6-20	70	8	44.210.0700	6-30	95	10
44.210.0300	16-30	75	10				



> **44.220** **INTERNATIONAL TOOLS**

NL ECO PRO HSS Freesboor  
 FR Foret fraiseur HSS ECO PRO  
 ES Broca fresa HSS ECO PRO  
 DE ECO PRO HSS Fräsbohrer



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 61</b> PVC
25-27	22-30	50-70	40-60	22-28

Ref.	d1	d2	l2	l1	z
44.220.0600	6	6	50	90	5

Ref.	d1	d2	l2	l1	z
44.220.0800	8	8	50	90	7





## > 46.100 SHAVIV

NL Handgrepen en Onderdelen  
FR Manches et accessoires  
ES Mangos y Accesorios  
DE Handgriffe und Einzelteile

Ref.	Type		Ref.	Type	
46.100.0010	Mango II	B, C, D, E, F, Burr-Bi, M	46.100.1200	ALU	B, C, D, E, F, Burr-Bi, M
46.100.1000	Classic A	B, C, D, E, F, Burr-Bi, M	46.100.1300	Set HC	Ø 1,0 - 8,0 mm, C55

## > 46.120 SHAVIV

NL Handontbramer en mesjes type B  
FR Ebavreur et lames type B  
ES Desbarbador y cuchillas tipo B  
DE Handentgrater und Klingen Typ B

Ref.	Type					P	H	M	K	N
46.120.0250	Mango II, B, B10, B20									
46.120.0255	Mango II, B, B10, B20									
46.120.0260	Mango II, B, 10x B10									
46.120.0265	Mango II, B, 10x B10									
46.120.0500	UB2000									
46.120.1001	B									
46.120.1002	B									
46.120.2100	B10					P				N
46.120.2101	B10P				TiN	P		M		N
46.120.2102	B10C				VHM SC		H			N
46.120.2109	B10L					P				N
46.120.2110	B11					P				N
46.120.2120	B12					P				N
46.120.2121	B12P				TiN	P		M		N
46.120.2200	B20								K	N
46.120.2201	B20P				TiN				K	N
46.120.2250	B25					P				N
46.120.2252	B25C				VHM SC	P				N
46.120.2300	B30					P				N
46.120.2301	B30P					P		M		N
46.120.2320	B32								K	N
46.120.2500	B50					P	H	M	K	N
46.120.2600	B60					P				N
46.120.2700	B70					P	H	M	K	N

> **46.130 SHAVIV**

NL Handontbramer en mesjes type C  
 FR Ebavureur et lames type C  
 ES Desbarbador y cuchillas tipo C  
 DE Handentgrater und Klengen Typ C

Ref.	Type					P	H	M	K	N
46.130.0250	Mango II, C, C42									
46.130.1100	Mango II									
46.130.2400	C40					<b>P</b>		<b>M</b>	<b>K</b>	<b>N</b>
46.130.2420	C42					<b>P</b>		<b>M</b>	<b>K</b>	<b>N</b>

> **46.140 SHAVIV**

NL Handontbramer en mesjes type D  
 FR Ebavureur et lames type D  
 ES Desbarbador y cuchillas tipo D  
 DE Handentgrater und Klengen Typ D

Ref.	Type					P	H	M	K	N
46.140.0250	Mango II, D, D80									
46.140.1100	D									
46.140.2800	D80									
46.140.2850	D85									

> **46.155 SHAVIV**

NL Handontbramer en mesjes type Multi Tool  
 FR Ebavureur et lames type Outil universel  
 ES Desbarbador y cuchillas tipo herramienta universal  
 DE Handentgrater und Klengen Typ Multi-Tool

Ref.	Type	
46.155.0250	Mango II, M, B10, B20, B30, E100, E200, E111	
46.155.1500	M	

> **46.160 SHAVIV**

NL Handontbramer en mesjes type F  
 FR Ebavureur et lames type F  
 ES Desbarbador y cuchillas tipo F  
 DE Handentgrater und Klengen Typ F

Ref.	Type					P	H	M	K	N
46.160.0250	Mango II, F, F20									
46.160.0255	Mango II, FR, F20									
46.160.1100	F									
46.160.1105	FR									
46.160.2120	F12					<b>P</b>		<b>M</b>	<b>K</b>	<b>N</b>
46.160.2200	F20					<b>P</b>		<b>M</b>	<b>K</b>	<b>N</b>





## > 46.180 SHAVIV

NL Handontbramer en mesjes type Burr-Bi  
FR Ebavureur et lames type Burr-Bi  
ES Desbarbador y cuchillas tipo Burr-Bi  
DE Handentgrater und Klengen Typ Burr-Bi

Ref.	Type					P	H	M	K	N
46.180.0250	Mango II, BR, 2x R10									
46.180.3110	R10		←			P		M	K	N
46.180.3120	R20		←			P		M		N
46.180.3130	R30		←			P		M		N

## > 46.300 SHAVIV

NL Handontbramer en mesjes type E  
FR Ebavureur et lames type E  
ES Desbarbador y cuchillas tipo E  
DE Handentgrater und Klengen Typ E

Ref.	Type					P	H	M	K	N
46.300.0250	Mango II, E, E100, E200, E300									
46.300.0255	Mango IIE, E100, E200, E300									
46.300.0260	Mango II, E, 10x E100									
46.300.0265	Mango II, E, 10x E100									
46.300.1000	SHAVIV 1, E100, E200, E300									
46.300.1100	SHAVIV 1 (A)									
46.300.1500	MB2000									
46.300.2001	E									
46.300.2002	E									
46.300.2100	E100		↷			P				N
46.300.2101	E100P		↷			TiN P		M		N
46.300.2102	E100C		↷			VHM SC	H			N
46.300.2104	E100S		↷			P		M		N
46.300.2109	E100L		↶			P				N
46.300.2110	E110		↷			P				N
46.300.2111	E110P		↷			TiN P		M		N
46.300.2150	E111		↷			P				N
46.300.2200	E200		↶						K	N
46.300.2201	E200P		↶			TiN			K	N
46.300.2250	E250		↷			P				N

46.300.2300	E300							<b>P</b>				<b>N</b>
46.300.2320	E320										<b>K</b>	<b>N</b>
46.300.2350	E350										<b>K</b>	<b>N</b>
46.300.2600	E600							<b>P</b>				<b>N</b>
46.300.2601	E601							<b>P</b>				<b>N</b>
46.300.2720	E720							<b>P</b>				<b>N</b>

> **46.400 SHAVIV**

NL Hulpgereedschap voor gereedschapmakers  
 FR Kit pour ajusteurs et outilleurs  
 ES Conjunto de herramientas para ajustadores  
 DE Hilfswerkzeuge für Werkzeugmacher

Ref.	Type					P	H	M	K	N
46.400.1000	TD									
46.400.2001	US1									
46.400.2380	UB38									





## > 49.140 INTERNATIONAL TOOLS

NL ECO PRO HM Set Stiffrezen  
FR Jeu de Fraises limes Carbure ECO PRO  
ES Juego de fresa rotativa MD ECO PRO  
DE ECO PRO HM Satz Frässtifte



6 - UNI  
P M K S H

6 - UNI  
P M K S H

**ECO PRO** VHM SC Ø6

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Contents	Ref.	Contents
49.140.0106	Form B, C, D, F, G - Ø 10 - 6-UNI	49.140.0126	Form B, C, D, F, G - Ø 12 - 6-UNI

## > 49.150 Phantom

NL HM set Stiffrezen  
FR Jeu de Fraises limes Carbure  
ES Juego de fresa rotativa MD  
DE HM Satz Frässtifte

1 - ALU  
N  
3 - FINE  
P M K S H  
4 - DIAMOND  
P M S  
6 - UNI  
P M K S H  
8 - STEEL  
P K  
9 - INOX  
M



VHM SC Ø6

Ref.	Contents	Ref.	Contents
49.150.0101	Form B, C, D, F, G - Ø 10 - 1-ALU	49.150.0108	Form B, C, D, F, G - Ø 10 - 8-STEEL
49.150.0103	Form B, C, D, F, G - Ø 10 - 3-FINE	49.150.0109	Form A, C, D, F, G - Ø 10 - 9-INOX
49.150.0104	Form B, C, D, F, G - Ø 10 - 4-DIAMOND	49.150.0126	Form B, C, D, F, G - Ø 12 - 6-UNI
49.150.0106	Form B, C, D, F, G - Ø 10 - 6-UNI		

## > 49.152 Phantom

NL HM Slotenmakers set  
FR Coffret spécial serrurier Carbure  
ES Juego especial cerrajero MD  
DE HM Schlüsseldienste set



VHM SC Ø6



**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Contents	Ref.	Contents
49.152.1000	41.530.0636/0306/0406/0616 + 41.690.4606		

> **49.230** **Phantom**

NL HSS-E Set Verzinkboren 42.300, 60°, schuin gat  
 FR Jeu de fraises à ébavurer HSS-E 42.300, 60°, à trou  
 ES Juego de avellanadores HSS-E 42.300, 60°, con agujero  
 DE HSS-E Satz Kegelsenker 42.300, 60°, Querloch



+6 6 (  **60°** 

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I



Ref.	Type	Ø mm
49.230.1000	42.300	10-15-20-25-30 mm

Ref.	Type	Ø mm

> **49.232** **Phantom**

NL HSS-E Set Verzinkboren 42.320, 60°, 1 snijkant  
 FR Jeu de fraises à ébavurer HSS-E 42.320, 60°, 1 dent  
 ES Juego de avellanadores HSS-E 42.320, 60°, 1 labio  
 DE HSS-E Satz Kegelsenker 42.320, 60°, 1 Schneide



+6 6 (  **60°** 

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	Type	Ø mm
49.232.1000	42.320	10-15-20-25-30 mm

Ref.	Type	Ø mm





## > 49.234 Phantom

NL HSS-E Set Verzinkboren 42.340, 60°, 3 snijkanten  
 FR Jeu de fraises à ébavurer HSS-E 42.340, 60°, 3 taillants  
 ES Juego de avellanadores HSS-E 42.340, 60°, 3 labios  
 DE HSS-E Satz Kegelsenker 42.340, 60°, 3 Schneiden



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Sl>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.234.1040	42.340	10,4-16,5-20,5-25-31 mm			

## > 49.240 INTERNATIONAL TOOLS

NL ECO HSS Set Verzinkboren 42.533, 90°, 3 snijkanten  
 FR Jeu de fraises à ébavurer HSS ECO 42.533, 90°, 3 taillants  
 ES Juego de avellanadores HSS ECO 42.533, 90°, 3 labios  
 DE ECO HSS Satz Kegelsenker 42.533, 90°, 3 Schneiden



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu
17-22	10-15	15-20	20-25	35-45

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.240.0630	42.533	6,3-8,3-10,4-12,4-16,5-20,5 mm	49.240.0631	42.533	6,3-8,3-10,4-12,4-16,5-20,5 mm

## > 49.242 INTERNATIONAL TOOLS

NL ECO PRO HSS Set Verzinkboren 42.535, 90°, 3 snijkanten  
 FR Jeu de fraises à ébavurer HSS ECO PRO 42.535, 90°, 3 taillants  
 ES Juego de avellanadores HSS ECO PRO 42.535, 90°, 3 labios  
 DE ECO PRO HSS Satz Kegelsenker 42.535, 90°, 3 Schneiden



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Sl>10%	<b>N 51</b> Cu
15-20	8-12	6-10	10-15	15-20	30-40	20-25	15-25

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.242.0630	42.535	6,3-8,3-10,4-12,4-16,5-20,5 mm			

> **49.244** **INTERNATIONAL TOOLS**

NL ECO PRO HSS Set Verzinkboren 42.536, 90°, 3 snijkanten, TiN  
 FR Jeu de fraises à ébavurer HSS ECO PRO 42.536, 90°, 3 taillants, TiN  
 ES Juego de avellanadores HSS ECO PRO 42.536, 90°, 3 labios, TiN  
 DE ECO PRO HSS Satz Kegelsenker 42.536, 90°, 3 Schneiden, TiN



HSS	TiN	DIN 335-C						
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu
15-20	8-12	6-10	5-10	10-15	15-20	30-40	20-25	15-25

Ref.	Type	Ø mm
49.244.0630	42.536	6,3-8,3-10,4-12,4-16,5-20,5 mm

Ref.	Type	Ø mm

> **49.248** **INTERNATIONAL TOOLS**

NL ECO HSS Set Verzinkboren 42.543, 90°, 3 snijkanten  
 FR Jeu de fraises à ébavurer HSS ECO 42.543, 90°, 3 taillants  
 ES Juego de avellanadores HSS ECO 42.543, 90°, 3 labios  
 DE ECO HSS Satz Kegelsenker 42.543, 90°, 3 Schneiden



HSS		90°					
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu
15-20	8-12	6-10	10-15	15-20	30-40	20-25	15-25

Ref.	Type	Ø mm
49.248.0630	42.543	6,3-8,3-10,4-12,4-16,5-20,5 mm

Ref.	Type	Ø mm

> **49.250** **Phantom**

NL HSS-E Set Verzinkboren 42.500, 90°, schuin gat  
 FR Jeu de fraises à ébavurer HSS-E 42.500, 90°, à trou  
 ES Juego de avellanadores HSS-E 42.500, 90°, con agujero  
 DE HSS-E Satz Kegelsenker 42.500, 90°, Querloch



+6		90°							
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe	N 61 PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I

Ref.	Type	Ø mm
49.250.1000	42.500	10-15-20-25-30 mm

Ref.	Type	Ø mm





## > 49.252 Phantom

NL HSS-E Set Verzinkboren 42.520, 90°, 1 snijkant  
 FR Jeu de fraises à ébavurer HSS-E 42.520, 90°, 1 dent  
 ES Juego de avellanadores HSS-E 42.520, 90°, 1 labio  
 DE HSS-E Satz Kegelsenker 42.520, 90°, 1 Schneide



+6 6 (		90°							
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I
Ref.	Type	Ø mm							
49.252.1000	42.520	10-15-20-25-30 mm							

Ref.	Type	Ø mm

## > 49.254 Phantom

NL HSS-E Set Verzinkboren 42.540, 90°, 3 snijkanten  
 FR Jeu de fraises à ébavurer HSS-E 42.540, 90°, 3 taillants  
 ES Juego de avellanadores HSS-E 42.540, 90°, 3 labios  
 DE HSS-E Satz Kegelsenker 42.540, 90°, 3 Schneiden



+6 6 (	DIN 335-C			90°								
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I
Ref.	Type	Ø mm										
49.254.0630	42.540	6,3-8,3-10,4-12,4-16,5-20,5 mm										
49.254.0631	42.540	6,3-10,4-16,5-20,5-25 mm										

Ref.	Type	Ø mm
49.254.1040	42.540	10,4-16,5-20,5-25-31 mm

> 49.255 **Phantom**

NL HSS-E Set Verzinkboren 42.550, 90°, 3 snijkanten  
 FR Jeu de fraises à ébavurer HSS-E 42.550, 90°, 3 taillants  
 ES Juego de avellanadores HSS-E 42.550, 90°, 3 labios  
 DE HSS-E Satz Kegelsenker 42.550, 90°, 3 Schneiden



HSS-E 8%	DIN 335-C												
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC	<b>S 71</b> Ni/Co
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-6 A

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.255.0631	42.550	6,3-10,4-16,5-20,5-25 mm			

> 49.256 **Phantom**

NL HSS-E Set Verzinkboren 42.541, 90°, 3 snijkanten, TiN  
 FR Jeu de fraises à ébavurer HSS-E 42.541, 90°, 3 taillants, TiN  
 ES Juego de avellanadores HSS-E 42.541, 90°, 3 labios, TiN  
 DE HSS-E Satz Kegelsenker 42.541, 90°, 3 Schneiden, TiN



+6 l	<b>TiN</b>	DIN 335-C										
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.256.1040	42.541	10,4-16,5-20,5-25-31 mm			





## > 49.259 Phantom

NL HSS-E Set Vari Verzinkboren 42.553, 90°, 3 snijkanten  
 FR Jeu de fraises à chanfreiner Vari HSS-E 42.553, 90°, 3 taillants  
 ES Juego de avellanadores Vari HSS-E 42.553, 90°, 3 labios  
 DE HSS-E Satz Kegelsenker ungleichteilung 42.553, 90°, 3 Schneiden



+6 6	DIN 335-C											
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I
Ref.	Type	Ø mm			Ref.	Type	Ø mm					
49.259.0620	42.553	6,3-8,3-10,4-12,4-16,5-20,5 mm			49.259.1020	42.553	10,4-12,4-16,5-20,5 mm					
49.259.0625	42.553	6,3-10,4-16,5-20,5-25 mm			49.259.1025	42.553	10,4-12,4-16,5-20,5-25 mm					

NIEUW NOUVEAU NUEVO NEU

## > 49.260 Phantom

NL HSS-E Set Vari Verzinkboren 42.554, 90°, 3 snijkanten, TiAIN  
 FR Jeu de fraises à chanfreiner Vari HSS-E 42.554, 90°, 3 taillants, TiAIN  
 ES Juego de avellanadores Vari HSS-E 42.554, 90°, 3 labios, TiAIN  
 DE HSS-E Satz Kegelsenker ungleichteilung 42.554, 90°, 3 Schneiden, TiAIN



+6 6	TiAIN	DIN 335-C											
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC	<b>S 72</b> Ti
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-8 A
Ref.	Type	Ø mm			Ref.	Type	Ø mm						
49.260.0620	42.554	6,3-8,3-10,4-12,4-16,5-20,5 mm			49.260.1020	42.554	10,4-12,4-16,5-20,5 mm						
49.260.0625	42.554	6,3-10,4-16,5-20,5-25 mm			49.260.1025	42.554	10,4-12,4-16,5-20,5-25 mm						



> **49.261 Phantom**

- NL HSS-E Set Vari Verzinkboren 42.555, 90°, 3 snijkanten, met drie platte vlakken
- FR Jeu de fraises à chanfreiner Vari HSS-E 42.555, 90°, 3 taillants, à 3 méplats
- ES Juego de avellanadores Vari HSS-E 42.555, 90°, 3 labios, con 3 chaflanes
- DE HSS-E Satz Kegelsenker ungleichteilung 42.555, 90°, 3 Schneiden, mit drei platten Flächen



+6 6 ( DIN 335-C

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.261.0620	42.555	6,3-8,3-10,4-12,4-16,5-20,5 mm	49.261.1020	42.555	10,4-12,4-16,5-20,5 mm
49.261.0625	42.555	6,3-8,3-10,4-12,4-16,5-20,5-25 mm	49.261.1025	42.555	10,4-12,4-16,5-20,5-25 mm

> **49.262 Phantom**

- NL HSS-E Set Vari Verzinkboren 42.556, 90°, 3 snijkanten, TiAIN, met drie platte vlakken
- FR Jeu de fraises à chanfreiner Vari HSS-E 42.556, 90°, 3 taillants, TiAIN, à 3 méplats
- ES Juego de avellanadores Vari HSS-E 42.556, 90°, 3 labios, TiAIN, con 3 chaflanes
- DE HSS-E Satz Kegelsenker ungleichteilung 42.556, 90°, 3 Schneiden, TiAIN, mit drei platten Flächen



+6 6 ( **TiAIN** DIN 335-C

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC	<b>S 72</b> Ti
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-8 A

**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	Ø mm	Ref.	Type	Ø mm
49.262.0620	42.556	6,3-8,3-10,4-12,4-16,5-20,5 mm	49.262.1020	42.556	10,4-12,4-16,5-20,5 mm
49.262.0625	42.556	6,3-8,3-10,4-12,4-16,5-20,5-25 mm	49.262.1025	42.556	10,4-12,4-16,5-20,5-25 mm





## > 49.267 Phantom

NL HSS-E Set Vari Verzinkboren 42.566, 90°, 3 snijkanten, lang  
 FR Jeu de fraises à chanfreiner Vari HSS-E 42.566, 90°, 3 taillants, version longue  
 ES Juego de avellanadores Vari HSS-E 42.566, 90°, 3 labios, larga  
 DE HSS-E Satz Kegelsenker ungleichteilung 42.566, 90°, 3 Schneiden, lang



+6 6 (	NORM	3	3	90°		VARI						
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe	N 61 PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I
Ref.	Type	Ø mm			Ref.	Type	Ø mm					
49.267.0620	42.566	6,3-8,3-10,4-12,4-16,5-20,5 mm			49.267.1020	42.566	10,4-12,4-16,5-20,5 mm					

NIEUW NOUVEAU NUEVO NEU

## > 49.268 Phantom

NL HSS-E Set Vari Verzinkboren 42.567, 90°, 3 snijkanten, lang  
 FR Jeu de fraises à chanfreiner Vari HSS-E 42.567, 90°, 3 taillants, version longue  
 ES Juego de avellanadores Vari HSS-E 42.567, 90°, 3 labios, larga  
 DE HSS-E Satz Kegelsenker ungleichteilung 42.567, 90°, 3 Schneiden, lang






+6 6 (	TiAIN	NORM	3	3	90°		VARI						
P 11 ≤600 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	M 22 INOX >850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 52 CuAlFe	N 61 PVC	S 72 Ti
35-45 C	20-30 C	16-20 B	8-15 A	12-15 B	8-12 A	20-30 C	30-40 C	50-60 D	35-40 C	20-30 D	30-40 C	35-70 I	4-8 A
Ref.	Type	Ø mm			Ref.	Type	Ø mm						
49.268.0620	42.567	6,3-8,3-10,4-12,4-16,5-20,5 mm			49.268.1020	42.567	10,4-12,4-16,5-20,5 mm						

NIEUW NOUVEAU NUEVO NEU

> **49.270 Phantom**

NL HSS-E Set Verzinkboren 42.700, 120°, schuin gat  
 FR Jeu de fraises à ébavurer HSS-E 42.700, 120°, à trou  
 ES Juego de avellanadores HSS-E 42.700, 120°, con agujero  
 DE HSS-E Satz Kegelsenker 42.700, 120°, Querloch



+6 6 (  **120°**  

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
35-45 C	20-30 D	15-20 C	20-30 C	30-40 D	55-65 I	30-40 F	20-30 E	30-40 D	50-100 I



Ref.	Type	Ø mm
49.270.1000	42.700	10-15-20-25-30 mm

Ref.	Type	Ø mm

> **49.320 Phantom**

NL HSS-E Set Kopverzinkboren 90°  
 FR Jeu de fraises à chambrer HSS-E 90°  
 ES Juego de avellanador para asientos 'Allen' HSS-E 90°  
 DE HSS-E Satz Flachsenker 90°



+6 6 (  **90°** **DIN 1866** 

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I

Ref.	Type	Ø mm
49.320.1000	43.200	1: M3-M4-M5-M6-M8-M10
49.320.2000	43.210	2: M3-M4-M5-M6-M8-M10

Ref.	Type	Ø mm
49.320.3000	43.240	3: M3-M4-M5-M6-M8-M10





## > 49.340 Phantom

NL HSS-E Set Kopverzinkboren 180°  
 FR Jeu de fraises à chambrer HSS-E 180°  
 ES Juego de avellanador para asientos 'Allen' HSS-E 180°  
 DE HSS-E Satz Flachsenker 180°



+6 E (		180°	DIN 373		1	2	3										
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52	N 61					
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe	PVC					
17-22 C	10-15 C	8-12 B	4-8 A	8-12 B	6-10 A	15-20 C	20-25 C	35-45 D	30-40 C	15-25 D	20-30 C	35-70 I					
Ref.	Type	Ø mm		Ref.	Type	Ø mm											
49.340.1000	43.320	1: M3-M4-M5-M6-M8-M10		49.340.3000	43.350	3: M3-M4-M5-M6-M8-M10											
49.340.2000	43.330	2: M3-M4-M5-M6-M8-M10															

## > 49.413 Phantom

NL HSS Set Getrapte Plaatboren gepsiraliseerd, 44.130, genitreerd  
 FR Jeu de forets étagé HSS goujure hélicoïdale, 44.130, nitruré  
 ES Juego de brocas escalonada HSS helicoidal, 44.130, nitrurada  
 DE HSS Satz Stufenbohrer spiralförmig, 44.130, nitriert



HSS	NIT.									
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 51	N 61	
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC	
25-27	22-30	15-20	8-12	5-8	15-20	25-30	45-50	25-40	22-28	
Ref.	Ø mm									
49.413.1000	1 (M4-M12), 2 (M4-M20), 3 (M6-M30)									

Ref.	Ø mm

## > 49.414 Phantom

NL HSS Set Getrapte Plaatboren gepsiraliseerd, 44.134, TiAIN  
 FR Jeu de forets étagé HSS goujure hélicoïdale, 44.134, TiAIN  
 ES Juego de brocas escalonada HSS helicoidal, 44.134, TiAIN  
 DE HSS Satz Stufenbohrer spiralförmig, 44.134, TiAIN



HSS	TiAIN									
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 51	N 61	
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC	
25-27	22-30	15-20	8-12	5-8	15-20	25-30	45-50	25-40	22-28	
Ref.	Ø mm									
49.414.1000	1 (M4-M12), 2 (M4-M20), 3 (M6-M30)									

Ref.	Ø mm

> **49.420 Phantom**

NL HSS Set Conische Plaatfreesen 44.200  
 FR Jeu de forets coniques HSS 44.200  
 ES Juego de fresas cónicas escalonadas HSS 44.200  
 DE HSS Satz konische Blechschälbohrer 44.200



49.420.3000



49.420.1000

HSS					
<b>P 11</b>	<b>P 12</b>	<b>N 41</b>	<b>N 42</b>	<b>N 61</b>	
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	Alu	Alu Si>10%	PVC	
25-27	22-30	50-70	40-60	22-28	

Ref.	∅ mm
49.420.1000	1 (3-14), 2 (6-20), 3 (16-30)

Ref.	∅ mm
49.420.3000	120 ml

> **49.490 Phantom**

NL set plaatboren, plaatfrees en verzinkboren  
 FR jeu de forets étagé, foret conique, fraise à ebavurer et à chanfreiner  
 ES juego brocas escalonadas, fresa cónica y avellanadores  
 DE Satz Stufenbohrer, Blechschälbohrer und Entgratungssenker



Ref.	∅ mm
49.490.1000	44.130.0100 (M4-M12), 44.130.0200 (M4-M20), 44.200.0200 (6-20 mm), 42.500.1500 (15 mm), 42.540.1240 (12,4 mm), 42.540.2500 (25 mm)

> **49.600 SHAVIV**

NL Assortiment  
 FR Coffret ébavureurs et lames  
 ES Surtido  
 DE Sortiment



Ref.	Type	Contents
49.600.0120	Mango II	Mango II, B, C, B10, B11, B20, B30, B60, B70, C40
49.600.0300	Mango II	Mango II, C, E, C42, E100P, E111, E200, E300, E600, E700





**NL Voedingswaardentabel (kop-)verzinkers**  
**FR Tableau des avances pour fraises à chanfreiner (ou chambrer)**  
**ES Tabla de avances para avellanador (para asientos 'Allen')**  
**DE Vorschubtabelle Kegel- und Flachsenker**

**P 11** = ISO  
 S900 N/mm<sup>2</sup>  
 25-35 E Vc = 25-35  
 FRC = E

d1 (mm)	FRC								
	A	B	C	D	E	F	G	H	I
	f (mm/n)								
4	0,069	0,080	0,081	0,109	0,129	0,117	0,109	0,101	0,129
5	0,077	0,081	0,092	0,123	0,131	0,133	0,121	0,113	0,145
6	0,087	0,083	0,094	0,127	0,134	0,145	0,124	0,120	0,155
8	0,094	0,097	0,104	0,132	0,144	0,148	0,143	0,130	0,168
10	0,095	0,097	0,114	0,136	0,147	0,148	0,147	0,134	0,173
12	0,097	0,100	0,122	0,136	0,147	0,149	0,148	0,147	0,189
14	0,099	0,106	0,107	0,139	0,146	0,151	0,149	0,161	0,207
16	0,104	0,110	0,123	0,142	0,147	0,155	0,155	0,173	0,222
20	0,103	0,112	0,121	0,145	0,149	0,161	0,174	0,186	0,239
25	0,102	0,123	0,118	0,145	0,151	0,157	0,196	0,218	0,280
31	0,107	0,127	0,122	0,146	0,150	0,162	0,204	0,238	0,306
40	0,113	0,131	0,126	0,151	0,155	0,167	0,214	0,246	0,316
50	0,126	0,137	0,137	0,157	0,157	0,183	0,220	0,248	0,318
63	0,126	0,137	0,137	0,157	0,157	0,183	0,220	0,248	0,318

**NL Toerentaltabel stiftfrezen**  
**FR Tableau des vitesses de rotation pour fraises limes**  
**ES Tabla de número de revoluciones para fresas rotativas**  
**DE Drehzahltablette Frässtifte**


d1 (mm) = Ø	P	H	M	K	N	S
		n = rpm				
3	60.000 - 80.000	60.000 - 80.000	60.000 - 80.000	45.000 - 80.000	60.000 - 80.000	60.000 - 80.000
6	45.000 - 60.000	30.000 - 45.000	30.000 - 45.000	22.000 - 60.000	15.000 - 60.000	30.000 - 45.000
8	40.000 - 50.000	25.000 - 40.000	25.000 - 40.000	18.000 - 50.000	12.000 - 55.000	25.000 - 40.000
10	30.000 - 40.000	19.000 - 30.000	19.000 - 30.000	15.000 - 40.000	10.000 - 50.000	19.000 - 30.000
12	22.000 - 30.000	15.000 - 22.000	15.000 - 22.000	11.000 - 30.000	7.000 - 30.000	15.000 - 22.000
16	18.000 - 20.000	12.000 - 18.000	12.000 - 18.000	9.000 - 20.000	6.000 - 20.000	12.000 - 18.000
20	15.000 - 17.000	10.000 - 15.000	10.000 - 15.000	8.000 - 17.000	5.000 - 17.000	10.000 - 15.000

**NL Toerentaltabel trappenboren**  
**FR Tableau des vitesses de rotation pour forets coniques étagés**  
**ES Tabla de número de revoluciones para brocas escalonadas**  
**DE Drehzahltablette Stufenbohrer**

nr.	P	M	N
		n = rpm	
1	770	310	2600
2	390	150	1300
3	510	210	1700
4	770	310	2600
6	770	310	2600
7	440	180	1500
11	340	140	1100
12	280	110	900
14	280	110	900

**NL Toerentaltabel plaatfrezen**  
**FR Tableau des vitesses de rotation pour forets fraiseurs**  
**ES Tabla de número de revoluciones para fresas cónicas escalonadas**  
**DE Drehzahltablette Fräsbohrern**

$$n = \frac{V_c \times 1000}{3,14 \times d1} \quad V_c = \frac{n \times 3,14 \times d1}{1000}$$

	P11	P12	M21		N41	N42	N43	N61	
	HSS	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS	HSS-E	
	0,1 - 2 mm		0,1 - 1 mm		0,1 - 5 mm			> 10 mm	
	n = rpm								
1	400 - 500	500 - 600	300 - 400	400 - 500	1000 - 1300	1200 - 1500	2000 - 2500	2500 - 3000	
2	250 - 325	300 - 400	250 - 350	325 - 400	800 - 900	900 - 1000	1500 - 1750	1700 - 2000	
3	200 - 250	250 - 300	80 - 110	100 - 150	300 - 450	450 - 600	1000 - 1300	1200 - 1500	
4	100 - 125	120 - 150	60 - 85	80 - 100	200 - 350	300 - 500	500 - 800	750 - 1000	
5	80 - 90	90 - 100	40 - 65	60 - 80	100 - 150	150 - 200	200 - 350	300 - 500	
6	50 - 75	75 - 80	20 - 30	30 - 40	80 - 110	100 - 150	150 - 250	225 - 300	
7	200 - 250	250 - 300	80 - 110	100 - 150	300 - 425	400 - 600	1000 - 1300	1250 - 1500	
8	250 - 325	300 - 400	250 - 325	300 - 400	800 - 900	900 - 1000	1500 - 1750	1750 - 2000	

FRC

NL: Voedingscode

FR: Codification vitesse d'avance

ES: Codificación de velocidad de avance

DE: Vorschubgeschwindigkeit Codierung

f (mm/n)

NL: Voeding per omwenteling (mm/n)

FR: Avance par tour (mm/tr)

ES: Avance por revolucion (mm/r)

DE: Vorschub pro Umdrehung (mm/U)

Vc

NL: Snijsnelheid (m/min)

FR: Vitesse de coupe (m/min)

ES: Velocidad de corte (m/min)

DE: Schnittgeschwindigkeit (m/min)

n=rpm

NL: Spiltoerental (omw/min)

FR: Vitesse de broche (tr/min)

ES: Velocidad del husillo (rpm)

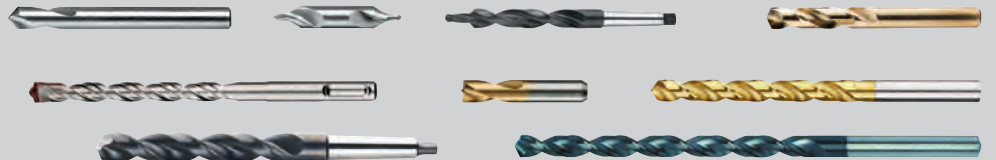
DE: Spindeldrehzahl (U/min)

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



SC 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



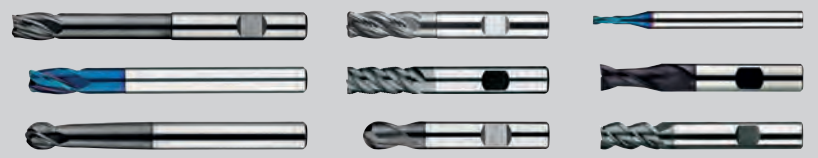
HSS-E 1

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



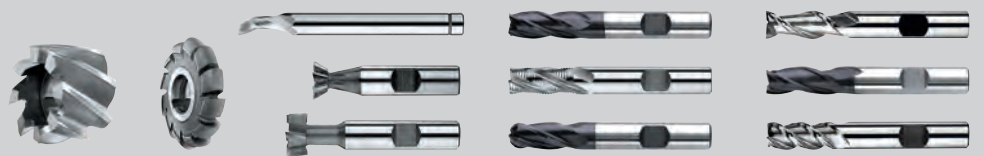
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



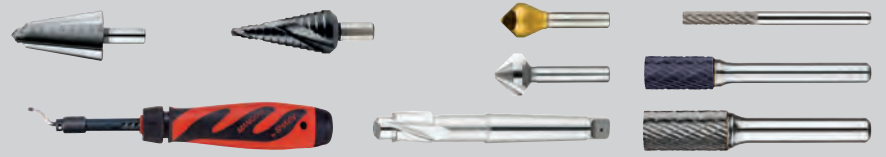
SC 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



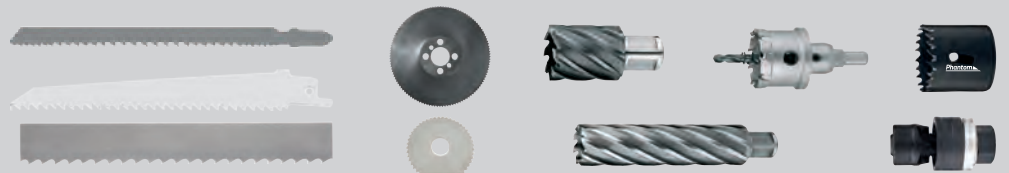
4

NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



5

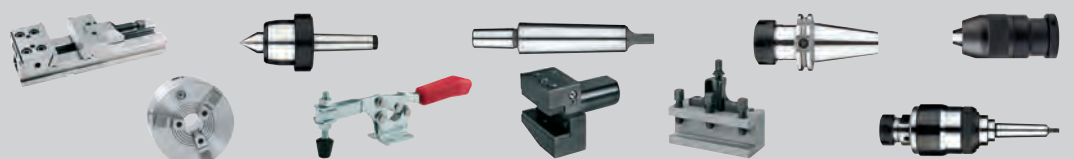
NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





**ICONEN    ICONES    ICONOS    PIKTOGRAMME**

	NL	FR	ES	DE
<b>HSS</b>	HSS	HSS	HSS	HSS
<b>HSS-E</b>	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)
<b>HM-TIP</b>	Hardmetaal Tip	Plaquette carbure brasée	Plaquetas de metal duro soldadas	mit HM-Schneiden
<b>MG HM</b>	Micro-Grain volhardmetaal	Carbure micrograin	Metal duro micrograno	Micro-Grain Vollhartmetall
<b>AlCrN-X</b>	AlCrN-X gecoat	Revêtement AlCrN-X	Recubrimiento AlCrN-X	AlCrN-X Be- schichtung
<b>" inch</b>	Diameter in inches	Diamètre en pouce	Diámetro en pulgadas	Durchmesser in Zoll-Masse
<b>DIN 212-B</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>DIN≈ 8051</b>	DIN bij benadering	Equivalent norme DIN	Según norma DIN	Ähnlich nach DIN

	NL	FR	ES	DE
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
<b>1:10</b>	Coniciteit	Conicité	Conicidad	Konizität
<b>h8</b>	Cilindrische schacht h8	Queue cylindrique h8	Mango cilíndrico h8	Zylinderschaft h8
<b>DIN 228-B</b>	Morse Konus Opname	Cône morse	Mango cónico	Morsekegel
<b>x0,01</b>	Oplopend met 0,01 mm	Croissant par 0,01 mm	Creciente por 0,01 mm	Ansteigend mit 0,01 mm
<b>H7</b>	Passing	Tolérance	Tolerancia	Passung
<b>≤0,003 -0,000 +0,003</b>	Tolerantie diameter	Tolérance diamètre	Tolerancia diámetro	Toleranz Durchmesser
<b>MT</b>	Ruimen van Morse Konus	Pour alésage cône morse	Para escariar mango cónico	Für reiben von Morsekegel

NL Ruimen  
FR Alésage  
ES Escariar  
DE Reibahlen





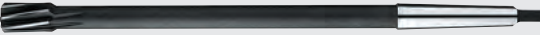

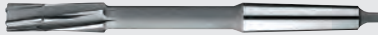






















**P** **K** Bij uitstek geschikt  
Très approprié  
**H** **N** Muy adecuado  
**M** **S** Ideal geeignet

**P** **K** Beperkt geschikt  
Approprié  
**H** **N** Adecuado  
**M** **S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

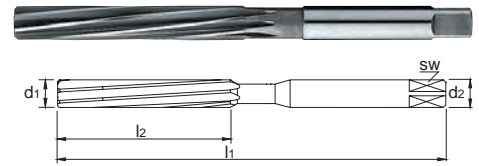
> 51.110	<b>Phantom</b>	HSS	DIN 206-B	H7	<b>P</b>	<b>K</b>	<b>N</b>			P. 3	
> 51.170	<b>Phantom</b>	HSS	DIN 206-B	H7	<b>P</b>	<b>K</b>	<b>N</b>			P. 3	
> 51.200	<b>HUNGER</b>	D			<b>P</b>	<b>K</b>	<b>N</b>			P. 4	
> 51.201	<b>HUNGER</b>	D								P. 4	
> 51.202	<b>HUNGER</b>	D								P. 4	
> 51.210	<b>HUNGER</b>	E			<b>P</b>	<b>K</b>	<b>N</b>			P. 5	
> 51.211	<b>HUNGER</b>	E								P. 5	
> 51.212	<b>HUNGER</b>	E								P. 5	
> 51.220	<b>HUNGER</b>	K			<b>P</b>	<b>K</b>	<b>N</b>			P. 6	
> 51.221	<b>HUNGER</b>	K								P. 6	
> 51.224	<b>HUNGER</b>	K								P. 6	
> 51.230	<b>HUNGER</b>	U			<b>P</b>	<b>K</b>	<b>N</b>			P. 7	
> 51.231	<b>HUNGER</b>	U								P. 7	
> 51.232	<b>HUNGER</b>	U								P. 7	
> 51.233	<b>HUNGER</b>	U								P. 7	
> 51.234	<b>HUNGER</b>	U								P. 8	
> 51.240	<b>HUNGER</b>	V			<b>P</b>	<b>K</b>	<b>N</b>			P. 8	
> 51.241	<b>HUNGER</b>	V								P. 8	
> 51.242	<b>HUNGER</b>	V								P. 8	
> 51.244	<b>HUNGER</b>	V								P. 9	
> 81.900										P. 9	
> 81.905										P. 9	
> 51.300	<b>Phantom</b>	HSS	DIN 212-C	H7		<b>K</b>	<b>N</b>			P. 10	
> 51.310	<b>Phantom</b>	HSS	DIN 212-B	H7	<b>P</b>	<b>K</b>	<b>N</b>			P. 10	
> 51.320	<b>Phantom</b>	+6.6 (	DIN 212-B	H7	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 10
> 51.324	<b>Phantom</b>	+6.6 (	DIN 212-B	H7	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 11
> 51.330	<b>Phantom</b>	MG HM	DIN 212-B	H7	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 11
> 51.334	<b>Phantom</b>	MG HM	DIN 212-B	H7	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 11
> 51.340	<b>Phantom</b>	+6.6 (	DIN 212-B	P7	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 12
> 51.350	<b>Phantom</b>	+6.6 (	DIN 212-B	x0,01	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 12
> 51.360	<b>Phantom</b>	MG HM	DIN 212-B	x0,01	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 13
> 51.400	<b>Phantom</b>	+6.6 (	NORM	H7	<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>		P. 13
> 51.420	<b>Phantom</b>	+6.6 (	DIN 212-E	H7	<b>P</b>			<b>N</b>		P. 13	

SC 1  
HSS-F 1  
2  
SC 3  
HSS-F 3  
4  
5

> 51.500	<b>Phantom</b>	HSS	DIN 208-A	H7		K	N		P. 14		
> 51.510	<b>Phantom</b>	HSS	DIN 208-B	H7	P	K	N		P. 14		
> 51.520	<b>Phantom</b>	+6.6 (	DIN 208-B	H7	P	M	K	N	S		P. 14
> 51.570	<b>Phantom</b>	+6.6 (	DIN 208-B	H7	P	M	K	N	S		P. 15
> 51.600	<b>Phantom</b>	+6.6 (	NORM	H7	P	M	K	N	S		P. 15
> 51.620	<b>Phantom</b>	+6.6 (	DIN 208-C	H7	P			N			P. 16
> 51.640	<b>Phantom</b>	HM-TIP	DIN 8094-B	H7	P	M	K	N	S		P. 16
> 51.645	<b>Phantom</b>	HM-TIP	DIN= 8051	H7	P	M	K	N	S		P. 16
> 51.650	<b>Phantom</b>	HSS	DIN 219-B	H7	P	K	N				P. 17
> 84.410	<b>Phantom</b>		DIN 217								P. 17
> 51.700	<b>Phantom</b>	HSS	DIN 311	k11	P	K	N				P. 17
> 51.720	<b>Phantom</b>	HSS	DIN 9-A	1:50		K	N				P. 18
> 51.730	<b>Phantom</b>	HSS	DIN 9-B	1:50	P	K	N				P. 18
> 51.760	<b>Phantom</b>	HSS	DIN 204	MT	P	K	N				P. 18
> 51.770	<b>Phantom</b>	HSS	NORM	1:10	P	K	N				P. 19
> 51.780	<b>Phantom</b>	HSS	NPT	1:16	P	K	N				P. 19
> 51.800	<b>Phantom</b>	HSS	DIN 2179	1:50	P	K	N				P. 19
> 51.810	<b>Phantom</b>	HSS	DIN 2180	1:50	P	K	N				P. 20
> 51.820	<b>Phantom</b>	+6.6 (	NORM	1:20	P	M	K	N	S		P. 20
> 51.830	<b>Phantom</b>	+6.6 (	NORM	1:20	P	M		N			P. 20
> 51.840	<b>Phantom</b>	+6.6 (	NORM	1:12,5	P	M	K	N	S		P. 21
> 51.850	<b>Phantom</b>	+6.6 (	NORM	1:12,5	P	M		N			P. 21
> 51.860	<b>Phantom</b>	+6.6 (	NORM	1:10	P	M	K	N	S		P. 21
> 51.870	<b>Phantom</b>	+6.6 (	NORM	1:10	P	M		N			P. 21
> 59.200	<b>HUNGER</b>	D			P	K	N				P. 22
> 59.210	<b>HUNGER</b>	E			P	K	N				P. 22
> 59.220	<b>HUNGER</b>	K			P	K	N				P. 22
> 59.230	<b>HUNGER</b>	U			P	K	N				P. 22
> 59.240	<b>HUNGER</b>	V			P	K	N				P. 23

➤ **51.110 Phantom**

NL HSS Handruimer H7  
 FR Alésoir à main HSS H7  
 ES Escariador mano HSS H7  
 DE HSS Handreibahle H7



HSS DIN 206-B H7

**P 11** ≤600 N/mm<sup>2</sup> **P 12** ≤850 N/mm<sup>2</sup> **P 13** ≤1000 N/mm<sup>2</sup> **K 31** GG **K 32** GGG GTS-GTW **N 41** Alu **N 51** Cu

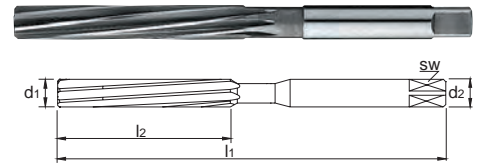
Ref.	d1	l1	l2	d2	sw
51.110.0200	2	50	25	2	1.6
51.110.0250	2.5	58	29	2.5	2
51.110.0300	3	62	31	3	2.24
51.110.0350	3.5	71	35	3.5	2.8
51.110.0400	4	76	38	4	3.15
51.110.0450	4.5	81	41	4.5	3.55
51.110.0500	5	87	44	5	4
51.110.0550	5.5	93	47	5.5	4.5
51.110.0600	6	93	47	6	4.5
51.110.0650	6.5	100	50	6.5	5
51.110.0700	7	107	54	7	5.6
51.110.0750	7.5	115	58	7.5	6.3
51.110.0800	8	115	58	8	6.3
51.110.0850	8.5	124	62	8.5	7.1
51.110.0900	9	124	62	9	7.1
51.110.0950	9.5	133	66	9.5	8
51.110.1000	10	133	66	10	8
51.110.1100	11	142	71	11	9

Ref.	d1	l1	l2	d2	sw
51.110.1200	12	152	76	12	10
51.110.1300	13	152	76	13	10
51.110.1400	14	163	81	14	11.2
51.110.1500	15	163	81	15	11.2
51.110.1600	16	175	87	16	12.5
51.110.1700	17	175	87	17	12.5
51.110.1800	18	188	93	18	14
51.110.1900	19	188	93	19	14
51.110.2000	20	201	100	20	16
51.110.2100	21	201	100	21	16
51.110.2200	22	215	107	22	18
51.110.2300	23	215	107	23	18
51.110.2400	24	231	115	24	20
51.110.2500	25	231	115	25	20
51.110.2600	26	231	115	26	20
51.110.2700	27	247	124	27	22.4
51.110.2800	28	247	124	28	22.4
51.110.2900	29	247	124	29	22.4

Ref.	d1	l1	l2	d2	sw
51.110.3000	30	247	124	30	22.4
51.110.3100	31	265	133	31	25
51.110.3200	32	265	133	32	25
51.110.3300	33	265	133	33	25
51.110.3400	34	284	142	34	28
51.110.3500	35	284	142	35	28
51.110.3600	36	284	142	36	28
51.110.3700	37	284	142	37	28
51.110.3800	38	305	152	38	31.5
51.110.3900	39	305	152	39	31.5
51.110.4000	40	305	152	40	31.5
51.110.4200	42	305	152	42	31.5
51.110.4400	44	326	163	44	35.5
51.110.4500	45	326	163	45	35.5
51.110.4600	46	326	163	46	35.5
51.110.4800	48	347	174	48	40
51.110.5000	50	347	174	50	40

➤ **51.170 Phantom**

NL HSS Handruimer H7  
 FR Alésoir à main HSS H7  
 ES Escariador mano HSS H7  
 DE HSS Handreibahle H7



HSS " inch DIN 206-B H7

**P 11** ≤600 N/mm<sup>2</sup> **P 12** ≤850 N/mm<sup>2</sup> **P 13** ≤1000 N/mm<sup>2</sup> **K 31** GG **K 32** GGG GTS-GTW **N 41** Alu **N 51** Cu

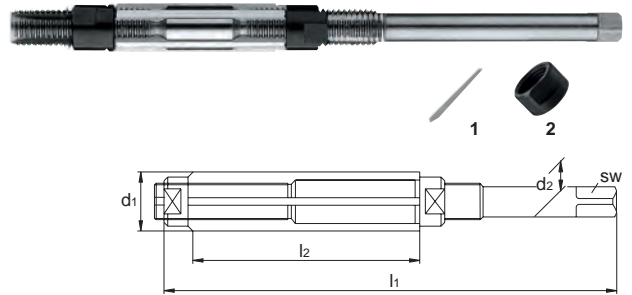
Ref.	d1	d1	l1	l2	d2	sw
51.170.0317	1/8	3.175	66	33	3.17	2.5
51.170.0476	3/16	4.762	87	44	4.76	4
51.170.0635	1/4	6.35	100	50	6.35	5
51.170.0794	5/16	7.937	115	58	7.94	6.3
51.170.0952	3/8	9.525	133	66	9.52	8
51.170.1032	13/32	10.319	133	66	10.32	8
51.170.1111	7/16	11.112	142	71	11.11	9
51.170.1270	1/2	12.7	152	76	12.7	10
51.170.1429	9/16	14.287	163	81	14.29	11.2
51.170.1588	5/8	15.875	175	87	15.88	12.5

Ref.	d1	d1	l1	l2	d2	sw
51.170.1746	11/16	17.462	201	100	17.46	14
51.170.1905	3/4	19.05	201	100	19.05	16
51.170.2063	13/16	20.637	201	100	20.63	16
51.170.2222	7/8	22.225	215	107	22.22	18
51.170.2381	15/16	23.812	231	115	23.81	10
51.170.2540	1	25.4	231	115	25.4	20
51.170.2698	1.1/16	26.988	247	124	26.98	22.4
51.170.2858	1.1/8	28.575	247	124	28.58	22.4
51.170.3175	1.1/4	31.75	265	133	31.75	25
51.170.3810	1.1/2	38.1	305	152	38.1	31.5



## > 51.200 HUNGER

NL HSS Verstelbare Handruimer type D  
 FR Alésoir expansible à main HSS type D  
 ES Escariador mano ajustable HSS tipo D  
 DE HSS Verstellbare Handreibahlen Typ D



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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Ref.	d1	l1	l2	z	d2	sw	1	2
51.200.0640	6,4-7,2	111	32	4	3,8	3	51.201.0640	51.202.0640
51.200.0720	7,2-8	111	32	4	4,25	3,5	51.201.0640	51.202.0700
51.200.0800	8-9	111	32	5	5,2	4,3	51.201.0800	51.202.0800
51.200.0900	9-10	115	32	5	5,6	4,3	51.201.0900	51.202.0900
51.200.1000	10-11	120	35	5	6,1	4,9	51.201.1000	51.202.1000
51.200.1100	11-12	125	35	5	7,4	6,2	51.201.1100	51.202.1100
51.200.1200	12-13,5	130	42	5	8,4	6,2	51.201.1200	51.202.1200
51.200.1350	13,5-15,5	145	50	5	9,4	7	51.201.1350	51.202.1350
51.200.1550	15,5-18	165	60	5	10,4	8	51.201.1550	51.202.1550
51.200.1800	18-21	180	65	5	11,4	9	51.201.1800	51.202.1800
51.200.2100	21-24	190	70	5	13,1	10	51.201.2100	51.202.2100
51.200.2400	24-27,5	205	75	5	14,1	11	51.201.2400	51.202.2400
51.200.2750	27,5-31,5	225	80	6	16,1	12	51.201.2750	51.202.2750
51.200.3150	31,5-37	240	90	6	18,1	14,5	51.201.3150	51.202.3150
51.200.3700	37-45	285	100	6	20,1	16	51.201.3700	51.202.3700
51.200.4500	45-55	320	109	6	25,1	20	51.201.4500	51.202.4500
51.200.5500	55-65	350	120	8	30,1	24	51.201.5500	51.202.5500
51.200.6500	65-80	460	145	10	38,5	29	51.201.6500	51.202.6500
51.200.8000	80-95	490	150	10	40,5	32	51.201.8000	51.202.8000
51.200.9500	95-110	490	150	10	45,4	36	51.201.9500	51.202.9500

## > 51.201 HUNGER

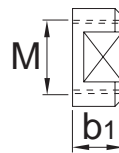
NL HSS Stel Reservemessen type D  
 FR Jeu de Lames de rechange HSS type D  
 ES Juego de cuchillas de recambio HSS tipo D  
 DE HSS Satz Ersatzmesser Typ D



Ref.	Ø mm	l2	Ref.	Ø mm	l2	Ref.	Ø mm	l2
51.201.0640	6,4-8	32	51.201.1550	15,5-18	60	51.201.4500	45-55	109
51.201.0800	8-9	32	51.201.1800	18-21	65	51.201.5500	55-65	120
51.201.0900	9-10	32	51.201.2100	21-24	70	51.201.6500	65-80	145
51.201.1000	10-11	35	51.201.2400	24-27,5	75	51.201.8000	80-95	150
51.201.1100	11-12	35	51.201.2750	27,5-31,5	80	51.201.9500	95-110	150
51.201.1200	12-13,5	42	51.201.3150	31,5-37	90			
51.201.1350	13,5-15,5	50	51.201.3700	37-45	100			

## > 51.202 HUNGER

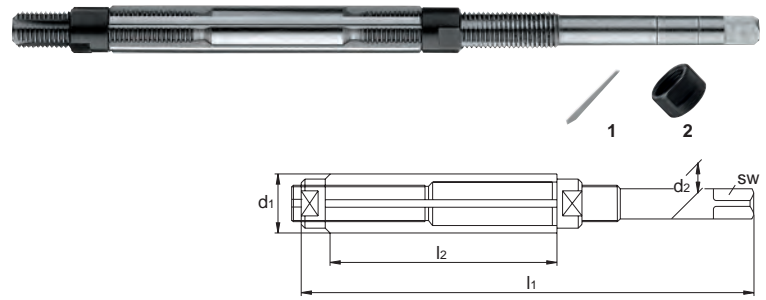
NL Reservemoer type D-K  
 FR Écrou de rechange type D-K  
 ES Tuerca de recambio tipo D-K  
 DE Ersatzmutter Typ D-K



Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M
51.202.0640	6,4-7,2	8	5x0,75	51.202.1350	13,5-15,5	10	11x1	51.202.3700	37-45	16	30x2
51.202.0700	7,2-8	8	5,75x1	51.202.1550	15,5-18	10	13x1	51.202.4500	45-55	16	36x2
51.202.0800	8-9	8	6,75x1	51.202.1800	18-21	11	15x1	51.202.5500	55-65	17	44x2
51.202.0900	9-10	8	7,5x1	51.202.2100	21-24	12	17x1,5	51.202.6500	65-80	20	55x2
51.202.1000	10-11	8,5	8x1	51.202.2400	24-27,5	13	19x1,5	51.202.8000	80-95	26	65x2
51.202.1100	11-12	9	9x1	51.202.2750	27,5-31,5	14	21x2	51.202.9500	95-110	26	75x2
51.202.1200	12-13,5	9	10x1	51.202.3150	31,5-37	15	25x2				

> **51.210 HUNGER**

NL HSS Verstelbare Handruimer extra lang, type E  
 FR Alésoir expansible à main HSS extra longue, type E  
 ES Escariador mano ajustable HSS extra larga, tipo E  
 DE HSS Verstellbare Handreibahlen extra lang, Typ E



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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Ref.	d1	l1	l2	z	d2	sw	1	2
51.210.1050	10,5-12	160	65	5	6,9	5,5	51.211.1050	51.212.1050
51.210.1200	12-13,5	170	70	5	8,4	6,2	51.211.1200	51.202.1200
51.210.1350	13,5-15,5	195	80	5	9,4	7	51.211.1350	51.202.1350
51.210.1550	15,5-17,5	215	90	5	10,4	8	51.211.1550	51.202.1550
51.210.1750	17,5-19,5	230	100	5	11,4	9	51.211.1750	51.212.1750
51.210.1950	19,5-21,5	240	110	5	13,1	10	51.211.1950	51.212.1950
51.210.2150	21,5-24,5	260	120	5	13,1	10	51.211.2150	51.202.2100
51.210.2450	24,5-27,5	280	130	5	14,1	11	51.211.2450	51.202.2400
51.210.2750	27,5-31,5	310	140	6	16,1	12	51.211.2750	51.202.2750
51.210.3150	31,5-37	320	150	6	18,1	14,5	51.211.3150	51.202.3150
51.210.3700	37-45	370	165	6	20,1	16	51.211.3700	51.202.3700
51.210.4500	45-55	425	180	6	25,1	20	51.211.4500	51.202.4500

> **51.211 HUNGER**

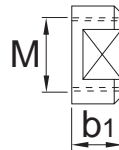
NL HSS Stel Reservemessen type E  
 FR Jeu de Lames de rechange HSS type E  
 ES Juego de cuchillas de recambio HSS tipo E  
 DE HSS Satz Ersatzmesser Typ E



Ref.	Ø mm	l2	Ref.	Ø mm	l2	Ref.	Ø mm	l2
51.211.1050	10,5-12	65	51.211.1750	17,5-19,5	100	51.211.2750	27,5-31,5	140
51.211.1200	12-13,5	70	51.211.1950	19,5-21,5	110	51.211.3150	31,5-37	150
51.211.1350	13,5-15,5	80	51.211.2150	21,5-24,5	120	51.211.3700	37-45	165
51.211.1550	15,5-17,5	90	51.211.2450	24,5-27,5	130	51.211.4500	45-55	180

> **51.212 HUNGER**

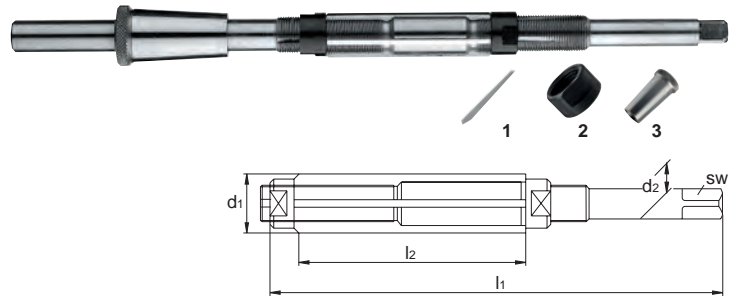
NL Reservemoer type E, (overige maten: 51.202)  
 FR Écrou de rechange type E, (autres dimensions: 51.202)  
 ES Tuerca de recambio tipo E, (otros tamaños: 51.202)  
 DE Ersatzmutter Typ E, (übrige Abmessungen: 51.202)



Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M
51.212.1050	10,5-12	9	8,25x1	51.212.1750	17,5-19,5	11	14x1	51.212.1950	19,5-21,5	11	16x1,5

## > 51.220 HUNGER

NL HSS Verstelbare Handruimer type K, enkelvoudige geleiding  
 FR Alésoir expansible à main HSS type K, guidage simple  
 ES Escariador mano ajustable HSS tipo K, guía simple  
 DE HSS Verstellbare Handreibahlen Typ K, einseitiger Führung



<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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Ref.	d1	l1	l2	z	d2	sw	1	2	3
51.220.0700	7-8	175	32	4	4.25	3.5	51.221.0700	51.202.0700	51.224.0700
51.220.0800	8-9	175	32	5	5.2	4.3	51.221.0800	51.202.0800	51.224.0800
51.220.0900	9-10	175	32	5	5.6	4.3	51.221.0900	51.202.0900	51.224.0900
51.220.1000	10-11	185	35	5	6.1	4.9	51.221.1000	51.202.1000	51.224.1000
51.220.1100	11-12	195	35	5	7.4	6.2	51.221.1100	51.202.1100	51.224.1100
51.220.1200	12-13,5	215	42	5	8.4	6.2	51.221.1200	51.202.1200	51.224.1200
51.220.1350	13,5-15,5	235	50	5	9.4	7	51.221.1350	51.202.1350	51.224.1350
51.220.1550	15,5-18	265	60	5	10.4	8	51.221.1550	51.202.1550	51.224.1550
51.220.1800	18-21	290	65	5	11.4	9	51.221.1800	51.202.1800	51.224.1800
51.220.2100	21-24	310	70	5	13.1	10	51.221.2100	51.202.2100	51.224.2100
51.220.2400	24-27,5	335	75	5	14.1	11	51.221.2400	51.202.2400	51.224.2400
51.220.2750	27,5-31,5	365	80	6	16.1	12	51.221.2750	51.202.2750	51.224.2750
51.220.3150	31,5-37	400	90	6	18.1	14,5	51.221.3150	51.202.3150	51.224.3150
51.220.3700	37-45	465	100	6	20.1	16	51.221.3700	51.202.3700	51.224.3700
51.220.4500	45-55	530	109	6	25.1	20	51.221.4500	51.202.4500	51.224.4500
51.220.5500	55-65	570	120	8	30.1	24	51.221.5500	51.202.5500	51.224.5500
51.220.6500	65-80	670	145	10	38.5	29	51.221.6500	51.202.6500	51.224.6500
51.220.8000	80-95	700	150	10	40.5	32	51.221.8000	51.202.8000	51.224.8000
51.220.9500	95-110	700	150	10	45.4	36	51.221.9500	51.202.9500	51.224.9500

## > 51.221 HUNGER

NL HSS Stel Reservemessen type K, (overige maten: 51.201)  
 FR Jeu de Lames de rechange HSS type K, (autres dimensions: 51.201)  
 ES Juego de cuchillas de recambio HSS tipo K, (otros tamaños: 51.201)  
 DE HSS Satz Ersatzmesser Typ K, (übrige Abmessungen: 51.201)



Ref.	Ø mm	l2	Ref.	Ø mm	l2	Ref.	Ø mm	l2
51.221.0700	7-8	32	51.221.1350	13,5-15,5	50	51.221.3150	31,5-37	90
51.221.0800	8-9	32	51.221.1550	15,5-18	60	51.221.3700	37-45	100
51.221.0900	9-10	32	51.221.1800	18-21	65	51.221.4500	45-55	109
51.221.1000	10-11	35	51.221.2100	21-24	70	51.221.5500	55-65	120
51.221.1100	11-12	35	51.221.2400	24-27,5	75			
51.221.1200	12-13,5	42	51.221.2750	27,5-31,5	80			

## > 51.224 HUNGER

NL Geleidebus type K  
 FR Bague de guidage type K  
 ES Anillo de guía tipo K  
 DE Führungsbüchsen Typ K

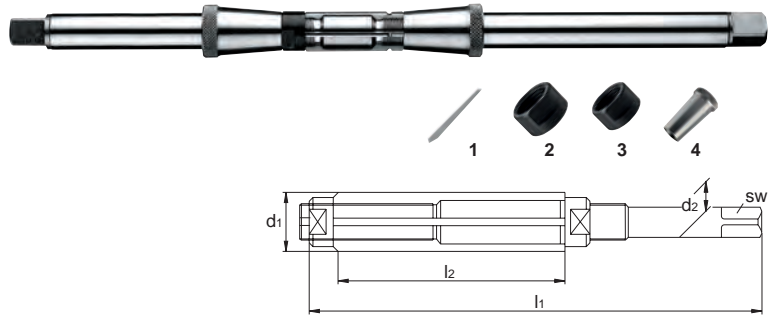


Ref.	Ø mm	Ref.	Ø mm	Ref.	Ø mm
51.224.0700	7-8	51.224.1550	15,5-18	51.224.4500	45-55
51.224.0800	8-9	51.224.1800	18-21	51.224.5500	55-65
51.224.0900	9-10	51.224.2100	21-24	51.224.6500	65-80
51.224.1000	10-11	51.224.2400	24-27,5	51.224.8000	80-95
51.224.1100	11-12	51.224.2750	27,5-31,5	51.224.9500	95-110
51.224.1200	12-13,5	51.224.3150	31,5-37		
51.224.1350	13,5-15,5	51.224.3700	37-45		



> **51.230 HUNGER**

NL HSS Verstelbare Handruimer type U, dubbele geleiding  
 FR Alésoir expansible à main HSS type U, guidage double  
 ES Escariador mano ajustable HSS tipo U, guía doble  
 DE HSS Verstellbare Handreibahlen Typ U, doppelter führung



<b>P 11</b> S600 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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Ref.	d1	l1	l2	z	d2	sw	1	2	3	4
51.230.1200	12-13,5	250	30	5	10.3	8	51.231.1200	51.232.1200	51.233.1200	51.234.1200
51.230.1350	13,5-15,5	270	33	5	11.8	9	51.231.1350	51.232.1350	51.202.1350	51.234.1350
51.230.1550	15,5-18	295	36	5	13.8	10	51.231.1550	51.232.1550	51.233.1550	51.234.1550
51.230.1800	18-19,5	330	40	5	16.3	12	51.231.1800	51.232.1800	51.233.1800	51.234.1800
51.230.1950	19,5-21	352	44	5	17.8	13	51.231.1950	51.232.1950	51.202.1950	51.234.1950
51.230.2100	21-24,5	352	44	5	18.8	13	51.231.2100	51.232.2100	51.233.2100	51.234.2100
51.230.2450	24,5-29	385	48	6	21.8	13	51.231.2450	51.232.2450	51.233.2450	51.234.2450
51.230.2900	29-34	418	52	6	24.8	16	51.231.2900	51.232.2900	51.233.2900	51.234.2900
51.230.3400	34-39	440	54	6	29.8	18	51.231.3400	51.232.3400	51.233.3400	51.234.3400
51.230.3900	39-45	475	60	6	32.8	18	51.231.3900	51.232.3900	51.233.3900	51.234.3900
51.230.4500	45-52	500	60	6	37.8	18	51.231.4500	51.232.4500	51.233.4500	51.234.4500
51.230.5200	52-59	500	60	6	39.8	18	51.231.4500	51.232.5200	51.233.5200	51.234.5200
51.230.5900	59-66	500	60	6	39.8	18	51.231.4500	51.232.5900	51.233.5900	51.234.5900

> **51.231 HUNGER**

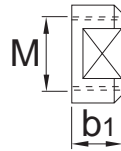
NL HSS Stel Reservemessen type U  
 FR Jeu de Lames de rechange HSS type U  
 ES Juego de cuchillas de recambio HSS tipo U  
 DE HSS Satz Ersatzmesser Typ U



Ref.	Ø mm	l2	Ref.	Ø mm	l2	Ref.	Ø mm	l2
51.231.1200	12-13,5	30	51.231.1950	19,5-22,5	44	51.231.3400	34-39	54
51.231.1350	13,5-15,5	33	51.231.2100	21-24,5	44	51.231.3900	39-45	60
51.231.1550	15,5-18	36	51.231.2450	24,5-29	48	51.231.4500	45-52/59-66	60
51.231.1800	18-21	40	51.231.2900	29-34	52			

> **51.232 HUNGER**

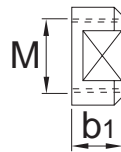
NL Reservemoer type U, groot  
 FR Écrou de rechange type U, grand  
 ES Tuerca de recambio tipo U, grande  
 DE Ersatzmutter Typ U, groß



Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M
51.232.1200	12-13,5	9	10x1	51.232.2100	21-24,5	12	17x1,5	51.232.4500	45-52	16	36x2
51.232.1350	13,5-15,5	10	11x1	51.232.2450	24,5-29	13	20x1,5	51.232.5200	52-59	15	39x2
51.232.1550	15,5-18	10	13x1	51.232.2900	29-34	14	24x2	51.232.5900	59-66	15	50x2
51.232.1800	18-21	11	15x1	51.232.3400	34-39	14,5	28x2				
51.232.1950	19,5-22,5	11	16x1	51.232.3900	39-45	15	31x2				

> **51.233 HUNGER**

NL Reservemoer type U, klein, met schaalverdeling, (overige maten: 51.202)  
 FR Écrou de rechange type U, petit, avec graduation, (autres dimensions: 51.202)  
 ES Tuerca de recambio tipo U, pequeño, con graduaciones, (otros tamaños: 51.202)  
 DE Ersatzmutter Typ U, klein, mit Skala, (übrige Abmessungen: 51.202)



Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M	Ref.	Ø mm	b1	M
51.233.1200	12-13,5	8,5	9x1	51.233.2450	24,5-29	12	19x1,5	51.233.4500	45-52	16	36x2
51.233.1550	15,5-18	9,5	12x1	51.233.2900	29-34	13	21x2	51.233.5200	52-59	15	39x2
51.233.1800	18-21	10,5	14x1	51.233.3400	34-39	14	26x2				
51.233.2100	21-24,5	11	16x1,5	51.233.3900	39-45	14,5	28x2				

## > 51.234 HUNGER

NL Geleidebus type U  
FR Bague de guidage type U  
ES Anillo de guía tipo U  
DE Führungsbüchsen Typ U



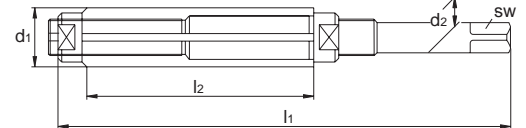
Ref.	Ø mm
51.234.1200	12-13,5
51.234.1350	13,5-15,5
51.234.1550	15,5-18
51.234.1800	18-21
51.234.1950	19,5-22,5

Ref.	Ø mm
51.234.2100	21-24,5
51.234.2450	24,5-29
51.234.2900	29-34
51.234.3400	34-39
51.234.3900	39-45

Ref.	Ø mm
51.234.4500	45-52
51.234.5200	52-59
51.234.5900	59-66

## > 51.240 HUNGER

NL HSS Verstelbare Handruimer type V, klepgeleideruimer  
FR Alésoir expansible à main HSS type V, pour guide de soupapes  
ES Escariador mano ajustable HSS tipo V, para guías de válvulas  
DE HSS Verstellbare Handreibahlen Typ V, für Ventilführungen



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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Ref.	d1	l1	l2	z	d2	sw	1	2	3
51.240.0540	5,4-6	160	28	3	5,3	4	51.241.0540	51.242.0540	51.244.0540
51.240.0590	5,9-6,5	160	28	3	5,6	4,3	51.241.0590	51.202.0640	51.244.0590
51.240.0640	6,4-7	160	28	3	6,1	4,9	51.241.0640	51.242.0640	51.244.0640
51.240.0690	6,9-7,5	160	28	3	6,6	5,5	51.241.0690	51.202.0700	51.244.0690
51.240.0740	7,4-8	165	28	3	7,1	5,5	51.241.0740	51.242.0740	51.244.0740
51.240.0790	7,9-8,5	170	28	3	7,6	6,2	51.241.0790	51.202.0800	51.244.0790
51.240.0840	8,4-9	175	28	3	8,1	6,2	51.241.0840	51.242.0840	51.244.0840
51.240.0890	8,9-9,5	180	32	4	8,6	7	51.241.0890	51.242.0890	51.244.0890
51.240.0940	9,4-10	190	32	4	9,1	7	51.241.0940	51.242.0940	51.244.0940
51.240.0990	9,9-11	200	36	5	9,6	8	51.241.0990	51.242.0990	51.244.0990
51.240.1090	10,9-12	220	36	5	10,5	8	51.241.1090	51.242.1090	51.244.1090

## > 51.241 HUNGER

NL HSS Stel Reservemessen type V  
FR Jeu de Lames de rechange HSS type V  
ES Juego de cuchillas de recambio HSS tipo V  
DE HSS Satz Ersatzmesser Typ V



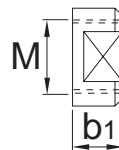
Ref.	Ø mm	l2
51.241.0540	5,4-6	28
51.241.0590	5,9-6,5	28
51.241.0640	6,4-7	28
51.241.0690	6,9-7,5	28

Ref.	Ø mm	l2
51.241.0740	7,4-8	28
51.241.0790	7,9-8,5	28
51.241.0840	8,4-9	28
51.241.0890	8,9-9,5	32

Ref.	Ø mm	l2
51.241.0940	9,4-10	32
51.241.0990	9,9-11	36
51.241.1090	10,9-12	36

## > 51.242 HUNGER

NL Reservemoer type V, (overige maten: 51.202)  
FR Écrou de rechange type V, (autres dimensions: 51.202)  
ES Tuerca de recambio tipo V, (otros tamaños: 51.202)  
DE Ersatzmutter Typ V, (übrige Abmessungen: 51.202)



Ref.	Ø mm	b1	M
51.242.0540	5,4-6	8	4,5x0,75
51.242.0640	6,4-7	8	5,5x0,75
51.242.0740	7,4-8	8	5,5x0,75

Ref.	Ø mm	b1	M
51.242.0840	8,4-9	8	7,25x1
51.242.0890	8,9-9,5	8,5	7,25x1
51.242.0940	9,4-10	8,5	7,75x1

Ref.	Ø mm	b1	M
51.242.0990	9,9-11	9	8,25x1
51.242.1090	10,9-12	9	8,75x1

► **51.244 HUNGER**

NL Geleidebus type V  
 FR Bague de guidage type V  
 ES Anillo de guía tipo V  
 DE Führungsbüchsen Typ V



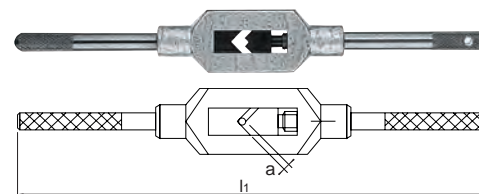
Ref.	Ø mm
51.244.0540	5,4-6
51.244.0590	5,9-6,5
51.244.0640	6,4-7
51.244.0690	6,9-7,5

Ref.	Ø mm
51.244.0740	7,4-8
51.244.0790	7,9-8,5
51.244.0840	8,4-9
51.244.0890	8,9-9,5

Ref.	Ø mm
51.244.0940	9,4-10
51.244.0990	9,9-11
51.244.1090	10,9-12

► **81.900**

NL Verstelbaar Wringijzer, standaard kwaliteit, Zink-legering  
 FR Tourne à gauche expansible, qualité standard, alliage de zinc  
 ES Giramacho extensible, calidad estándar, aleación de cinc  
 DE Verstellbare Windeisen, Standard-Qualität, Zinkdruckgu



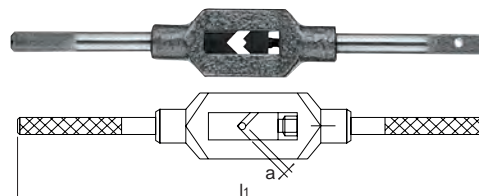
DIN  
 1814

Ref.	Nr.	M	BSW	BSP	l1	a
81.900.0000	0	M1-M8	1/16-1/4	-	125	2,1-4,9
81.900.0100	1	M1-M10	1/16-3/8	1/8	180	2,1-5,5
81.900.0150	1,5	M1-M12	1/16-1/2	1/8	200	2,1-7
81.900.0200	2	M3,5-M12	5/32-1/2	1/8	280	3-8

Ref.	Nr.	M	BSW	BSP	l1	a
81.900.0300	3	M5-M20	7/32-3/4	1/8-1/2	375	4,9-12
81.900.0400	4	M11-M27	7/16-1	1/4-3/4	500	6,2-16
81.900.0500	5L	M13-M32	1/2-1.1/4	1/4-1	750	7-20

► **81.905**

NL Verstelbaar Wringijzer, extra kwaliteit, staal  
 FR Tourne à gauche expansible, qualité supérieure, acier  
 ES Giramacho extensible, calidad superior, acero  
 DE Verstellbare Windeisen, Extra-Qualität, Stahl



DIN  
 1814

Ref.	Nr.	M	BSW	BSP	l1	a
81.905.0000	0	M1-M8	1/16-1/4	-	130	2,1-4,9
81.905.0100	1	M1-M10	1/16-3/8	1/8	180	2,1-5,5
81.905.0150	1,5	M1-M12	1/16-1/2	1/8	200	2,1-7
81.905.0200	2	M3,5-M12	5/32-1/2	1/8	280	3-8
81.905.0300	3	M5-M20	7/32-3/4	1/8-1/2	375	4,9-12

Ref.	Nr.	M	BSW	BSP	l1	a
81.905.0400	4	M11-M27	7/16-1	1/4-3/4	500	6,2-16
81.905.0500	5S	M13-M32	1/2-1.1/4	1/4-1	750	7-20
81.905.0600	6L	M18-M42	3/4-1.1/2	1/2-1.1/4	1000	11-24
81.905.0800	8	M25-M64	1-2.1/2	3/4-3	1250	16-40



**> 51.300 Phantom**

NL HSS Machineruimer H7, rechte groeven  
 FR Alésoir machine HSS H7, goujures droites  
 ES Escariador máquina HSS H7, canales rectas  
 DE HSS Maschinenreibahlen H7, gerade Nuten

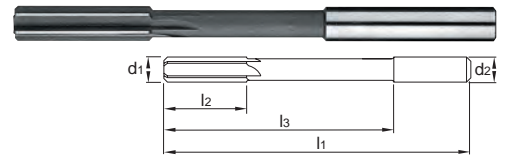
HSS DIN 212 A/C h9 H7

K 31 GG K 32 GGG GTS-GTW N 51 Cu

4-5 C 6-15 D 12-20 D

Ref.	d1	l1	l2	l3	z	d2
51.300.0400	4	75	19	32	6	4
51.300.0450	4.5	80	21	33	6	4.5
51.300.0500	5	86	23	34	6	5
51.300.0550	5.5	93	26	36	6	5.6
51.300.0600	6	93	26	36	6	5.6
51.300.0650	6.5	101	28	38	6	6.3

Ref.	d1	l1	l2	l3	z	d2
51.300.0700	7	109	31	40	6	7.1
51.300.0800	8	117	33	42	6	8
51.300.0900	9	125	36	44	6	9
51.300.1000	10	133	38	46	6	10
51.300.1100	11	142	41	46	8	10
51.300.1200	12	151	44	46	8	10



**> 51.310 Phantom**

NL HSS Machineruimer H7  
 FR Alésoir machine HSS H7  
 ES Escariador máquina HSS H7  
 DE HSS Maschinenreibahlen H7

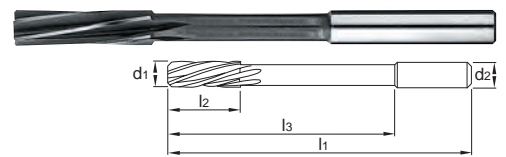
HSS DIN 212 B/D h9 H7

P 11 s800 N/mm² P 12 s850 N/mm² P 13 s1000 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu

10-15 E 8-15 D 4-5 C 4-5 C 6-15 D 30-50 F 12-20 D

Ref.	d1	l1	l2	l3	z	d2
51.310.0400	4	75	19	47	6	4
51.310.0450	4.5	80	21	52	6	4.5
51.310.0500	5	86	23	58	6	5
51.310.0550	5.5	93	26	58	6	5.6
51.310.0600	6	93	26	58	6	5.6
51.310.0650	6.5	101	28	65	6	6.3
51.310.0700	7	109	31	73	6	7.1

Ref.	d1	l1	l2	l3	z	d2
51.310.0800	8	117	33	81	6	8
51.310.0900	9	125	36	85	6	9
51.310.1000	10	133	38	93	6	10
51.310.1100	11	142	41	102	8	10
51.310.1200	12	151	44	111	8	10
51.310.1300	13	151	44	111	8	10
51.310.1400	14	160	47	117	8	12.5



**> 51.320 Phantom**

NL HSS-E Machineruimer H7  
 FR Alésoir machine HSS-E H7  
 ES Escariador máquina HSS-E H7  
 DE HSS-E Maschinenreibahlen H7

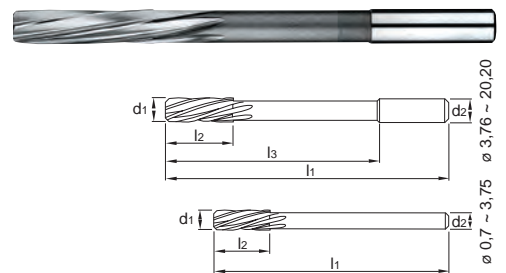
+6 ( DIN 212 B/D h8 H7

P 11 s800 N/mm² P 12 s850 N/mm² P 13 s1000 N/mm² P 14 s1400 N/mm² M 21 INOX s850N/mm² M 22 INOX >850N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu S 71 Ni/Co S 72 Ti

15-22 E 12-17 D 7-10 C 5-7 B 4-6 A 3-5 A 4-5 C 6-15 D 25-35 G 20-30 G 12-17 D 2-3 A 2-3 A

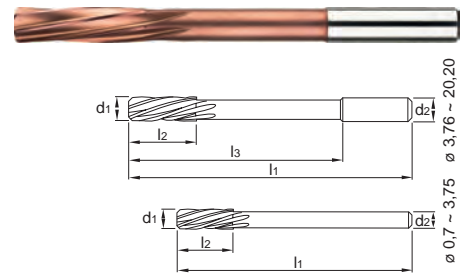
Ref.	d1	l1	l2	l3	z	d2
51.320.0100	1	40	5		4	1
51.320.0150	1.5	40	8		6	1.5
51.320.0200	2	49	11		6	2
51.320.0250	2.5	57	14		6	2.5
51.320.0300	3	61	15		6	3
51.320.0350	3.5	70	18		6	3.5
51.320.0400	4	75	19	47	6	4
51.320.0450	4.5	80	21	52	6	4.5
51.320.0500	5	86	23	58	6	5
51.320.0550	5.5	93	26	58	6	5.6

Ref.	d1	l1	l2	l3	z	d2
51.320.0600	6	93	26	58	6	5.6
51.320.0650	6.5	101	28	65	6	6.3
51.320.0700	7	109	31	73	6	7.1
51.320.0750	7.5	109	31	73	6	7.1
51.320.0800	8	117	33	81	6	8
51.320.0850	8.5	117	33	81	6	8
51.320.0900	9	125	36	85	6	9
51.320.0950	9.5	125	36	85	6	9
51.320.1000	10	133	38	93	6	10
51.320.1050	10.5	133	38	93	6	10



> **51.324 Phantom**

NL HSS-E Machineruimer AICrN-X, H7  
 FR Alésoir machine HSS-E AICrN-X, H7  
 ES Escariador máquina HSS-E AICrN-X, H7  
 DE HSS-E Maschinenreibahlen AICrN-X, H7



+6 E ( AICrN-X DIN 212 B/D h8 H7

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A

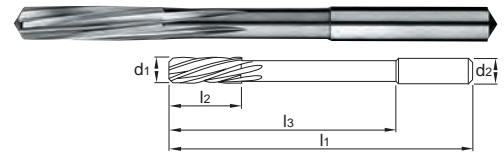
Ref.	d1	l1	l2	l3	z	d2
51.324.0100	1	40	5		4	1
51.324.0150	1.5	40	8		6	1.5
51.324.0200	2	49	11		6	2
51.324.0250	2.5	57	14		6	2.5
51.324.0300	3	61	15		6	3

Ref.	d1	l1	l2	l3	z	d2
51.324.0400	4	75	19	47	6	4
51.324.0500	5	86	23	58	6	5
51.324.0600	6	93	26	58	6	5.6
51.324.0700	7	109	31	73	6	7.1
51.324.0800	8	117	33	81	6	8

Ref.	d1	l1	l2	l3	z	d2
51.324.0900	9	125	36	85	6	9
51.324.1000	10	133	38	93	6	10
51.324.1200	12	151	44	111	6	10

> **51.330 Phantom**

NL VHM Machineruimer H7  
 FR Alésoir machine Carbure H7  
 ES Escariador máquina MD H7  
 DE VHM Maschinenreibahlen H7



MG HM DIN 212 B/D h8 H7

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
25-40 E	20-25 D	12-18 C	10-15 B	8-14 A	7-12 A	8-15 C	15-20 D	50-60 G	40-60 G	20-30 D	6-10 A	6-10 A

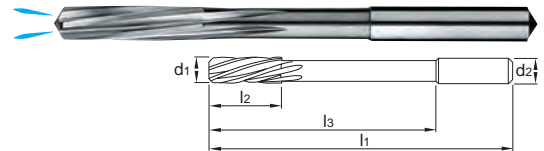
Ref.	d1	l1	l2	l3	d2
51.330.0100	1	40	8	22	1
51.330.0150	1.5	40	8	24	1.5
51.330.0200	2	49	11	31	2
51.330.0250	2.5	57	14	38	2.5

Ref.	d1	l1	l2	l3	d2
51.330.0300	3	61	15	38	3
51.330.0400	4	75	19	51	4
51.330.0500	5	86	23	60	5
51.330.0600	6	93	26	73	6

Ref.	d1	l1	l2	l3	d2
51.330.0800	8	117	33	86	8
51.330.1000	10	133	38	99	10
51.330.1200	12	151	44	106	12
51.330.1400	14	160	47	110	14

> **51.334 Phantom**

NL VHM Machineruimer H7, met koelkanaal  
 FR Alésoir machine Carbure H7, à trou d'huile  
 ES Escariador máquina MD H7, con canal de refrigeración  
 DE VHM Maschinenreibahlen H7, mit Innenkühlung



MG HM DIN 212 B/D h6 H7

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
25-40 E	20-25 D	12-18 C	10-15 B	8-14 A	7-12 A	8-15 C	15-20 D	50-60 G	40-60 G	20-30 D	6-10 A	6-10 A

Ref.	d1	l1	l2	l3	d2
51.334.0400	4	75	19	51	4
51.334.0500	5	86	23	60	5

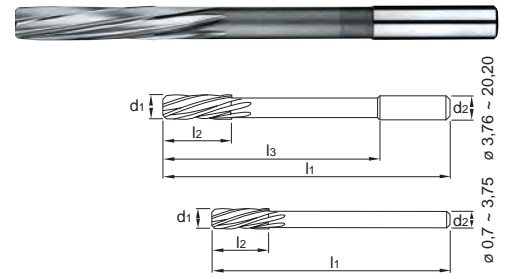
Ref.	d1	l1	l2	l3	d2
51.334.0600	6	93	26	73	6
51.334.0800	8	117	33	86	8

Ref.	d1	l1	l2	l3	d2
51.334.1000	10	133	38	99	10
51.334.1200	12	151	44	106	12



> 51.340 Phantom

NL HSS-E Machineruimer passing P7  
 FR Alésoir machine HSS-E tolérance P7  
 ES Escariador máquina HSS-E tolerancia P7  
 DE HSS-E Maschinenreibahlen Passung P7



+6 6 ( DIN 212 B/D h8 P7

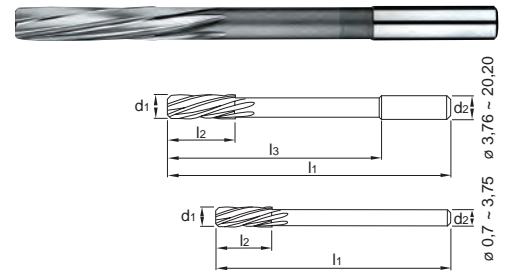
<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
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15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A
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Ref.	d1	l1	l2	l3	z	d2	Ref.	d1	l1	l2	l3	z	d2	Ref.	d1	l1	l2	l3	z	d2
51.340.0100	1	40	5		4	1	51.340.0700	7	109	31	73	6	7.1	51.340.1300	13	151	44	111	6	10
51.340.0200	2	49	11		6	2	51.340.0800	8	117	33	81	6	8	51.340.1400	14	160	47	117	8	12.5
51.340.0300	3	61	15		6	3	51.340.0900	9	125	36	85	6	9	51.340.1500	15	162	50	117	8	12.5
51.340.0400	4	75	19	47	6	4	51.340.1000	10	133	38	93	6	10	51.340.1600	16	170	52	125	8	12.5
51.340.0500	5	86	23	58	6	5	51.340.1100	11	142	41	102	6	10	51.340.1800	18	182	56	137	8	14
51.340.0600	6	93	26	58	6	5.6	51.340.1200	12	151	44	111	6	10	51.340.2000	20	195	60	147	8	16

> 51.350 Phantom

NL HSS-E Precisie Machineruimer x 0,01 mm  
 FR Alésoir machine de précision HSS-E x 0,01 mm  
 ES Escariador máquina de precisión HSS-E x 0,01 mm  
 DE HSS-E Präzisions Maschinenreibahlen x 0,01 mm



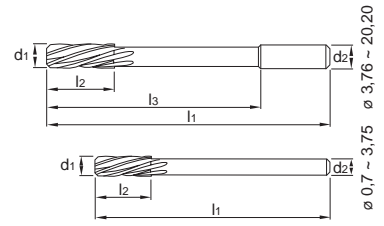
+6 6 ( DIN 212 B/D h8 x0,01 ≤ø3 -0,000 +0,003 ≤ø6 -0,000 +0,004 >ø6 -0,000 +0,005

<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
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15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A
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Ref.	d1	d2	l1	l2	l3	z	Ref.	d1	d2	l1	l2	l3	z
51.350.0070-51.350.0079	0.70 - 0.79	0.70 - 0.79	33	5		4	51.350.0581-51.350.0600	5.81 - 6.00	5.6	93	26	58	6
51.350.0080-51.350.0105	0.80 - 1.05	0.80 - 1.05	38	5		4	51.350.0601-51.350.0670	6.01 - 6.70	6.3	101	28	65	6
51.350.0106-51.350.0150	1.06 - 1.50	1.06 - 1.50	40	7		6	51.350.0671-51.350.0750	6.71 - 7.50	7.1	109	31	73	6
51.350.0151-51.350.0155	1.51 - 1.55	1.51 - 1.55	43	9		6	51.350.0751-51.350.0850	7.51 - 8.50	8	117	33	81	6
51.350.0156-51.350.0170	1.56 - 1.70	1.56 - 1.70	43	9		6	51.350.0851-51.350.0949	8.51 - 9.49	9	125	36	85	6
51.350.0171-51.350.0179	1.51 - 1.79	1.51 - 1.79	46	10		6	51.350.0950-51.350.1060	9.50 - 10.60	10	133	38	93	6
51.350.0180-51.350.0190	1.80 - 1.90	1.80 - 1.90	46	10		6	51.350.1061-51.350.1180	10.61 - 11.80	10	142	41	102	6
51.350.0191-51.350.0212	1.81 - 2.12	1.81 - 2.12	49	11		6	51.350.1181-51.350.1320	11.81 - 13.20	10	151	44	111	6
51.350.0213-51.350.0236	2.13 - 2.36	2.13 - 2.36	53	12		6	51.350.1321-51.350.1396	13.21 - 13.96	12.5	162	50	115	6
51.350.0237-51.350.0265	2.37 - 3.65	2.37 - 3.65	57	14		6	51.350.1397-51.350.1500	13.97 - 15.00	12.5	162	50	117	6
51.350.0266-51.350.0300	2.66 - 3.00	2.66 - 3.00	61	15		6	51.350.1501-51.350.1600	15.01 - 16.00	12.5	170	52	125	8
51.350.0301-51.350.0335	3.01 - 3.35	3.01 - 3.35	65	16		6	51.350.1601-51.350.1620	16.01 - 16.20	12.5	175	54	130	8
51.350.0336-51.350.0375	3.36 - 3.75	3.36 - 3.75	70	18		6	51.350.1697-51.350.1700	16.97 - 17.00	14	175	54	130	8
51.350.0376-51.350.0425	3.76 - 4.25		75	19	47	6	51.350.1701-51.350.1800	17.01 - 18.00	14	182	56	137	8
51.350.0426-51.350.0475	4.26 - 4.75	4.5	80	21	52	6	51.350.1801-51.350.1900	18.01 - 19.00	16	189	58	141	8
51.350.0476-51.350.0530	4.76 - 5.30	5	86	23	58	6	51.350.1905-51.350.2020	19.05 - 20.20	16	195	60	147	8
51.350.0531-51.350.0580	5.31 - 5.80	5.6	93	26	58	6							

> **51.360 Phantom**



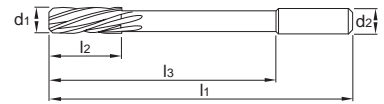
NL VHM Precisie Machineruimer x 0,01 mm  
 FR Alésoir machine de précision Carbure x 0,01 mm  
 ES Escariador máquina de precisión MD x 0,01 mm  
 DE VHM Präzisions Maschinenreibahlen x 0,01 mm

<b>MG HM</b>	<b>DIN 212 B/D</b>	<b>h6</b>	<b>x0,01</b>	<b>≤ø3 -0,000 +0,003</b>	<b>≤ø6 -0,000 +0,004</b>	<b>&gt;ø6 -0,000 +0,005</b>						
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
25-40 E	20-25 D	12-18 C	10-15 B	8-14 A	7-12 A	8-15 C	15-20 D	50-60 G	40-60 G	20-30 D	6-10 A	6-10 A

Ref.	d1	d2	l1	l2	l3	z	Ref.	d1	d2	l1	l2	l3	z
51.360.0070-51.360.0079	0.70 - 0.79	0.7-0.79	33	7		4	51.360.0756-51.360.0855	7.56 - 8.55	8	117	33	86	6
51.360.0080-51.360.0105	0.80 - 1.05	0.8-1.05	38	7		4	51.360.0856-51.360.0955	8.60 - 9.55	9	125	36	91	6
51.360.0106-51.360.0155	1.06 - 1.55	1.06-1.55	40	10		6	51.360.0956-51.360.1130	9.56 - 11.30	10	133	38	99	6
51.360.0156-51.360.0179	1.56 - 1.79	1.56-1.79	43	11		6	51.360.1131-51.360.1305	11.31 - 13.05	12	151	44	106	6
51.360.0180-51.360.0236	1.80 - 2.36	1.8-2.36	49	12		6	51.360.1397-51.360.1405	13.97 - 14.05	14	160	47	110	8
51.360.0237-51.360.0375	2.37 - 3.75	2.37-3.75	57	18		6	51.360.1497-51.360.1505	14.97 - 15.05	14	162	50	112	8
51.360.0376-51.360.0425	3.76 - 4.25	4	75	19	51	6	51.360.1597-51.360.1605	15.97 - 16.05	16	170	52	117	8
51.360.0426-51.360.0475	4.26 - 4.75	4.5	80	21	55	6	51.360.1697-51.360.1705	16.97 - 17.05	16	175	54	122	8
51.360.0476-51.360.0530	4.76 - 5.30	5	86	23	60	6	51.360.1797-51.360.1805	17.97 - 18.05	16	182	56	129	8
51.360.0535-51.360.0580	5.35 - 5.80	5.5	93	27	66	6	51.360.1897-51.360.1905	18.97 - 19.05	16	189	58	136	8
51.360.0581-51.360.0670	5.81 - 6.70	6	101	28	73	6	51.360.1997-51.360.2005	19.97 - 20.05	16	195	60	142	8
51.360.0671-51.360.0755	6.71 - 7.55	7	109	31	80	6							

> **51.400**

NL HSS-E Machineruimer H7, extra lang  
 FR Alésoir machine HSS-E H7, extra longue  
 ES Escariador máquina HSS-E H7, extra larga  
 DE HSS-E Maschinenreibahlen H7, extra lang

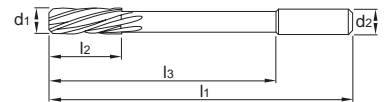


<b>+6 E</b>	<b>NORM</b>	<b>h8</b>	<b>H7</b>									
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A

Ref.	d1	l1	l2	l3	d2	Ref.	d1	l1	l2	l3	d2	Ref.	d1	l1	l2	l3	d2
51.400.0200	2	65	14	45	2	51.400.0500	5	115	16	90	5	51.400.0900	9	175	18	140	9
51.400.0250	2.5	75	14	55	2.5	51.400.0600	6	130	16	100	6	51.400.1000	10	190	20	150	10
51.400.0300	3	90	14	70	3	51.400.0700	7	140	18	110	7	51.400.1100	11	200	20	160	10
51.400.0400	4	105	16	80	4	51.400.0800	8	160	18	130	8	51.400.1200	12	210	20	160	12

> **51.420 Phantom**

NL HSS-E Machineschilruimer H7  
 FR Alésoir taille Gammon HSS-E H7  
 ES Escariador máquina Gammon HSS-E H7  
 DE HSS-E Maschinenschälreibahlen H7



<b>+6 E</b>	<b>DIN 212-E</b>	<b>h8</b>	<b>H7</b>			
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-22 E	12-17 D	7-10 C	5-7 B	25-35 G	20-30 G	12-17 D

Ref.	d1	l1	l2	l3	d2	Ref.	d1	l1	l2	l3	d2	Ref.	d1	l1	l2	l3	d2
51.420.0300	3	61	20	42	3	51.420.0600	6	101	28	73	6	51.420.0900	9	125	36	91	9
51.420.0400	4	75	24	51	4	51.420.0700	7	109	31	80	7	51.420.1000	10	133	38	99	10
51.420.0500	5	86	26	60	5	51.420.0800	8	117	33	86	8	51.420.1200	12	151	44	106	12



> 51.500 Phantom

NL HSS Machineruimer H7, rechte groeven, MK  
 FR Alésoir machine HSS H7, goujures droites, CM  
 ES Escariador máquina HSS H7, canales rectas, CM  
 DE HSS Maschinenreibahlen H7, gerade Nuten, MK

HSS DIN 208-A DIN 228-B H7

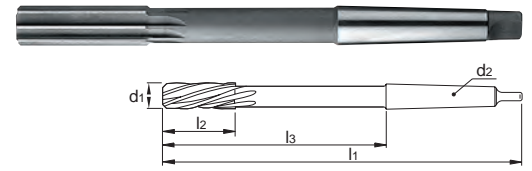
K 31 GG K 32 GGG GTS-GTW N 51 Cu

4-5 C 6-15 D 12-20 D

Ref.	d1	d2	l1	l2	l3
51.500.0500	5	MK 1	133	26	67
51.500.0600	6	MK 1	138	28	72
51.500.0700	7	MK 1	150	31	84
51.500.0800	8	MK 1	156	33	90
51.500.0900	9	MK 1	162	36	96
51.500.1000	10	MK 1	168	38	102
51.500.1100	11	MK 1	175	41	109
51.500.1200	12	MK 1	182	44	116
51.500.1300	13	MK 1	182	44	116
51.500.1400	14	MK 1	189	47	123

Ref.	d1	d2	l1	l2	l3
51.500.1500	15	MK 2	204	50	124
51.500.1600	16	MK 2	210	52	130
51.500.1700	17	MK 2	214	54	134
51.500.1800	18	MK 2	219	56	139
51.500.1900	19	MK 2	223	58	143
51.500.2000	20	MK 2	228	60	148
51.500.2100	21	MK 2	232	62	152
51.500.2200	22	MK 2	237	64	157
51.500.2300	23	MK 2	241	66	161
51.500.2400	24	MK 3	268	68	168

Ref.	d1	d2	l1	l2	l3
51.500.2500	25	MK 3	268	68	168
51.500.2600	26	MK 3	273	70	173
51.500.2800	28	MK 3	277	71	177
51.500.3000	30	MK 3	281	73	181
51.500.3100	31	MK 4	285	77	193
51.500.3200	32	MK 4	317	77	193
51.500.3300	33	MK 4	317	77	193
51.500.3400	34	MK 4	321	78	197



> 51.510 Phantom

NL HSS Machineruimer H7, MK  
 FR Alésoir machine HSS H7, CM  
 ES Escariador máquina HSS H7, CM  
 DE HSS Maschinenreibahlen H7, MK

HSS DIN 208-B DIN 228-B H7

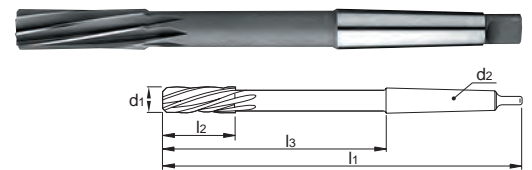
P 11 ≤800 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 51 Cu

10-15 E 8-15 D 4-5 C 4-5 C 6-15 D 30-50 F 12-20 D

Ref.	d1	d2	l1	l2	l3
51.510.0500	5	MK 1	133	26	67
51.510.0600	6	MK 1	138	28	72
51.510.0700	7	MK 1	150	31	84
51.510.0800	8	MK 1	156	33	90
51.510.0900	9	MK 1	162	36	96
51.510.1000	10	MK 1	168	38	102
51.510.1100	11	MK 1	175	41	109
51.510.1200	12	MK 1	182	44	116
51.510.1300	13	MK 1	182	44	116
51.510.1400	14	MK 1	189	47	123

Ref.	d1	d2	l1	l2	l3
51.510.1500	15	MK 2	204	50	124
51.510.1600	16	MK 2	210	52	130
51.510.1700	17	MK 2	214	54	134
51.510.1800	18	MK 2	219	56	139
51.510.1900	19	MK 2	223	58	143
51.510.2000	20	MK 2	228	60	148
51.510.2100	21	MK 2	232	62	152
51.510.2200	22	MK 2	237	64	157
51.510.2300	23	MK 2	241	66	161
51.510.2400	24	MK 3	268	68	168

Ref.	d1	d2	l1	l2	l3
51.510.2500	25	MK 3	268	68	168
51.510.2600	26	MK 3	273	70	173
51.510.2700	27	MK 3	277	71	177
51.510.2800	28	MK 3	277	71	177
51.510.3000	30	MK 3	281	73	181
51.510.3100	31	MK 4	285	77	193
51.510.3200	32	MK 4	317	77	193
51.510.3400	34	MK 4	321	78	197



> 51.520 Phantom

NL HSS-E Machineruimer H7, MK  
 FR Alésoir machine HSS-E H7, CM  
 ES Escariador máquina HSS-E H7, CM  
 DE HSS-E Maschinenreibahlen H7, MK

+6 E DIN 208-B DIN 228-B H7

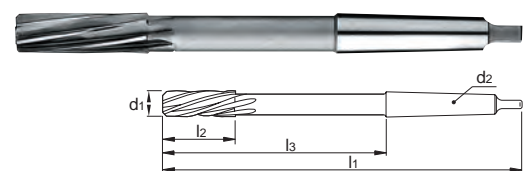
P 11 ≤800 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² P 14 ≤1400 N/mm² M 21 INOX ≤850 N/mm² M 22 INOX >850 N/mm² K 31 GG K 32 GGG GTS-GTW N 41 Alu N 42 Alu Si>10% N 51 Cu S 71 Ni/Co S 72 Ti

15-22 E 12-17 D 7-10 C 5-7 B 4-6 A 3-5 A 4-5 C 6-15 D 25-35 G 20-30 G 12-17 D 2-3 A 2-3 A

Ref.	d1	d2	l1	l2	l3
51.520.0400	4	MK 1	120	24	54
51.520.0500	5	MK 1	133	26	67
51.520.0600	6	MK 1	138	28	72
51.520.0700	7	MK 1	150	31	84
51.520.0800	8	MK 1	156	33	90
51.520.0900	9	MK 1	162	36	96
51.520.1000	10	MK 1	168	38	102
51.520.1050	10.5	MK 1	168	41	109
51.520.1100	11	MK 1	175	41	109
51.520.1150	11.5	MK 1	175	41	109
51.520.1200	12	MK 1	182	44	116
51.520.1250	12.5	MK 1	182	44	116

Ref.	d1	d2	l1	l2	l3
51.520.1300	13	MK 1	182	44	116
51.520.1350	13.5	MK 1	189	47	123
51.520.1400	14	MK 1	189	47	123
51.520.1450	14.5	MK 2	204	50	124
51.520.1500	15	MK 2	204	50	124
51.520.1550	15.5	MK 2	210	52	130
51.520.1600	16	MK 2	210	52	130
51.520.1650	16.5	MK 2	214	54	134
51.520.1700	17	MK 2	214	54	134
51.520.1750	17.5	MK 2	219	56	139
51.520.1800	18	MK 2	219	56	139
51.520.1850	18.5	MK 2	223	58	143

Ref.	d1	d2	l1	l2	l3
51.520.1900	19	MK 2	223	58	143
51.520.1950	19.5	MK 2	228	60	148
51.520.2000	20	MK 2	228	60	148
51.520.2050	20.5	MK 2	232	62	152
51.520.2100	21	MK 2	232	62	152
51.520.2150	21.5	MK 2	237	64	157
51.520.2200	22	MK 2	237	64	157
51.520.2250	22.5	MK 2	241	66	161
51.520.2300	23	MK 2	241	66	161
51.520.2400	24	MK 3	268	68	168
51.520.2500	25	MK 3	268	68	168
51.520.2600	26	MK 3	273	70	173

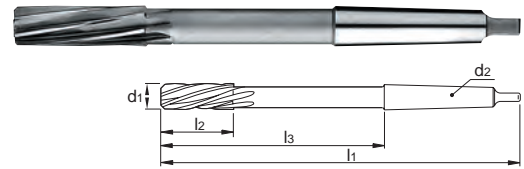


> **51.520 Phantom**

Ref.	d1	d2	l1	l2	l3	Ref.	d1	d2	l1	l2	l3	Ref.	d1	d2	l1	l2	l3
51.520.2700	27	MK 3	277	71	177	51.520.3500	35	MK 4	321	78	197	51.520.4300	43	MK 4	336	83	212
51.520.2800	28	MK 3	277	71	177	51.520.3600	36	MK 4	325	79	201	51.520.4400	44	MK 4	336	83	212
51.520.2900	29	MK 3	281	73	181	51.520.3700	37	MK 4	325	79	201	51.520.4500	45	MK 4	336	83	212
51.520.3000	30	MK 3	281	73	181	51.520.3800	38	MK 4	329	81	205	51.520.4600	46	MK 4	340	84	216
51.520.3100	31	MK 4	285	77	193	51.520.3900	39	MK 4	329	81	205	51.520.4700	47	MK 4	340	84	216
51.520.3200	32	MK 4	317	77	193	51.520.4000	40	MK 4	329	81	205	51.520.4800	48	MK 4	344	86	220
51.520.3300	33	MK 4	317	77	193	51.520.4100	41	MK 4	333	82	209	51.520.4900	49	MK 4	344	86	220
51.520.3400	34	MK 4	321	78	197	51.520.4200	42	MK 4	333	82	209	51.520.5000	50	MK 4	344	86	220

> **51.570 Phantom**

NL HSS-E Machineruimer H7, MK  
 FR Alésoir machine HSS-E H7, CM  
 ES Escariador máquina HSS-E H7, CM  
 DE HSS-E Maschinenreibahlen H7, MK



+6 6 ( **inch** **DIN 208-B** **DIN 228-B** **H7** )

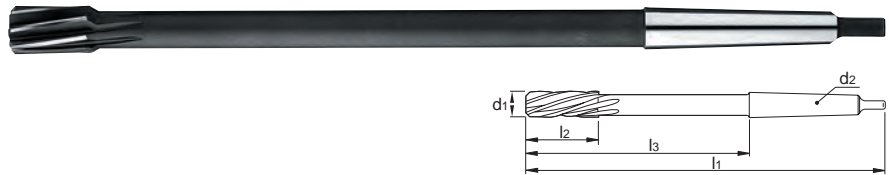
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
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15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A
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Ref.	d1	d2	l1	l2	l3	Ref.	d1	d2	l1	l2	l3		
51.570.0794	5/16	7.937	MK 1	156	33	90	51.570.1588	5/8	15.875	MK 2	210	52	130
51.570.0952	3/8	9.525	MK 1	168	38	102	51.570.1905	3/4	19.05	MK 2	223	58	143
51.570.1111	7/16	11.112	MK 1	182	44	116	51.570.2222	7/8	22.225	MK 2	237	64	157
51.570.1270	1/2	12.7	MK 1	182	44	116	51.570.2540	1	25.4	MK 3	273	70	173
51.570.1429	9/16	14.287	MK 2	204	50	124							

> **51.600 Phantom**

NL HSS-E Machineruimer H7, extra lang, MK  
 FR Alésoir machine HSS-E H7, extra longue, CM  
 ES Escariador máquina HSS-E H7, extra larga, CM  
 DE HSS-E Maschinenreibahlen H7, extra lang, MK



+6 6 ( **NORM** **DIN 228-B** **H7** )

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
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15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A
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Ref.	d1	d2	l1	l2	l3	Ref.	d1	d2	l1	l2	l3	Ref.	d1	d2	l1	l2	l3
51.600.1300	13	MK 1	245	22	180	51.600.2200	22	MK 2	280	28	200	51.600.3200	32	MK 4	375	36	250
51.600.1400	14	MK 1	245	22	180	51.600.2400	24	MK 3	300	32	200	51.600.3400	34	MK 4	375	36	250
51.600.1500	15	MK 2	260	22	180	51.600.2500	25	MK 3	320	32	220	51.600.3600	36	MK 4	375	40	250
51.600.1600	16	MK 2	260	25	180	51.600.2600	26	MK 3	330	32	230	51.600.3800	38	MK 4	395	40	270
51.600.1800	18	MK 2	260	25	180	51.600.2800	28	MK 3	340	32	240	51.600.4000	40	MK 4	395	40	270
51.600.2000	20	MK 2	270	28	190	51.600.3000	30	MK 3	350	36	250						



**> 51.620 Phantom**

NL HSS-E Machineschilruimer H7, MK  
 FR Alésoir taille Gammon HSS-E H7, CM  
 ES Escariador máquina Gammon HSS-E H7, CM  
 DE HSS-E Maschinenschälreibahlen H7, MK

+6.6 ( DIN 208-C DIN 228-B H7

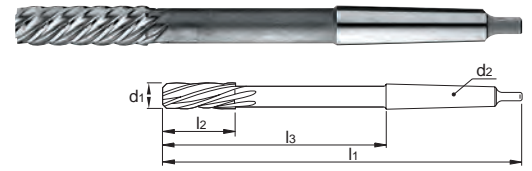
P 11 P 12 P 13 P 14 N 41 N 42 N 51  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> Alu Alu Si>10% Cu

15-22 E 12-17 D 7-10 C 5-7 B 25-35 G 20-30 G 12-17 D

Ref.	d1	d2	l1	l2	l3
51.620.1200	12	MK 1	182	44	116
51.620.1400	14	MK 2	189	47	123
51.620.1500	15	MK 2	204	50	124
51.620.1600	16	MK 2	210	52	130
51.620.1800	18	MK 2	219	56	139
51.620.2000	20	MK 2	228	60	148
51.620.2200	22	MK 2	237	64	157

Ref.	d1	d2	l1	l2	l3
51.620.2400	24	MK 3	268	68	168
51.620.2500	25	MK 3	268	68	168
51.620.2600	26	MK 3	273	70	173
51.620.2700	27	MK 3	277	71	177
51.620.2800	28	MK 3	277	71	177
51.620.2900	29	MK 3	281	73	181
51.620.3000	30	MK 3	281	73	181

Ref.	d1	d2	l1	l2	l3
51.620.3100	31	MK 3	285	77	193
51.620.3200	32	MK 4	317	77	193
51.620.3400	34	MK 4	321	78	197
51.620.3500	35	MK 4	321	78	197
51.620.3800	38	MK 4	329	81	205
51.620.4000	40	MK 4	329	81	205



**> 51.640 Phantom**

NL HM-tip Machineruimer H7, MK  
 FR Alésoir machine pointe carb. mét. H7, CM  
 ES Escariador máquina punta MD H7, CM  
 DE HM-Schneiden Maschinenreibahlen H7, MK

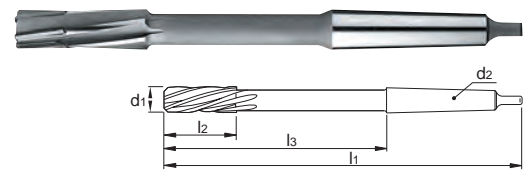
HM-TIP DIN 8094-B DIN 228-B H7

P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 41 N 42 N 51 S 71 S 72  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> INOX s850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu Ni/Co Ti

25-40 E 20-25 D 12-18 C 10-15 B 8-14 A 7-12 A 8-15 C 15-20 D 50-60 G 40-60 G 20-30 D 6-10 A 6-10 A

Ref.	d1	d2	l1	l2	l3	z
51.640.1000	10	MK 1	168	38	102	6
51.640.1200	12	MK 1	182	44	116	6
51.640.1400	14	MK 1	189	47	123	6
51.640.1500	15	MK 2	204	50	124	6
51.640.1600	16	MK 2	210	52	130	6
51.640.1800	18	MK 2	219	56	139	6
51.640.2000	20	MK 2	228	60	148	6

Ref.	d1	d2	l1	l2	l3	z
51.640.2200	22	MK 2	237	64	157	6
51.640.2400	24	MK 3	268	68	168	8
51.640.2500	25	MK 3	268	68	168	8
51.640.2600	26	MK 3	273	70	173	8
51.640.2800	28	MK 3	277	71	177	8
51.640.3000	30	MK 3	281	73	181	8
51.640.3500	35	MK 4	321	78	197	8



**> 51.645 Phantom**

NL HM-tip Machineruimer 1% nastelbaar, H7, MK  
 FR Alésoir machine pointe carb. mét. 1% réglable, H7, CM  
 ES Escariador máquina punta MD 1% extensible, H7, CM  
 DE HM-Schneiden Maschinenreibahlen 1% nachstellbar, H7, MK

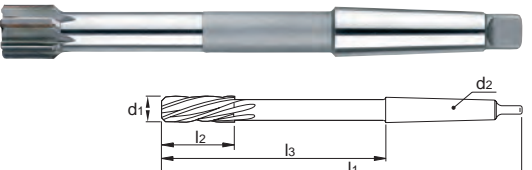
HM-TIP DIN ≈ 8051 DIN 228-B H7

P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 41 N 42 N 51 S 71 S 72  
 s800 N/mm<sup>2</sup> s850 N/mm<sup>2</sup> s1000 N/mm<sup>2</sup> s1400 N/mm<sup>2</sup> INOX s850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu Ni/Co Ti

25-40 E 20-25 D 12-18 C 10-15 B 8-14 A 7-12 A 8-15 C 15-20 D 50-60 G 40-60 G 20-30 D 6-10 A 6-10 A

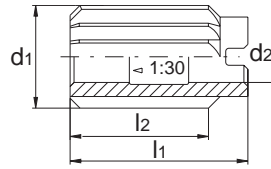
Ref.	d1	d2	l1	l2	l3	z
51.645.0800	8	MK 1	156	16	90	4
51.645.1000	10	MK 1	168	19	102	6
51.645.1200	12	MK 1	182	19	116	6
51.645.1300	13	MK 1	182	19	116	6
51.645.1400	14	MK 1	189	19	123	6

Ref.	d1	d2	l1	l2	l3	z
51.645.1500	15	MK 2	204	19	124	6
51.645.1600	16	MK 2	210	22	130	6
51.645.1800	18	MK 2	219	22	139	6
51.645.2000	20	MK 2	228	22	148	6
51.645.2500	25	MK 3	268	25	168	8



> **51.650 Phantom**

NL HSS Opsteekruimer H7  
 FR Alésoir machine creux HSS H7  
 ES Escariador hueco HSS H7  
 DE HSS Aufsteckreibahlen H7



HSS DIN 219-B H7

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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10-15 E	8-15 D	4-5 C	4-5 C	6-15 D	30-50 F	12-20 D
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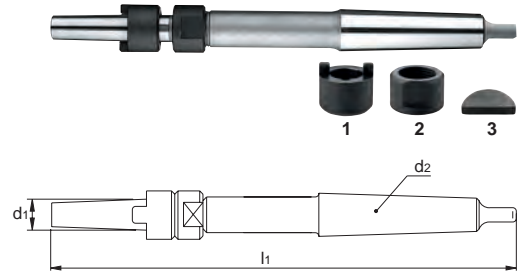
Ref.	d1	d2	l1	l2	84.410
51.650.2500	25	13	45	32	Nr. 2
51.650.2600	26	13	45	32	Nr. 2
51.650.2700	27	13	45	32	Nr. 2
51.650.2800	28	13	45	32	Nr. 2
51.650.2900	29	13	45	32	Nr. 2
51.650.3000	30	13	45	32	Nr. 2
51.650.3100	31	16	50	36	Nr. 3
51.650.3200	32	16	50	36	Nr. 3
51.650.3300	33	16	50	36	Nr. 3
51.650.3400	34	16	50	36	Nr. 3
51.650.3500	35	16	50	36	Nr. 3
51.650.3600	36	19	56	40	Nr. 4
51.650.3700	37	19	56	40	Nr. 4

Ref.	d1	d2	l1	l2	84.410
51.650.3800	38	19	56	40	Nr. 4
51.650.3900	39	19	56	40	Nr. 4
51.650.4000	40	19	56	40	Nr. 4
51.650.4100	41	19	56	40	Nr. 4
51.650.4200	42	19	56	40	Nr. 4
51.650.4300	43	22	63	45	Nr. 5
51.650.4400	44	22	63	45	Nr. 5
51.650.4500	45	22	63	45	Nr. 5
51.650.4600	46	22	63	45	Nr. 5
51.650.4700	47	22	63	45	Nr. 5
51.650.4800	48	22	63	45	Nr. 5
51.650.4900	49	22	63	45	Nr. 5
51.650.5000	50	22	63	45	Nr. 5

Ref.	d1	d2	l1	l2	84.410
51.650.5200	52	27	71	50	Nr. 6
51.650.5500	55	27	71	50	Nr. 6
51.650.5800	58	27	71	50	Nr. 6
51.650.6000	60	27	71	50	Nr. 6
51.650.6200	62	32	80	56	Nr. 7
51.650.6500	65	32	80	56	Nr. 7
51.650.6800	68	32	80	56	Nr. 7
51.650.7000	70	32	80	56	Nr. 7
51.650.7200	72	40	90	63	Nr. 8
51.650.7500	75	40	90	63	Nr. 8
51.650.8000	80	40	90	63	Nr. 8

> **84.410 Phantom**

NL Opsteekhouder, voor opsteekruimers DIN 219 en opsteekopboor DIN 222, MK  
 FR Arbre de montage, pour alésoirs creux DIN 219 et forets creux DIN 222, CM  
 ES Porta-escariadores, para escariadores huecos DIN 219 y brocas escariadores huecos DIN 222, CM  
 DE Aufsteckhalter, für Aufsteckreibahlen DIN 219 und Aufsteckaufbohrer DIN 222, MK

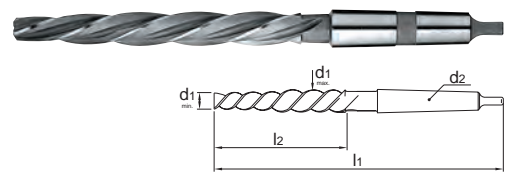


DIN 217

Ref.	Nr.	d1	l1	d2	Ø 51.650	Ø 13.350	1	2	3
84.410.0200	2	13	250	MK 3	25-30	25-35	84.411.0200	84.412.0200	84.413.0200
84.410.0300	3	16	261	MK 3	31-35	36-45	84.411.0300	84.412.0300	84.413.0300
84.410.0400	4	19	298	MK 4	36-42	46-52	84.411.0400	84.412.0400	84.413.0400
84.410.0500	5	22	312	MK 4	43-50	53-62	84.411.0500	84.412.0500	84.413.0500
84.410.0600	6	27	359	MK 5	51-60	63-75	84.411.0600	84.412.0600	84.413.0600
84.410.0700	7	32	376	MK 5	61-71	76-90	84.411.0700	84.412.0700	84.413.0700
84.410.0800	8	40	396	MK 5	72-85	91-100	84.411.0800	84.412.0800	84.413.0800
84.410.0900	9	50	416	MK 5	86-100	-	84.411.0900	84.412.0900	84.413.0900

> **51.700 Phantom**

NL HSS Klknagelgatruimer tolerantie k11, MK  
 FR Alésoir de chaudronniers HSS tolérance k11, CM  
 ES Escariador de caldereria HSS tolerancia k11, CM  
 DE HSS Nietlochreibahlen Toleranz k11, MK



HSS DIN 311 DIN 228-B k11

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
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10-15	8-15	4-5	4-5	6-15	30-50	12-20
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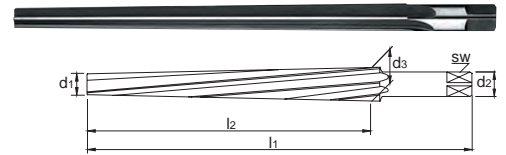
Ref.	d1 min.	d1 max.	l1	l2	d2
51.700.1000	7	10	171	95	MK 1
51.700.1100	7.7	11	176	100	MK 1
51.700.1200	8.4	12	199	105	MK 2
51.700.1300	9.1	13	199	105	MK 2
51.700.1400	9.8	14	209	115	MK 2
51.700.1500	10.5	15	219	125	MK 2
51.700.1600	11.2	16	229	135	MK 2
51.700.1700	11.9	17	251	135	MK 3
51.700.1800	12.6	18	261	145	MK 3

Ref.	d1 min.	d1 max.	l1	l2	d2
51.700.1900	13.3	19	261	145	MK 3
51.700.2000	14	20	271	155	MK 3
51.700.2100	14.7	21	271	155	MK 3
51.700.2200	15.4	22	281	165	MK 3
51.700.2300	16.1	23	281	165	MK 3
51.700.2400	16.8	24	296	180	MK 3
51.700.2500	17.5	25	296	180	MK 3
51.700.2600	18.2	26	296	180	MK 3
51.700.2800	19.6	28	311	195	MK 3

Ref.	d1 min.	d1 max.	l1	l2	d2
51.700.3000	21	30	311	195	MK 3
51.700.3100	21.7	31	326	210	MK 3
51.700.3200	22.4	32	354	210	MK 4
51.700.3400	23.8	34	364	220	MK 4
51.700.3700	25.9	37	364	220	MK 4
51.700.3800	26.6	38	374	230	MK 4
51.700.4000	28	40	374	230	MK 4

## > 51.720 Phantom

NL HSS Pengatruimer coniciteit 1:50  
 FR Alésoir conique HSS conicité 1:50  
 ES Escariador cónico HSS conicidad 1:50  
 DE HSS Kegelschleifbahnen Konizität 1:50



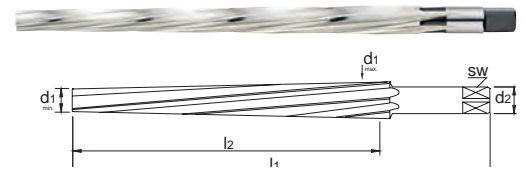
Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.720.0200	2	1.9	2.85	72	48	3.15	2.5
51.720.0250	2.5	2.4	3.36	68	48	3.15	2.5
51.720.0300	3	2.9	4.06	80	58	4	3.15
51.720.0400	4	3.9	5.26	93	68	5	4
51.720.0500	5	4.9	6.36	100	73	6.3	5

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.720.0600	6	5.9	8	135	105	8	6.3
51.720.0800	8	7.9	10.8	180	145	10	8
51.720.1000	10	9.9	13.4	215	175	12.5	10
51.720.1200	12	11.8	16	255	210	14	11.2
51.720.1400	14	13.8	18	255	210	16	12.5

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.720.1600	16	15.8	20.4	280	230	18	14
51.720.2000	20	19.8	24.8	310	250	22.4	18
51.720.2500	25	24.7	30.7	370	300	28	22.4
51.720.3000	30	29.7	36.1	400	320	31.5	25

## > 51.730 Phantom

NL HSS Pengatruimer coniciteit 1:50  
 FR Alésoir conique HSS conicité 1:50  
 ES Escariador cónico HSS conicidad 1:50  
 DE HSS Kegelschleifbahnen Konizität 1:50



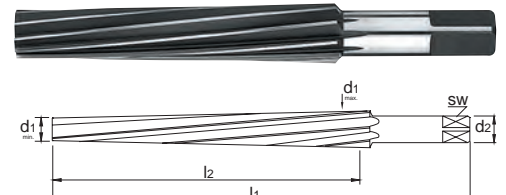
Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.730.0100	1	0.9	1.46	46	28	3.15	2.5
51.730.0150	1.5	1.4	2.14	57	37	3.15	2.5
51.730.0200	2	1.9	2.86	68	48	3.15	2.5
51.730.0250	2.5	2.4	3.36	68	48	3.15	2.5
51.730.0300	3	2.9	4.06	80	58	4	3.15
51.730.0400	4	3.9	5.26	93	68	5	4

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.730.0500	5	4.9	6.36	100	73	6.3	5
51.730.0600	6	5.9	8	135	105	8	6.3
51.730.0700	7	6.9	9	140	105	9	7.1
51.730.0800	8	7.9	10.8	180	145	10	8
51.730.1000	10	9.9	13.4	215	175	12.5	10
51.730.1200	12	11.8	16	255	210	14	11.2

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.730.1400	14	13.8	18	260	210	18	14
51.730.1600	16	15.8	20.4	280	230	18	14
51.730.2000	20	19.8	24.8	310	250	22.4	18
51.730.2500	25	24.7	30.7	370	300	28	22.4
51.730.3000	30	29.7	36.1	400	320	31.5	25

## > 51.760 Phantom

NL HSS Morse Konus Eindruimer  
 FR Alésoir finition pour cône morse HSS  
 ES Escariador para cono Morse HSS  
 DE HSS Kegelschleifbahnen für Morsekegel

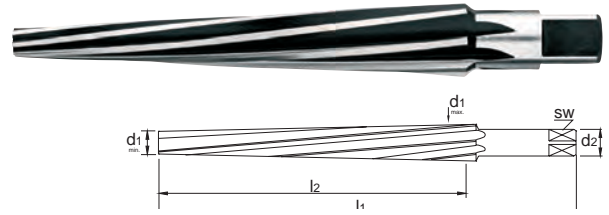


Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.760.0000	0	6.547	9.722	93	61	8	6.3
51.760.0100	1	9.571	12.863	102	66	10	8
51.760.0200	2	14.733	18.679	121	79	14	11.2
51.760.0300	3	20.01	24.829	146	96	20	16

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.760.0400	4	26.229	32.41	179	119	25	20
51.760.0500	5	37.873	45.767	222	150	31.5	25
51.760.0600	6	54.172	65.016	300	208	45	35.5

> **51.770 Phantom**

NL HSS Conische Ruimer coniciteit 1:10  
 FR Alésoir conique HSS conicité 1:10  
 ES Escariador cónico HSS conicidad 1:10  
 DE HSS konische Reibahlen Konizität 1:10



HSS NORM 1:10

P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu
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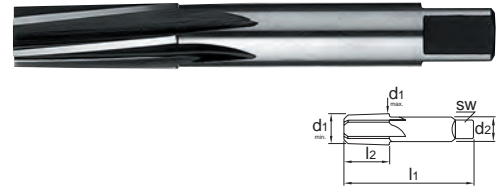
Ref.	d1 min.	d1 max.	l1	l2	d2	sw
51.770.0300	3	10	100	70	8	6.3
51.770.0500	5	15	140	100	12.5	10

Ref.	d1 min.	d1 max.	l1	l2	d2	sw
51.770.1000	10	25	195	150	20	16
51.770.1500	15	35	250	200	28	22.4

Ref.	d1 min.	d1 max.	l1	l2	d2	sw
51.770.2300	23	45	275	220	40	31.5
51.770.3000	30	55	310	250	45	35.5

> **51.780 Phantom**

NL HSS Conische Ruimer NPT, voor conische boringen 1:16  
 FR Alésoir conique HSS NPT, pour perçage conique 1:16  
 ES Escariador cónico HSS NPT, para perforación cónica 1:16  
 DE HSS konische NPT-Reibahlen NPT, für konische Bohrungen 1:16



HSS NPT NORM 1:16

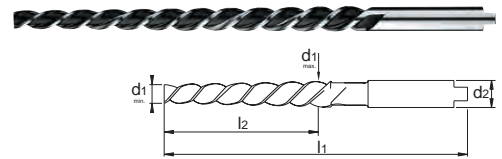
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu
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Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.780.0794	1/16	6.1	7.68	53.98	19.05	7.94	5.9
51.780.1029	1/8	8.03	9.19	53.98	19.05	19.05	8.3
51.780.1372	1/4	10.31	11.99	61.91	26.99	14.29	10.6
51.780.1715	3/8	13.72	15.39	65.09	26.99	17.8	13.4

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	sw
51.780.2134	1/2	16.89	19.08	79.38	34.93	17.5	13.1
51.780.2667	3/4	22.25	24.43	82.55	34.93	23.02	17.2
51.780.3340	1	28.02	30.78	95.25	34.45	28.5	21.4

> **51.800 Phantom**

NL HSS Pengatschilruimer coniciteit 1:50  
 FR Alésoir conique taille Gammon HSS conicité 1:50  
 ES Escariador cónico Gammon HSS conicidad 1:50  
 DE HSS Kegelschälreibahlen Konizität 1:50



HSS DIN 2179 1:50

P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu
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Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2
51.800.0200	2	1.9	2.86	86	48	3.15
51.800.0250	2.5	2.4	3.36	86	48	3.15
51.800.0300	3	2.9	4.06	100	58	4

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2
51.800.0400	4	3.9	5.26	112	68	5
51.800.0500	5	4.9	6.36	122	73	6.3
51.800.0600	6	5.9	8	160	105	8

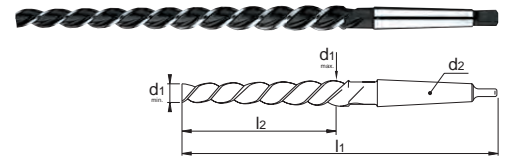
Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2
51.800.0800	8	7.9	10.8	207	145	10
51.800.1000	10	9.9	13.4	245	175	12.5
51.800.1200	12	11.8	16	290	210	16





**> 51.810 Phantom**

NL HSS Pengatschilruimer coniciteit 1:50, MK  
 FR Alésoir conique taille Gammon HSS conicité 1:50, CM  
 ES Escariador cónico Gammon HSS conicidad 1:50, CM  
 DE HSS Kegelschälreibahlen Konizität 1:50, MK



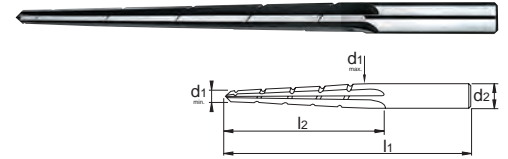
**HSS** **DIN 2180** **DIN 228-B** **1:50**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu
10-15 E	8-15 D	4-5 C	4-5 C	6-15 D	30-50 F	12-20 D

Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2	Ref.	Nr.	d1 min.	d1 max.	l1	l2	d2
51.810.0500	5	4.9	6.36	155	73	MK 1	51.810.1200	12	11.8	16	315	210	MK 2	51.810.3000	30	29.7	36.1	475	320	MK 4
51.810.0600	6	5.9	8	187	105	MK 1	51.810.1600	16	15.8	20.4	335	230	MK 2	51.810.4000	40	39.7	46.5	495	340	MK 4
51.810.0800	8	7.9	10.8	227	145	MK 1	51.810.2000	20	19.8	24.8	377	250	MK 3							
51.810.1000	10	9.9	13.4	257	175	MK 1	51.810.2500	25	24.7	30.7	427	300	MK 3							

**> 51.820 Phantom**

NL HSS-E Pengatruimer coniciteit 1:20  
 FR Alésoir conique HSS-E conicité 1:20  
 ES Escariador cónico HSS-E conicidad 1:20  
 DE HSS-E Kegleireibahlen Konizität 1:20



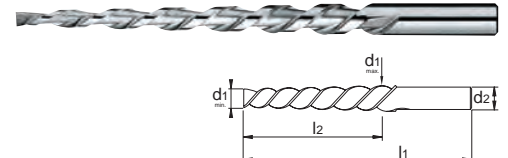
**+6** **NORM** **1:20**

<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A

Ref.	d1 min.	d1 max.	l1	l2	d2	Ref.	d1 min.	d1 max.	l1	l2	d2	Ref.	d1 min.	d1 max.	l1	l2	d2
51.820.0100	1	2	50	20	2	51.820.0400	4	8	130	80	8	51.820.0700	7	14	200	140	14
51.820.0200	2	4	80	40	4	51.820.0500	5	10	155	100	10						
51.820.0300	3	6	110	60	6	51.820.0600	6	12	180	120	12						

**> 51.830 Phantom**

NL HSS-E Pengatschilruimer coniciteit 1:20  
 FR Alésoir conique taille Gammon HSS-E conicité 1:20  
 ES Escariador cónico Gammon HSS-E conicidad 1:20  
 DE HSS-E Kegelschälreibahlen Konizität 1:20



**+6** **NORM** **1:20**

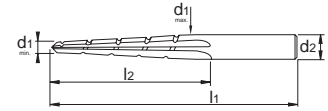
<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	25-35 G	20-30 G	12-17 D

Ref.	d1 min.	d1 max.	l1	l2	d2	Ref.	d1 min.	d1 max.	l1	l2	d2	Ref.	d1 min.	d1 max.	l1	l2	d2
51.830.0300	3	6	110	60	6	51.830.0500	5	10	155	100	10	51.830.0700	7	14	200	140	14
51.830.0400	4	8	130	80	8	51.830.0600	6	12	180	120	12						





**> 51.840 Phantom**



NL HSS-E Pengatruimer coniciteit 1:12,5  
 FR Alésoir conique HSS-E conicité 1:12,5  
 ES Escariador cónico HSS-E conicidad 1:12,5  
 DE HSS-E Kegeldreibahnen Konizität 1:12,5



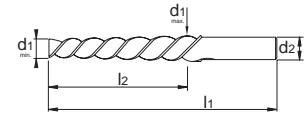
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A

Ref.	d1 min.	d1 max	l1	l2	d2
51.840.0200	2	6	100	50	6
51.840.0300	3	8	110	62	8

Ref.	d1 min.	d1 max	l1	l2	d2
51.840.0400	4	10	130	75	10
51.840.0500	5	12	150	90	12

Ref.	d1 min.	d1 max	l1	l2	d2
51.840.0600	6	14	160	100	14

**> 51.850 Phantom**



NL HSS-E Pengatschilruimer coniciteit 1:12,5  
 FR Alésoir conique Gammon HSS-E conicité 1:12,5  
 ES Escariador cónico Gammon HSS-E conicidad 1:12,5  
 DE HSS-E Kegelschälreibahnen Konizität 1:12,5



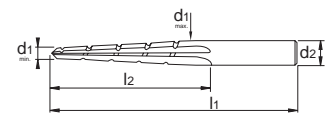
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	25-35 G	20-30 G	12-17 D

Ref.	d1 min.	d1 max	l1	l2	d2
51.850.0200	2	6	100	50	6
51.850.0300	3	8	110	62	8

Ref.	d1 min.	d1 max	l1	l2	d2
51.850.0400	4	10	130	75	10
51.850.0500	5	12	150	90	12

Ref.	d1 min.	d1 max	l1	l2	d2
51.850.0600	6	14	160	100	14

**> 51.860 Phantom**



NL HSS-E Pengatruimer coniciteit 1:10  
 FR Alésoir conique HSS-E conicité 1:10  
 ES Escariador cónico HSS-E conicidad 1:10  
 DE HSS-E Kegeldreibahnen Konizität 1:10



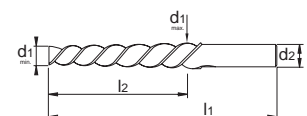
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	4-5 C	6-15 D	25-35 G	20-30 G	12-17 D	2-3 A	2-3 A

Ref.	d1 min.	d1 max	l1	l2	d2
51.860.0200	2	6	90	40	6
51.860.0300	3	8	100	50	8

Ref.	d1 min.	d1 max	l1	l2	d2
51.860.0400	4	10	115	60	10
51.860.0500	5	12	130	70	12

Ref.	d1 min.	d1 max	l1	l2	d2
51.860.0600	6	14	140	80	14

**> 51.870 Phantom**



NL HSS-E Pengatschilruimer coniciteit 1:10  
 FR Alésoir conique Gammon HSS-E conicité 1:10  
 ES Escariador cónico Gammon HSS-E conicidad 1:10  
 DE HSS-E Kegelschälreibahnen Konizität 1:10



<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu
15-22 E	12-17 D	7-10 C	5-7 B	4-6 A	3-5 A	25-35 G	20-30 G	12-17 D

Ref.	d1 min.	d1 max	l1	l2	d2
51.870.0200	2	6	90	40	6
51.870.0300	3	8	100	50	8

Ref.	d1 min.	d1 max	l1	l2	d2
51.870.0400	4	10	115	60	10
51.870.0500	5	12	130	70	12

Ref.	d1 min.	d1 max	l1	l2	d2
51.870.0600	6	14	140	80	14

## > 59.200 HUNGER

NL Set Verstelbare Handruimers type D  
 FR Jeu d'Alésoirs type D  
 ES Juego de escariadores mano ajustables tipo D  
 DE Satz Verstellbare Handreibahlen Typ D



Ref.	Type	Ø mm	Cassette
59.200.3150	51.200 - 11x	8-31,5	Filled

Ref.	Type	Ø mm	Cassette
59.200.4500	51.200 - 13x	8-45	Filled

## > 59.210 HUNGER

NL Set Verstelbare Handruimers type E  
 FR Jeu d'Alésoirs type E  
 ES Juego de escariadores mano ajustables tipo E  
 DE Satz Verstellbare Handreibahlen Typ E



Ref.	Type	Ø mm	Cassette
59.210.3150	51.210 - 9x	10,5-31,5	Filled

Ref.	Type	Ø mm	Cassette
59.210.4500	51.210 - 13x	10,5-45	Filled

## > 59.220 HUNGER

NL Set Verstelbare Handruimers type K  
 FR Jeu d'Alésoirs type K  
 ES Juego de escariadores mano ajustables tipo K  
 DE Satz Verstellbare Handreibahlen Typ K



Ref.	Type	Ø mm	Cassette
59.220.3150	51.220 - 11x	8-31,5	Filled

Ref.	Type	Ø mm	Cassette
59.220.4500	51.220 - 13x	8-45	Filled

## > 59.230 HUNGER

NL Set Verstelbare Handruimers type U  
 FR Jeu d'Alésoirs type U  
 ES Juego de escariadores mano ajustables tipo U  
 DE Satz Verstellbare Handreibahlen Typ U



Ref.	Type	Ø mm	Cassette
59.230.3400	51.230 - 7x	12-34	Filled

Ref.	Type	Ø mm	Cassette
59.230.4500	51.230 - 9x	12-45	Filled

> **59.240 HUNGER**

- NL Set Verstelbare Handruimers type V
- FR Jeu d'Alésoirs type V
- ES Juego de escariadores mano ajustables tipo V
- DE Satz Verstellbare Handreibahlen Typ V



Ref.	Type	Ø mm	Cassette
59.240.1200	51.240 - 10x	5,9-12	Filled

Ref.	Type	Ø mm	Cassette
59.240.1250	51.240 - 10x + 51.244 - 10x	5,9-12	Filled



NL Voedingswaardentabel ruimers  
 FR Tableau des avances alésoirs  
 ES Tabla de avances escariadores  
 DE Vorschubtabelle Reibahlen

**P 11** = ISO  
 S600 N/mm<sup>2</sup>

25-35 Vc = 25-35  
 E FRC = E

FRC							
	A	B	C	D	E	F	G
d1(mm)	f (mm/n)						
1	0,07	0,07	0,07	0,07	0,07	0,07	0,08
2	0,07	0,08	0,08	0,1	0,15	0,2	0,15
6	0,1	0,09	0,1	0,12	0,15	0,22	0,18
10	0,12	0,15	0,18	0,18	0,25	0,3	0,22
15	0,15	0,2	0,2	0,18	0,25	0,35	0,35
20	0,2	0,25	0,22	0,25	0,3	0,4	0,37
25	0,25	0,27	0,25	0,3	0,35	0,4	0,37
30	0,25	0,3	0,3	0,33	0,37	0,45	0,45
40	0,3	0,35	0,35	0,4	0,45	0,5	0,5

NL Voorboormaat voor ruimen  
 FR Tableau de diamètre de pré-perçage pour alésage  
 ES Tabla de perforación previa para escariar  
 DE Bohrungsdurchmesser für Reiben

ISO	P11	P12	P13	P14	M21	M22	K31	K32	N41	N42	N51	N52	N61	S71	S72
≤ Ø 6 mm	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2	0,1 - 0,2
≤ Ø 10 mm	0,2	0,2	0,2	0,1 - 0,2	0,2	0,1 - 0,2	0,2	0,2	0,2 - 0,3	0,1 - 0,2	0,2 - 0,3	0,2	0,2	0,2	0,1 - 0,2
≤ Ø 16 mm	0,2 - 0,3	0,2 - 0,3	0,2	0,2	0,2	0,2	0,3	0,2 - 0,3	0,3 - 0,4	0,2	0,3 - 0,4	0,2 - 0,3	0,2	0,2	0,2
≤ Ø 25 mm	0,3 - 0,4	0,3 - 0,4	0,3	0,3	0,3	0,3	0,4	0,3 - 0,4	0,4 - 0,5	0,3	0,4 - 0,5	0,3	0,3	0,3	0,3
≥ Ø 25 mm	0,4 - 0,5	0,4 - 0,5	0,4 - 0,5	0,4 - 0,5	0,3 - 0,4	0,3 - 0,4	0,5	0,4 - 0,5	0,5	0,3 - 0,4	0,5	0,3 - 0,4	0,3 - 0,4	0,3 - 0,4	0,3 - 0,4

**FRC**

NL: Voedingscode

FR: Codification vitesse d'avance

ES: Codificación de velocidad de avance

DE: Vorschubgeschwindigkeit Codierung

**f (mm/n)**

NL: Voeding per omwenteling (mm/n)

FR: Avance par tour (mm/tr)

ES: Avance por revolucion (mm/r)

DE: Vorschub pro Umdrehung (mm/U)

**Vc**

NL: Snij snelheid (m/min)

FR: Vitesse de coupe (m/min)

ES: Velocidad de corte (m/min)

DE: Schnittgeschwindigkeit (m/min)

**n=rpm**

NL: Spiltoerental (omw/min)

FR: Vitesse de broche (tr/min)

ES: Velocidad del husillo (rpm)

DE: Spindeldrehzahl (U/min)

NL Herleidingstabel passingen  
 FR Tableau de normalisation des tolérances  
 ES Tabla de normalización de las tolerancias  
 DE Zurückführungstabelle Passungen

d1 (mm)	C8	C9	C10	C11	CD7	D7	D8	D9	D10	D11	D12	E7	E8	E9	EF8	F7	F8
1	1,07	1,07	1,08	1,10	1,04	1,02	1,03	1,03	1,04	1,06	1,08	1,02	1,02	1,09	1,02	1,01	1,01
2	2,07	2,07	2,08	2,10	2,04	2,02	2,03	2,03	2,04	2,06	2,08	2,02	2,02	2,03	2,02	2,01	2,01
3	3,07	3,07	3,08	3,10	3,04	3,02	3,03	3,03	3,04	3,06	3,08	3,02	3,02	3,03	3,02	3,01	3,01
4	4,08	4,09	4,10	4,12	4,05	4,04	4,04	4,05	4,06	4,08	4,10	4,02	4,03	4,04	4,03	4,01	4,02
5	5,08	5,09	5,10	5,12	5,05	5,04	5,04	5,05	5,06	5,08	5,10	5,02	5,03	5,04	5,03	5,01	5,02
6	6,08	6,09	6,10	6,12	6,05	6,04	6,04	6,05	6,06	6,08	6,10	6,02	6,03	6,04	6,03	6,01	6,02
7	7,09	7,10	7,12	7,15	7,06	7,05	7,05	7,06	7,08	7,10	7,14	7,03	7,04	7,05	7,03	7,02	7,03
8	8,09	8,10	8,12	8,15	8,06	8,05	8,05	8,06	8,08	8,10	8,14	8,03	8,04	8,05	8,03	8,02	8,03
9	9,09	9,10	9,12	9,15	9,06	9,05	9,05	9,06	9,08	9,10	9,14	9,03	9,04	9,05	9,03	9,02	9,03
10	10,09	10,10	10,12	10,15	10,06	10,05	10,05	10,06	10,08	10,10	10,14	10,03	10,04	10,05	10,03	10,02	10,03
11	11,11	11,12	11,14	11,18	-	11,06	11,06	11,08	11,10	11,13	11,20	11,04	11,05	11,06	-	11,02	11,03
12	12,11	12,12	12,14	12,18	-	12,06	12,06	12,08	12,10	12,13	12,20	12,04	12,05	12,06	-	12,02	12,03

d1 (mm)	F9	F10	G6	G7	H5	H6	H7	H8	H9	H10	H11	H12	H13	HJ6	J7	J8	JS7
1	1,02	1,04	1,00	1,01	1,00	1,00	1,00	1,01	1,01	1,02	1,04	1,06	1,09	1,00	1,00	1,00	1,00
2	2,02	2,04	2,00	2,01	2,00	2,00	2,00	2,01	2,01	2,02	2,04	2,06	2,09	2,00	2,00	2,00	2,00
3	3,02	3,04	3,00	3,01	3,00	3,00	3,00	3,01	3,01	3,02	3,04	3,06	3,09	3,00	3,00	3,00	3,00
4	4,03	4,04	4,01	4,01	4,00	4,00	4,00	4,01	4,02	4,03	4,05	4,08	4,12	4,00	4,00	4,00	4,00
5	5,03	5,04	5,01	5,01	5,00	5,00	5,00	5,01	5,02	5,03	5,05	5,08	5,12	5,00	5,00	5,00	5,00
6	6,03	6,04	6,01	6,01	6,00	6,00	6,00	6,01	6,02	6,03	6,05	6,08	6,12	6,00	6,00	6,00	6,00
7	7,03	7,05	7,01	7,01	7,00	7,00	7,01	7,01	7,02	7,04	7,06	7,10	7,12	7,00	7,00	7,00	7,00
8	8,03	8,05	8,01	8,01	8,00	8,00	8,01	8,01	8,02	8,04	8,06	8,10	8,16	8,00	8,00	8,00	8,00
9	9,03	9,05	9,01	9,01	9,00	9,00	9,01	9,01	9,02	9,04	9,06	9,10	9,16	9,00	9,00	9,00	9,00
10	10,03	10,05	10,01	10,01	10,00	10,00	10,01	10,02	10,02	10,04	10,06	10,10	10,16	10,00	10,00	10,00	10,00
11	11,04	11,06	11,01	11,01	11,00	11,00	11,01	11,02	11,03	11,05	11,07	11,14	11,20	11,00	11,00	11,00	11,00
12	12,04	12,06	12,01	12,01	12,00	12,00	12,01	12,02	12,03	12,05	12,07	12,14	12,20	12,00	12,00	12,00	12,00

d1 (mm)	JS8	JS9	K6	K7	K8	M6	M7	M8	N6	N7	N8	P6	P7	P8	R6	R7	S6
1	1,00	1,00	-	-	0,99	-	0,99	0,99	0,99	0,99	0,99	0,99	0,99	0,99	-	0,98	0,98
2	2,00	2,00	-	-	1,99	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	-	1,98	1,98
3	3,00	3,00	-	-	2,99	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	-	2,98	2,98
4	4,00	4,00	4,00	4,00	4,00	3,99	3,99	3,99	3,99	3,99	3,99	3,99	3,99	3,98	3,98	3,98	3,98
5	5,00	5,00	5,00	5,00	5,00	4,99	4,99	4,99	4,99	4,99	4,99	4,99	4,99	4,98	4,98	4,98	4,98
6	6,00	6,00	6,00	6,00	6,00	5,99	5,99	5,99	5,99	5,99	5,99	5,99	5,99	5,98	5,98	5,98	5,98
7	7,00	7,00	-	7,00	7,00	6,99	6,99	6,99	-	6,99	6,99	6,98	6,98	6,97	6,98	6,98	6,97
8	8,00	8,00	-	8,00	8,00	7,99	7,99	7,99	-	7,99	7,99	7,98	7,98	7,97	7,98	7,98	7,97
9	9,00	9,00	-	9,00	9,00	8,99	8,99	8,99	-	8,99	8,99	8,98	8,98	8,97	8,98	8,98	8,97
10	10,00	10,00	-	10,00	10,00	9,99	9,99	9,99	-	9,99	9,99	9,98	9,98	9,97	9,98	9,98	9,97
11	11,00	11,01	-	11,00	11,00	10,99	10,99	10,99	-	10,99	10,99	10,98	10,98	10,97	10,97	10,98	10,97
12	12,00	12,01	-	12,00	12,00	11,99	11,99	11,99	-	11,99	11,99	11,98	11,98	11,97	11,97	11,98	11,97

d1 (mm)	S7	U6	U7	X7	X8	X9	Z7	Z8	Z9	Z10	ZA7	ZA8	ZA9	ZB8	ZB9
1	0,98	0,98	0,98	0,97	0,97	0,97	0,97	0,97	0,96	0,96	0,96	0,96	0,95	0,95	0,95
2	1,98	1,98	1,98	1,97	1,97	1,97	1,97	1,97	1,96	1,96	1,96	1,96	1,95	1,95	1,95
3	2,98	2,98	2,98	2,97	2,97	2,97	2,97	2,97	2,96	2,96	2,96	2,96	2,95	2,95	2,95
4	3,98	3,97	3,97	3,97	3,96	3,96	3,96	3,96	3,95	3,95	3,96	3,95	3,94	3,94	3,94
5	4,98	4,97	4,97	4,97	4,96	4,96	4,96	4,96	4,95	4,95	4,96	4,95	4,94	4,94	4,94
6	5,98	5,97	5,97	5,97	5,96	5,96	5,96	5,96	5,95	5,95	5,96	5,95	5,94	5,94	5,94
7	6,97	6,97	6,97	6,97	6,96	6,95	6,96	6,95	6,93	6,94	6,94	6,94	6,93	6,92	6,92
8	7,97	7,97	7,97	7,97	7,96	7,95	7,96	7,95	7,93	7,94	7,94	7,94	7,93	7,92	7,92
9	8,97	8,97	8,97	8,97	8,96	8,95	8,96	8,95	8,93	8,94	8,94	8,94	8,93	8,92	8,92
10	9,97	9,97	9,97	9,97	9,96	9,95	9,96	9,95	9,93	9,94	9,94	9,94	9,93	9,92	9,92
11	10,97	10,96	10,96	10,96	10,95	10,94	10,95	10,94	10,92	10,93	10,93	10,93	10,91	10,90	10,90
12	11,94	11,96	11,96	11,96	11,95	11,94	11,95	11,94	11,92	11,93	11,93	11,93	11,91	11,90	11,90





1 SC



1 HSS(+E)



2



3 SC



3 HSS-E

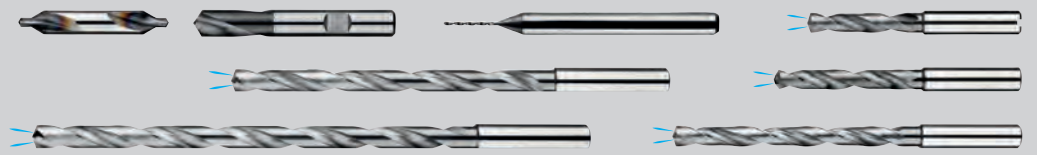


4



5

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



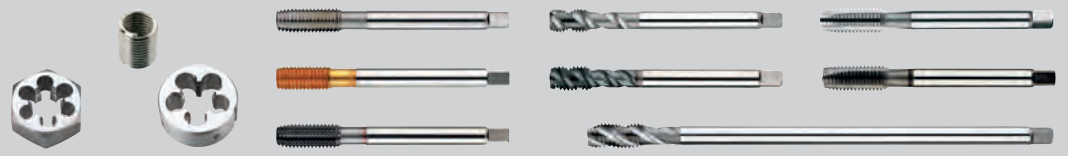
SP 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



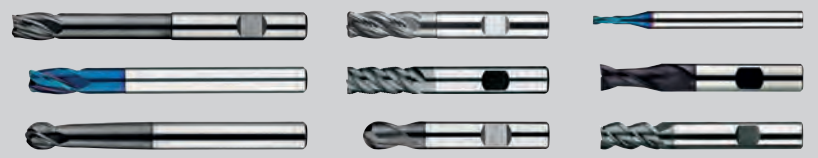
HSS-E 1

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



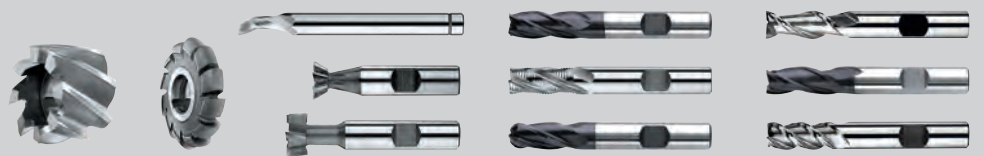
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



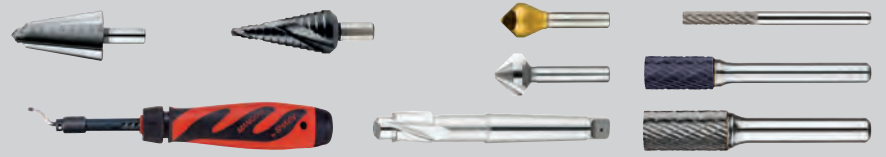
SP 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



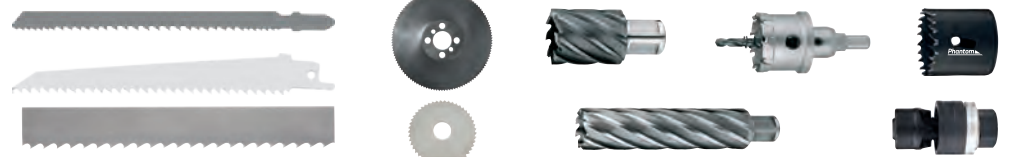
4

NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



5

NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher

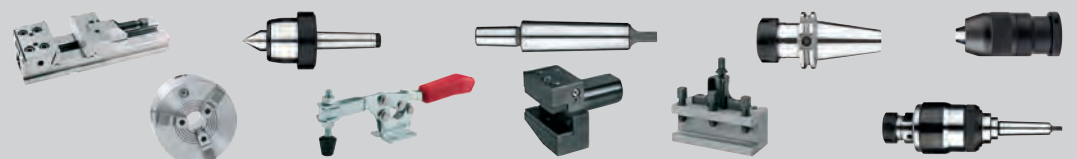


6

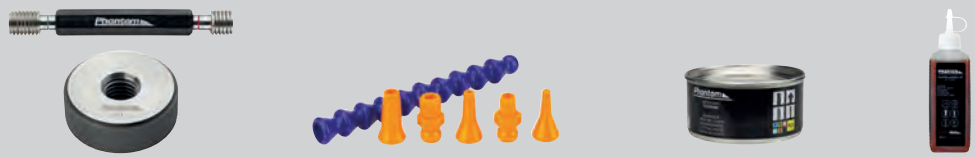
NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge


















NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
	HSS	HSS	HSS	HSS
	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalto)	HSS-E (5% Cobalt)
	HSS-E (8% Cobalt)	HSS-E (8% Cobalt)	HSS-E (8% Cobalto)	HSS-E (8% Cobalt)
	Hardmetaal Tip	Plaquette carbure brasée	Plaquetas de metal duro soldadas	mit HM-Schneiden
	Volhardmetaal	Carbure monobloc	Metal duro integral	Hartmetall
	Hoog gelegeerd Chroom Vanadium staal	Acier hautement allié au Chrome Vanadium	Acero de alta aleación de Cromo Vanadio	Hochlegiert Chrom-Vanadium-Stahl
	HSS Bi-Metaal	Bi-métal HSS	HSS Bimetálica	HSS Bi-Metall
	Stoomontlaten	Vaporisé	Vaporizado	Dampfangelassen
	Genitreerd	Nitruré	Nitrurado	Nitriert
	TiN gecoat	Revêtement TiN	Recubrimiento TiN	TiN Beschichtung
	TiAlN gecoat	Revêtement TiAlN	Recubrimiento TiAlN	TiAlN Beschichtung
	AlCrN gecoat	Revêtement AlCrN	Recubrimiento AlCrN	AlCrN Beschichtung
	AlCrN-X gecoat	Revêtement AlCrN-X	Recubrimiento AlCrN-X	AlCrN-X Beschichtung
	Verzinkfrees met 3 snijkanten	Fraise à chanfreiner à trois dents	Avellanador con 3 dientes	Kegelsenker mit 3 Schneiden
	Materiaaldikte	Épaisseur du matériau	Espesor de material	Materialstärke
	Onvertand	Sans dents	Sin dientes	Unverzahnt
	Rechte tand	Denture angulaire	Forma de diente recta	Gerader Zahn
	Gebogen tand	Denture angulaire moyenne	Forma de diente gruesa	Gebogene Zahn
	Om en om afgeschuinde tand	Denture angulaire moyenne alternée	Forma de diente gruesa alternativa	Gebogene Zahn, jeder zweite abgeschragt
	Met voor- en nasnijder	Denture rectifiée et affûtée	Con dientes rectificadas y afiladas	Mit Vor- und Nachschneider
	Constante tandsteek	A pas constant	Paso constante	Konstanter Verzahnung
	Variabele tandsteek	A pas variable	Paso variable	Variabler Verzahnung
	Normale tand 0°	Angle de coupe 0°	Ángulo de corte 0°	Normaler Zahn 0°
	Positieve spaanhoek	Angle de coupe positif	Ángulo de corte positivo	Positivem Spannwinkel
	Positieve spaanhoek 5°	Angle de coupe positif 5°	Ángulo de corte positivo 5°	Positivem Spannwinkel 5°
	Negatieve spaanhoek 5°	Angle de coupe négatif 5°	Ángulo de corte negativo 5°	Negativem Spannwinkel 5°
	Voor gebundeld massief materiaal	Pour matériaux pleins en paquet	Para material en barras en paquetes	Für gebündelt massiv Material
	Voor gebundelde profielen	Pour profilés en paquet	Para material de perfiles en paquetes	Für gebündelte Profile
	Stafmateriaal dun	Matériaux pleins fins	Material en barras delgado	Stangenmaterial dünn
	Stafmateriaal dik	Matériaux pleins épais	Material en barras grande	Stangenmaterial dick






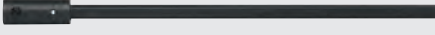


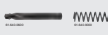



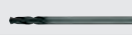







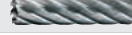



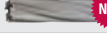









	NL	FR	ES	DE
	Kokerprofiel dunwandig	Profilés fins	Material de perfiles delgado	Schlauchmaterial dünn
	Kokerprofiel dikwandig	Profilés épais	Material de perfiles grande	Schlauchmaterial dick
	H-Profiel	Profil H	Perfil H	Profil H
	Strip	Bande	Tira	Streifen
	Standaard kernboor opname Weldon 19 mm	Cône fraise à carotter standard, Weldon 19 mm	Sujeción estándar fresa hueca, Weldon 19 mm	Standard Kernbohrer-aufnahme Weldon 19 mm
	Snelwisselopname Quick 19 mm	Changement rapide d'outil 19 mm	Sujeción de cambio rápido 19 mm	Schnellwechsell Kernbohrer-aufnahme 19 mm
	Fein Quickin kernboor opname 18 mm	Cône fraise à carotter Fein Quickin 18 mm	Sujeción Fein Quickin fresa hueca 18 mm	Fein Quickin Kernbohrer-aufnahme 18 mm
	Buis gietijzer	Tube fonte	Tube fundición	Gussrohre
	Gesloten profiel	Profil fermé	Perfil cerrado	Geschlossene Profile
	Contoursnede	Pour contours	Corte perfiles	Kurvenschnitt
	Harthout	Bois dur	Madera dura	Hartholz
	Hogesnelheid-snede	Coupe ultra-rapide	Corte rápido	Sehr schneller Schnitt
	Keukenblad	Plan de travail	Encimera	Küchenarbeitsplatten
	Laminaat	Parquet	Laminado	Laminat
	Gelamineerde platen	Contreplaqué filmé	Chapa laminada	Beschichtete Platten
	Gelijmd hout	Contreplaqué	Tableros contrachapada	Multiplex / Tischlerplatten
	Non ferro / aluminium	Non ferreux / aluminium	Metal no férreo / Aluminio	Buntmetall / Aluminium
	Renovatie / Raamkozijnen	Renovation bâtiment / Châssis fenêtre	Renovación / Marcos	Altbausanierung / Fensterrahmen
	Open profielen	Profil ouvert	Perfil abierto	Offene Profile
	Pallets	Palette / Bois de palette	Pallet	Palettenbau
	Kunststof	Plastique	Plástico	Kunststoff
	Multiplex	Contreplaqué	Madera contrachapada	Sperrholz
	Versterkt kunststof	Plastique renforcé	Plástico fortalece	Faserverstärkte Kunststoffe
	Sandwich panelen	Contreplaquet	Material tupo Sandwich	Sandwich-Material
	Dun plaatmateriaal	Matériaux plat fins	Material de chapas fino	Stahlbleche
	Zacht hout / bouw hout	Bois de construction	Madera de construcción	Weich- / Konstruktionsholz
	Stalen buizen	Tube en acier	Tubos en acero	Stahlrohre
	Rechte snede	Coupe droite	Corte recto	Gerader Schnitt
	Schone snede	Coupe sans éclats sur la surface	Corte muy liso	Sehr sauberer Schnitt

NL Zagen en Ponsen  
FR Sciage et Poinçonnage  
ES Serrar y Punzonar  
DE Sägen un Blechlocher













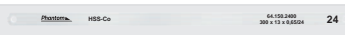



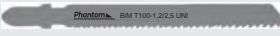





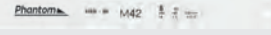


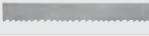
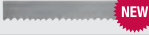










**P** **K** Bij uitstek geschikt  
Très approprié  
**H** **N** Muy adecuado  
**M** **S** Ideal geeignet










**P** **K** Bepoort geschikt  
Approprié  
**H** **N** Adecuado  
**M** **S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

> 61.105	<b>Phantom</b>	BiM 8% Co	<b>P M K N</b>			P. 4
> 61.110	<b>Phantom</b>	BiM 8% Co	<b>P M K N</b>			P. 4
> 61.130	<b>Phantom</b>	HM-TIP				P. 5
> 61.150	<b>Phantom</b>					P. 5
> 61.151	<b>Phantom</b>					P. 5
> 61.160	<b>Phantom</b>					P. 6
> 61.170	<b>Phantom</b>					P. 6
> 61.630	<b>Phantom</b>	HM-TIP 0,5-5 mm	<b>P M K N</b>			P. 6
> 61.640	<b>Phantom</b>					P. 6
> 61.670	<b>Phantom</b>	HM-TIP 0,5-25 mm	<b>P M K N</b>			P. 7
> 61.675	<b>Phantom</b>					P. 7
> 61.680	<b>Phantom</b>	HM-TIP 0,5-55 mm	<b>P M K N</b>			P. 8
> 61.685	<b>Phantom</b>					P. 8
> 62.100	<b>Phantom</b>	HSS-EX 0,5-30 mm	<b>P K N</b>			P. 8
> 62.104	<b>Phantom</b>	HSS-EX 0,5-30 mm	TiAIN <b>P M K N</b>			P. 9
> 62.122	<b>Phantom</b>	HSS-EX 0,5-30 mm	NIT. <b>P M K N</b>			P. 9
> 62.130	<b>Phantom</b>	HSS-EX 0,5-30 mm	<b>P</b>			P. 10
> 62.150	<b>Phantom</b>	HSS-EX 0,5-55 mm	<b>P K N</b>			P. 10
> 62.154	<b>Phantom</b>	HSS-EX 0,5-55 mm	TiAIN <b>P M K N</b>			P. 11
> 62.162	<b>Phantom</b>	HSS-EX 0,5-55 mm	NIT. <b>P M K N</b>			P. 11
> 62.180	<b>Phantom</b>	HSS-EX 0,5-110 mm	<b>P K N</b>			P. 12
> 62.200	<b>Phantom</b>	HM-TIP 0,5-40 mm	<b>P M K N</b>			P. 13
> 62.210	<b>Phantom</b>	HM-TIP 0,5-40 mm	<b>P</b>			P. 13
> 62.220	<b>Phantom</b>	HM-TIP 0,5-55 mm	<b>P M K N</b>			<b>NEW</b> P. 14
> 62.240	<b>Phantom</b>	HM-TIP 0,5-110 mm	<b>P M K N</b>			<b>NEW</b> P. 14
> 62.250	<b>Phantom</b>	HSS-EX 0,5-40 mm	Ø18 FEIN QUICKIN <b>P M K N</b>			P. 15
> 62.270	<b>Phantom</b>	HM-TIP 0,5-40 mm	Ø18 FEIN QUICKIN <b>P M K N</b>			<b>NEW</b> P. 15
> 62.280	<b>Phantom</b>	HM-TIP 0,5-55 mm	Ø18 FEIN QUICKIN <b>P M K N</b>			<b>NEW</b> P. 16
> 62.295	<b>Phantom</b>	HSS 3 90°	<b>P M K N</b>			P. 16
> 62.300	<b>Phantom</b>					P. 17
> 62.350	<b>Phantom</b>					<b>NEW</b> P. 18
> 63.200	<b>Phantom</b>	HSS DIN 1837-A	<b>P M K</b>			P. 19
> 63.210	<b>Phantom</b>	HSS +GF+	<b>P M K</b>			P. 20
> 63.220	<b>Phantom</b>	VHM SC DIN 1837-A	<b>P M K N S</b>			P. 20

SP 1  
HSS-F 1  
2  
SP 3  
HSS-F 3  
4  
5  
6

> 63.250	Phantom	HSS	DIN 1838-B	B	P M K N					 P. 21
> 63.270	Phantom	VHM SC	DIN 1838-B	A	P M K N S					 P. 22
> 63.400	Phantom	HSS	OX.	C + BW	P K N					 P. 23
> 63.401	Phantom	HSS	TiN	C + BW	P K N					 P. 24
> 63.410	Phantom	HSS	OX.	Z=0						 P. 24
> 63.420	Phantom	+6 6 (	OX.	C + BW	P M K N					 P. 25
> 63.424	Phantom	+6 6 (	TiAlN	C + BW	P M K N					 P. 25
> 63.430	Phantom	+6 6 (	OX.	Z=0						 P. 26
> 63.450	Phantom	HM-TIP		$\alpha 5^\circ$					N	 P. 26
> 63.460	Phantom	HM-TIP		$\alpha 5^\circ$					N	 P. 27
> 64.150	Phantom	HSS-Co	300mm 12"							P. 28
> 64.450	Phantom	cv	150mm 6"							P. 28
> 64.460	Phantom	HSS	300mm 12"							P. 28
> 64.500	Phantom									P. 29
> 64.600	Phantom									P. 31
> 64.605	Phantom									P. 33
> 64.630	Phantom									P. 33
> 66.110	Phantom	BIM HSS			P K N					P. 34
> 66.130	Phantom	BIM HSS	KASTO		P K N					P. 34
> 66.160	Phantom	BIM 8% Co	INOX		P M K N					P. 35
> 66.450	Phantom	BIM 8% Co	VARI	$\alpha 0^\circ$	P M K N S					P. 36
> 66.460	Phantom	BIM 8% Co	VARI	$\alpha 10^\circ$	P M K N S					P. 36
> 66.580	Phantom	BIM 10% Co	VARI	$\alpha 15^\circ$	P M S					P. 37
> 66.700	Phantom	BIM 8% Co	VARI	$\alpha 5^\circ$	P M K N S					P. 37
> 67.100	Phantom									P. 38
> 67.110	Phantom									P. 38
> 67.120	Phantom									P. 39
> 67.130	Phantom		INOX							P. 39
> 67.250	Phantom									P. 40
> 67.290	Phantom									P. 40
> 67.300	Phantom									P. 40
> 69.111	Phantom	BIM 8% Co			P M K N					P. 41
> 69.130	Phantom	HM-TIP								P. 41

> 69.210	<b>Phantom</b>	HSS-EX 0.5-30 mm	P K N		 P. 42
> 69.212	<b>Phantom</b>	HSS-EX 0.5-30 mm	NIT. P M K N		 P. 42
> 69.215	<b>Phantom</b>	HSS-EX 0.5-55 mm	P K N		 P. 42
> 69.216	<b>Phantom</b>	HSS-EX 0.5-55 mm	NIT. P M K N		 P. 43
> 69.710	<b>Phantom</b>				 P. 43
> 69.712	<b>Phantom</b>				 P. 43
> 69.725	<b>Phantom</b>				 P. 44
> 69.790	<b>Phantom</b>				 P. 44
> 69.795	<b>Phantom</b>				 P. 44



## > 61.105 Phantom

NL HSS-Co 8% Bi-Metaal Gatzaag  
 FR Scie cloche HSS-Co 8% Bi-métal  
 ES Corona Perforadora HSS-Co 8% Bi-Metal  
 DE HSS-Co 8% Bi-Metall Lochsäge



Ref.	d1	Ref.	d1	Ref.	d1
61.105.0014	14	61.105.0041	41	61.105.0076	76
61.105.0016	16	61.105.0043	43	61.105.0079	79
61.105.0017	17	61.105.0044	44	61.105.0083	83
61.105.0018	18	61.105.0046	46	61.105.0086	86
61.105.0019	19	61.105.0048	48	61.105.0089	89
61.105.0020	20	61.105.0049	49	61.105.0090	90
61.105.0021	21	61.105.0050	50	61.105.0092	92
61.105.0022	22	61.105.0051	51	61.105.0095	95
61.105.0024	24	61.105.0052	52	61.105.0098	98
61.105.0025	25	61.105.0054	54	61.105.0100	100
61.105.0027	27	61.105.0056	56	61.105.0102	102
61.105.0028	28	61.105.0057	57	61.105.0105	105
61.105.0029	29	61.105.0059	59	61.105.0108	108
61.105.0030	30	61.105.0060	60	61.105.0111	111
61.105.0032	32	61.105.0061	61	61.105.0114	114
61.105.0033	33	61.105.0064	64	61.105.0121	121
61.105.0034	34	61.105.0065	65	61.105.0127	127
61.105.0035	35	61.105.0067	67	61.105.0133	133
61.105.0037	37	61.105.0068	68	61.105.0140	140
61.105.0038	38	61.105.0070	70	61.105.0146	146
61.105.0040	40	61.105.0073	73	61.105.0152	152

## > 61.110 Phantom

NL HSS-Co 8% Bi-Metaal Gatzaag voor dunne plaat en buizen  
 FR Scie cloche HSS-Co 8% Bi-métal pour tôle fine et tube  
 ES Corona Perforadora HSS-Co 8% Bi-Metal para chapa fina y tubos  
 DE HSS-Co 8% Bi-Metall Lochsäge für dünne Platte und Rohren



Ref.	d1	Ref.	d1	Ref.	d1
61.110.0014	14	61.110.0051	51	61.110.0098	98
61.110.0016	16	61.110.0054	54	61.110.0100	100
61.110.0017	17	61.110.0057	57	61.110.0102	102
61.110.0019	19	61.110.0060	60	61.110.0105	105
61.110.0020	20	61.110.0064	64	61.110.0108	108
61.110.0021	21	61.110.0067	67	61.110.0111	111
61.110.0022	22	61.110.0068	68	61.110.0114	114
61.110.0024	24	61.110.0070	70	61.110.0121	121
61.110.0025	25	61.110.0073	73	61.110.0127	127
61.110.0027	27	61.110.0076	76	61.110.0133	133
61.110.0030	30	61.110.0079	79	61.110.0140	140
61.110.0032	32	61.110.0083	83	61.110.0152	152
61.110.0035	35	61.110.0086	86	61.110.0160	160
61.110.0038	38	61.110.0089	89	61.110.0168	168
61.110.0040	40	61.110.0090	90	61.110.0177	177
61.110.0044	44	61.110.0092	92	61.110.0210	210
61.110.0048	48	61.110.0095	95		

> **61.130** **Phantom**

NL **HM-tip Gatzaag** snijdiepte 58 mm  
 FR **Scie cloche** pointe carb. mét. profondeur de coupe 58 mm  
 ES **Corona Perforadora punta MD** profundidad de corte 58 mm  
 DE **HM-Schneiden Lochsäge** schnittiefe 58 mm



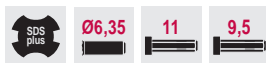
Ref.	d1
61.130.0014	14
61.130.0016	16
61.130.0017	17
61.130.0018	18
61.130.0019	19
61.130.0020	20
61.130.0021	21
61.130.0022	22
61.130.0024	24
61.130.0025	25
61.130.0027	27
61.130.0028	28
61.130.0029	29
61.130.0030	30
61.130.0032	32
61.130.0033	33
61.130.0035	35
61.130.0037	37
61.130.0038	38
61.130.0040	40
61.130.0041	41

Ref.	d1
61.130.0043	43
61.130.0044	44
61.130.0046	46
61.130.0048	48
61.130.0049	49
61.130.0051	51
61.130.0052	52
61.130.0054	54
61.130.0056	56
61.130.0057	57
61.130.0059	59
61.130.0060	60
61.130.0061	61
61.130.0064	64
61.130.0065	65
61.130.0067	67
61.130.0068	68
61.130.0070	70
61.130.0073	73
61.130.0076	76
61.130.0079	79

Ref.	d1
61.130.0083	83
61.130.0086	86
61.130.0089	89
61.130.0090	90
61.130.0092	92
61.130.0095	95
61.130.0098	98
61.130.0100	100
61.130.0102	102
61.130.0105	105
61.130.0108	108
61.130.0111	111
61.130.0114	114
61.130.0121	121
61.130.0127	127
61.130.0133	133
61.130.0140	140
61.130.0146	146
61.130.0152	152

> **61.150** **Phantom**

NL **Houder voor Gatzaag 61.105 en 61.110**  
 FR **Arbre pour Scies cloches 61.105 et 61.110**  
 ES **Husillo para Corona perforadora 61.105 y 61.110**  
 DE **Halter für Lochsägen 61.105 und 61.110**



Ref.	Nr	Ø	d2
61.150.0100	1	14-30	11mm - 7/16"
61.150.0201	2	32-210	11mm - 7/16"
61.150.0400	4	14-30	Ø 6,35mm - 1/4"

Ref.	Nr	Ø	d2
61.150.0500	5	14-30	9,5mm - 3/8"
61.150.0601	6	32-210	9,5mm - 3/8"
61.150.0800	8	14-30	SDS+

Ref.	Nr	Ø	d2
61.150.0901	9	32-210	SDS+

> **61.151** **Phantom**

NL **Houder voor HM-tip Gatzaag 61.130**  
 FR **Arbre pour Scies trépan à plaquette carbure brasée 61.130**  
 ES **Husillo para Corona perforadora punta MD 61.130**  
 DE **Halter für HM-Bohrkrone 61.130**



Ref.	Nr	Ø	d2
61.151.0100	1	14-30	9,5mm - 3/8"

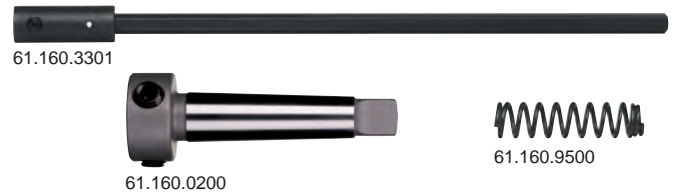
Ref.	Nr	Ø	d2
61.151.0200	2	32-152	9,5mm - 3/8"

Ref.	Nr	Ø	d2



## > 61.160 Phantom

NL Toebehoren voor Gatzaag 61.105, 61.110 en 61.130  
 FR Accessoires pour Scie cloches 61.105, 61.110 et 61.130  
 ES Accesorios para Corona perforadora 61.105, 61.110 y 61.130  
 DE Zubehör für Lochsagen 61.105, 61.110 und 61.130



Ref.	Type	61.150	Ref.	Type	61.150	Ref.	Type	61.150
61.160.0200	MK 2	1,2	61.160.3301	l=300	1,2	61.160.9500		1-9

## > 61.170 Phantom

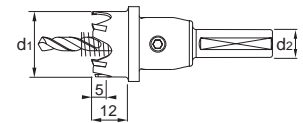
NL Centerboor voor Gatzaag 61.105, 61.110 en 61.130  
 FR Foret à centrer pour Scies cloches 61.105, 61.110 et 61.130  
 ES Broca de centrar para la Corona perforadora 61.105, 61.110 y 61.130  
 DE Zentrierbohrer für Lochsäge 61.105, 61.110 und 61.130



Ref.	Type	d2	l1	61.1xx	Nr
61.170.0600	HSS-E	6.35	90	61.150	1,2, 5, 6, 8, 9
61.170.0601	HSS-E	6.35	115	61.150	4
61.170.0602	HSS-E	6.35	110	61.151	1,2
61.170.0603	Carbide Tipped	6.35	110	61.151	1,2

## > 61.630 Phantom

NL HM-tip Gatfrees materiaaldikte <5 mm  
 FR Scie trépan pointe carb. mét. épaisseur <5 mm  
 ES Corona fresa punta MD espesor <5 mm  
 DE HM-Schneiden Lochfräser Materialdicke <5 mm



HM-TIP	0.5-5 mm	P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 42	N 52	N 62
		≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	INOX >850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si-10%	CuAlFe	GFK/CFK
		36	34	30	25	20	10	60	40	90	35	30

Ref.	d1	d2	z	Ref.	d1	d2	z	Ref.	d1	d2	z
61.630.0140	14	10	6	61.630.0225	22.5	10	6	61.630.0400	40	13	6
61.630.0150	15	10	6	61.630.0230	23	10	6	61.630.0430	43	13	6
61.630.0152	15.2	10	6	61.630.0240	24	10	6	61.630.0450	45	13	6
61.630.0160	16	10	6	61.630.0250	25	10	6	61.630.0480	48	13	6
61.630.0170	17	10	6	61.630.0260	26	10	6	61.630.0500	50	13	6
61.630.0180	18	10	6	61.630.0270	27	10	6	61.630.0550	55	13	6
61.630.0186	18.6	10	6	61.630.0280	28	10	6	61.630.0600	60	13	8
61.630.0190	19	10	6	61.630.0283	28.3	10	6	61.630.0700	70	13	8
61.630.0200	20	10	6	61.630.0300	30	10	6	61.630.0760	76	13	10
61.630.0204	20.4	10	6	61.630.0320	32	10	6	61.630.0800	80	13	12
61.630.0210	21	10	6	61.630.0350	35	13	6				
61.630.0220	22	10	6	61.630.0380	38	13	6				

## > 61.640 Phantom

NL Toebehoren voor HM-tip Gatfrees 61.630  
 FR Accessoires pour Scies trépan à plaquette carbure brasée. 61.630  
 ES Accesorios para Corona fresa punta MD 61.630  
 DE Zubehör für HM bestückte Tieflochfräser 61.630

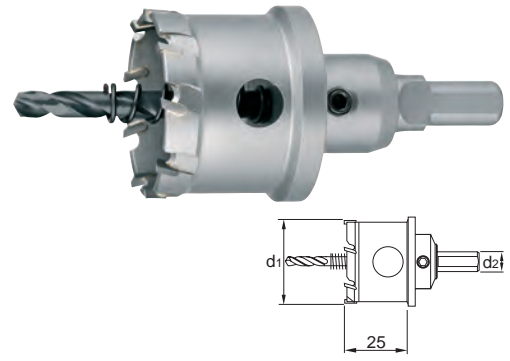


Ref.	Description	Ref.	Description	Ref.	Description
61.640.0600	HSS 6x46,5 mm	61.640.9000	spring		



> **61.670 Phantom**

- NL HM-tip Gatfrees diepgat uitvoering 25 mm, materiaaldikte <12 mm
- FR Scie trépan pointe carb. mét. profondeur de coupe 25 mm, épaisseur <12 mm
- ES Corona fresa punta MD profundidad de corte 25 mm, espesor <12 mm
- DE HM-Schneiden Lochfräser Tiefloch-Ausführung 25 mm, Materialdicke <12 mm



<b>P 11</b> s800 N/mm <sup>2</sup>	<b>P 12</b> s850 N/mm <sup>2</sup>	<b>P 13</b> s1000 N/mm <sup>2</sup>	<b>P 14</b> s1400 N/mm <sup>2</sup>	<b>M 21</b> INOX s850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
36	34	30	25	20	10	60	40	90	35	30

Ref.	d1	d2	z
61.670.0016	16	10	6
61.670.0017	17	10	6
61.670.0018	18	10	6
61.670.0019	19	10	6
61.670.0020	20	10	6
61.670.0021	21	10	6
61.670.0022	22	10	6
61.670.0023	23	10	6
61.670.0024	24	10	6
61.670.0025	25	10	6
61.670.0026	26	10	6
61.670.0027	27	10	6
61.670.0028	28	10	6
61.670.0029	29	10	6
61.670.0030	30	10	6
61.670.0031	31	10	6
61.670.0032	32	10	6
61.670.0033	33	10	6
61.670.0034	34	10	6
61.670.0035	35	10	6
61.670.0036	36	10	6
61.670.0037	37	10	6
61.670.0038	38	10	6

Ref.	d1	d2	z
61.670.0039	39	10	6
61.670.0040	40	10	6
61.670.0041	41	10	6
61.670.0042	42	10	6
61.670.0043	43	10	6
61.670.0044	44	10	6
61.670.0045	45	10	6
61.670.0046	46	10	6
61.670.0047	47	10	6
61.670.0048	48	10	6
61.670.0049	49	10	6
61.670.0050	50	10	6
61.670.0051	51	10	6
61.670.0052	52	10	6
61.670.0053	53	10	6
61.670.0054	54	10	6
61.670.0055	55	10	6
61.670.0056	56	10	6
61.670.0057	57	10	6
61.670.0058	58	10	6
61.670.0060	60	10	8
61.670.0061	61	10	8
61.670.0062	62	10	8

Ref.	d1	d2	z
61.670.0063	63	10	8
61.670.0064	64	10	8
61.670.0065	65	10	8
61.670.0066	66	10	8
61.670.0067	67	10	8
61.670.0068	68	10	8
61.670.0070	70	10	8
61.670.0072	72	10	10
61.670.0074	74	10	10
61.670.0075	75	10	10
61.670.0076	76	10	10
61.670.0077	77	10	12
61.670.0078	78	10	12
61.670.0079	79	10	12
61.670.0080	80	13	12
61.670.0082	82	13	12
61.670.0083	83	13	12
61.670.0084	84	13	12
61.670.0085	85	13	12
61.670.0090	90	13	14
61.670.0092	92	13	14
61.670.0095	95	13	14
61.670.0100	100	13	14

> **61.675 Phantom**

- NL Onderdelen en Toebehoren voor HM-tip Gatfrees 61.670
- FR Pièces détachées et Accessoires pour Scies trépan à plaquette carbure brasée. 61.670
- ES Componentes y Accesorios para Corona fresa punta MD 61.670
- DE Einzelteile und Zubehör für HM bestückte Tieflochfräser 61.670



61.675.0600



61.675.9000

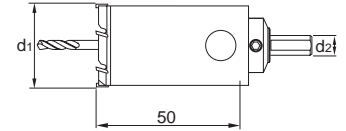
Ref.	Description
61.675.0600	HSS 6x76 mm

Ref.	Description
61.675.9000	

Ref.	Description

## > 61.680 Phantom

- NL HM-tip Gatfrees lange diepgat uitvoering 50 mm, materiaaldikte <12 mm  
 FR Scie trépan pointe carb. mét. profondeur de coupe 50 mm, épaisseur <12 mm  
 ES Corona fresa punta MD profundidad de corte 50 mm, espesor <12 mm  
 DE HM-Schneiden Lochfräser lange Tiefloch-Ausführung 50 mm, Materialdicke <12 mm



<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>P 14</b> S1400 N/mm <sup>2</sup>	<b>M 21</b> INOX S850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
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36	34	30	25	20	10	60	40	90	35	30
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Ref.	d1	d2	z	Ref.	d1	d2	z	Ref.	d1	d2	z
61.680.0020	20	10	6	61.680.0037	37	10	6	61.680.0057	57	10	6
61.680.0021	21	10	6	61.680.0038	38	10	6	61.680.0060	60	10	8
61.680.0022	22	10	6	61.680.0039	39	10	6	61.680.0061	61	10	8
61.680.0023	23	10	6	61.680.0040	40	10	6	61.680.0062	62	10	8
61.680.0024	24	10	6	61.680.0041	41	10	6	61.680.0064	64	10	8
61.680.0025	25	10	6	61.680.0042	42	10	6	61.680.0065	65	10	8
61.680.0026	26	10	6	61.680.0043	43	10	6	61.680.0067	67	10	8
61.680.0027	27	10	6	61.680.0045	45	10	6	61.680.0070	70	10	8
61.680.0028	28	10	6	61.680.0048	48	10	6	61.680.0075	75	10	10
61.680.0030	30	10	6	61.680.0050	50	10	6	61.680.0076	76	10	10
61.680.0032	32	10	6	61.680.0051	51	10	6	61.680.0080	80	13	12
61.680.0033	33	10	6	61.680.0053	53	10	6	61.680.0090	90	13	14
61.680.0034	34	10	6	61.680.0054	54	10	6	61.680.0100	100	13	14
61.680.0035	35	10	6	61.680.0055	55	10	6				

## > 61.685 Phantom

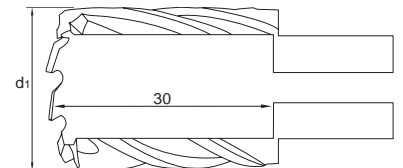
- NL HSS Centreerboor voor HM-tip Gatfrees 61.680  
 FR Foret à centrer HSS pour Scies trépan à plaquette carbure brasée 61.680  
 ES Broca de centrar HSS para Corona fresa punta MD 61.680  
 DE HSS Zentrierbohrer für HM bestückte Tieflochfräser 61.680



Ref.	Description	Ref.	Description	Ref.	Description
61.685.0600	HSS 6x104 mm				

## > 62.100 Phantom

- NL HSS-EX Kernboor snijdiepte 30 mm  
 FR Fraise à carotter HSS-EX profondeur de coupe 30 mm  
 ES Fresa hueca HSS-EX profundidad de corte 30 mm  
 DE HSS-EX Kernbohr Schnittiefe 30 mm



<b>P 11</b> S600 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
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25	20	13	18	38	32	22	17
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Ref.	d1	Ref.	d1	Ref.	d1
62.100.1200	12	62.100.2000	20	62.100.2800	28
62.100.1300	13	62.100.2100	21	62.100.2900	29
62.100.1400	14	62.100.2200	22	62.100.3000	30
62.100.1500	15	62.100.2300	23	62.100.3100	31
62.100.1600	16	62.100.2400	24	62.100.3200	32
62.100.1700	17	62.100.2500	25	62.100.3300	33
62.100.1800	18	62.100.2600	26	62.100.3400	34
62.100.1900	19	62.100.2700	27	62.100.3500	35

> **62.100 Phantom**

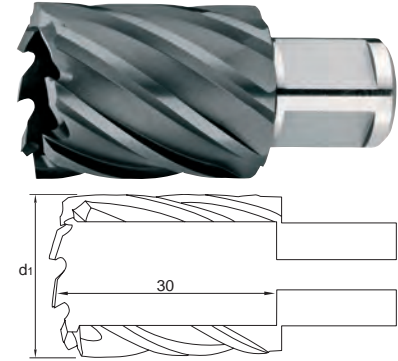
Ref.	d1
62.100.3600	36
62.100.3700	37
62.100.3800	38
62.100.3900	39
62.100.4000	40
62.100.4100	41
62.100.4200	42
62.100.4300	43
62.100.4400	44
62.100.4500	45

Ref.	d1
62.100.4600	46
62.100.4700	47
62.100.4800	48
62.100.4900	49
62.100.5000	50
62.100.5100	51
62.100.5200	52
62.100.5300	53
62.100.5400	54
62.100.5500	55

Ref.	d1
62.100.5600	56
62.100.5700	57
62.100.5800	58
62.100.5900	59
62.100.6000	60
62.100.6100	61
62.100.6200	62
62.100.6300	63
62.100.6400	64
62.100.6500	65

> **62.104 Phantom**

NL HSS-EX Kernboor TiAIN, snijdiepte 30 mm  
 FR Fraise à carotter HSS-EX TiAIN, profondeur de coupe 30 mm  
 ES Fresa hueca HSS-EX TiAIN, profundidad de corte 30 mm  
 DE HSS-EX Kernbohr TiAIN, Schnitttiefe 30 mm



HSS-EX **TiAIN**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25	20	13	10	4	18	38	32	22	17

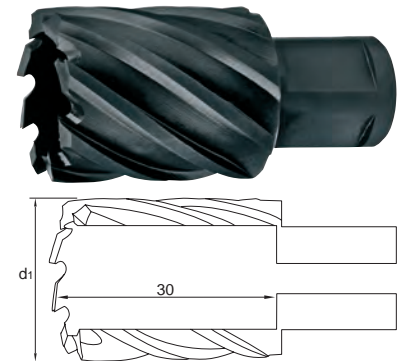
Ref.	d1
62.104.1200	12
62.104.1300	13
62.104.1400	14
62.104.1500	15
62.104.1600	16
62.104.1700	17
62.104.1800	18
62.104.1900	19

Ref.	d1
62.104.2000	20
62.104.2100	21
62.104.2200	22
62.104.2300	23
62.104.2400	24
62.104.2500	25
62.104.2600	26
62.104.2700	27

Ref.	d1
62.104.2800	28
62.104.3000	30
62.104.3500	35
62.104.4000	40
62.104.4500	45
62.104.5000	50
62.104.5500	55
62.104.6000	60

> **62.122 Phantom**

NL HSS-EX Kernboor genitreerd, snijdiepte 30 mm  
 FR Fraise à carotter HSS-EX nitruré, profondeur de coupe 30 mm  
 ES Fresa hueca HSS-EX nitrurada, profundidad de corte 30 mm  
 DE HSS-EX Kernbohr nitriert, Schnitttiefe 30 mm



HSS-EX **NIT.**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
31	18	16	9	10	4	20	16	38	40	36	36	22

Ref.	d1
62.122.1200	12
62.122.1300	13
62.122.1400	14
62.122.1500	15
62.122.1600	16
62.122.1700	17
62.122.1800	18
62.122.1900	19
62.122.2000	20
62.122.2100	21

Ref.	d1
62.122.2200	22
62.122.2300	23
62.122.2400	24
62.122.2500	25
62.122.2600	26
62.122.2700	27
62.122.2800	28
62.122.2900	29
62.122.3000	30
62.122.3100	31

Ref.	d1
62.122.3200	32
62.122.3300	33
62.122.3400	34
62.122.3500	35
62.122.3600	36
62.122.3700	37
62.122.3800	38
62.122.3900	39
62.122.4000	40
62.122.4100	41

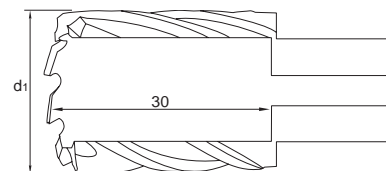
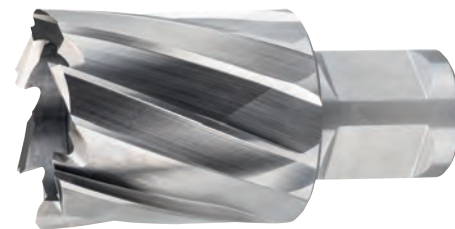


## > 62.122 Phantom

Ref.	d1	Ref.	d1	Ref.	d1
62.122.4200	42	62.122.5000	50	62.122.5800	58
62.122.4300	43	62.122.5100	51	62.122.5900	59
62.122.4400	44	62.122.5200	52	62.122.6000	60
62.122.4500	45	62.122.5300	53	62.122.6100	61
62.122.4600	46	62.122.5400	54	62.122.6200	62
62.122.4700	47	62.122.5500	55	62.122.6300	63
62.122.4800	48	62.122.5600	56	62.122.6400	64
62.122.4900	49	62.122.5700	57	62.122.6500	65

## > 62.130 Phantom

NL HSS-EX Kernboor Rail, snijdiepte 30 mm  
 FR Fraise à carotter HSS-EX Rail, profondeur de coupe 30 mm  
 ES Fresa hueca HSS-EX Rail, profundidad de corte 30 mm  
 DE HSS-EX Kernbohr Rail, Schnittiefe 30 mm

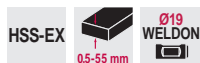
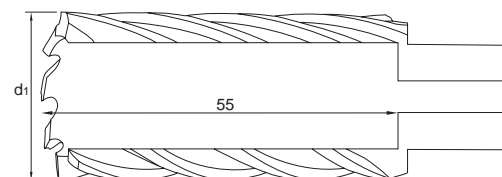


16	9
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Ref.	d1	Ref.	d1	Ref.	d1
62.130.1800	18	62.130.2400	24	62.130.3000	30
62.130.1900	19	62.130.2500	25	62.130.3100	31
62.130.2000	20	62.130.2600	26	62.130.3200	32
62.130.2200	22	62.130.2700	27	62.130.3400	34
62.130.2300	23	62.130.2800	28	62.130.3600	36

## > 62.150 Phantom

NL HSS-EX Kernboor snijdiepte 55 mm  
 FR Fraise à carotter HSS-EX profondeur de coupe 55 mm  
 ES Fresa hueca HSS-EX profundidad de corte 55 mm  
 DE HSS-EX Kernbohr Schnittiefe 55 mm



25	20	13	18	38	32	22	17
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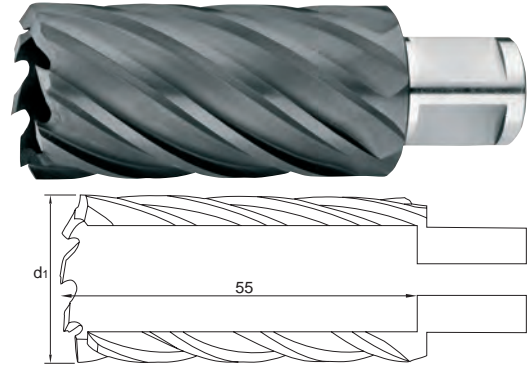
Ref.	d1	Ref.	d1	Ref.	d1
62.150.1200	12	62.150.2500	25	62.150.3800	38
62.150.1300	13	62.150.2600	26	62.150.3900	39
62.150.1400	14	62.150.2700	27	62.150.4000	40
62.150.1500	15	62.150.2800	28	62.150.4100	41
62.150.1600	16	62.150.2900	29	62.150.4200	42
62.150.1700	17	62.150.3000	30	62.150.4300	43
62.150.1800	18	62.150.3100	31	62.150.4400	44
62.150.1900	19	62.150.3200	32	62.150.4500	45
62.150.2000	20	62.150.3300	33	62.150.4600	46
62.150.2100	21	62.150.3400	34	62.150.4700	47
62.150.2200	22	62.150.3500	35	62.150.4800	48
62.150.2300	23	62.150.3600	36	62.150.4900	49
62.150.2400	24	62.150.3700	37	62.150.5000	50

> **62.150** **Phantom**

Ref.	d1	Ref.	d1	Ref.	d1
62.150.5100	51	62.150.5600	56	62.150.6100	61
62.150.5200	52	62.150.5700	57	62.150.6200	62
62.150.5300	53	62.150.5800	58	62.150.6300	63
62.150.5400	54	62.150.5900	59	62.150.6400	64
62.150.5500	55	62.150.6000	60	62.150.6500	65

> **62.154** **Phantom**

NL HSS-EX Kernboor TiAIN, snijdiepte 55 mm  
 FR Fraise à carotter HSS-EX TiAIN, profondeur de coupe 55 mm  
 ES Fresa hueca HSS-EX TiAIN, profundidad de corte 55 mm  
 DE HSS-EX Kernbohr TiAIN, Schnitttiefe 55 mm



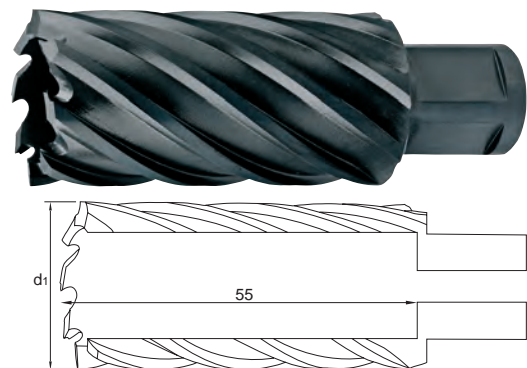
HSS-EX **TiAIN** **Ø19** 0.5-55 mm

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
25	20	13	10	4	18	38	32	22	17

Ref.	d1	Ref.	d1	Ref.	d1
62.154.1200	12	62.154.2000	20	62.154.3200	32
62.154.1300	13	62.154.2100	21	62.154.3500	35
62.154.1400	14	62.154.2200	22	62.154.4000	40
62.154.1500	15	62.154.2400	24	62.154.4500	45
62.154.1600	16	62.154.2500	25	62.154.5000	50
62.154.1700	17	62.154.2600	26	62.154.5500	55
62.154.1800	18	62.154.2800	28	62.154.6000	60
62.154.1900	19	62.154.3000	30		

> **62.162** **Phantom**

NL HSS-EX Kernboor genitreerd, snijdiepte 55 mm  
 FR Fraise à carotter HSS-EX nitruré, profondeur de coupe 55 mm  
 ES Fresa hueca HSS-EX nitrurada, profundidad de corte 55 mm  
 DE HSS-EX Kernbohr nitriert, Schnitttiefe 55 mm



HSS-EX **NIT.** **Ø19** 0.5-55 mm

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
31	18	16	9	10	4	20	16	38	40	36	36	22

Ref.	d1	Ref.	d1	Ref.	d1
62.162.1200	12	62.162.2050	20.5	62.162.3500	35
62.162.1300	13	62.162.2100	21	62.162.3600	36
62.162.1400	14	62.162.2200	22	62.162.3700	37
62.162.1450	14.5	62.162.2300	23	62.162.3800	38
62.162.1500	15	62.162.2400	24	62.162.3900	39
62.162.1550	15.5	62.162.2500	25	62.162.4000	40
62.162.1600	16	62.162.2600	26	62.162.4100	41
62.162.1650	16.5	62.162.2700	27	62.162.4200	42
62.162.1700	17	62.162.2800	28	62.162.4300	43
62.162.1750	17.5	62.162.2900	29	62.162.4400	44
62.162.1800	18	62.162.3000	30	62.162.4500	45
62.162.1850	18.5	62.162.3100	31	62.162.4600	46
62.162.1900	19	62.162.3200	32	62.162.4700	47
62.162.1950	19.5	62.162.3300	33	62.162.4800	48
62.162.2000	20	62.162.3400	34	62.162.4900	49

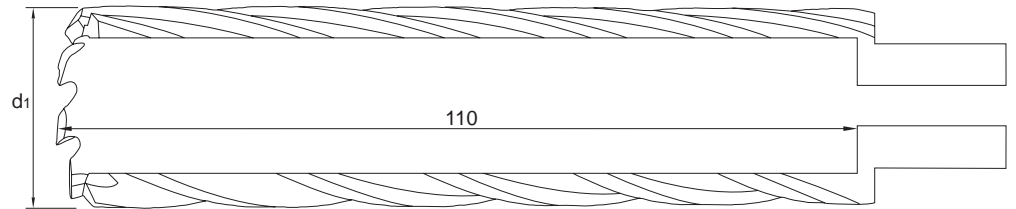


## > 62.162 Phantom

Ref.	d1	Ref.	d1	Ref.	d1
62.162.5000	50	62.162.5600	56	62.162.6200	62
62.162.5100	51	62.162.5700	57	62.162.6300	63
62.162.5200	52	62.162.5800	58	62.162.6400	64
62.162.5300	53	62.162.5900	59	62.162.6500	65
62.162.5400	54	62.162.6000	60		
62.162.5500	55	62.162.6100	61		

## > 62.180 Phantom

NL HSS-EX Kernboor snijdiepte 110 mm  
 FR Fraise à carotter HSS-EX profondeur de coupe 110 mm  
 ES Fresa hueca HSS-EX profundidad de corte 110 mm  
 DE HSS-EX Kernbohr Schnitttiefe 110 mm



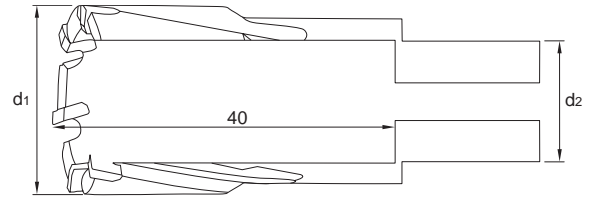
P 11	P 12	P 13	K 31	N 41	N 42	N 51	N 61
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	Alu	Alu Si>10%	Cu	PVC
25	20	13	18	38	32	22	17

Ref.	d1	Ref.	d1	Ref.	d1
62.180.1800	18	62.180.2500	25	62.180.3400	34
62.180.1900	19	62.180.2600	26	62.180.3500	35
62.180.2000	20	62.180.2700	27	62.180.4000	40
62.180.2100	21	62.180.2800	28	62.180.4500	45
62.180.2200	22	62.180.3000	30	62.180.5000	50
62.180.2400	24	62.180.3200	32		



> **62.200 Phantom**

NL **HM-tip Kernboor snijdiepte 40 mm**  
 FR **Fraise à carotter pointe carb. mét. profondeur de coupe 40 mm**  
 ES **Fresa hueca punta MD profundidad de corte 40 mm**  
 DE **HM-Schneiden Kernbohr Schnittiefe 40 mm**



<b>P 11</b> ≤560 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤950N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
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36	34	30	25	20	20	10	60	40	90	35	30
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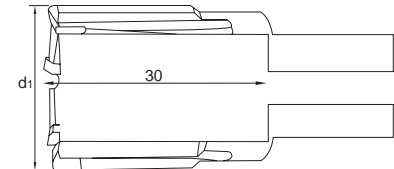
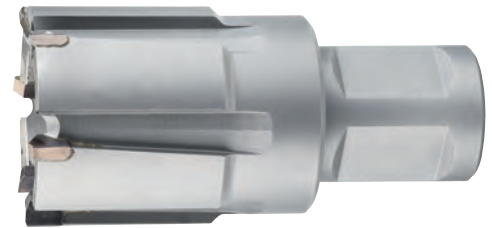
Ref.	d1
62.200.1200	12
62.200.1300	13
62.200.1400	14
62.200.1500	15
62.200.1600	16
62.200.1700	17
62.200.1800	18
62.200.1900	19
62.200.2000	20

Ref.	d1
62.200.2100	21
62.200.2200	22
62.200.2300	23
62.200.2400	24
62.200.2500	25
62.200.2600	26
62.200.2700	27
62.200.2800	28
62.200.3000	30

Ref.	d1
62.200.3200	32
62.200.3500	35
62.200.3600	36
62.200.4000	40
62.200.4500	45
62.200.5000	50
62.200.5500	55
62.200.6000	60

> **62.210 Phantom**

NL **HM-tip Kernboor Rail, snijdiepte 30 mm**  
 FR **Fraise à carotter pointe carb. mét. Rail, profondeur de coupe 30 mm**  
 ES **Fresa hueca punta MD Rail, profundidad de corte 30 mm**  
 DE **HM-Schneiden Kernbohr Rail, Schnittiefe 30 mm**



<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>
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30	25
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Ref.	d1
62.210.1800	18
62.210.1900	19
62.210.2000	20
62.210.2200	22

Ref.	d1
62.210.2400	24
62.210.2600	26
62.210.2800	28
62.210.3000	30

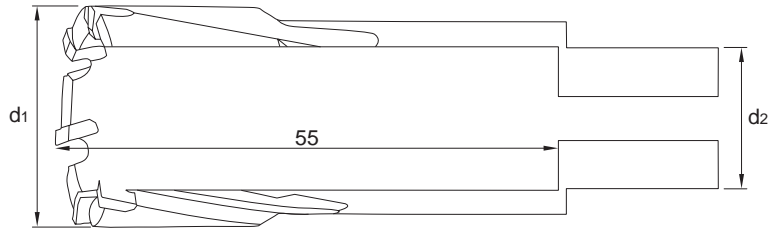
Ref.	d1
62.210.3100	31
62.210.3200	32
62.210.3600	36





## > 62.220 Phantom

NL HM-tip Kernboor snijdiepte 55 mm  
 FR Fraise à carotter pointe carb. mét. profondeur de coupe 55 mm  
 ES Fresa hueca punta MD profundidad de corte 55 mm  
 DE HM-Schneiden Kernbohr Schnittiefe 55 mm



**NIEUW / NOUVEAU / NUEVO / NEU**

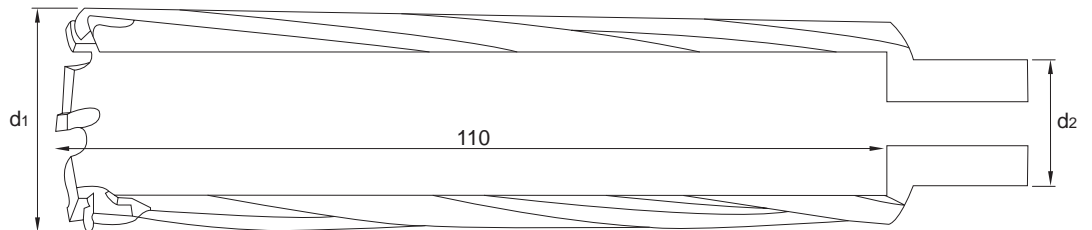
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
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36	34	30	25	20	20	10	60	40	90	35	30
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Ref.	d1	d2	Ref.	d1	d2	Ref.	d1	d2
62.220.1200	12	19	62.220.2400	24	19	62.220.5500	55	19
62.220.1300	13	19	62.220.2500	25	19	62.220.6000	60	19
62.220.1400	14	19	62.220.2600	26	19	62.220.6500	65	32
62.220.1500	15	19	62.220.2700	27	19	62.220.7000	70	32
62.220.1600	16	19	62.220.2800	28	19	62.220.7500	75	32
62.220.1700	17	19	62.220.3000	30	19	62.220.8000	80	32
62.220.1800	18	19	62.220.3200	32	19	62.220.8500	85	32
62.220.1900	19	19	62.220.3500	35	19	62.220.9000	90	32
62.220.2000	20	19	62.220.3600	36	19	62.220.9500	95	32
62.220.2100	21	19	62.220.4000	40	19	62.220.9910	100	32
62.220.2200	22	19	62.220.4500	45	19			
62.220.2300	23	19	62.220.5000	50	19			

## > 62.240 Phantom

NL HM-tip Kernboor snijdiepte 110 mm  
 FR Fraise à carotter pointe carb. mét. profondeur de coupe 110 mm  
 ES Fresa hueca punta MD profundidad de corte 110 mm  
 DE HM-Schneiden Kernbohr Schnittiefe 110 mm



**NIEUW / NOUVEAU / NUEVO / NEU**

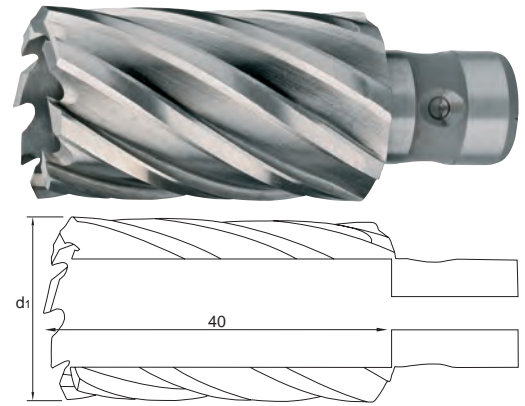
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
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36	34	30	25	20	20	10	60	40	90	35	30
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Ref.	d1	Ref.	d1	Ref.	d1
62.240.1400	14	62.240.2200	22	62.240.3200	32
62.240.1500	15	62.240.2300	23	62.240.3500	35
62.240.1600	16	62.240.2400	24	62.240.3600	36
62.240.1700	17	62.240.2500	25	62.240.4000	40
62.240.1800	18	62.240.2600	26	62.240.4500	45
62.240.1900	19	62.240.2700	27	62.240.5000	50
62.240.2000	20	62.240.2800	28	62.240.5500	55
62.240.2100	21	62.240.3000	30	62.240.6000	60

> **62.250 Phantom**

- NL HSS-EX Kernboor met Fein QuickIN opname, snijdiepte 40 mm
- FR Fraise à carotter HSS-EX Fein QuickIN, profondeur de coupe 40 mm
- ES Fresa hueca HSS-EX con mango Fein QuickIn, profundidad de corte 40 mm
- DE HSS-EX Kernbohr mit Fein QuickIN Aufnahme, Schnitttiefe 40 mm



HSS-EX **Ø18**  
0,5-40 mm FEIN QUICKIN

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 61</b> PVC
31	18	16	9	10	4	20	16	38	40	36	36	22

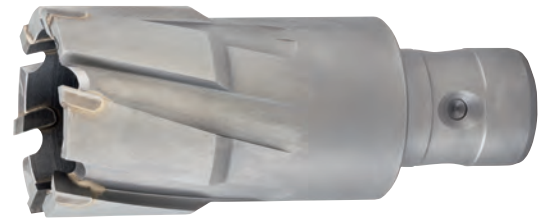
Ref.	d1
62.250.1200	12
62.250.1300	13
62.250.1400	14
62.250.1500	15
62.250.1600	16
62.250.1700	17
62.250.1800	18
62.250.1900	19
62.250.2000	20

Ref.	d1
62.250.2100	21
62.250.2200	22
62.250.2300	23
62.250.2400	24
62.250.2500	25
62.250.2600	26
62.250.2700	27
62.250.2800	28
62.250.2900	29

Ref.	d1
62.250.3000	30
62.250.3200	32
62.250.3500	35
62.250.4000	40
62.250.4500	45
62.250.5000	50
62.250.5500	55
62.250.6000	60

> **62.270 Phantom**

- NL HM-tip Kernboor met Fein QuickIN opname, snijdiepte 40 mm
- FR Fraise à carotter pointe carb. mét. Fein QuickIN, profondeur de coupe 40 mm
- ES Fresa hueca punta MD con mango Fein QuickIn, profundidad de corte 40 mm
- DE HM-Schneiden Kernbohr mit Fein QuickIN Aufnahme, Schnittiefe 40 mm



HM-TIP **Ø18**  
0,5-40 mm FEIN QUICKIN

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
36	34	30	25	20	20	10	60	40	90	35	30

Ref.	d1
62.270.1200	12
62.270.1300	13
62.270.1400	14
62.270.1500	15
62.270.1600	16
62.270.1700	17
62.270.1800	18
62.270.1900	19
62.270.2000	20

Ref.	d1
62.270.2100	21
62.270.2200	22
62.270.2300	23
62.270.2400	24
62.270.2500	25
62.270.2600	26
62.270.2700	27
62.270.2800	28
62.270.2900	29

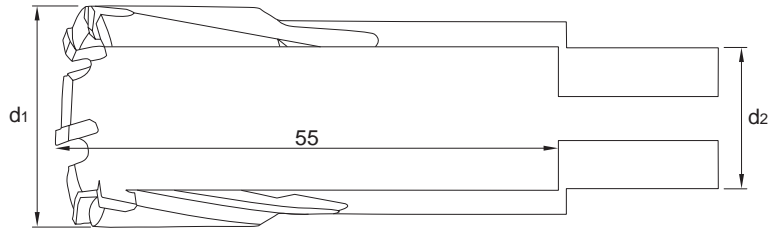
Ref.	d1
62.270.3000	30
62.270.3200	32
62.270.3500	35
62.270.4000	40
62.270.4500	45
62.270.5000	50
62.270.5500	55
62.270.6000	60

**NIEUW / NOUVEAU / NUEVO / NEU**



## > 62.280 Phantom

- NL HM-tip Kernboor met Fein QuickIN opname, snijdiepte 55 mm  
 FR Fraise à carotter pointe carb. mét. Fein QuickIN, profondeur de coupe 55 mm  
 ES Fresa hueca punta MD con mango Fein QuickIn, profundidad de corte 55 mm  
 DE HM-Schneiden Kernbohr mit Fein QuickIN Aufnahme, Schnittiefe 55 mm



**HM-TIP**  
 0,5-55 mm  
 Ø18  
 FEIN  
 QUICKIN

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 42</b> Alu Si>10%	<b>N 52</b> CuAlFe	<b>N 62</b> GFK/CFK
36	34	30	25	20	20	10	60	40	90	35	30

Ref.	d1
62.280.1200	12
62.280.1300	13
62.280.1400	14
62.280.1500	15
62.280.1600	16
62.280.1700	17
62.280.1800	18
62.280.1900	19
62.280.2000	20

Ref.	d1
62.280.2100	21
62.280.2200	22
62.280.2300	23
62.280.2400	24
62.280.2500	25
62.280.2600	26
62.280.2700	27
62.280.2800	28
62.280.2900	29

Ref.	d1
62.280.3000	30
62.280.3200	32
62.280.3500	35
62.280.4000	40
62.280.4500	45
62.280.5000	50
62.280.5500	55
62.280.6000	60

**NIEUW / NOUVEAU / NUEVO / NEU**

## > 62.295 Phantom

- NL HSS Verzinkboor 90°  
 FR Fraise à chanfreiner HSS 90°  
 ES Avellanador HSS 90°  
 DE HSS Kegelsenker 90°



**HSS**  
 3  
 90°  
 Ø19  
 WELDON

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
30	25	20	8	20	30	30	25	20

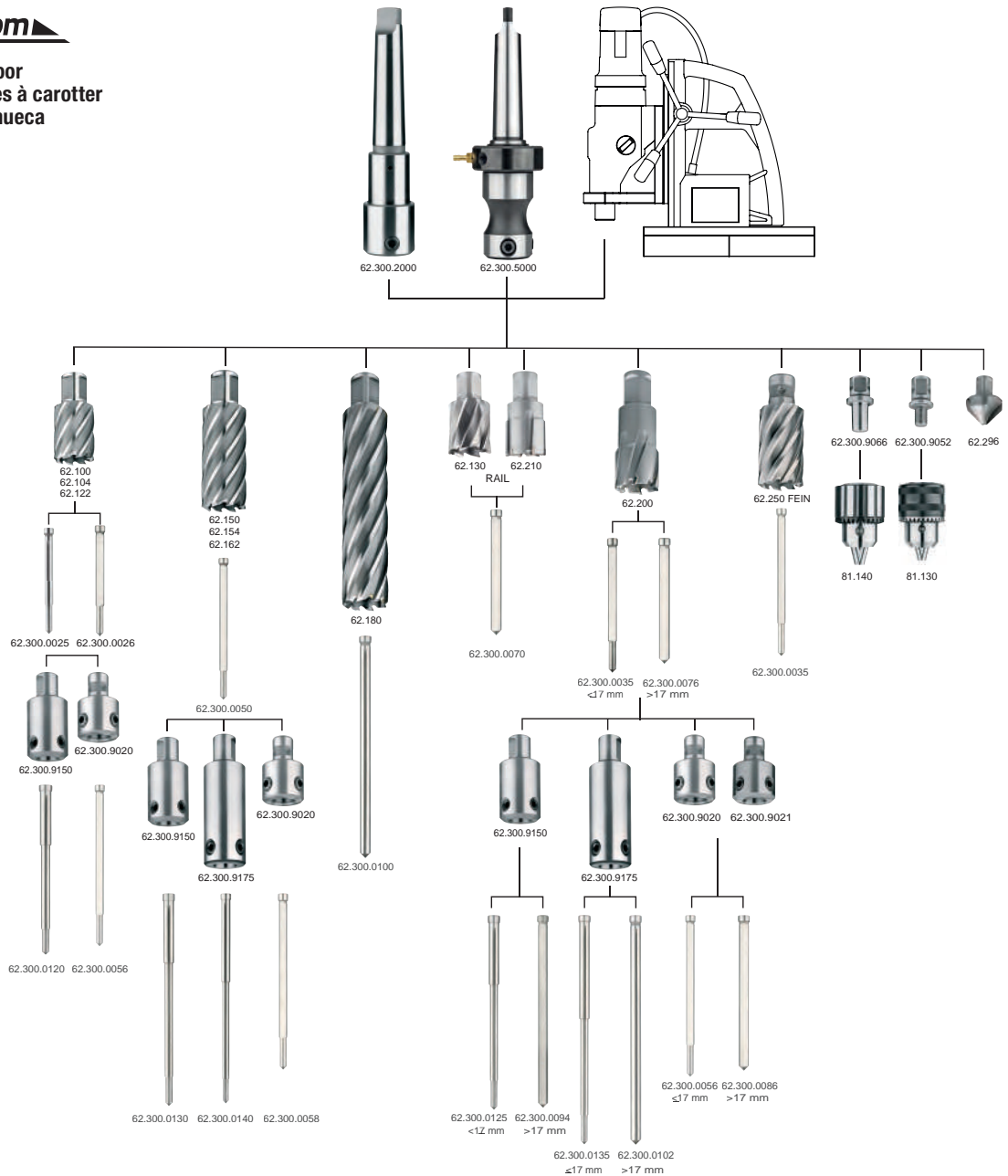
Ref.	d1
62.295.0325	25
62.295.0330	30

Ref.	d1
62.295.0340	40
62.295.0355	55

Ref.	d1

> **62.300 Phantom**

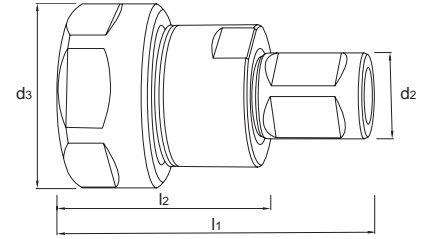
NL Toebehoren voor Kernboor  
 FR Accessoires pour Fraises à carotter  
 ES Accesorios para Fresa hueca  
 DE Zubehör für Kernbohrer



Ref.	Type	d1	l1	62.XXX
62.300.0025	30 mm	6,35/5,3	77	62.100, 62.104, 62.122
62.300.0026	30 mm	6,35/5,3	77	62.100, 62.104, 62.122
62.300.0035	40 mm	6,35/5,3	90	62.200(=17 mm), 62.250
62.300.0050	55 mm	6,35/5,3	102	62.150, 62.154, 62.162
62.300.0056	40 mm	6,35/5,3	116	62.200=17 mm + 62.300.9020
62.300.0058	55 mm	6,35/5,3	127	62.150, 62.154, 62.162 + 62.300.9020
62.300.0070	30 mm	7,98	77	62.130, 62.210
62.300.0076	40 mm	7,98	90	62.200 >17 mm
62.300.0086	40 mm	7,98	118	62.200 >17 mm + 62.300.9021
62.300.0090	55 mm	7,98	115	62.280
62.300.0094	40 mm	7,98	145	62.200 >17 mm + 62.300.9150
62.300.0100	110 mm	7,98	160	62.180
62.300.0102	40 mm	7,98	165	62.200 >17 mm + 62.300.9175
62.300.0120	30 mm	7,98/6,35/5,3	127	62.100, 62.104, 62.122 + 62.300.9150
62.300.0125	40 mm	7,98/6,35/5,3	140	62.200=17 mm + 62.300.9150
62.300.0130	55 mm	7,98/6,35/5,3	153	62.150, 62.154, 62.162 + 62.300.9150
62.300.0135	40 mm	7,98/6,35/5,3	165	62.200=17 mm + 62.300.9175
62.300.0140	55 mm	7,98/6,35/5,3	178	62.150, 62.154, 62.162 + 62.300.9175
62.300.1000	MK 2			
62.300.2000	MK 3			
62.300.3000	MK 4			
62.300.4000	MK 2			
62.300.5000	MK 3			
62.300.6000	MK 4			
62.300.9015	Fein M18 -> Weldon		43	
62.300.9020	Fein QuickIn -> Weldon	6,35	29	
62.300.9021	Fein QuickIn -> Weldon	7,98	29	
62.300.9052	Weldon + Nitto -> 1/2"-20 UNF			
62.300.9066	Weldon + Nitto -> B16			
62.300.9150	Weldon -> Weldon	7,98	50	
62.300.9175	Weldon -> Weldon	7,98	75	

> 62.350 **Phantom**

NL Kernboor, ER Spantanghouder  
 FR Fraise à carotter, Mandrin porte-pinces ER  
 ES Fresa hueca, Portapinzas ER  
 DE Kernbohr, ER-Spannzangenfutter

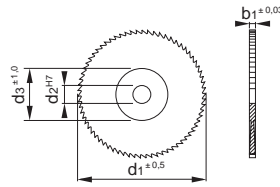


**NIEUW NOUVEAU NUEVO NEU**

Ref.	d2	Type	Clamping range Ø	l2	l3	d3
62.350.1925	Ø 19 Weldon	ER25	1-20	46	24	42

> **63.200 Phantom**

NL HSS Metaalcirkelzaag fijn  
 FR Fraise-scie HSS pas fin  
 ES Fresa sierra circular HSS paso fino  
 DE HSS Metallkreissägeblätter fein



**HSS** **DIN 1837-A**

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW
30-40	25-35	15-25	15-20	10-15	25-30	20-25

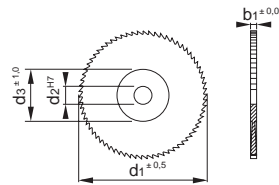
Ref.	d1	b1	d2	d3	z
63.200.0303	32	0.3	8	14	80
63.200.0304	32	0.4	8	14	80
63.200.0305	32	0.5	8	14	80
63.200.0306	32	0.6	8	14	64
63.200.0308	32	0.8	8	14	64
63.200.0310	32	1	8	14	64
63.200.0312	32	1.2	8	14	48
63.200.0315	32	1.5	8	14	48
63.200.0316	32	1.6	8	14	48
63.200.0320	32	2	8	14	48
63.200.0403	40	0.3	10	18	100
63.200.0404	40	0.4	10	18	100
63.200.0405	40	0.5	10	18	80
63.200.0406	40	0.6	10	18	80
63.200.0408	40	0.8	10	18	80
63.200.0410	40	1	10	18	64
63.200.0412	40	1.2	10	18	64
63.200.0415	40	1.5	10	18	64
63.200.0416	40	1.6	10	18	64
63.200.0420	40	2	10	18	48
63.200.0425	40	2.5	10	18	48
63.200.0430	40	3	10	18	48
63.200.0503	50	0.3	13	25	128
63.200.0504	50	0.4	13	25	100
63.200.0505	50	0.5	13	25	100
63.200.0506	50	0.6	13	25	100
63.200.0508	50	0.8	13	25	80
63.200.0510	50	1	13	25	80
63.200.0512	50	1.2	13	25	80
63.200.0515	50	1.5	13	25	64
63.200.0516	50	1.6	13	25	64
63.200.0520	50	2	13	25	64
63.200.0525	50	2.5	13	25	64
63.200.0530	50	3	13	25	48
63.200.0540	50	4	13	25	48
63.200.0603	63	0.3	16	32	128
63.200.0604	63	0.4	16	32	128
63.200.0605	63	0.5	16	32	128
63.200.0606	63	0.6	16	32	100
63.200.0608	63	0.8	16	32	100
63.200.0610	63	1	16	32	100
63.200.0612	63	1.2	16	32	80
63.200.0615	63	1.5	16	32	80
63.200.0616	63	1.6	16	32	80
63.200.0620	63	2	16	32	80
63.200.0625	63	2.5	16	32	64
63.200.0630	63	3	16	32	64
63.200.0640	63	4	16	32	64
63.200.0650	63	5	16	32	48
63.200.0660	63	6	16	32	48
63.200.0803	80	0.3	22	36	160
63.200.0804	80	0.4	22	36	160
63.200.0805	80	0.5	22	36	128
63.200.0806	80	0.6	22	36	128
63.200.0808	80	0.8	22	36	128
63.200.0810	80	1	22	36	100
63.200.0812	80	1.2	22	36	100
63.200.0815	80	1.5	22	36	100
63.200.0816	80	1.6	22	36	100

Ref.	d1	b1	d2	d3	z
63.200.0820	80	2	22	36	80
63.200.0825	80	2.5	22	36	80
63.200.0830	80	3	22	36	80
63.200.0840	80	4	22	36	64
63.200.0850	80	5	22	36	64
63.200.0860	80	6	22	36	64
63.200.1005	100	0.5	22	40	160
63.200.1006	100	0.6	22	40	160
63.200.1008	100	0.8	22	40	128
63.200.1010	100	1	22	40	128
63.200.1012	100	1.2	22	40	128
63.200.1015	100	1.5	22	40	100
63.200.1016	100	1.6	22	40	100
63.200.1020	100	2	22	40	100
63.200.1025	100	2.5	22	40	100
63.200.1030	100	3	22	40	80
63.200.1040	100	4	22	40	80
63.200.1050	100	5	22	40	80
63.200.1060	100	6	22	40	64
63.200.1210	125	1	22	40	160
63.200.1212	125	1.2	22	40	128
63.200.1215	125	1.5	22	40	128
63.200.1216	125	1.6	22	40	128
63.200.1220	125	2	22	40	128
63.200.1225	125	2.5	22	40	100
63.200.1230	125	3	22	40	100
63.200.1240	125	4	22	40	100
63.200.1250	125	5	22	40	80
63.200.1260	125	6	22	40	80
63.200.1610	160	1	32	63	160
63.200.1612	160	1.2	32	63	160
63.200.1615	160	1.5	32	63	160
63.200.1616	160	1.6	32	63	160
63.200.1620	160	2	32	63	128
63.200.1625	160	2.5	32	63	128
63.200.1630	160	3	32	63	128
63.200.1640	160	4	32	63	100
63.200.1650	160	5	32	63	100
63.200.1660	160	6	32	63	100
63.200.2010	200	1	32	63	200
63.200.2012	200	1.2	32	63	200
63.200.2016	200	1.6	32	63	160
63.200.2020	200	2	32	63	160
63.200.2025	200	2.5	32	63	160
63.200.2030	200	3	32	63	128
63.200.2040	200	4	32	63	128
63.200.2050	200	5	32	63	128
63.200.2060	200	6	32	63	100
63.200.2520	250	2	32	63	200
63.200.2525	250	2.5	32	63	160
63.200.2530	250	3	32	63	160
63.200.2540	250	4	32	63	160
63.200.2550	250	5	32	63	128
63.200.2560	250	6	32	63	128
63.200.3125	315	2.5	40	80	200
63.200.3130	315	3	40	80	200
63.200.3140	315	4	40	80	160
63.200.3150	315	5	40	80	160
63.200.3160	315	6	40	80	160



## > 63.210 Phantom

NL HSS Metaalcirkelzaag GF  
 FR Fraise-scie HSS GF  
 ES Fresa sierra circular HSS GF  
 DE HSS Metallkreissägeblätter GF



HSS +GF+ BW

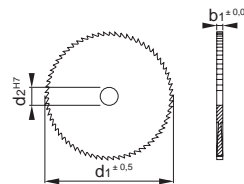
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
30-40	25-35	15-25	15-20	10-15	6-8	25-30	20-25	500-700	500-700	200-400	200-600

Ref.	d1	b1	d2	d3	z
63.210.0612	63	1.2	16	36	100
63.210.0616	63	1.6	16	36	44
63.210.0617	63	1.6	16	36	64
63.210.0618	63	1.6	16	36	80
63.210.0716	68	1.6	16	42	44
63.210.0717	68	1.6	16	42	84
63.210.0718	68	1.6	16	42	72

Ref.	d1	b1	d2	d3	z
63.210.0719	68	1.6	16	42	64
63.210.0720	68	2	16	42	44
63.210.0814	80	1.6	16	42	44
63.210.0816	80	1.6	16	42	64
63.210.0818	80	1.6	16	42	80
63.210.0828	80	2	16	42	80

## > 63.220 Phantom

NL VHM Metaalcirkelzaag fijn  
 FR Fraise-scie Carbure pas fin  
 ES Fresa sierra circular MD paso fino  
 DE VHM Metallkreissägeblätter fein



VHM SC DIN 1837-A A

<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850 N/mm <sup>2</sup>	<b>M 22</b> INOX >850 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
100-200	80-160	60-120	40-80	50-100	25-60	60-120	60-120	150-600	80-300	80-300	150-600	25-60	30-60

Ref.	d1	b1	d2	z
63.220.0102	15	0.2	5	64
63.220.0103	15	0.3	5	64
63.220.0104	15	0.4	5	64
63.220.0105	15	0.5	5	48
63.220.0106	15	0.6	5	48
63.220.0107	15	0.7	5	48
63.220.0108	15	0.8	5	40
63.220.0109	15	0.9	5	40
63.220.0110	15	1	5	40
63.220.0112	15	1.2	5	40
63.220.0115	15	1.5	5	40
63.220.0116	15	1.6	5	40
63.220.0118	15	1.8	5	40
63.220.0120	15	2	5	40
63.220.0202	20	0.2	5	80
63.220.0203	20	0.3	5	64
63.220.0204	20	0.4	5	64
63.220.0205	20	0.5	5	48
63.220.0206	20	0.6	5	48
63.220.0207	20	0.7	5	48
63.220.0208	20	0.8	5	48
63.220.0209	20	0.9	5	40
63.220.0210	20	1	5	40
63.220.0212	20	1.2	5	40
63.220.0215	20	1.5	5	40
63.220.0216	20	1.6	5	40
63.220.0218	20	1.8	5	32

Ref.	d1	b1	d2	z
63.220.0220	20	2	5	32
63.220.0225	20	2.5	5	32
63.220.0230	20	3	5	32
63.220.0302	30	0.2	8	100
63.220.0303	30	0.3	8	80
63.220.0304	30	0.4	8	80
63.220.0305	30	0.5	8	80
63.220.0306	30	0.6	8	64
63.220.0307	30	0.7	8	64
63.220.0308	30	0.8	8	64
63.220.0309	30	0.9	8	64
63.220.0310	30	1	8	64
63.220.0312	30	1.2	8	48
63.220.0315	30	1.5	8	48
63.220.0316	30	1.6	8	48
63.220.0318	30	1.8	8	48
63.220.0320	30	2	8	48
63.220.0325	30	2.5	8	40
63.220.0330	30	3	8	40
63.220.0402	40	0.2	10	128
63.220.0403	40	0.3	10	100
63.220.0404	40	0.4	10	100
63.220.0405	40	0.5	10	80
63.220.0406	40	0.6	10	80
63.220.0407	40	0.7	10	80
63.220.0408	40	0.8	10	80
63.220.0409	40	0.9	10	64

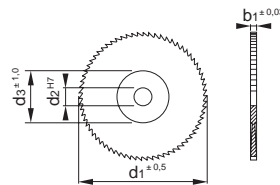


> **63.220 Phantom**

Ref.	d1	b1	d2	z	Ref.	d1	b1	d2	z
63.220.0410	40	1	10	64	63.220.0625	63	2.5	16	64
63.220.0412	40	1.2	10	64	63.220.0630	63	3	16	64
63.220.0415	40	1.5	10	64	63.220.0805	80	0.5	22	128
63.220.0416	40	1.6	10	64	63.220.0806	80	0.6	22	128
63.220.0418	40	1.8	10	48	63.220.0808	80	0.8	22	128
63.220.0420	40	2	10	48	63.220.0810	80	1	22	100
63.220.0425	40	2.5	10	48	63.220.0812	80	1.2	22	100
63.220.0430	40	3	10	48	63.220.0815	80	1.5	22	100
63.220.0502	50	0.2	13	128	63.220.0816	80	1.6	22	100
63.220.0503	50	0.3	13	128	63.220.0818	80	1.8	22	80
63.220.0504	50	0.4	13	100	63.220.0820	80	2	22	80
63.220.0505	50	0.5	13	100	63.220.0825	80	2.5	22	80
63.220.0506	50	0.6	13	100	63.220.0830	80	3	22	80
63.220.0507	50	0.7	13	80	63.220.1005	100	0.5	22	160
63.220.0508	50	0.8	13	80	63.220.1006	100	0.6	22	160
63.220.0509	50	0.9	13	80	63.220.1008	100	0.8	22	128
63.220.0510	50	1	13	80	63.220.1010	100	1	22	128
63.220.0512	50	1.2	13	80	63.220.1012	100	1.2	22	128
63.220.0515	50	1.5	13	64	63.220.1015	100	1.5	22	100
63.220.0516	50	1.6	13	64	63.220.1016	100	1.6	22	100
63.220.0518	50	1.8	13	64	63.220.1018	100	1.8	22	100
63.220.0520	50	2	13	64	63.220.1020	100	2	22	100
63.220.0525	50	2.5	13	64	63.220.1025	100	2.5	22	100
63.220.0530	50	3	13	48	63.220.1030	100	3	22	80
63.220.0603	63	0.3	16	128	63.220.1208	125	0.8	22	160
63.220.0604	63	0.4	16	128	63.220.1210	125	1	22	160
63.220.0605	63	0.5	16	128	63.220.1212	125	1.2	22	128
63.220.0606	63	0.6	16	100	63.220.1215	125	1.5	22	128
63.220.0607	63	0.7	16	100	63.220.1216	125	1.6	22	128
63.220.0608	63	0.8	16	100	63.220.1218	125	1.8	22	128
63.220.0609	63	0.9	16	100	63.220.1220	125	2	22	128
63.220.0610	63	1	16	100	63.220.1610	160	1	32	160
63.220.0612	63	1.2	16	80	63.220.1612	160	1.2	32	160
63.220.0615	63	1.5	16	80	63.220.1615	160	1.5	32	160
63.220.0616	63	1.6	16	80	63.220.1616	160	1.6	32	160
63.220.0618	63	1.8	16	80	63.220.1620	160	2	32	128
63.220.0620	63	2	16	80					

> **63.250 Phantom**

NL HSS Metaalcirkelzaag grof  
 FR Fraise-scie HSS pas grossier  
 ES Fresa sierra circular HSS grueso  
 DE HSS Metallkreissägeblätter grob



**HSS** **DIN 1838-B** **B**

<b>P 11</b> ≤500 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 61</b> PVC
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30-40	25-35	15-25	15-20	10-15	6-8	25-30	20-25	500-700	500-700	200-400	200-600
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Ref.	d1	b1	d2	d3	z	Ref.	d1	b1	d2	d3	z
63.250.0505	50	0.5	13	25	48	63.250.0620	63	2	16	32	40
63.250.0506	50	0.6	13	25	48	63.250.0625	63	2.5	16	32	32
63.250.0508	50	0.8	13	25	40	63.250.0630	63	3	16	32	40
63.250.0510	50	1	13	25	40	63.250.0640	63	4	16	32	32
63.250.0512	50	1.2	13	25	40	63.250.0650	63	5	16	32	24
63.250.0516	50	1.6	13	25	32	63.250.0660	63	6	16	32	24
63.250.0520	50	2	13	25	32	63.250.0805	80	0.5	22	36	64
63.250.0525	50	2.5	13	25	32	63.250.0806	80	0.6	22	36	64
63.250.0530	50	3	13	25	24	63.250.0808	80	0.8	22	36	64
63.250.0540	50	4	13	25	24	63.250.0810	80	1	22	36	48
63.250.0550	50	5	13	25	24	63.250.0812	80	1.2	22	36	48
63.250.0560	50	6	13	25	20	63.250.0815	80	1.5	22	36	48
63.250.0605	63	0.5	16	32	64	63.250.0816	80	1.6	22	36	48
63.250.0606	63	0.6	16	32	48	63.250.0820	80	2	22	36	40
63.250.0608	63	0.8	16	32	48	63.250.0825	80	2.5	22	36	40
63.250.0610	63	1	16	32	48	63.250.0830	80	3	22	36	40
63.250.0612	63	1.2	16	32	40	63.250.0840	80	4	22	36	32
63.250.0615	63	1.5	16	32	40	63.250.0850	80	5	22	36	32
63.250.0616	63	1.6	16	32	40	63.250.0860	80	6	22	36	32



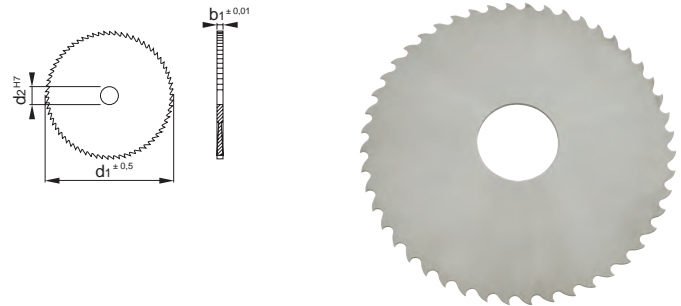
## > 63.250 Phantom

Ref.	d1	b1	d2	d3	z
63.250.1005	100	0.5	22	40	80
63.250.1006	100	0.6	22	40	80
63.250.1008	100	0.8	22	40	64
63.250.1010	100	1	22	40	64
63.250.1012	100	1.2	22	40	64
63.250.1015	100	1.5	22	40	64
63.250.1016	100	1.6	22	40	48
63.250.1020	100	2	22	40	48
63.250.1025	100	2.5	22	40	48
63.250.1030	100	3	22	40	40
63.250.1040	100	4	22	40	40
63.250.1050	100	5	22	40	40
63.250.1060	100	6	22	40	32
63.250.1210	125	1	22	40	80
63.250.1212	125	1.2	22	40	64
63.250.1215	125	1.5	22	40	64
63.250.1216	125	1.6	22	40	64
63.250.1220	125	2	22	40	64
63.250.1225	125	2.5	22	40	48
63.250.1230	125	3	22	40	48
63.250.1240	125	4	22	40	48
63.250.1250	125	5	22	40	40
63.250.1260	125	6	22	40	40
63.250.1610	160	1	32	63	80
63.250.1612	160	1.2	32	63	80
63.250.1615	160	1.5	32	63	80

Ref.	d1	b1	d2	d3	z
63.250.1616	160	1.6	32	63	80
63.250.1620	160	2	32	63	64
63.250.1625	160	2.5	32	63	64
63.250.1630	160	3	32	63	64
63.250.1640	160	4	32	63	48
63.250.1650	160	5	32	63	48
63.250.1660	160	6	32	63	48
63.250.2016	200	1.6	32	63	80
63.250.2020	200	2	32	63	80
63.250.2025	200	2.5	32	63	80
63.250.2030	200	3	32	63	64
63.250.2040	200	4	32	63	64
63.250.2050	200	5	32	63	64
63.250.2060	200	6	32	63	48
63.250.2520	250	2	32	63	100
63.250.2525	250	2.5	32	63	80
63.250.2530	250	3	32	63	80
63.250.2540	250	4	32	63	80
63.250.2550	250	5	32	63	64
63.250.2560	250	6	32	63	64
63.250.3125	315	2.5	40	80	100
63.250.3130	315	3	40	80	100
63.250.3140	315	4	40	80	80
63.250.3150	315	5	40	80	80
63.250.3160	315	6	40	80	80

## > 63.270 Phantom

NL VHM Metaalcirkelzaag grof  
FR Fraise-scie Carbone pas grossier  
ES Fresa sierra circular MD grueso  
DE VHM Metallkreissägeblätter grob



VHM SC DIN 1838-B B

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 61	S 71	S 72
≤500 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	INOX >850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	PVC	Ni/Co	Ti

100-200	80-160	60-120	40-80	50-100	25-60	60-120	60-120	150-600	80-300	80-300	150-600	25-60	30-60
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Ref.	d1	b1	d2	z
63.270.0103	15	0.3	5	20
63.270.0104	15	0.4	5	20
63.270.0105	15	0.5	5	20
63.270.0106	15	0.6	5	20
63.270.0108	15	0.8	5	20
63.270.0110	15	1	5	20
63.270.0112	15	1.2	5	20
63.270.0115	15	1.5	5	20
63.270.0120	15	2	5	20
63.270.0130	15	3	5	20
63.270.0203	20	0.3	5	20
63.270.0204	20	0.4	5	20
63.270.0205	20	0.5	5	20
63.270.0206	20	0.6	5	20
63.270.0208	20	0.8	5	20
63.270.0210	20	1	5	20
63.270.0212	20	1.2	5	20
63.270.0215	20	1.5	5	20
63.270.0220	20	2	5	20
63.270.0230	20	3	5	20
63.270.0303	30	0.3	8	30
63.270.0304	30	0.4	8	30
63.270.0305	30	0.5	8	30
63.270.0306	30	0.6	8	30
63.270.0308	30	0.8	8	24
63.270.0310	30	1	8	24
63.270.0312	30	1.2	8	24
63.270.0315	30	1.5	8	24
63.270.0320	30	2	8	24
63.270.0325	30	2.5	8	24

Ref.	d1	b1	d2	z
63.270.0330	30	3	8	24
63.270.0403	40	0.3	10	40
63.270.0404	40	0.4	10	40
63.270.0405	40	0.5	10	40
63.270.0406	40	0.6	10	40
63.270.0408	40	0.8	10	32
63.270.0410	40	1	10	32
63.270.0412	40	1.2	10	32
63.270.0415	40	1.5	10	32
63.270.0420	40	2	10	24
63.270.0425	40	2.5	10	24
63.270.0430	40	3	10	24
63.270.0504	50	0.4	13	48
63.270.0505	50	0.5	13	48
63.270.0506	50	0.6	13	48
63.270.0508	50	0.8	13	40
63.270.0510	50	1	13	40
63.270.0512	50	1.2	13	40
63.270.0515	50	1.5	13	32
63.270.0516	50	1.6	13	32
63.270.0520	50	2	13	32
63.270.0525	50	2.5	13	32
63.270.0530	50	3	13	24
63.270.0604	63	0.4	16	64
63.270.0605	63	0.5	16	64
63.270.0606	63	0.6	16	48
63.270.0608	63	0.8	16	48
63.270.0610	63	1	16	48
63.270.0612	63	1.2	16	40
63.270.0615	63	1.5	16	40

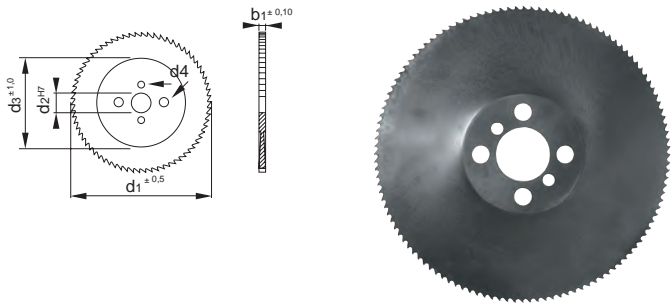
> **63.270 Phantom**

Ref.	d1	b1	d2	z
63.270.0616	63	1.6	16	40
63.270.0620	63	2	16	40
63.270.0625	63	2.5	16	32
63.270.0630	63	3	16	32
63.270.0806	80	0.6	22	64
63.270.0808	80	0.8	22	64
63.270.0810	80	1	22	48
63.270.0812	80	1.2	22	48
63.270.0815	80	1.5	22	48
63.270.0816	80	1.6	22	48
63.270.0820	80	2	22	40
63.270.0825	80	2.5	22	40
63.270.0830	80	3	22	40
63.270.1008	100	0.8	22	64
63.270.1010	100	1	22	64

Ref.	d1	b1	d2	z
63.270.1012	100	1.2	22	64
63.270.1015	100	1.5	22	48
63.270.1016	100	1.6	22	48
63.270.1020	100	2	22	48
63.270.1025	100	2.5	22	48
63.270.1030	100	3	22	40
63.270.1208	125	0.8	22	80
63.270.1210	125	1	22	80
63.270.1212	125	1.2	22	64
63.270.1215	125	1.5	22	64
63.270.1216	125	1.6	22	64
63.270.1220	125	2	22	64
63.270.1225	125	2.5	22	48
63.270.1230	125	3	22	48

> **63.400 Phantom**

NL HSS Afkortzaag stoomontlaten  
 FR Fraise-scie à tronçonner HSS vaporisé  
 ES Fresa sierra circular tronzadora HSS vaporizada  
 DE HSS Trennsägeblätter dampfangelassen



**HSS** **OX.** **T 4** **T 5**  
 BW C

**P 11** **P 12** **P 13** **K 31** **K 32** **N 41** **N 42** **N 51** **N 61**  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si-10% Cu PVC

30-40 25-35 15-25 25-30 20-25 500-700 500-700 200-400 200-600

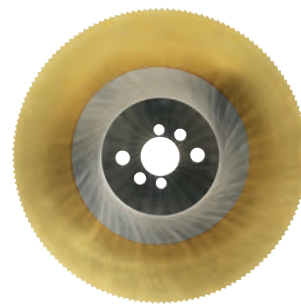
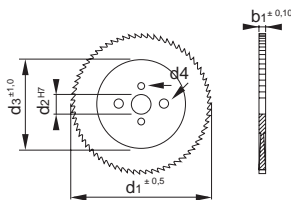
Ref.	d1	b1	d2	d3	z	t	d4
63.400.2013	200	1.8	32	90	130	5	2/8-45+2/11-63
63.400.2016	200	1.8	32	90	160	4	2/8-45+2/11-63
63.400.2018	200	1.8	32	90	180	3,5	2/8-45+2/11-63
63.400.2126	225	1.2	32	100	264	2,5	2/8-45+2/11-63+2/9-50
63.400.2209	225	2	32	90	90	8	2/8-45+2/11-63+2/9-50
63.400.2212	225	2	32	90	120	6	2/8-45+2/11-63+2/9-50
63.400.2214	225	2	32	90	140	5	2/8-45+2/11-63+2/9-50
63.400.2218	225	2	32	90	180	4	2/8-45+2/11-63+2/9-50
63.400.2222	225	2	32	90	220	3	2/8-45+2/11-63+2/9-50
63.400.2312	225	2	40	90	120	6	2/8-55+4/11-63
63.400.2318	225	2	40	90	180	4	2/8-55+4/11-63
63.400.2326	225	2	40	90	220	3	2/8-55+4/11-63
63.400.2508	250	2	32	90	80	10	2/8-45+2/11-63+2/9-50
63.400.2510	250	2	32	90	100	8	2/8-45+2/11-63+2/9-50
63.400.2512	250	2	32	90	128	6	2/8-45+2/11-63+2/9-50
63.400.2516	250	2	32	90	160	5	2/8-45+2/11-63+2/9-50
63.400.2520	250	2	32	90	200	4	2/8-45+2/11-63+2/9-50
63.400.2525	250	2	32	90	250	3	2/8-45+2/11-63+2/9-50
63.400.2566	250	2.5	32	100	160	5	2/8-45+2/11-63+2/9-50
63.400.2570	250	2.5	32	100	200	4	2/8-45+2/11-63+2/9-50
63.400.2575	250	2.5	32	100	250	3	2/8-45+2/11-63+2/9-50
63.400.2608	250	2.5	40	100	80	10	2/8-55+4/12-64
63.400.2610	250	2.5	40	100	100	8	2/8-55+4/12-64
63.400.2612	250	2.5	40	100	128	6	2/8-55+4/12-64
63.400.2616	250	2.5	40	100	160	5	2/8-55+4/12-64
63.400.2620	250	2.5	40	100	200	4	2/8-55+4/12-64
63.400.2625	250	2.5	40	100	250	3	2/8-55+4/12-64
63.400.2709	275	2.5	32	100	90	10	2/8-45+2/11-63+2/12-75
63.400.2711	275	2.5	32	100	110	8	2/8-45+2/11-63+2/12-75
63.400.2714	275	2.5	32	100	140	6	2/8-45+2/11-63+2/12-75
63.400.2718	275	2.5	32	100	180	5	2/8-45+2/11-63+2/12-75
63.400.2722	275	2.5	32	100	220	4	2/8-45+2/11-63+2/12-75
63.400.2728	275	2.5	32	100	280	3	2/8-45+2/11-63+2/12-75
63.400.2809	275	2.5	40	100	90	10	2/8-55+4/12-64
63.400.2811	275	2.5	40	100	110	8	2/8-55+4/12-64
63.400.2814	275	2.5	40	100	140	6	2/8-55+4/12-64
63.400.2818	275	2.5	40	100	180	5	2/8-55+4/12-64
63.400.2822	275	2.5	40	100	220	4	2/8-55+4/12-64
63.400.2828	275	2.5	40	100	280	3	2/8-55+4/12-64
63.400.3009	300	2.5	32	100	90	10	2/8-45+4/11-63
63.400.3012	300	2.5	32	100	120	8	2/8-45+4/11-63
63.400.3016	300	2.5	32	100	160	6	2/8-45+4/11-63
63.400.3018	300	2.5	32	100	180	5	2/8-45+4/11-63
63.400.3020	300	2.5	32	100	200	4	2/8-45+4/11-63

Ref.	d1	b1	d2	d3	z	t	d4
63.400.3022	300	2.5	32	100	220	4	2/8-45+4/11-63
63.400.3030	300	2.5	32	100	300	3	2/8-45+4/11-63
63.400.3059	300	3	40	100	90	10	2/8-55+4/12-64
63.400.3062	300	3	40	100	120	8	2/8-55+4/12-64
63.400.3066	300	3	40	100	160	6	2/8-55+4/12-64
63.400.3068	300	3	40	100	180	5	2/8-55+4/12-64
63.400.3072	300	3	40	100	220	4	2/8-55+4/12-64
63.400.3080	300	3	40	100	300	3	2/8-55+4/12-64
63.400.3110	315	2.5	32	100	100	10	2/8-45+4/11-63
63.400.3112	315	2.5	32	100	120	8	2/8-45+4/11-63
63.400.3116	315	2.5	32	100	160	6	2/8-45+4/11-63
63.400.3120	315	2.5	32	100	200	5	2/8-45+4/11-63
63.400.3124	315	2.5	32	100	240	4	2/8-45+4/11-63
63.400.3130	315	2.5	32	100	300	3	2/8-45+4/11-63
63.400.3160	315	2.5	40	100	100	10	2/8-55+2/12-64
63.400.3162	315	2.5	40	100	120	8	2/8-55+4/12-64
63.400.3166	315	2.5	40	100	160	6	2/8-55+4/12-64
63.400.3170	315	2.5	40	100	200	5	2/8-55+4/12-64
63.400.3174	315	2.5	40	100	240	4	2/8-55+4/12-64
63.400.3180	315	2.5	40	100	300	3	2/8-55+4/12-64
63.400.3512	350	3	32	120	120	9	2/8-45+4/11-63
63.400.3514	350	3	32	120	140	8	2/8-45+4/11-63
63.400.3518	350	3	32	120	180	6	2/8-45+4/11-63
63.400.3522	350	3	32	120	220	5	2/8-45+4/11-63
63.400.3528	350	3	32	120	280	4	2/8-45+4/11-63
63.400.3535	350	3	32	120	350	3	2/8-45+4/11-63
63.400.3562	350	3	40	120	120	9	2/8-55+4/12-64
63.400.3564	350	3	40	120	140	8	2/8-55+4/12-64
63.400.3568	350	3	40	120	180	6	2/8-55+2/12-64
63.400.3572	350	3	40	120	220	5	2/8-55+2/12-64
63.400.3578	350	3	40	120	280	4	2/8-55+2/12-64
63.400.3585	350	3	40	120	350	3	2/8-55+4/12-64
63.400.3608	350	3	50	120	80	14	4/15-80+4/14-85
63.400.3612	350	3	50	120	120	9	4/15-80+4/14-85
63.400.3616	350	3	50	120	160	7	4/15-80+4/14-85
63.400.3622	350	3	50	120	220	5	4/15-80+4/14-85
63.400.3711	370	3	50	120	110	10	4/15-80+4/14-85
63.400.3716	370	3	50	120	160	7	4/15-80+4/14-85
63.400.3722	370	3	50	120	220	5	4/15-80+4/14-85
63.400.4008	400	3	50	120	80	16	4/15-80+4/14-85
63.400.4010	400	3	50	120	100	12	4/15-80+4/14-85
63.400.4012	400	3	50	120	120	10	4/15-80+4/14-85
63.400.4016	400	3	50	120	160	8	4/15-80+4/14-85
63.400.4020	400	3	50	120	200	6	4/15-80+4/14-85



## > 63.401 Phantom

NL HSS Afkortzaag TiN  
 FR Fraise-scie à tronçonner HSS TiN  
 ES Fresa sierra circular tronczadora HSS TiN  
 DE HSS Trennsägeblätter TiN



HSS TiN T 4 T 5  
 BW C

P 11 P 12 P 13 K 31 K 32 N 41 N 42 N 51 N 61  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> GG GGG GT-S-GTW Alu Alu Si-10% Cu PVC

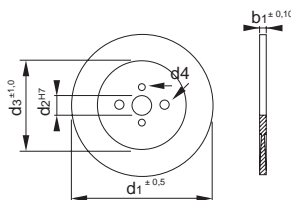
30-40 25-35 15-25 25-30 20-25 500-700 500-700 200-400 200-600

Ref.	d1	b1	d2	d3	z	t	d4
63.401.2512	250	2	32	100	128	6	2/8-45+2/11-63+2/9-50
63.401.2516	250	2	32	100	160	5	2/8-45+2/11-63+2/9-50
63.401.2520	250	2	32	100	200	4	2/8-45+2/11-63+2/9-50
63.401.2525	250	2	32	100	250	3	2/8-45+2/11-63+2/9-50
63.401.2566	250	2.5	32	100	160	5	2/8-45+2/11-63+2/9-50
63.401.2570	250	2.5	32	100	200	4	2/8-45+2/11-63+2/9-50
63.401.2714	275	2.5	32	100	140	6	2/8-45+2/11-63+2/12-75
63.401.2718	275	2.5	32	100	180	5	2/8-45+2/11-63+2/12-75
63.401.2722	275	2.5	32	100	220	4	2/8-45+2/11-63+2/12-75
63.401.2814	275	2.5	40	100	140	6	2/8-55+4/12-64
63.401.2818	275	2.5	40	100	180	5	2/8-55+4/12-64
63.401.2822	275	2.5	40	100	220	4	2/8-55+4/12-64

Ref.	d1	b1	d2	d3	z	t	d4
63.401.3016	300	2.5	32	100	160	6	2/8-45+4/11-63
63.401.3018	300	2.5	32	100	180	5	2/8-45+4/11-63
63.401.3022	300	2.5	32	100	220	4	2/8-45+4/11-63
63.401.3116	315	2.5	32	100	160	6	2/8-45+4/11-63
63.401.3120	315	2.5	32	100	200	5	2/8-45+4/11-63
63.401.3124	315	2.5	32	100	240	4	2/8-45+4/11-63
63.401.3166	315	2.5	40	100	160	6	2/8-55+4/12-64
63.401.3170	315	2.5	40	100	200	5	2/8-55+4/12-64
63.401.3174	315	2.5	40	100	240	4	2/8-55+4/12-64
63.401.3518	350	3	32	100	180	6	2/8-45+4/11-63
63.401.3522	350	3	32	100	220	5	2/8-45+4/11-63

## > 63.410 Phantom

NL HSS Afkortzaag onvertand, stoomontlaten  
 FR Fraise-scie à tronçonner HSS sans dents, vaporisé  
 ES Fresa sierra circular tronczadora HSS sin dientes, vaporizada  
 DE HSS Trennsägeblätter unverzahnt, dampfangelassen



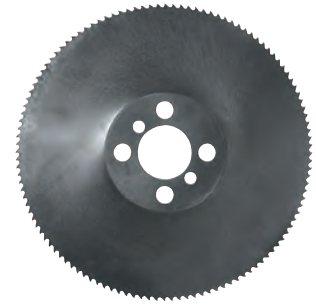
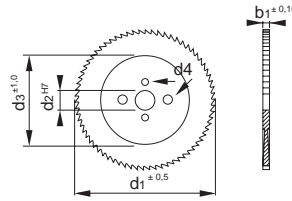
HSS OX. Z=0

Ref.	d1	b1	d2	d3	d4
63.410.2532	250	2	32	100	2/8-45+2/11-63+2/9-50
63.410.2540	250	2.5	40	100	2/8-55+4/12-64
63.410.2732	275	2.5	32	100	2/8-45+2/11-63+2/12-75
63.410.2740	275	2.5	40	100	2/8-55+4/12-64
63.410.3032	300	2.5	32	100	2/8-45+4/11-63

Ref.	d1	b1	d2	d3	d4
63.410.3040	300	2.5	40	100	2/8-55+2/12-64
63.410.3132	315	2.5	32	100	2/8-45+4/11-63
63.410.3140	315	2.5	40	100	2/8-55+2/12-64
63.410.3542	350	2.5	40	120	2/8-55+4/12-64
63.410.3543	350	3	40	120	2/8-55+4/12-64

> **63.420 Phantom**

NL HSS-E Afkortzaag stoomontlaten  
 FR Fraise-scie à tronçonner HSS-vaporisé  
 ES Fresa sierra circular tronzadora HSS-E vaporizada  
 DE HSS-E Trennsägeblätter dampfangelassen



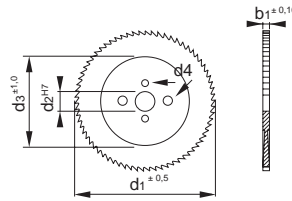
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Ref.	d1	b1	d2	d3	z	t	d4
63.420.2218	225	2	32	90	180	4	2/8-45+2/11-63+2/9-50
63.420.2222	225	2	32	90	220	3	2/8-45+2/11-63+2/9-50
63.420.2516	250	2	32	100	160	5	2/8-45+2/11-63+2/9-50
63.420.2520	250	2	32	100	200	4	2/8-45+2/11-63+2/9-50
63.420.2525	250	2	32	100	250	3	2/8-45+2/11-63+2/9-50
63.420.2714	275	2.5	32	100	140	6	2/8-45+2/11-63+2/12-75
63.420.2718	275	2.5	32	100	180	5	2/8-45+2/11-63+2/12-75
63.420.2722	275	2.5	32	100	220	4	2/8-45+2/11-63+2/12-75
63.420.2814	275	2.5	40	100	140	6	2/8-55+4/12-64
63.420.2818	275	2.5	40	100	180	5	2/8-55+4/12-64
63.420.2822	275	2.5	40	100	220	4	2/8-55+4/12-64
63.420.3018	300	2.5	32	100	180	5	2/8-45+4/11-63

Ref.	d1	b1	d2	d3	z	t	d4
63.420.3020	300	2.5	32	100	200	5	2/8-45+4/11-63
63.420.3022	300	2.5	32	100	220	4	2/8-45+4/11-63
63.420.3030	300	2.5	32	100	300	3	2/8-45+4/11-63
63.420.3116	315	2.5	32	100	160	6	2/8-45+2/11-63
63.420.3120	315	2.5	32	100	200	5	2/8-45+4/11-63
63.420.3124	315	2.5	32	100	240	4	2/8-45+4/11-63
63.420.3166	315	2.5	40	100	160	6	2/8-55+4/12-64
63.420.3170	315	2.5	40	100	200	5	2/8-55+4/12-64
63.420.3174	315	2.5	40	100	240	4	2/8-55+4/12-64
63.420.3518	350	3	32	120	180	6	2/8-45+4/11-63
63.420.3522	350	3	32	120	220	5	2/8-45+4/11-63
63.420.3528	350	3	32	120	280	4	2/8-45+4/11-63

> **63.424 Phantom**

NL HSS-E Afkortzaag TiAIN  
 FR Fraise-scie à tronçonner HSS-E TiAIN  
 ES Fresa sierra circular tronzadora HSS-E TiAIN  
 DE HSS-E Trennsägeblätter TiAIN



+6 6 ( **TiAIN** **T 4** **T 5** **INOX** **P 11** **P 12** **P 13** **P 14** **M 21** **M 22** **K 31** **K 32** **N 41** **N 42** **N 51** **N 61** **GG** **GGG** **GGT-GTW** **Alu** **Alu Si>10%** **Cu** **PVC** **≤5600 N/mm²** **≤5850 N/mm²** **≤1000 N/mm²** **≤1400 N/mm²** **INOX ≤850N/mm²** **INOX >850N/mm²** **30-40** **25-35** **15-25** **15-20** **10-15** **6-8** **25-30** **20-25** **500-700** **500-700** **200-400** **200-600**

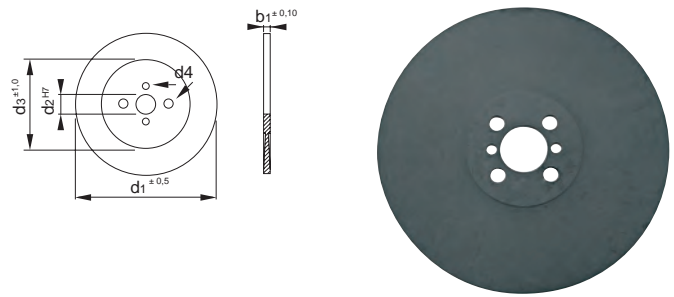
Ref.	d1	b1	d2	d3	z	t	d4
63.424.2822	275	2.5	40	100	220	4	2/8-55+4/12-64
63.424.3022	300	2.5	32	100	220	4	2/8-45+4/11-63
63.424.3030	300	2.5	32	100	300	3	2/8-45+4/11-63
63.424.3116	315	2.5	32	100	160	6	2/8-45+2/11-63
63.424.3120	315	2.5	32	100	200	5	2/8-45+4/11-63
63.424.3124	315	2.5	32	100	240	4	2/8-45+4/11-63

Ref.	d1	b1	d2	d3	z	t	d4
63.424.3166	315	2.5	40	100	160	6	2/8-55+4/12-64
63.424.3170	315	2.5	40	100	200	5	2/8-55+4/12-64
63.424.3174	315	2.5	40	100	240	4	2/8-55+4/12-64
63.424.3518	350	3	32	120	180	6	2/8-45+4/11-63
63.424.3522	350	3	32	120	220	5	2/8-45+4/11-63



## > 63.430 Phantom

NL HSS-E Afkortzaag onvertand, stoomontlaten  
 FR Fraise-scie à tronçonner HSS-E sans dents, vaporisé  
 ES Fresa sierra circular tronzadora HSS-E sin dientes, vaporizada  
 DE HSS-E Trennsägeblätter unverzahnt, dampfangelassen



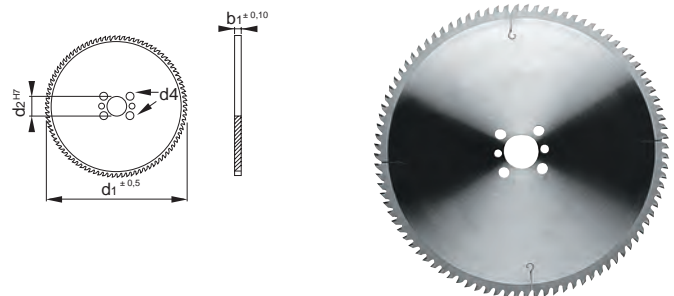
+6 ( OX. Z=0

Ref.	d1	b1	d2	d3	d4
63.430.2532	250	2	32	100	2/8-45+2/11-63+2/9-50
63.430.2740	275	2.5	40	100	2/8-55+4/12-64
63.430.3032	300	2.5	32	100	2/8-45+4/11-63
63.430.3040	300	2.5	40	100	2/8-55+4/12-64

Ref.	d1	b1	d2	d3	d4
63.430.3132	315	2.5	32	100	2/8-45+2/11-63
63.430.3140	315	2.5	40	100	2/8-55+4/12-64
63.430.3532	350	3	32	120	2/8-45+2/11-63
63.430.3540	350	2.5	40	120	2/8-55+4/12-64

## > 63.450 Phantom

NL HM-tip Cirkelzaag positieve spaanhoek  
 FR Fraise-scie pointe carb. mét. angle de coupe positif  
 ES Fresa sierra circular punta MD ángulo de corte positivo  
 DE HM-Schneiden Kreissägeblätter mit positivem Spanwinkel



HM-TIP  $\alpha 5^\circ$

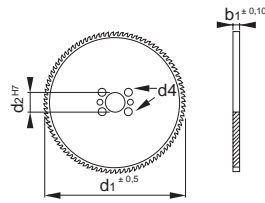
N 41 Alu N 42 Alu Si>10%

Ref.	d1	b1	d2	z	d4
63.450.2032	200	3.2	32	64	
63.450.2532	250	3.4	32	60	
63.450.2533	250	3.4	32	80	
63.450.3029	300	3.4	32	72	2/11-63
63.450.3031	300	3.4	32	84	2/11-63
63.450.3032	300	3.4	32	96	

Ref.	d1	b1	d2	z	d4
63.450.3534	350	3.4	32	84	2/11-63
63.450.3535	350	3.4	32	96	2/11-63
63.450.3536	350	3.4	32	108	2/11-63
63.450.4030	400	4	32	96	
63.450.4032	400	4	32	108	2/11-63

> **63.460 Phantom**

NL **HM-tip Cirkelzaag negatieve spaanhoek**  
 FR **Fraise-scie pointe carb. mét. angle de coupe négatif**  
 ES **Fresa sierra circular punta MD ángulo de corte negativo**  
 DE **HM-Schneiden Kreissägeblätter negativem Spanwinkel**



Ref.	d1	b1	d2	z	d4
63.460.2032	200	3.2	32	64	2/11-63
63.460.2532	250	3.4	32	60	
63.460.2533	250	3.4	32	80	
63.460.3029	300	3.4	32	72	2/11-63
63.460.3031	300	3.4	32	84	2/11-63
63.460.3032	300	3.4	32	96	

Ref.	d1	b1	d2	z	d4
63.460.3529	350	3.4	32	84	2/11-63
63.460.3531	350	3.4	32	96	2/11-63
63.460.3533	350	3.4	32	108	2/11-63
63.460.4032	400	4	32	96	2/11/63
63.460.4034	400	4	32	108	2/11/63





## > 64.150 Phantom

NL HSS-Co Handzaagblad  
 FR Lame de scie à main HSS-Co  
 ES Hoja de sierra manual HSS-Co  
 DE HSS-Co Handsägeblätter

Phantom HSS-Co

64.150.2400  
 300 x 13 x 0,65/24

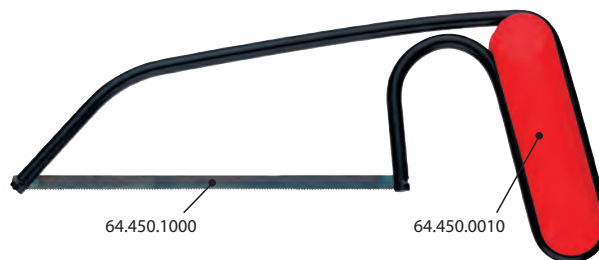
24

HSS-Co  
 300mm  
 12"

Ref.	T/"	t
64.150.1800	18	1,4
64.150.2400	24	1
64.150.3200	32	0,8

## > 64.450 Phantom

NL CV Junior Zaagblad 6" en Houder  
 FR Lame de scie Junior 6" et Arbre Acier spécial (Chrome)  
 ES Hoja de sierra Junior 6" y Mango Cromo Vanadium  
 DE CV junior Sägeblätter 6" und Halter



CV  
 150mm  
 6"

Ref.	NR
64.450.0010	1
64.450.1000	144
64.450.2000	12

## > 64.460 Phantom

NL HSS Metaalzaagbeugel robuuste uitvoering  
 FR Monture de scie à métaux HSS version Heavy Duty  
 ES Mango de sierra HSS versión macizo  
 DE HSS Metallsägebogen robuste Ausführung

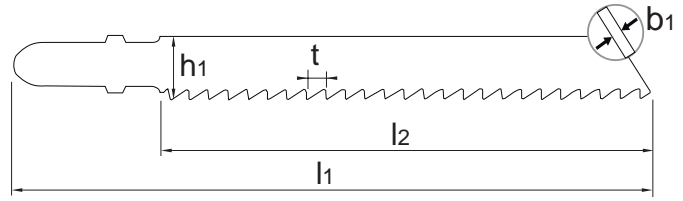


HSS  
 24  
 TPI  
  
  
 300mm  
 12"

Ref.	Nr.
64.460.1001	1

> **64.500** **Phantom**

NL Decoupeerzaag, voor metaal  
 FR Lame de scie sauteuse, pour métal  
 ES Hojas de sierra de calar, para metal  
 DE Stichsägeblätter, für Metall

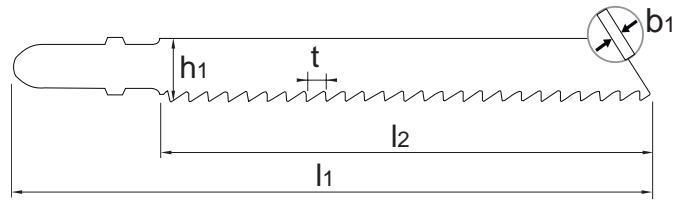


















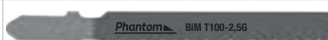



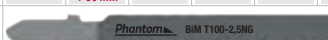


























Ref.	Type	l1	l2	h1	b1	t	
64.500.0710	T75-0,9	75	50	8,0	1,00	0,9	 BiM HSS 0,5-1,5 mm
64.500.0711	T75-1,1 INOX	75	50	9,5	1,00	1,1	 HM 1,5-3 mm
64.500.0714	T75-1,2	75	50	8,0	1,00	1,2	 BiM HSS 1-3 mm
64.500.0720	T75-2	75	50	8,0	1,00	2	 BiM HSS 2,6-6 mm
64.500.1018	T100-1,2/2,5 UNI	100	75	8,0	1,00	1,2-2,5	 BiM HSS 1,5-10 mm
64.500.1021	T100-2	100	75	8,0	1,27	2	 HSS 2-20 mm
64.500.1025	T100-3	100	75	8,0	1,15	3	 HSS 3-15 mm
64.500.1027	T100-3C	100	75	6,2	1,15	3	 HSS 3-15 mm
64.500.1312	T132-1,2	132	110	8,0	1,00	1,2	 BiM HSS 1-3 mm
64.500.1313	T132-1/1,6 UNI	132	110	8,0	1,00	1-1,6	 BiM HSS 1,2-6 mm
64.500.1321	T132-1,8/2,5 UNI	132	110	8,0	1,27	1,8-2,5	 BiM HSS 3-100 mm
64.500.1330	T132-2/4 UNI	132	110	8,0	1,27	2-4	 BiM HSS 3-65 mm



# > 64.500 Phantom

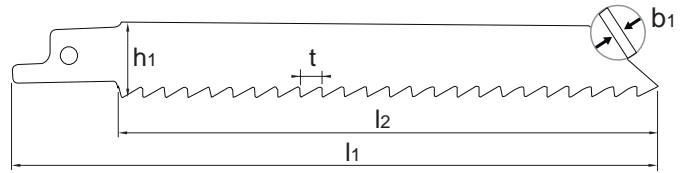
NL Decoupeerzaag, voor hout, tegels, cellenbeton en composiet  
 FR lame de scie sauteuse, pour bois  
 ES Hojas de sierra de calar, para madera  
 DE Stichsägeblätter, für Holz



Ref.	Type	l1	l2	h1	b1	t	
64.500.0725	T75-2C	75	50	5,4	1,25	2	 CV  2-15 mm  SOFT  MDF
64.500.0819	T80-1,9	80	55	8,0	1,27	1,9	 BiM HSS  1,5-5 mm  SOFT  MDF
64.500.1020	T100-2G	100	75	8,0	1,27	2	 BiM HSS  2-30 mm  SOFT  MDF
64.500.1024	T100-2,5CG	100	75	8,0	1,27	2,5	 CV  4-30 mm  SOFT  MDF
64.500.1026	T100-2,5G	100	75	8,0	1,27	2,5	 BiM HSS  4-30 mm  SOFT  MDF
64.500.1028	T100-2,5NG	100	75	8,0	1,27	2,5	 BiM HSS  3-30 mm  SOFT  MDF
64.500.1042	T100-4G	100	75	8,0	1,27	4	 BiM HSS  5-50 mm  SOFT  MDF
64.500.1150	T115-2,5/3,2G	115	90	8,0	1,45	2,5-3,2	 CV  3-15 mm  SOFT  MDF
64.500.1340	T132-4G	132	110	8,0	1,27	4	 BiM HSS  5-100 mm  SOFT  MDF
64.500.1540	T150-4	150	130	8,0	1,25	4	 CV  5-120 mm  SOFT  MDF
64.500.1950	T75-HM	75	50	8,0	1,00	-	 HM  1-15 mm  SOFT
64.500.2043	T100-4,3HM	100	75	8,0	1,25	4,3	 HM  5-50 mm  SOFT  GFK

> **64.600** **Phantom**

NL Reciprozaag  
 FR lame de scie sabre  
 ES Hojas de sierra de sable  
 DE Säbelsägeblätter











Ref.	Type	l1	l2	h1	b1	t	
64.600.1510	R150-1	150	130	19,0	0,90	1	Phantom BIM R150-1 BiM HSS 0,7-3 mm
64.600.1514	R150-1,4	150	130	19,0	0,90	1,4	Phantom BIM R150-1,4 BiM HSS 1,5-4 mm INOX
64.600.1518	R150-1,8	150	130	19,0	0,90	1,8	Phantom BIM R150-1,8 BiM HSS 3-8 mm INOX
64.600.1519	R150-1,8 90°	150	130	25,4	0,90	1,8	Phantom BIM R150-1,8 90° BiM HSS 3-8 mm INOX 90°
64.600.1522	R150-1,8/2,5 UNI	150	130	19,0	1,27	1,8-2,5	Phantom BIM R150-1,8/2,5 UNI BiM HSS 3-12 mm UNI INOX 90°
64.600.1525	R150-2,5	150	130	19,0	0,90	2,5	Phantom BIM R150-2,5 BiM HSS 3-12 mm Cu Ni Ms Zn Al
64.600.1540	R150-4,2C	150	130	19,0	1,27	4,2	Phantom BIM R150-4,2C BiM HSS 6-100 mm MDF
64.600.2014	R200-1,4	200	180	19,0	0,90	1,4	Phantom BIM R200-1,4 BiM HSS 1,5-4 mm INOX
64.600.2018	R200-1,8	200	180	19,0	0,90	1,8	Phantom BIM R200-1,8 BiM HSS 2-8 mm
64.600.2023	R200-1,8/2,5 UNI	200	180	19,0	1,27	1,8-2,5	Phantom BIM R200-1,8/2,5 UNI BiM HSS 3-12 mm UNI 90°
64.600.2025	R200-2,5	200	180	19,0	0,90	2,5	Phantom BIM R200-2,5 BiM HSS 3-150 mm GG
64.600.2090	R200-2,4/4,2 UNI	200	180	19,0	1,27	2,4-4,2	Phantom BIM R200-2,4/4,2 UNI BiM HSS 3-18 mm UNI MDF Cu Ni Ms Zn Al
64.600.2214	R230-1,4	230	210	19,0	0,90	1,4	Phantom BIM R230-1,4



Ref.	Type	l1	l2	h1	b1	t	
64.600.2218	R230-1,8	230	210	19,0	0,90	1,8	Phantom BIM R230-1,8 BiM HSS 2-8 mm
64.600.2220	R230-2	230	210	19,0	1,27	2	Phantom BIM R230-2 BiM HSS 2,5-10 mm
64.600.2221	R230-1,8/2,5 UNI	230	210	19,0	0,90	1,8-2,5	Phantom BIM R230-1,8/2,5 UNI BiM HSS 3-12 mm UNI
64.600.2225	R230-2,5	230	210	19,0	0,90	2,5	Phantom BIM R230-2,5 BiM HSS 3-12 mm
64.600.2232	R230-2,2/3,2 UNI	230	210	19,0	1,27	2,2-3,2	Phantom BIM R230-2,2/3,2 UNI BiM HSS 3-12 mm UNI, MDF, 90°
64.600.2332	R230-3,2	230	210	19,0	1,57	3,2	Phantom BIM R230-3,2 BiM HSS 4-12 mm, 90°, GG, Ni Ms Zn Al
64.600.2342	R230-4,2C	230	210	19,0	1,27	4,2	Phantom BIM R230-4,2C BiM HSS 6-175 mm, MDF
64.600.2356	R230-5/6,5	230	210	19,0	1,20	5-6,5	Phantom CV R230-5/6,5 CV 15-190 mm SOFT
64.600.3018	R300-1,8	300	280	19,0	0,90	1,8	Phantom BIM R300-1,8 BiM HSS 2-8 mm INOX
64.600.3021	R300-1,8/2,5 UNI	300	280	19,0	0,90	1,8-2,5	Phantom BIM R300-1,8/2,5 UNI BiM HSS 3-12 mm UNI
64.600.3025	R300-2,5	300	280	19,0	0,90	2,5	Phantom BIM R300-2,5 BiM HSS 3-12 mm, GG, Ni Ms Zn Al
64.600.3032	R300-4,2C	300	280	19,0	1,27	4,2	Phantom BIM R300-4,2C BiM HSS 6-250 mm, MDF
















> **64.605** **Phantom**

NL **HM-tip Reciprozaag**  
 FR **Lame de scie sabre pointe carb. mét.**  
 ES **Hojas de sierra de sable punta MD**  
 DE **HM-Schneiden Säbelsägeblätter**

Ref.	Type	l1	l2	h1	b1	t	
64.605.1542	RHM150-4,2	150	130	19	0,9	4,2	   
64.605.3013	RHM300-1,3	300	200	46	2,97	18	   

> **64.630** **Phantom**

NL **HSS Bi-Metaal Carrosseriezaag**  
 FR **Lame de scie sabre HSS Bi-métal**  
 ES **Hojas de sierra de sable HSS Bi-Metal**  
 DE **HSS Bi-Metall Karosseriesägeblätter**

Ref.	Type	l1	l2	h1	b1	t	
64.630.1007	R100-0,7	100	75	12,3	0,65	0,7	    
64.630.1010	R100-1	100	75	12,3	0,65	1	    
64.630.1018	R100-1,8	100	75	12,3	0,65	1,8	    



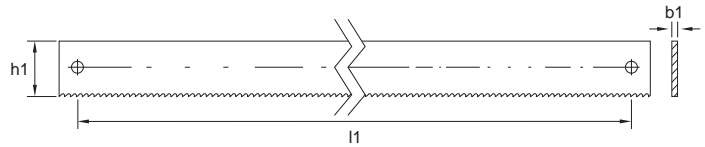
## > 66.110 Phantom

NL M2 Bi-Metal Machinezaagblad  
FR Lame de scie Bi-métal M2  
ES Hoja de sierra de máquina Bi-metal M2  
DE M2 Bi-Metall Maschinensägeblätter

Bim  
HSS

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si-10%	<b>N 51</b> Cu	<b>N 61</b> PVC
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Ref.	l1	l2	b1	T <sup>90</sup>
66.110.3036	300	25	1.25	10
66.110.3037	300	25	1.25	14
66.110.3054	300	32	1.6	6
66.110.3055	300	32	1.6	8
66.110.3056	300	32	1.6	10
66.110.3514	350	25	1.25	6
66.110.3515	350	25	1.25	8
66.110.3516	350	25	1.25	10
66.110.3517	350	25	1.25	14
66.110.3534	350	32	1.6	6
66.110.3535	350	32	1.6	8
66.110.3536	350	32	1.6	10
66.110.3537	350	32	1.6	14
66.110.3553	350	38	2	4
66.110.3554	350	38	2	6
66.110.3555	350	38	2	8
66.110.3556	350	38	2	10
66.110.3557	350	38	2	14
66.110.4034	400	25	1.25	6
66.110.4035	400	25	1.25	8
66.110.4036	400	25	1.25	10
66.110.4037	400	25	1.25	14
66.110.4054	400	32	1.6	6
66.110.4055	400	32	1.6	8
66.110.4056	400	32	1.6	10
66.110.4057	400	32	1.6	14
66.110.4073	400	38	2	4
66.110.4074	400	38	2	6
66.110.4075	400	38	2	8



Ref.	l1	l2	b1	T <sup>90</sup>
66.110.4076	400	38	2	10
66.110.4077	400	38	2	14
66.110.4233	425	32	1.6	4
66.110.4234	425	32	1.6	6
66.110.4513	450	32	1.6	4
66.110.4515	450	32	1.6	8
66.110.4516	450	32	1.6	10
66.110.4553	450	38	2	4
66.110.4554	450	38	2	6
66.110.4555	450	38	2	8
66.110.4556	450	38	2	10
66.110.5013	500	38	2	4
66.110.5014	500	38	2	6
66.110.5015	500	38	2	8
66.110.5016	500	38	2	10
66.110.5214	525	40	2	6
66.110.5513	550	45	2.25	4
66.110.5514	550	45	2.25	6
66.110.5515	550	45	2.25	8
66.110.5516	550	45	2.25	10
66.110.6013	600	50	2.5	4
66.110.6014	600	50	2.5	6
66.110.6015	600	50	2.5	8
66.110.6016	600	50	2.5	10
66.110.6513	650	50	2.5	4
66.110.6514	650	50	2.5	6
66.110.6515	650	50	2.5	8
66.110.6516	650	50	2.5	10

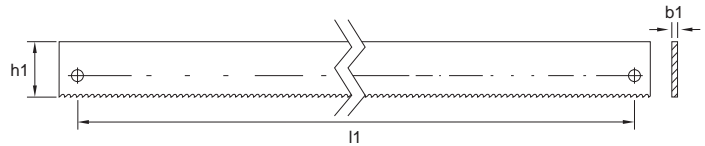
## > 66.130 Phantom

NL M2 Bi-Metal Machinezaagblad type Kasto  
FR Lame de scie Bi-métal M2 type Kasto  
ES Hoja de sierra de máquina Bi-metal M2 tipo Kasto  
DE M2 Bi-Metall Maschinensägeblätter Typ Kasto

Bim  
HSS KASTO

<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si-10%	<b>N 51</b> Cu	<b>N 61</b> PVC
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Ref.	l1	l2	b1	T <sup>90</sup>
66.130.4074	400	38	2	6
66.130.4075	400	38	2	8
66.130.4076	400	38	2	10
66.130.4553	450	38	2	4
66.130.4555	450	38	2	8
66.130.4556	450	38	2	10
66.130.5513	550	45	2.25	4
66.130.5514	550	45	2.25	6

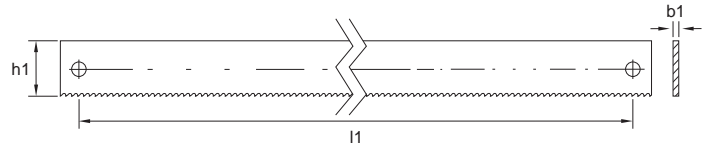


Ref.	l1	l2	b1	T <sup>90</sup>
66.130.5515	550	45	2.25	8
66.130.5516	550	45	2.25	10
66.130.5713	575	50	2.5	4
66.130.5714	575	50	2.5	6
66.130.5715	575	50	2.5	8
66.130.6533	650	50	2.5	4
66.130.6534	650	50	2.5	6
66.130.6535	650	50	2.5	8



> **66.160 Phantom**

NL M42 Bi-Metal Machinezaagblad  
 FR Lame de scie Bi-métal M42  
 ES Hoja de sierra de máquina Bi-metal M42  
 DE M42 Bi-Metall Maschinensägeblätter



BiM  
8% Co **INOX**

- P 11**  
≤600 N/mm<sup>2</sup>
- P 12**  
≤850 N/mm<sup>2</sup>
- P 13**  
≤1000 N/mm<sup>2</sup>
- P 14**  
≤1400 N/mm<sup>2</sup>
- M 21**  
INOX  
≤850N/mm<sup>2</sup>
- M 22**  
INOX  
>850N/mm<sup>2</sup>
- K 31**  
GG
- K 32**  
GGG  
GTS-GTW
- N 41**  
Alu
- N 42**  
Alu  
Si>10%
- N 51**  
Cu
- N 61**  
PVC

Ref.	l1	l2	b1	T/''
66.160.4094	400	40	2	6
66.160.4095	400	40	2	8
66.160.4096	400	40	2	10
66.160.4097	400	40	2	14
66.160.4554	450	40	2	6

Ref.	l1	l2	b1	T/''
66.160.4555	450	40	2	8
66.160.4556	450	40	2	10
66.160.5014	500	40	2	6
66.160.5015	500	40	2	8
66.160.5713	575	50	2.5	4

Ref.	l1	l2	b1	T/''
66.160.5714	575	50	2.5	6
66.160.7013	700	50	2.5	4
66.160.7014	700	50	2.5	6



## > 66.450 Phantom

NL M42 Bi-Metaal Bandzaag voor profielmateriaal  
 FR Scie à ruban Bi-métal M42 pour profilés  
 ES Sierra de cinta Bimetal M42 para materiales de perfiles  
 DE M42 Bi-Metall Sägebänder für Profilmaterial



BIM HSS	HSS-E 8%	VARI	$\alpha 0^\circ$								
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 51 Cu	S 71 Ni/Co	S 72 Ti
50-120	35-50	30-45	30-40	30-40	10-30	30-60	30-60	80-800	50-400	10-25	10-20

h1 x b1 (mm)	z=5-8/”	z=6-10/”	z=8-12/”	z=10-14/”
13 x 0,65		66.450.07...	66.450.08...	66.450.09...
13 x 0,9		66.450.17...	66.450.18...	66.450.19...
20 x 0,9	66.450.26...	66.450.27...	66.450.28...	66.450.29...
27 x 0,9	66.450.36...	66.450.37...	66.450.38...	66.450.39...
34 x 1,1	66.450.56...	66.450.57...	66.450.58...	

## > 66.460 Phantom

NL M42 Bi-Metal Bandzaag voor grotere afmetingen  
 FR Scie à ruban Bi-métal M42 pour matériaux de grandes dimensions  
 ES Sierra de cinta Bi-metal M42 para materiales con dimensiones grandes  
 DE M42 Bi-Metall Sägebänder größer Abmessung



BIM HSS	HSS-E 8%	VARI	$\alpha 10^\circ$					
P 11 ≤800 N/mm <sup>2</sup>	P 12 ≤850 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	P 14 ≤1400 N/mm <sup>2</sup>	M 21 INOX ≤850 N/mm <sup>2</sup>	M 22 INOX >850 N/mm <sup>2</sup>	K 31 GG	N 41 Alu	N 42 Alu Si>10%
50-120	35-50	30-45	30-40	30-40	10-30	30-60	80-800	80-800

h1 x b1 (mm)	z=2-3/”	z=3-4/”	z=4-6/”
20 x 0,9			66.460.25...
27 x 0,9		66.460.34...	66.460.35...
34 x 1,1	66.460.53...	66.460.54...	66.460.55...
41 x 1,3	66.460.63...	66.460.64...	66.460.65...
54 x 1,6	66.460.73...	66.460.74...	

> **66.580 Phantom**

- NL **M51 Bi-Metal Bandzaag voor grotere afmetingen, extra slijtvast**
- FR **Scie à ruban Bi-métal M51 pour matériaux de grandes dimensions, très résistante à l'usure**
- ES **Sierra de cinta Bi-metal M51 para materiales con dimensiones grandes, extra resistente al desgaste**
- DE **M51 BiMetall Sägebänder größer Abmessung, besonders Verschleissfest**



BiM HSS	10% Co	VARI	α10°				
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>S 71</b> Ni/Co	<b>S 72</b> Ti
50-120	35-50	30-45	30-40	30-40	10-30	10-25	10-20

h1 x b1 (mm)	z=3-4/''	z=4-6/''	z=5-8/''
27 x 0,9	66.580.44....	66.580.45....	66.580.46....
34 x 1,1	66.580.54....	66.580.55....	
41 x 1,3	66.580.64....	66.580.65....	

> **66.700 Phantom**

- NL **HP2 UNI M42 Bi-Metaal Bandzaag universele multizaag**
- FR **Scie à ruban Bi-métal M42 HP2 UNI scie multifonction**
- ES **Sierra de cinta Bimetal M42 HP2 UNI sierra universal**
- DE **HP2 UNI M42 Bi-Metall Sägebänder Universal-Sägeband**



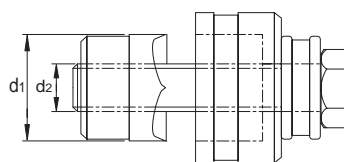
BiM HSS	HSS-E 8%	VARI	α5°	HP2 UNI											
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 51</b> Cu	<b>S 71</b> Ni/Co	<b>S 72</b> Ti	<b>NIEUW / NOUVEAU / NUEVO / NEU</b>			
50-120	35-50	30-45	30-40	30-40	10-30	30-60	30-60	80-800	50-400	10-25	10-20				

h1 x b1 (mm)	z=3-4/''	z=4-6/''	z=5-7/''	z=8-11/''
27 x 0,9	66.700.34....	66.700.35....	66.700.36....	66.700.38....
34 x 1,1	66.700.54....	66.700.55....	66.700.56....	
41 x 1,3	66.700.64....	66.700.65....	66.700.66....	
54 x 1,6	66.460.74....			



## > 67.100 Phantom

NL Gatenpons voor handgebruik, incl bout  
 FR Emporte-pièces pour usage à la main, Boulon inclus  
 ES Sacabocado para uso manual, con tornillo  
 DE Blechlocher für Handgebrauch, mit Schraube



1

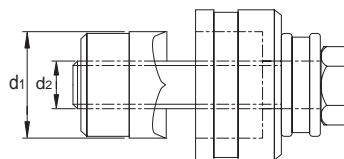


67.300.5000

Ref.	d1	M	PG	1	d2
67.100.1270	12.7	12	7	67.300.0940	9,5x40
67.100.1520	15.2		9	67.300.0940	9,5x40
67.100.1600	16.2	16		67.300.0940	9,5x40
67.100.1860	18.6		11	67.300.0940	9,5x40
67.100.2040	20.4	20	13	67.300.0940	9,5x40
67.100.2200	22			67.300.0940	9,5x40
67.100.2250	22.5		16	67.300.0940	9,5x40
67.100.2500	25			67.300.0950	9,5x50
67.100.2540	25.4	25		67.300.0950	9,5x50
67.100.2830	28.3		21	67.300.0950	9,5x50
67.100.3050	30.5			67.300.0950	9,5x50
67.100.3170	31.7			67.300.0950	9,5x50
67.100.3200	32.5	32		67.300.0950	9,5x50
67.100.3500	35			67.300.1955	19x55
67.100.3700	37		29	67.300.1955	19x55
67.100.3800	38			67.300.1955	19x55
67.100.4050	40.5	40		67.300.1955	19x55
67.100.4700	47		36	67.300.1975	19x75
67.100.5050	50.5	50		67.300.1975	19x75
67.100.5400	54		42	67.300.1975	19x75
67.100.6000	60		48	67.300.1975	19x75
67.100.6350	63.5	63		67.300.1975	19x75
67.100.7000	70			67.300.1975	19x75
67.100.7550	75.5	75		67.300.1975	19x75

## > 67.110 Phantom

NL Gatenpons voor handgebruik, incl bout en lager  
 FR Emporte-pièces pour usage à la main, Boulon à roulement à billes inclus  
 ES Sacabocado para uso manual, con tornillo y rodamiento de bolas  
 DE Blechlocher für Handgebrauch, mit Schraube und Kugellager



1

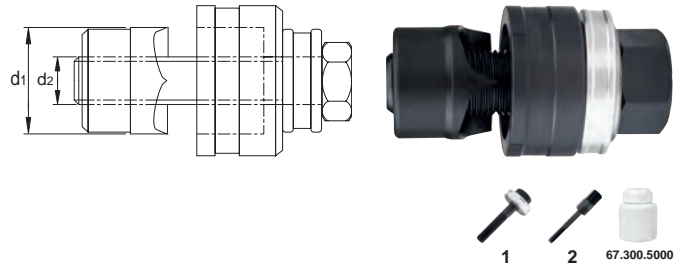


67.300.5000

Ref.	d1	M	PG	1	d2
67.110.1271	12.7	12	7	67.300.0951	9,5x50
67.110.1521	15.2		9	67.300.0951	9,5x50
67.110.1601	16.2	16		67.300.0951	9,5x50
67.110.1861	18.6		11	67.300.0951	9,5x50
67.110.2041	20.4	20	13	67.300.0951	9,5x50
67.110.2201	22			67.300.0951	9,5x50
67.110.2251	22.5		16	67.300.0951	9,5x50
67.110.2501	25			67.300.0951	9,5x50
67.110.2541	25.4	25		67.300.0951	9,5x50
67.110.2831	28.3		21	67.300.0951	9,5x50
67.110.3051	30.5			67.300.0951	9,5x50
67.110.3171	31.7			67.300.0951	9,5x50
67.110.3201	32.5	32		67.300.0951	9,5x50
67.110.3501	35			67.300.1956	19x55
67.110.3701	37		29	67.300.1956	19x55
67.110.3801	38			67.300.1956	19x55
67.110.4051	40.5	40		67.300.1956	19x55
67.110.4701	47		36	67.300.1976	19x75
67.110.5051	50.5	50		67.300.1976	19x75
67.110.5401	54		42	67.300.1976	19x75
67.110.6001	60		48	67.300.1976	19x75
67.110.6351	63.5	63		67.300.1976	19x75
67.110.7001	70			67.300.1976	19x75
67.110.7551	75.5	75		67.300.1976	19x75

► **67.120 Phantom**

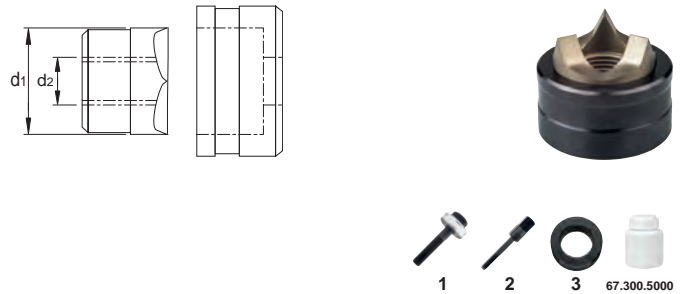
- NL **Gatenpons met 3-voudig slijtstempel, voor hand- en hydraulisch gebruik, incl bout en lager**
- FR **Emporte-pièces à trois pointes, pour usage à la main et hydraulique, Boulon à roulement à billes inclus**
- ES **Sacabocado con punzón cortador, para uso manual e hidráulico, con tornillo y rodamiento de bolas**
- DE **Blechlocher mit Spaltstempel, für hydraulischen Gebrauch, mit Schraube und Kugellager**



Ref.	d1	M	PG	1	d2	2	d2
67.120.1201	12.5	12		67.300.0949	6x40	67.300.1992	19x6
67.120.1521	15.2		9	67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.1601	16.2	16		67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.1861	18.6		11	67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.2041	20.4	20	13	67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.2251	22.5		16	67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.2501	25.4	25		67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.2831	28.3		21	67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.3051	30.5			67.300.0951	9,5x50	67.300.1993	19x9,5
67.120.3201	32.5	32		67.300.1956	19x55	67.300.1991	19
67.120.3701	37		29	67.300.1956	19x55	67.300.1991	19
67.120.4001	40.5	40		67.300.1976	19x75	67.300.1991	19
67.120.4701	47		36	67.300.1976	19x75	67.300.1991	19
67.120.5001	50.5	50		67.300.1976	19x75	67.300.1991	19
67.120.5401	54		42	67.300.1976	19x75	67.300.1991	19
67.120.6001	60		48	67.300.1976	19x75	67.300.1991	19
67.120.6301	63.5	63		67.300.1976	19x75	67.300.1991	19

► **67.130 Phantom**

- NL **Gatenpons met 3-voudig slijtstempel, voor hand- en hydraulisch gebruik, roestvaststaal, excl. bout**
- FR **Emporte-pièces à trois pointes, pour usage à la main et hydraulique, Inox, boulon non inclus**
- ES **Sacabocado con punzón cortador, para uso manual e hidráulico, acero inoxidable, sin tornillo.**
- DE **Blechlocher mit Spaltstempel, für hydraulischen Gebrauch, rostfreien Stahl, ohne Schraube**

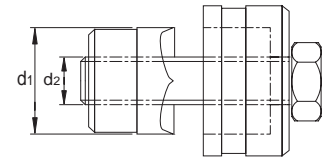


Ref.	d1	M	PG	1	d2	2	d2	3
67.130.1521	15.2		9	67.300.1110	11,1x60	67.300.1995	19x11,1	67.300.3030
67.130.1600	16.2	16		67.300.1110	11,1x60	67.300.1995	19x11,1	67.300.3030
67.130.1861	18.6		11	67.300.1110	11,1x60	67.300.1995	19x11,1	67.300.3030
67.130.2041	20.4	20	13	67.300.1110	11,1x60	67.300.1995	19x11,1	67.300.3030
67.130.2251	22.5		16	67.300.1110	11,1x60	67.300.1995	19x11,1	67.300.3030
67.130.2500	25.4	25		67.300.1110	11,1x60	67.300.1995	19x11,1	67.300.3030
67.130.2831	28.3		21	67.300.1956	19x55	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.3050	30.5			67.300.1956	19x55	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.3200	32.5	32		67.300.1956	19x55	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.3701	37		29	67.300.1956	19x55	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.4000	40.5	40		67.300.1976	19x75	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.4701	47		36	67.300.1976	19x75	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.5000	50.5	50		67.300.1976	19x75	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.5401	54		42	67.300.1976	19x75	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.6001	60		48	67.300.1976	19x75	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020
67.130.6300	63.5	63		67.300.1976	19x75	67.300.1991	19	67.300.3000 / 67.300.3010 / 67.300.3020



## > 67.250 Phantom

NL Gatenpons Sanitair, incl bout  
 FR Emporte-pièces Sanitaire, Boulon inclus  
 ES Sacabocado Sanitario, con tornillo  
 DE Blechlocher Sanitär, mit Schraube



Ref.	d1	1	d2
67.250.2830	28.3	67.300.1010	10x1
67.250.3170	31.7	67.300.1010	10x1
67.250.3500	35	67.300.1010	10x1

## > 67.290 Phantom

NL Hydraulische Handpomp  
 FR Pompe Hydraulique  
 ES Aparato Hidráulico manual  
 DE Hydraulische Handpumpe



Ref.	Contents
67.290.1000	Hydraulic Hand Pump

## > 67.300 Phantom

NL Onderdelen en Toebehoren voor Gatenpons  
 FR Pièces détachées et Accessoires pour Emporte-pièces  
 ES Componentes fundamentales y Accesorios para Sacabocado  
 DE Einzelteile und Zubehör für Blechlocher

Ref.	Contents
67.300.0940	drawbolt 9.5 x 40
67.300.0949	drawbolt 6 x 40 with ball bearing
67.300.0950	drawbolt 9.5 x 50
67.300.0951	drawbolt 9.5 x 50 with ball bearing
67.300.1010	drawbolt M10 x 1 x 50
67.300.1110	drawbolt 11,1x60 with ball bearing
67.300.1955	drawbolt 19x55
67.300.1956	drawbolt 19x55 with ball bearing
67.300.1975	drawbolt 19 x 75
67.300.1976	drawbolt 19 x 75 with ball bearing
67.300.1991	drawbolt M19x120 hydraulic use
67.300.1992	drawbolt M19x6 for hydraulic use
67.300.1993	drawbolt M19 x 9.5 for hydraulic use
67.300.1995	drawbolt M19 x 11.1 for hydraulic use
67.300.3000	distance bush for punch tools nr. 1 10/D23
67.300.3010	distance bush for punch tools nr. 2 16/D23
67.300.3020	distance bush for punch tools nr. 3 23/D30
67.300.3030	distance bush for punch tools nr. 4 23/D11,6
67.300.3040	distance bush for punch tools nr. 5 38/D23
67.300.5000	tube of grease





## > 69.210 Phantom

- NL HSS-EX Set Kernboren snijdiepte 30 mm, 62.100  
 FR Jeu de Fraises à carotter HSS-EX profondeur de coupe 30 mm, 62.100  
 ES Juego de Fresas huecas HSS-EX profundidad de corte 30 mm, 62.100  
 DE HSS-EX Satz Kernbohrer Schnittiefe 30 mm, 62.100



HSS-EX	$\varnothing 19$ WELDON	0,5-30 mm					
<b>P 11</b>	<b>P 12</b>	<b>P 13</b>	<b>K 31</b>	<b>N 41</b>	<b>N 42</b>	<b>N 51</b>	<b>N 61</b>
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	Alu	Alu Si>10%	Cu	PVC
25	20	13	18	38	32	22	17

Ref.	Ø mm
69.210.0001	12-14-16-18-20-22 + 62.300.0025

## > 69.212 Phantom

- NL HSS-EX Set Kernboren genitreerd, snijdiepte 30 mm, 62.122  
 FR Jeu de Fraises à carotter HSS-EX nitruré, profondeur de coupe 30 mm, 62.122  
 ES Juego de Fresas huecas HSS-EX nitrurada, profundidad de corte 30 mm, 62.122  
 DE HSS-EX Satz Kernbohrer nitriert, Schnittiefe 30 mm, 62.122



HSS-EX	<b>NIT.</b>	$\varnothing 19$ WELDON	0,5-30 mm									
<b>P 11</b>	<b>P 12</b>	<b>P 13</b>	<b>P 14</b>	<b>M 21</b>	<b>M 22</b>	<b>K 31</b>	<b>K 32</b>	<b>N 41</b>	<b>N 42</b>	<b>N 51</b>	<b>N 52</b>	<b>N 61</b>
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	INOX >850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe	PVC
31	18	16	9	10	4	20	16	38	40	36	36	22

Ref.	Ø mm
69.212.2001	12-14-16-18-20-22 + 62.300.0025

## > 69.215 Phantom

- NL HSS-EX Set Kernboren snijdiepte 55 mm, 62.150  
 FR Jeu de Fraises à carotter HSS-EX profondeur de coupe 55 mm, 62.150  
 ES Juego de Fresas huecas HSS-EX profundidad de corte 55 mm, 62.150  
 DE HSS-EX Satz Kernbohrer Schnittiefe 55 mm, 62.150



HSS-EX	$\varnothing 19$ WELDON	0,5-55 mm					
<b>P 11</b>	<b>P 12</b>	<b>P 13</b>	<b>K 31</b>	<b>N 41</b>	<b>N 42</b>	<b>N 51</b>	<b>N 61</b>
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	Alu	Alu Si>10%	Cu	PVC
25	20	13	18	38	32	22	17

Ref.	Ø mm
69.215.0001	14-16-18-20-22-26 + 62.300.0050

> **69.216 Phantom**

- NL HSS-EX Set Kernboren genitreerd, snijdiepte 55 mm, 62.162
- FR Jeu de Fraises à carotter HSS-EX nituré, profondeur de coupe 55 mm, 62.162
- ES Juego de Fresas huecas HSS-EX nitrurada, profundidad de corte 55 mm, 62.162
- DE HSS-EX Satz Kernbohrer nitriert, Schnittiefe 55 mm, 62.162



HSS-EX	NIT.	0,5-55 mm	WELDON	Ø19										
<b>P 11</b>	<b>P 12</b>	<b>P 13</b>	<b>P 14</b>	<b>M 21</b>	<b>M 22</b>	<b>K 31</b>	<b>K 32</b>	<b>N 41</b>	<b>N 42</b>	<b>N 51</b>	<b>N 52</b>	<b>N 61</b>		
≤500 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	≤1400 N/mm <sup>2</sup>	INOX S850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe	PVC		
31	18	16	9	10	4	20	16	38	40	36	36	22		
Ref.										Ø mm				
69.216.2001										14-16-18-20-22-26 + 62.300.0050				

> **69.710 Phantom**

- NL Set met Gatenponsen 67.110
- FR Jeu d'Emporte-pièces 67.110
- ES Juego de Sacabocados 67.110
- DE Satz Blechlocher 67.110



Ref.	1	2	3	4
69.710.2101	PG 9, PG 11, PG 13, PG16, PG21	67.300.0951 (2x) 9,5x50	11.130.1000	67.300.5000

> **69.712 Phantom**

- NL Set met Gatenponsen met 3-voudig splijtstempel, voor hand- en hydraulisch gebruik, 67.120
- FR Jeu d'Emporte-pièces à trois pointes, pour usage à la main et hydraulique, 67.120
- ES Juego de Sacabocados con punzón cortador, para uso manual e hidráulico, 67.120
- DE Satz Blechlocher mit Spaltstempel, für hydraulischen Gebrauch, 67.120



Ref.	1	2	3	4
69.712.3051	PG9, PG11, PG13, PG16, PG21 + 30,5	67.300.0951 (2x) 9,5x50	11.130.1000	67.300.5000
69.712.6001	PG9, PG11, PG13, PG16, PG21, PG29, PG36, PG42, PG48 + 30,5	67.300.0951 (2x) 9,5x50 - 67.300.1956 19x55 - 67.300.1976 19x75	11.130.1000	67.300.5000
69.712.7001	M12, M16, M20, M25, M32, M40	67.300.0949 6x40 - 67.300.0951 9,5x50 - 67.300.1956 19x55	11.130.1000	67.300.5000
69.712.7002	M16, M20, M25, M32, M40, M50, M63	67.300.0951 (2x) 9,5x50 - 67.300.1956 19x55 - 67.300.1976 19x75	11.130.1000	67.300.5000



## > 69.725 Phantom

NL Set met Gatenpensen Sanitair, 67.250  
 FR Jeu d'Emporte-pièces Sanitaire, 67.250  
 ES Juego de Sacabocados Sanitario, 67.250  
 DE Satz Blechlocher Sanitär, 67.250



Ref.	1	2	3	4
69.725.3500	28,3-31,7-35	67.300.1010 (3x)	11.130.1000	67.300.5000

## > 69.790 Phantom

NL Set Hydraulische Handpomp en Gatenpensen 67.120  
 FR Jeu de Pompe hydraulique et d'Emporte-pièces 67.120  
 ES Juego de Aparato Hidráulico manual y Sacabocados 67.120  
 DE Satz Hydraulische Handpumpe und Blechlocher 67.120



Ref.	1	2	3	4	5
69.790.1000	PG9, PG11, PG13, PG16, PG21, PG29, PG36, PG42, PG48	67.300.1993, 67.300.1991	67.300.3030, 67.300.3000, 67.300.3010, 67.300.3020	11.130.1000	67.300.5000
69.790.1200	M16, M20, M25, M32, M40	67.300.1993, 67.300.1991	67.300.3030, 67.300.3000, 67.300.3010, 67.300.3020	11.130.1000	67.300.5000

## > 69.795 Phantom

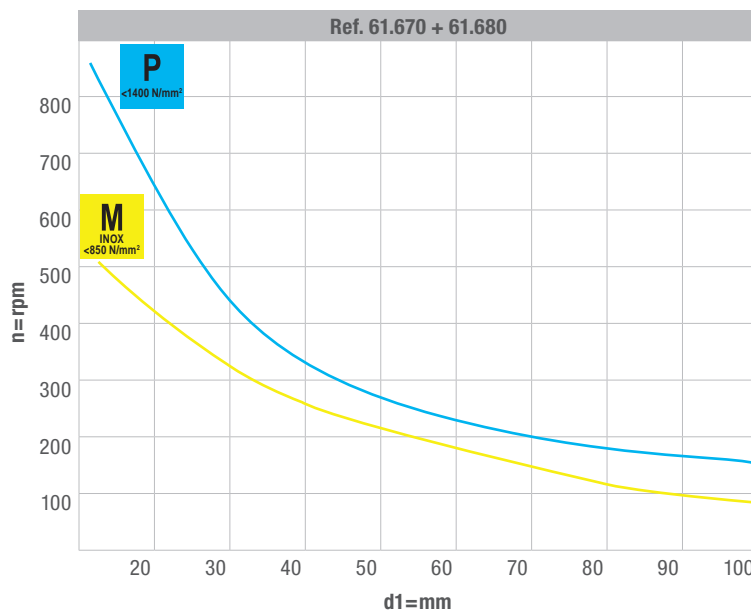
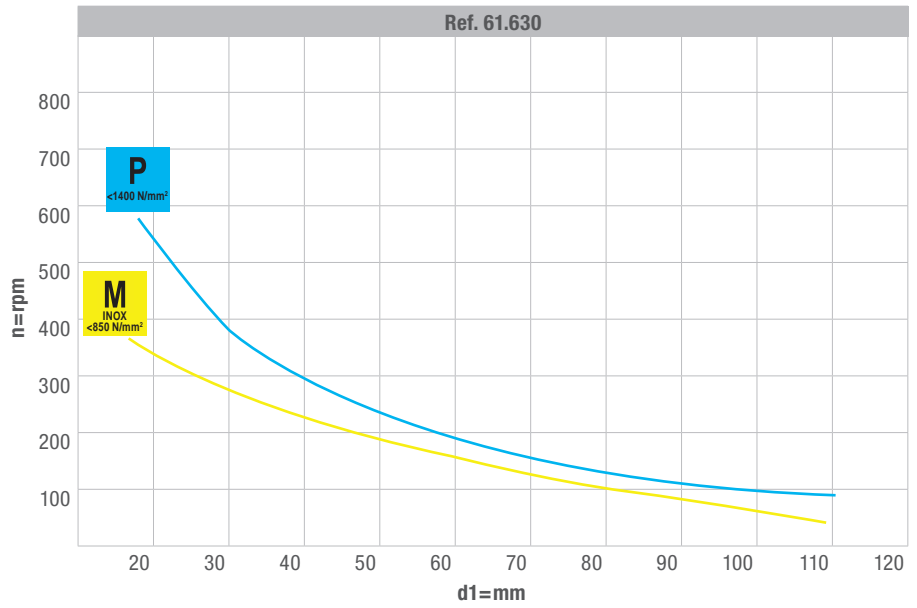
NL Set Hydraulische Handpomp en Gatenpensen 67.130  
 FR Jeu de Pompe hydraulique et d'Emporte-pièces 67.130  
 ES Juego de Aparato Hidráulico manual y Sacabocados 67.130  
 DE Satz Hydraulische Handpumpe und Blechlocher 67.130



Ref.	1	2	3	4	5
69.795.1000	PG 9, PG 11, PG 13, PG 16, PG 21, PG 29, PG 36, PG 42	67.300.1995, 67.300.1991	67.300.3030, 67.300.3000, 67.300.3010, 67.300.3020	11.130.1150	67.300.5000
69.795.1200	M16, M20, M25, M32, M40	67.300.1995, 67.300.1991	67.300.3030, 67.300.3000, 67.300.3010, 67.300.3020	11.130.1150	67.300.5000

NL Aanbevolen toerentallen gatzagen  
 FR Vitesses de rotation recommandées pour scies cloches  
 ES Número de revoluciones recomendados para coronas perforadoras  
 DE Drehzahlempfehlung Lochsägen

Ref. 61.105			
d1 (mm)	n=rpm		
	P	M	N
14	620	310	940
16	550	275	825
17	520	260	775
18	480	240	720
19	480	240	690
20	425	210	635
21	410	205	610
22	390	195	585
24	360	180	530
25	350	175	525
27	325	160	480
28	310	155	465
29	300	150	450
30	285	145	425
32	275	140	410
33	260	135	390
34	255	130	380
35	250	125	375
37	235	115	350
38	230	115	345
40	215	110	315
41	210	105	315
43	200	100	295
44	195	95	290
46	185	90	280
48	180	90	270
49	175	85	260
50	170	85	255
51	165	80	250
52	165	80	250
54	160	80	240
57	150	75	225
59	145	70	220
60	140	70	215
61	135	70	210
64	135	65	205
65	135	65	205
67	130	60	195
68	130	60	190
70	125	60	185
73	120	60	180
76	115	55	170
79	110	55	165
83	105	50	155
86	100	50	145
89	95	45	145
90	95	45	140
92	95	45	140
95	90	45	135
98	90	45	135
100	85	40	130
102	85	40	130
105	80	40	120
108	80	40	120
111	75	35	110
114	75	35	105
121	70	35	100
127	65	30	90
133	65	30	90
140	60	30	85
146	55	25	80
152	55	25	80

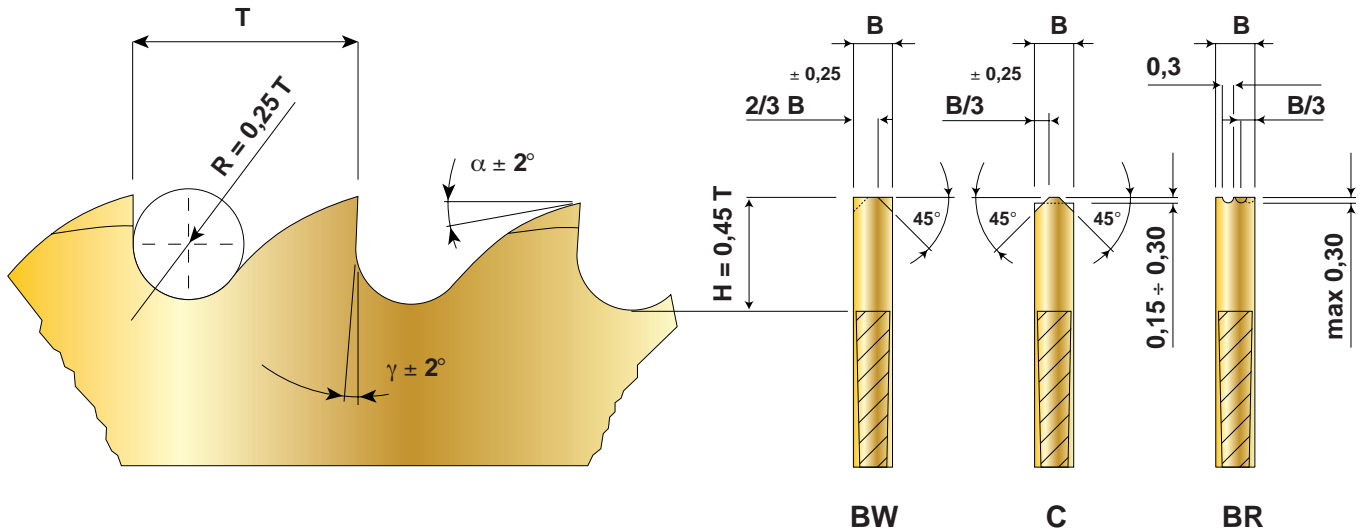


**n=rpm**  
 NL: Toerental (omw/min)  
 FR: Vitesse de rotation (tr/min)  
 ES: Número de revoluciones (rpm)  
 DE: Drehzahl (U/min)



NL Technische informatie afkortzagen 63.4XX  
 FR Information technique fraise-scie à tronçonner 63.4XX  
 ES Información técnica fresa sierra circular tronzoadora 63.4XX  
 DE Technische Informationen Trennsägeblätter 63.4XX

NL Tandvormen  
 FR Formes de dents  
 ES Forma de los dientes  
 DE Zahnform



B zaagbladdikte  
 épaisseur de la lame  
 espesor de la sierra  
 Sägeblattstärke

T tandsteek  
 pas de la dent  
 paso de diente  
 Zahnteilung

H tandhoogte  
 hauteur de dent  
 altura de diente  
 Zahnhöhe

R spaankamer diameter  
 diamètre du fond de la dent  
 diametro de la garganta  
 Spanraumdurchmesser

g spaanhoek  
 angle d'attaque  
 angulo de desprendimiento  
 Spanwinkel

a vrijloophoek  
 angle de dépouille  
 angulo de desmoldeo posterior  
 Rückenfreiwinkel

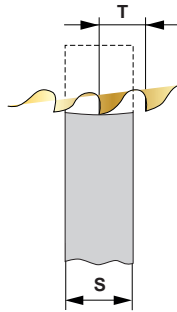
HSS	63.400 63.401	HSS-E	63.420 63.424
g	$18^\circ \pm 2^\circ$		$18^\circ \pm 2^\circ$
a	$10^\circ \pm 2^\circ$		$10^\circ \pm 2^\circ$

NL Snijhoeken  
 FR Arête de coupe  
 ES Angulo de corte  
 DE Spanwinkel

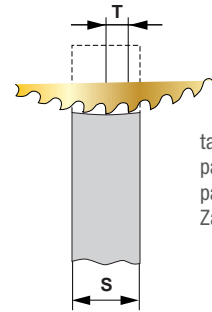
ISO	GR.	HSS		HSS-E	
		g8	a8	g8	a8
P	11	18°	10°		
	12	18°	10°		
	13	18°	10°	18°	10°
	14			18°	10°
M	21	18°	10°	18°	10°
	22			18°	10°
K	31	10°	6°		
	32	10°	6°		
	41	25°	10°		
N	42				
	51	20°			
	52	15°			
	61				
S	71			18°	10°
	72			18°	10°

NL Tandsteek  
FR Pas de dent  
ES Paso de diente  
DE Verzahnung

NL massief materiaal  
FR matériaux pleins  
ES materiales macizos  
DE Vollmaterial

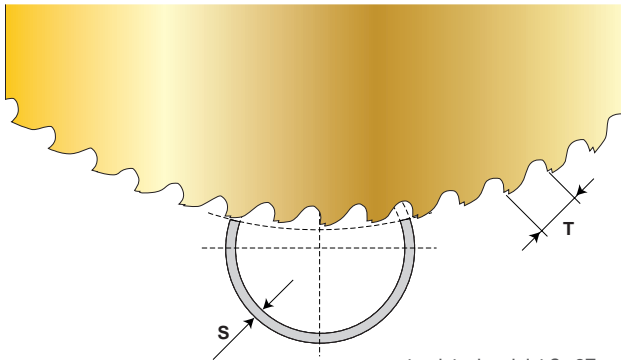


tandsteek onjuist  $S < 3T$   
pas de la dent incorrect  $S < 3T$   
paso de diente incorrecto  $S < 3T$   
Zahnteilung nicht korrekt  $S < 3T$

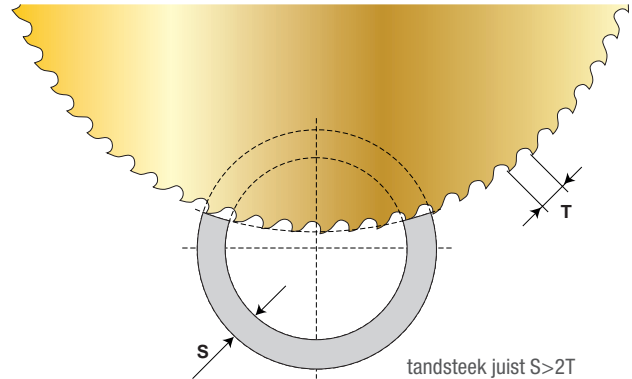


tandsteek juist  $S > 3T$   
pas de la dent correct  $S > 3T$   
paso de diente correcto  $S > 3T$   
Zahnteilung nicht korrekt  $S > 3T$

NL buis en profielen  
FR tubes et profilés  
ES tubos y perfiles  
DE Rohre und Profile



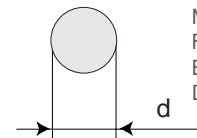
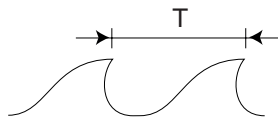
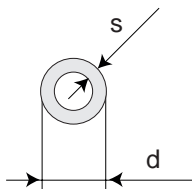
tandsteek onjuist  $S < 2T$   
pas de la dent incorrect  $S < 2T$   
paso de diente incorrecto  $S < 2T$   
Zahnteilung nicht korrekt  $S < 2T$



tandsteek juist  $S > 2T$   
pas de la dent correct  $S > 2T$   
paso de diente correcto  $S > 2T$   
Zahnteilung nicht korrekt  $S > 2T$

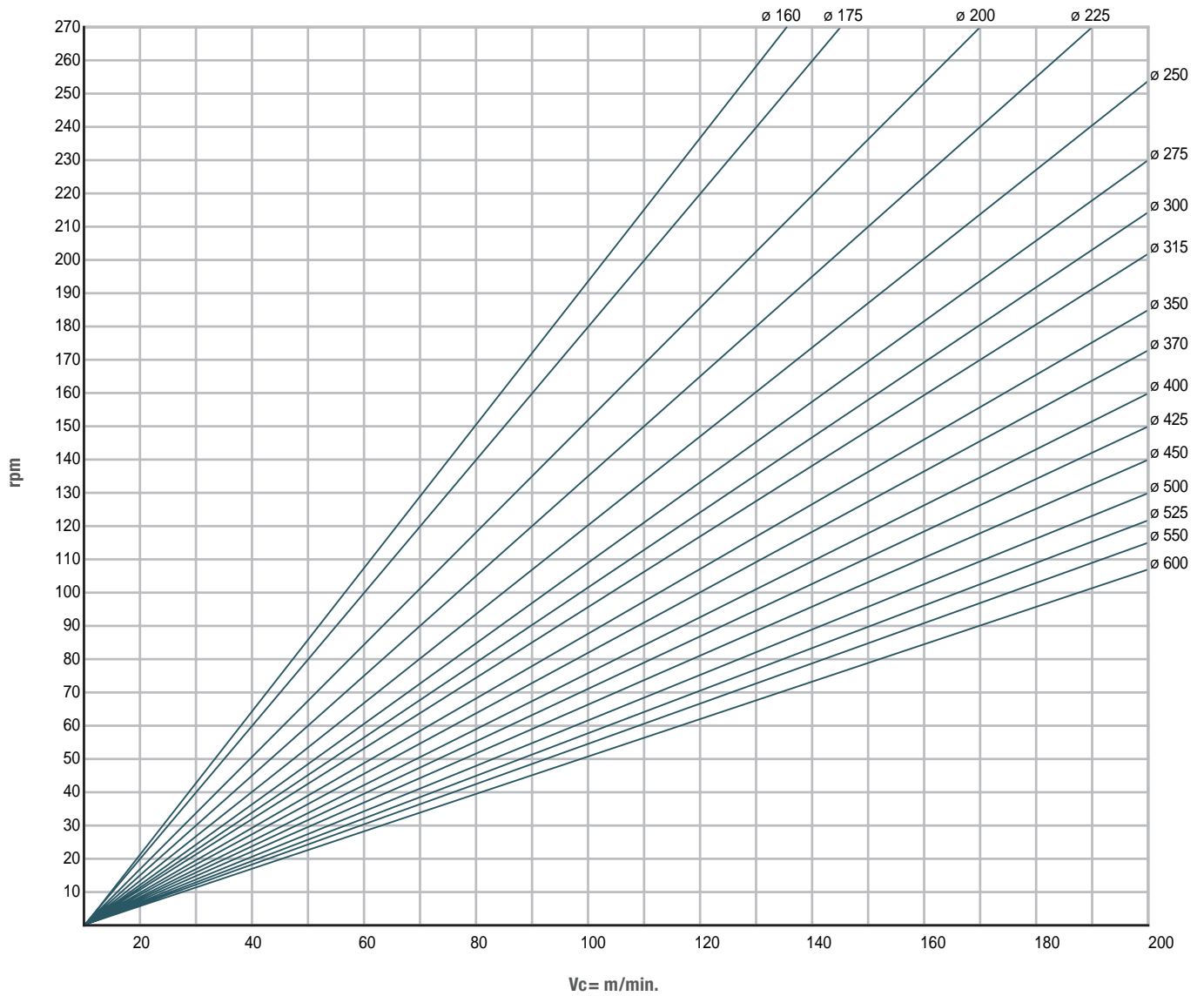
$fz = 0,05 \div 0,08 \text{ mm/Z}$					$fz < 0,08 \text{ mm/Z}$		$fz > 0,08 \text{ mm/Z}$	
d	s	T	s	T	d	T	T	
$\leq 20 \text{ mm}$	$\leq 1 \text{ mm}$	3	$> 1 \text{ mm}$	4	$\leq 20 \text{ mm}$	5,5		
$\leq 30 \text{ mm}$	$\leq 1,5 \text{ mm}$	5	$> 1,5 \text{ mm}$	5,5	$\leq 30 \text{ mm}$	7		
$\leq 40 \text{ mm}$	$\leq 2 \text{ mm}$	6	$> 2 \text{ mm}$	7	$\leq 40 \text{ mm}$	8		
$\leq 50 \text{ mm}$	$\leq 4 \text{ mm}$	6	$> 4 \text{ mm}$	7	$\leq 50 \text{ mm}$	9		
$\leq 60 \text{ mm}$	$\leq 4 \text{ mm}$	7	$> 4 \text{ mm}$	8	$\leq 60 \text{ mm}$	10		12
$\leq 70 \text{ mm}$	$\leq 3 \text{ mm}$	7	$> 3 \text{ mm}$	8	$\leq 70 \text{ mm}$	11		12
$\leq 80 \text{ mm}$	$\leq 4 \text{ mm}$	8	$> 4 \text{ mm}$	10	$\leq 80 \text{ mm}$	12		14
$\leq 90 \text{ mm}$	$\leq 4 \text{ mm}$	8	$> 4 \text{ mm}$	10	$\leq 90 \text{ mm}$	12		14
$\leq 100 \text{ mm}$	$\leq 7 \text{ mm}$	10	$> 7 \text{ mm}$	12	$\leq 100 \text{ mm}$	14		16
$\leq 120 \text{ mm}$	$\leq 5 \text{ mm}$	10	$> 5 \text{ mm}$	12	$\leq 120 \text{ mm}$	14		16
$\leq 140 \text{ mm}$	$\leq 4 \text{ mm}$	10	$> 4 \text{ mm}$	12	$\leq 140 \text{ mm}$	16		18

NL buis en profielen  
FR tubes et profilés  
ES tubos y perfiles  
DE Rohre und Profil



NL massief materiaal  
FR matériaux pleins  
ES materiales macizos  
DE Vollmaterial

NL Toerentabel  
 FR Tableau des vitesses de rotation  
 ES Tabla de número de revoluciones  
 DE Drehzahltable





NL Tandvormen  
FR Formes des dents  
ES Forma de los dientes  
DE Sägezahnformen

NL M42/M51 strook  
FR M42/M51 bande  
ES M42/M51 banda  
DU M42/M51 Band



NL Speciaal lasproces  
FR Procédé de soudage spécial  
ES Cinta de aleación de acero endurecido  
DU Spezielles Schweißverfahren

NL Band uit gehard gelegeerd staal  
FR Lame en acier allié trempé  
ES Procedimiento especial de soldadura  
DU Band aus gehärtetem legiertem Stahl

NL Vibratie-arm zagen  
FR Scies basses vibrations  
ES Serrar sin vibracion  
DU Vibrationsarme Sägen



NL Variabele vertanding  
FR Pas variable  
ES Dentado variable  
DU Variable Verzahnung

> 66.450



NL Speciale tand  
FR Denture spéciale  
ES Dentado especial  
DU Spezial Zahn

NL **BANDZAAG VOOR:**

- > Profielen
- > Klein stafmateriaal
- GEGEVENS:**
- > Spaanhoek 0°

ES **SIERRA DE CINTA PARA:**

- > Perfiles
- > Barras de acero
- DATOS:**
- > Ángulo de corte 0°

FR **SCIE À RUBAN POUR :**

- > Profils
- > Matériaux pleins fins
- CARACTÉRISTIQUES :**
- > Angle de coupe 0°

DU **SÄGEBAND FÜR:**

- > Profile
- > Stangenmaterial dünn
- DETAILS:**
- > Spanwinkel 0°

> 66.460



NL Speciale tand  
FR Denture spéciale  
ES Dentado especial  
DU Spezial Zahn

NL **BANDZAAG VOOR:**

- > Massief materiaal
- > Dikwandig profiel
- GEGEVENS:**
- > Positieve spaanhoek 10°

ES **SIERRA DE CINTA PARA:**

- > Material macizo
- > Perfiles de pared grueso
- DATOS:**
- > Ángulo de corte positivo 10°

FR **SCIE À RUBAN POUR :**

- > Matériaux massifs
- > Profils épais
- CARACTÉRISTIQUES :**
- > Angle de coupe positif 10°

DU **SÄGEBAND FÜR:**

- > Vollmaterial
- > Dickwandige profile
- DETAILS:**
- > 10° positiver Spanwinkel

> 66.580



NL Speciale tand  
FR Denture spéciale  
ES Dentado especial  
DU Spezial Zahn

NL **BANDZAAG VOOR:**

- > Massief materiaal
- > Dikwandig profiel
- GEGEVENS:**
- > Positieve spaanhoek 10°

ES **SIERRA DE CINTA PARA:**

- > Material macizo
- > Perfiles de pared grueso
- DATOS:**
- > Ángulo de corte positivo 10°

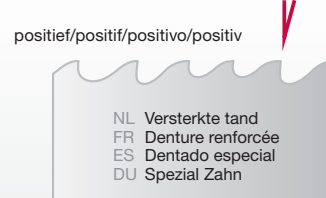
FR **SCIE À RUBAN POUR :**

- > Matériaux massifs
- > Profils épais
- CARACTÉRISTIQUES :**
- > Angle de coupe positif 10°

DU **SÄGEBAND FÜR:**

- > Vollmaterial
- > Dickwandige profile
- DETAILS:**
- > 10° positiver Spanwinkel

> 66.700



NL Versterkte tand  
FR Denture renforcée  
ES Dentado especial  
DU Spezial Zahn

NL **BANDZAAG VOOR:**

- > Profielen
- > Constructie balkstaal
- GEGEVENS:**
- > Positieve spaanhoek 5°

ES **SIERRA DE CINTA PARA:**

- > Perfiles
- > Viga de acero
- DATOS:**
- > Ángulo de corte positivo 5°

FR **SCIE À RUBAN POUR :**

- > Profils
- > Poutrelles Aciers
- CARACTÉRISTIQUES :**
- > Angle de coupe positif 5°

DU **SÄGEBAND FÜR:**

- > Profile
- > Bauträger Stahl
- DETAILS:**
- > 5° positiver Spanwinkel

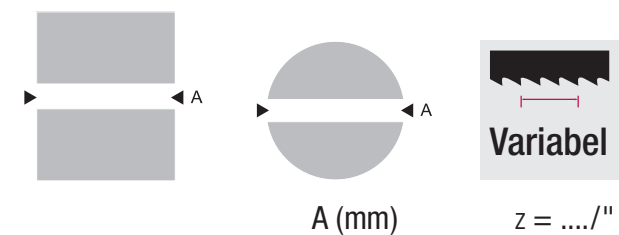


NL **BANDZAGEN:** Aantal tanden per inch  
 FR **SCIÉS A RUBAN:** Nombre de dents par pouce  
 ES **SIERRAS DE SINTA :** El Número de dientes por Pulgada  
 DE **SAGEBANDER :** Anzahl Zähne pro Zoll

NL Massief materiaal  
 FR Matériau solide  
 ES Materiales Macizos  
 DE Vollmaterial

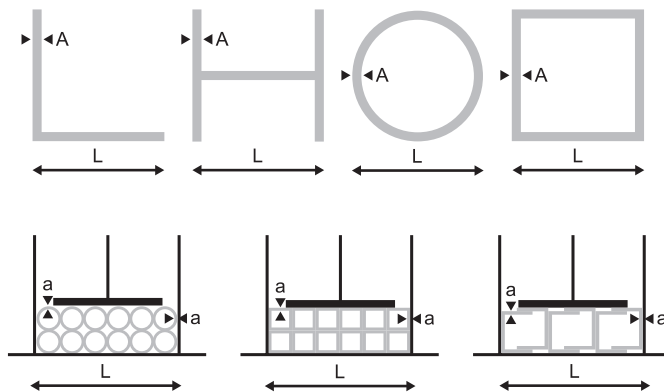


NL Profielen  
 FR Profilés  
 ES Perfiles  
 DE Profilen



2	10/14
3	
5	8/12
8	
12	6/10
16	
18	5/8
30	
40	4/6
70	
100	3/4
140	
200	2/3
240	
300	1,4/2
450	
600	0,75/1,2
750	

Dimensions: 66.700, 66.580, 66.450, 66.460



**VOORBEELD/EXEMPLE/EJEMPLO/BEISPIEL**

6 x □ 50 x 50 x 5mm

$$A = \frac{a \times \text{aantal wanden/nombre des parois/numero des paredes/Anzahl Wände}}{2}$$

$$A = \frac{5 \times 12 = 30 \text{ mm}}{2} \quad L = 6 \times 50 = 300 \text{ mm}$$

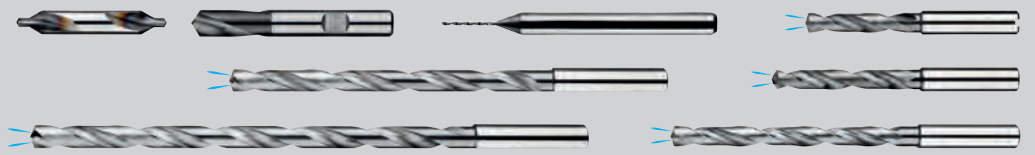
mm. A mm.	20	40	60	80	100	120	150	200	300	500
2	10/14	10/14	10/14	10/14	10/14	10/14	10/14	8/12	6/10	6/10
3	10/14	10/14	10/14	10/14	8/12	8/12	8/12	6/10	5/8	5/8
4	8/12	8/12	8/12	8/12	8/12	6/10	6/10	6/10	5/8	5/8
5	8/12	8/12	8/12	6/10	6/10	6/10	6/10	5/8	5/8	4/6
6	6/10	6/10	6/10	6/10	6/10	6/10	5/8	5/8	4/6	4/6
8	6/10	6/10	6/10	6/10	5/8	5/8	5/8	4/6	4/6	3/4
10		5/8	5/8	5/8	5/8	5/8	4/6	4/6	4/6	3/4
12		5/8	5/8	5/8	4/6	4/6	4/6	4/6	3/4	3/4
15		4/6	4/6	4/6	4/6	4/6	3/4	3/4	3/4	2/3
20			4/6	4/6	3/4	3/4	3/4	3/4	2/3	2/3
30				3/4	3/4	3/4	2/3	2/3	2/3	2/3
50							2/3	2/3	2/3	1,4/2

> 5/8 ≈ 5/7 > 8/12 ≈ 8/11

**OPSPANNEN/SERRAGE/FIJACION/SPANNEN**

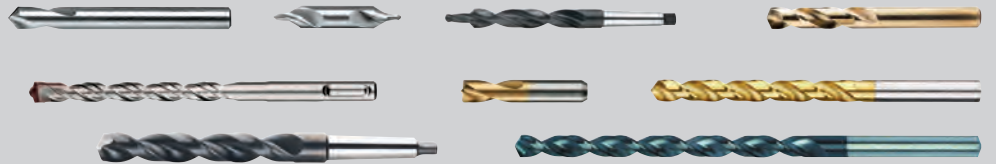


NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



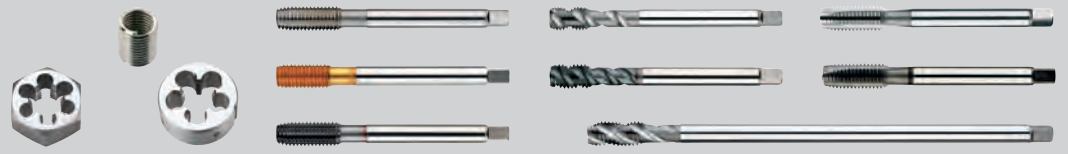
sp 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



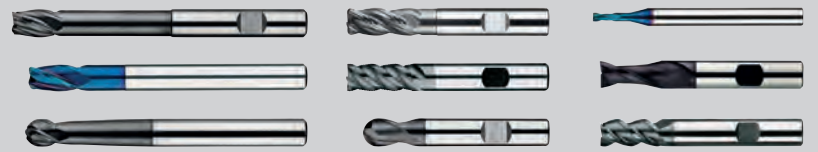
HSS(-E) 1

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



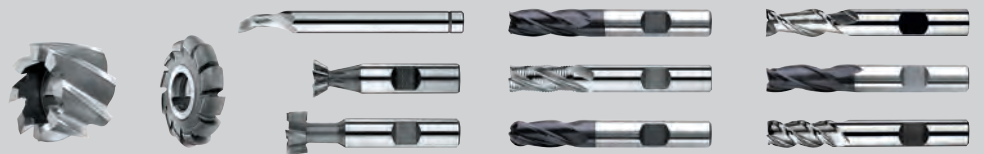
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



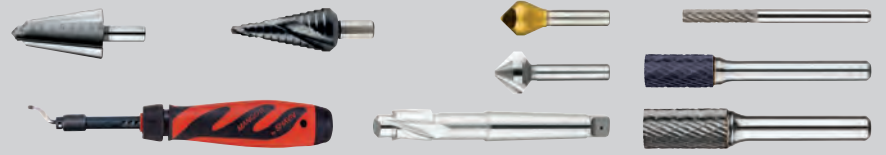
sp 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



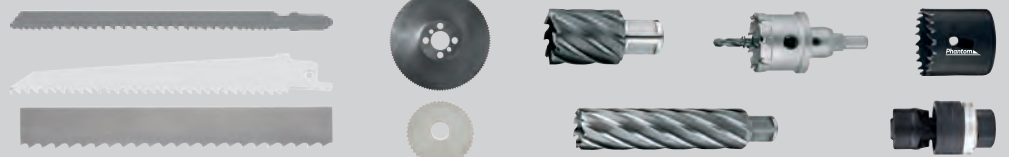
4

NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



5

NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



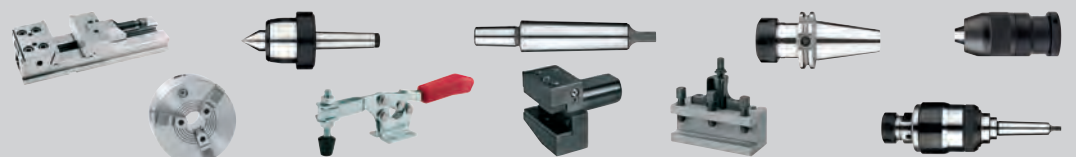
6

NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



7

NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig





## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
<b>HSS-E</b>	HSS-E (5% Cobalt)	HSS-E (5% Cobalt)	HSS-E (5% Cobalto)	HSS-E (5% Cobalt)
<b>10% Co</b>	HSS-E (10% Cobalt)	HSS-E (10% Cobalt)	HSS-E (10% Cobalto)	HSS-E (10% Cobalt)
<b>MG HM</b>	Micro-Grain volhardmetaal	Carbure micro-grain	Metal duro micrograno	Micro-Grain Vollhartmetall
<b>HM-TIP</b>	Hardmetaal Tip	Plaquette carbure brasée	Plaquetas de metal duro soldadas	mit HM-Schneiden
<b>DIN 4964-A</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm

	NL	FR	ES	DE
	Doorlopende gaten	Trou débouchant	Agujero pasante	Durchgangslöcher
	Blinde gaten	Trou borgne	Agujero ciego	Sacklöcher
	Doorlopende gaten, schroefdraad	Trou débouchant, filetage	Agujero pasante, rosca	Durchgangslöcher, Gewinde
<b>h8</b>	Tolerantie diameter	Tolérance diamètre	Tolerancia diámetro	Toleranz Durchmesser
<b>0,02</b>	Rechtheidstolerantie	Tolérance de rectitude	Tolerancia de rectitud	Geradheitstoleranz

	NL	FR	ES	DE
	<b>Algemeen</b>	<b>Général</b>	<b>General</b>	<b>Allgemein</b>
	Fijn/hadraaien	Tournage fin et finition	Mecanizado fino y en acabado	Feinzerspanung / Schlichten
	Midden	Torneage en général	Mecanizado medio	Mittlere Zerspanung
	Ruw/voordraaien	Usinage d'ébauche	Mecanizado en desbaste	Grobzerspanung
	Constante sneddiepte	Coupe continue	Corte continuo	Glatter Schnitt
	Wisselende sneddiepte	Profondeur de coupe variables	Profundidad de corte variable	Wechselnde Schnittiefen
	Onderbroken snedes	Coupe interrompue	Corte interrumpido	Unterbrochener Schnitt
	<b>Draaien</b>	<b>Tournage</b>	<b>Tornear</b>	<b>Drehen</b>
$a_p$ (mm)	Sneddiepte	Profondeur de coupe	Profundidad de corte	Schnittiefe
$d_{min}$	Minimale diameter	Diamètre minimum	Diámetro mínimo	Minimale Durchmesser
$f_n$ (mm)	Voeding per omwenteling	Avances par tour	Avances por revolucion	Vorschub pro Umdrehung
	<b>Draadsnijden</b>	<b>Fileter</b>	<b>Roscar</b>	<b>Gewindeschneiden</b>
	<b>Borgring steken</b>	<b>Gorges de circlips</b>	<b>Tronzar arandelas de retención</b>	<b>Sprengingplatte steken</b>
$P$ (mm)	Spoed (mm)	Pas (mm)	Paso (mm)	Steigung (mm)
$P$ (inch)	Aantal gangen (inch)	Nombre de filets	Número de hilos	Gewindegänge
$x a_p$	Aantal snedes	Nombre de fils	Número de cortes	Anzahl der Durchgänge
$m$ (H13)	Borgringmaat	Largeur de gorges	Tamaño del arandela de retención	Maß der Sicherungsring
	<b>Steken</b>	<b>Tronçonner</b>	<b>Tronzar</b>	<b>Stechen</b>
	<b>Steekhouder</b>	<b>Lame à tronçonner</b>	<b>Portaplaquite de tronzado</b>	<b>Schneidenträger</b>
$t_{max}$	Max. steekdiepte	Profondeur max. de tronçonnage	Profundidad de tronzado maxima	Max. Stechtiefe
$d_{max}$	Max. steekdiameter	Diamètre max. de tronçonnage	Diametro de tronzado maximo	Max. Stechdurchmesser
	<b>Steekplaten</b>	<b>Plaquette à tronçonner</b>	<b>Plaquita para tronzar</b>	<b>Stechplatten</b>
$a$	Steekbreedte a	Largeur de coupe a	Anchura de corta a	Stechbreite a
$a_p$ max	Maximale sneddiepte	Profondeur de coupe max.	Profundidad de corte max.	Maximale Schnittiefe
$f_{rad}$	Voeding radiaal	Avance radial	Avance radial	Vorschub radial
$f_{ax}$	Voeding axiaal	Avance axial	Avance axial	Vorschub axial
$r$	Radius	Rayon	Radio	Radius
	<b>Kartelen</b>	<b>Moleter</b>	<b>Moleteadores</b>	<b>Rändeln</b>
$P$	Steek	Passe	Paso	Teilung
	<b>Frezen</b>	<b>Fraisage</b>	<b>Fresar</b>	<b>Fräsen</b>
$f_z$ (mm)	Voeding per tand	Avances par dent	Avances por diente	Vorschub pro Zahn
	<b>Materiaalgroepen</b>	<b>Groups de matières</b>	<b>Grupos de materiales</b>	<b>Materialgruppen</b>
<b>P</b>	Staal	Acier	Acero	Stahl
<b>H</b>	Geharde staalsoorten	Acier trempé	Acero templado	Gehärtete Stahlsorten
<b>M</b>	Roestvaststaal	Inox	Acero inoxidable	Rostfreier Stahl
<b>K</b>	Gietijzer	Fonte	Fundición	Gusseisen
<b>N</b>	Non-Ferro metalen & kunststoffen	Métaux non-ferreux & Plastiques	Metal non-ferrosos & Plásticos	Nichteisen Legierungen & Kunststoffen
<b>S</b>	Superlegeringen	Alliages super	Aleaciones súper	Superlegeringen

NL Draaien  
FR Tournage  
ES Tornear  
DE Dreh- und Fräswerkzeuge

**P K** Bij uitstek geschikt  
Très approprié  
**H N** Muy adecuado  
**M S** Ideal geeignet

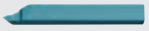
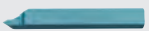










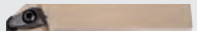











**P K** Beperkt geschikt  
Approprié  
**H N** Adecuado  
**M S** Eingeschränkt geeignet























P= pagina  
P= page  
P= página  
P= Seite

> 71.110	<b>Phantom</b>		P. 6
> 71.130	<b>Phantom</b>		P. 6
> 71.140	<b>Phantom</b>		P. 6
> 71.150	<b>Phantom</b>		P. 7
> 71.160	<b>Phantom</b>		P. 7
> 71.171			P. 7
> 71.175			P. 7
> 71.270			P. 8
> 71.400			P. 8
> 71.410			P. 8
> 71.420			P. 8
> 71.440			P. 8
> 71.500			P. 9
> 71.510			P. 9
> 71.520			P. 9
> 71.530			P. 9
> 71.550			P. 9
> 71.570			P. 10
> 71.600			P. 11
> 71.605			P. 11
> 71.610			P. 11
> 71.615			P. 11
> 71.620			P. 12
> 71.640			P. 12
> 71.650			P. 12
> 71.670			P. 13
> 71.680			P. 13
> 71.690			P. 13
> 71.695			P. 13
> 71.700			P. 14
> 71.705			P. 14
> 71.710			P. 14
> 71.715			P. 14
> 71.730			P. 15









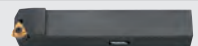



















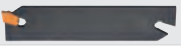




> 71.750				P. 15
> 71.760				P. 15
> 71.770				P. 15
> 71.780				P. 16
> 72.121	<b>Phantom</b>	CKJNR/L		P. 18
> 73.105	<b>Phantom</b>	KNUX		P. 19
> 72.156	<b>Phantom</b>	CTGPR/L		P. 20
> 73.171	<b>Phantom</b>	TPMR		P. 21
> 73.175		TPUN		
> 73.180		TPUX		
> 72.240	<b>Phantom</b>	PCLNR/L		P. 22
> 72.245		DCLNR/L		
> 73.200	<b>Phantom</b>	CNMG CNMA		P. 23
> 73.201				
> 73.203				
> 73.204				
> 73.206				
> 72.265	<b>Phantom</b>	DDJNR/L		P. 24
> 72.280		PDNNR/L		
> 73.211	<b>Phantom</b>	DNMG		P. 25
> 73.213				
> 72.325	<b>Phantom</b>	DSSNR/L		P. 26
> 73.241	<b>Phantom</b>	SNMG		P. 27
> 73.243				
> 72.340	<b>Phantom</b>	PTGNR/L		P. 28
> 73.250	<b>Phantom</b>	TNMG		P. 29
> 73.251				
> 73.253				
> 72.385	<b>Phantom</b>	DWLNR/L		P. 30
> 73.291	<b>Phantom</b>	WNMG		P. 31
> 73.293				
> 72.420	<b>Phantom</b>	SCLCR/L		P. 32
> 73.500	<b>Phantom</b>	CCMT CCGT		P. 33
> 73.501				
> 73.503				
> 73.505				
> 72.450	<b>Phantom</b>	SDJCR/L		P. 34
> 72.455		SDNCN		
> 73.510	<b>Phantom</b>	DCMT DCGT		P. 35
> 73.511				
> 73.513				
> 73.515				
> 72.461	<b>Phantom</b>	SRDCN		P. 36
> 73.521	<b>Phantom</b>	RCMT		P. 37



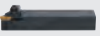







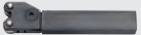






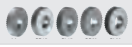















> 72.485	<b>Phantom</b>	SSSCR		P. 38
> 73.530 > 73.531 > 73.535	<b>Phantom</b>	SCMT SCGT		P. 39
> 72.500 > 72.505	<b>Phantom</b>	STFCR STGCR/L		P. 40
> 73.540 > 73.541 > 73.543 > 73.545	<b>Phantom</b>	TCMT TCGT		P. 41
> 72.515 > 72.520	<b>Phantom</b>	SVJCR/L SVVCN		P. 42
> 73.591 > 73.595	<b>Phantom</b>	VCMT VCGT		P. 43
> 72.540	<b>Phantom</b>	S-CTFPR/L		P. 44
> 73.171 > 73.175 > 73.180	<b>Phantom</b>	TPMR TPUN TPUX		P. 45
> 72.545 > 72.555	<b>Phantom</b>	S-PCLNR A-DCLNR/L		P. 46
> 73.200 > 73.201 > 73.203 > 73.204 > 73.206	<b>Phantom</b>	CNMG CNMA		P. 47
> 72.557	<b>Phantom</b>	A-DDUNR/L		P. 48
> 73.211 > 73.213	<b>Phantom</b>	DNMG		P. 49
> 72.565	<b>Phantom</b>	A-PTFNR/L		P. 50
> 73.250 > 73.251 > 73.253	<b>Phantom</b>	TNMG		P. 51
> 72.570	<b>Phantom</b>	A-PWLNRL/L		P. 52
> 73.291 > 73.293	<b>Phantom</b>	WNMG		P. 53
> 72.585 > 72.590	<b>Phantom</b>	S-SCLCR A-SCLCR/L		P. 54
> 73.500 > 73.501 > 73.503 > 73.505	<b>Phantom</b>	CCMT CCGT		P. 55
> 72.595 > 72.600	<b>Phantom</b>	S-SDUCR A-SDUCR/L		P. 56
> 73.510 > 73.511 > 73.513 > 73.515	<b>Phantom</b>	DCMT DCGT		P. 57
> 72.610	<b>Phantom</b>	A-SSSCR		P. 58
> 73.530 > 73.531 > 73.535	<b>Phantom</b>	SCMT SCGT		P. 59







> 72.615	<b>Phantom</b>	S-STFCR		P. 60
> 72.620		A-STFCR/L		
> 73.540	<b>Phantom</b>	TCMT		P. 61
> 73.541		TCGT		
> 73.543				
> 73.545				
> 72.630	<b>Phantom</b>	A-SVUCR		P. 62
> 73.591	<b>Phantom</b>	VCMT		P. 63
> 73.595		VCGT		
> 74.101	<b>Phantom</b>	NL-AL		P. 64
> 74.102	<b>Phantom</b>	AL-LH		P. 64
> 74.125	<b>Phantom</b>	NVR-AVR		P. 65
> 74.126	<b>Phantom</b>	NVR-LH		P. 65
> 74.150	<b>Phantom</b>	ER 60° UNI		P. 66
> 74.151	<b>Phantom</b>	EL 60° UNI		P. 66
> 74.155	<b>Phantom</b>	IR 60° UNI		P. 66
> 74.156	<b>Phantom</b>	IL 60° UNI		P. 66
> 74.160	<b>Phantom</b>	ER 55° UNI		P. 66
> 74.165	<b>Phantom</b>	IR 55° UNI		P. 66
> 74.170	<b>Phantom</b>	ER 60° M UNI-INOX		P. 67
> 74.175	<b>Phantom</b>	iR 60° M UNI-INOX		P. 68
> 74.180	<b>Phantom</b>	ER 55° UNI		P. 69
> 74.185	<b>Phantom</b>	IR 55° UNI		P. 69
> 74.190	<b>Phantom</b>	ER 55° BSP-BSW		P. 70
> 74.195	<b>Phantom</b>	IR 55° BSP-BSW		P. 70
> 74.240	<b>Phantom</b>	ER 55° TR		P. 71
> 74.245	<b>Phantom</b>	IR 55° TR		P. 71
> 74.390	<b>Phantom</b>	ER DIN 471		P. 72
> 74.395	<b>Phantom</b>	IR DIN 472		P. 72
> 74.410	<b>Phantom</b>	FX		P. 73
> 74.480	<b>Phantom</b>	FX		P. 73
> 74.500	<b>Phantom</b>	PTNZ		P. 74
> 74.510	<b>Phantom</b>	EXN		P. 74
> 74.517	<b>Phantom</b>	EXN		P. 74

> 74.582	<b>Phantom</b>	EXN, EXR, EXL		P. 75
> 74.599	<b>Phantom</b>	RXN		P. 75
> 74.522	<b>Phantom</b>	EJN		P. 76
> 74.596	<b>Phantom</b>	DXN		P. 76
> 74.540	<b>Phantom</b>	EJN		P. 76
> 74.560	<b>Phantom</b>	EJN		P. 76
> 75.100	<b>Phantom</b>	M1		P. 77
> 75.103	<b>Phantom</b>	M2		P. 77
> 75.106	<b>Phantom</b>	M3		P. 77
> 75.109	<b>Phantom</b>	M6		P. 78
> 75.115	<b>Phantom</b>	M7		P. 78
> 75.121	<b>Phantom</b>	MCNCS		P. 78
> 75.125	<b>Phantom</b>	MCNC		P. 79
> 75.129	<b>Phantom</b>	MFCNCS		P. 79
> 75.133	<b>Phantom</b>	MFCNC		P. 80
> 75.158	<b>Phantom</b>	MFCNC 16x16		P. 81
> 75.174	<b>Phantom</b>	M1, M2, M3, M6, M7		P. 81
> 75.182	<b>Phantom</b>	MFCNCS, MFCNC 20x25 - 25x25		P. 81
> 75.197	<b>Phantom</b>	MCNCS, MCNC		P. 82
> 76.100	<b>Phantom</b>	45° SE 1204		P. 83
> 76.615	<b>Phantom</b>	SE 1204		P. 83
> 76.125	<b>Phantom</b>	45° SN 1205		P. 84
> 76.500	<b>Phantom</b>	SN 1205		P. 84
> 76.135	<b>Phantom</b>	90° XN 0806		P. 85
> 76.520	<b>Phantom</b>	XN 0806		P. 85
> 76.145	<b>Phantom</b>	90° AP 1003		P. 86
> 76.146	<b>Phantom</b>	90° AP 1003		P. 86
> 76.365	<b>Phantom</b>	APKT, APHT 1003		P. 86
> 76.155	<b>Phantom</b>	90° AP 1604		P. 87
> 76.156	<b>Phantom</b>	90° AP 1604		P. 87
> 76.366	<b>Phantom</b>	APKT, APHT 1604		P. 87
> 79.510	<b>Phantom</b>	KM1-M7		P. 88
> 79.613	<b>Phantom</b>	XNEX 0806		P. 88





## > 71.110 Phantom

NL HSS-E 5% Toolbit, geharde en geslepen uitvoering  
 FR Barreau HSS-E 5%, trempé et rectifié  
 ES Cuchilla HSS-E 5%, versión templada y rectificada  
 DE HSS-E 5% Drehlinge, gehärtete und geschliffene Ausführung



HSS-E	5% Co	DIN 4964-D	h14
-------	----------	---------------	-----

Ref.	h1	b1	l1
71.110.0625	6	4	160
71.110.0825	8	4	160
71.110.0845	8	6	160
71.110.1023	10	4	150
71.110.1033	10	5	150
71.110.1041	10	6	100
71.110.1043	10	6	150
71.110.1055	10	8	160
71.110.1213	12	3	150

Ref.	h1	b1	l1
71.110.1223	12	4	150
71.110.1233	12	5	150
71.110.1243	12	6	150
71.110.1251	12	8	100
71.110.1253	12	8	150
71.110.1263	12	10	150
71.110.1441	14	6	100
71.110.1465	14	10	160
71.110.1625	16	4	160

Ref.	h1	b1	l1
71.110.1643	16	6	150
71.110.1653	16	8	150
71.110.1663	16	10	150
71.110.1825	18	4	160
71.110.1845	18	6	160
71.110.2057	20	8	200
71.110.2067	20	10	200
71.110.2073	20	12	150
71.110.2085	20	16	160

Ref.	h1	b1	l1
71.110.2545	25	6	160
71.110.2575	25	12	160
71.110.2585	25	16	160
71.110.2595	25	20	160
71.110.3047	30	6	200
71.110.3077	30	12	200
71.110.3097	30	20	200
71.110.3257	32	8	200
71.110.3287	32	16	200

## > 71.130 Phantom

NL HSS-E 5% Toolbit, geharde en geslepen uitvoering  
 FR Barreau HSS-E 5%, trempé et rectifié  
 ES Cuchilla HSS-E 5%, versión templada y rectificada  
 DE HSS-E 5% Drehlinge, gehärtete und geschliffene Ausführung



HSS-E	5% Co	DIN 4964-B	h14
-------	----------	---------------	-----

Ref.	h1	b1	l1
71.130.0410	4	4	100
71.130.0415	4	4	150
71.130.0420	4	4	200
71.130.0510	5	5	100
71.130.0610	6	6	100
71.130.0615	6	6	150
71.130.0620	6	6	200
71.130.0810	8	8	100

Ref.	h1	b1	l1
71.130.0815	8	8	150
71.130.0820	8	8	200
71.130.1010	10	10	100
71.130.1015	10	10	150
71.130.1020	10	10	200
71.130.1210	12	12	100
71.130.1215	12	12	150
71.130.1220	12	12	200

Ref.	h1	b1	l1
71.130.1415	14	14	150
71.130.1420	14	14	200
71.130.1610	16	16	100
71.130.1615	16	16	150
71.130.1620	16	16	200
71.130.1815	18	18	150
71.130.1820	18	18	200
71.130.2010	20	20	100

Ref.	h1	b1	l1
71.130.2015	20	20	150
71.130.2020	20	20	200
71.130.2515	25	25	150
71.130.2520	25	25	200
71.130.3020	30	30	200
71.130.3220	32	32	200

## > 71.140 Phantom

NL HSS-E 10% Toolbit, geharde en geslepen uitvoering  
 FR Barreau HSS-E 10%, entièrement trempé et rectifié  
 ES Cuchilla HSS-E 10%, totalmente templado y rectificado  
 DE HSS-E 10% Drehlinge, völlig gehärtet und geschliffen



HSS-E	10% Co	DIN 4964-B	h14
-------	-----------	---------------	-----

Ref.	h1	b1	l1
71.140.0410	4	4	100
71.140.0415	4	4	150
71.140.0420	4	4	200
71.140.0510	5	5	100
71.140.0515	5	5	150
71.140.0520	5	5	200
71.140.0610	6	6	100

Ref.	h1	b1	l1
71.140.0615	6	6	150
71.140.0620	6	6	200
71.140.0810	8	8	100
71.140.0815	8	8	150
71.140.0820	8	8	200
71.140.1010	10	10	100
71.140.1015	10	10	150

Ref.	h1	b1	l1
71.140.1020	10	10	200
71.140.1210	12	12	100
71.140.1215	12	12	150
71.140.1220	12	12	200
71.140.1415	14	14	150
71.140.1420	14	14	200
71.140.1610	16	16	100

Ref.	h1	b1	l1
71.140.1615	16	16	150
71.140.1620	16	16	200
71.140.1815	18	18	150
71.140.1820	18	18	200
71.140.2015	20	20	150
71.140.2020	20	20	200
71.140.2520	25	25	200

> **71.150** **Phantom**



NL HSS-E 5% Toolbit, geharde en geslepen uitvoering  
 FR Barreau HSS-E 5%, trempé et rectifié  
 ES Cuchilla HSS-E 5%, versión templada y rectificada  
 DE HSS-E 5% Drehlinge, gehärtete und geschliffene Ausführung

HSS-E 5% Co DIN 4964-A h8

Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1
71.150.0410	4	100	71.150.0615	6	150	71.150.1020	10	200	71.150.1620	16	200
71.150.0415	4	150	71.150.0620	6	200	71.150.1210	12	100	71.150.1815	18	150
71.150.0420	4	200	71.150.0810	8	100	71.150.1215	12	150	71.150.1820	18	200
71.150.0510	5	100	71.150.0815	8	150	71.150.1220	12	200	71.150.2020	20	200
71.150.0515	5	150	71.150.0820	8	200	71.150.1415	14	150	71.150.2520	25	200
71.150.0520	5	200	71.150.1010	10	100	71.150.1420	14	200			
71.150.0610	6	100	71.150.1015	10	150	71.150.1615	16	150			

> **71.160** **Phantom**



NL HSS-E 10% Toolbit, geharde en geslepen uitvoering  
 FR Barreau HSS-E 10%, trempé et rectifié  
 ES Cuchilla HSS-E 10%, versión templada y rectificada  
 DE HSS-E 10% Drehlinge, gehärtete und geschliffene Ausführung

HSS-E 10% Co DIN 4964-A h8

Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1
71.160.0310	3	100	71.160.0610	6	100	71.160.1015	10	150	71.160.1615	16	150
71.160.0410	4	100	71.160.0615	6	150	71.160.1020	10	200	71.160.1620	16	200
71.160.0415	4	150	71.160.0620	6	200	71.160.1210	12	100	71.160.1815	18	150
71.160.0420	4	200	71.160.0810	8	100	71.160.1215	12	150	71.160.1820	18	200
71.160.0510	5	100	71.160.0815	8	150	71.160.1220	12	200	71.160.2020	20	200
71.160.0515	5	150	71.160.0820	8	200	71.160.1415	14	150	71.160.2520	25	200
71.160.0520	5	200	71.160.1010	10	100	71.160.1420	14	200			

> **71.171**



NL VHM-MG Staaf, geslepen, met enkelzijdige fase 45°  
 FR Barreau Carbure MG, rectifié, avec phase unilatérale 45°  
 ES Barra MD-MG, rectificadas, con fase unilateral 45°  
 DE VHM-MG Stäbe, geschmiedet, mit einseitiger Fase 45°

MG HM NORM K20 K40 h5 0,02

Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1
71.171.0610	6	100	71.171.1010	10	100	71.171.1612	16	120			
71.171.0810	8	100	71.171.1210	12	100	71.171.2515	25	150			

> **71.175**



NL VHM-MG Staaf, geslepen  
 FR Barreau Carbure MG, rectifié  
 ES Barra MD-MG, rectificadas  
 DE VHM-MG Stäbe, geschmiedet

MG HM NORM K15 K20 h6 0,02

Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1
71.175.0200	2	330	71.175.0400	4	330	71.175.0600	6	330	71.175.1000	10	330
71.175.0300	3	330	71.175.0500	5	330	71.175.0800	8	330	71.175.1200	12	330





### > 71.270

NL HSS Steekbeitel  
FR Outil à saigner HSS  
ES Herramienta de tronzar HSS  
DE HSS Stechdrehmeissel



Ref.	h1	b1	l1	a	t max
71.270.2005	20	20	210	5	48
71.270.2006	20	20	210	6	60

Ref.	h1	b1	l1	a	t max
71.270.2008	20	20	210	8	80
71.270.2508	25	25	250	8	80

Ref.	h1	b1	l1	a	t max

### > 71.400

NL HSS Rechte Ruwbeitel, rechts  
FR HSS Outil à charioter droit, à droite  
ES HSS Herramienta de torneado recto, a derecha  
DE HSS Gerader Schruppdrehmeissel, Rechts



Ref.	h1	b1	l1
71.400.0808	8	8	80
71.400.1010	10	10	100

Ref.	h1	b1	l1
71.400.1212	12	12	125
71.400.1616	16	16	150

Ref.	h1	b1	l1
71.400.2020	20	20	175
71.400.2525	25	25	200

### > 71.410

NL HSS Gebogen Ruwbeitel, rechts  
FR Outil à charioter courbé HSS, à droite  
ES Herramienta de torneado curva HSS, a derecha  
DE HSS Gebogene Schruppdrehmeissel, Rechts



Ref.	h1	b1	l1
71.410.0808	8	8	80
71.410.1010	10	10	100

Ref.	h1	b1	l1
71.410.1212	12	12	125
71.410.1616	16	16	150

Ref.	h1	b1	l1
71.410.2020	20	20	175
71.410.2525	25	25	200

### > 71.420

NL HSS Boorbeitel, rechts, voor doorlopende gaten  
FR Outil à aléser HSS, à droite, pour trous débouchants  
ES Herramienta de torneado interno HSS, a derecha, para agujeros pasantes  
DE HSS Bohrdrehmeissel, Rechts, für Durchgangslöcher



Ref.	h1	b1	l1	d1 min.
71.420.0606	6	6	130	11
71.420.0808	8	8	140	14
71.420.1010	10	10	160	18

Ref.	h1	b1	l1	d1 min.
71.420.1212	12	12	180	21
71.420.1616	16	16	210	27
71.420.2020	20	20	250	34

Ref.	h1	b1	l1	d1 min.
71.420.2525	25	25	300	43

### > 71.440

NL HSS Boorbeitel, rechts, voor blinde gaten  
FR Outil à aléser, à droite HSS, pour trous borgnes  
ES Herramienta de torneado interior HSS, a derecha, para agujeros ciegos  
DE HSS Bohrdrehmeissel, Rechts, für Sacklöcher



Ref.	h1	b1	l1	d1 min.
71.440.0606	6	6	130	11
71.440.0808	8	8	140	14
71.440.1010	10	10	160	18

Ref.	h1	b1	l1	d1 min.
71.440.1212	12	12	180	21
71.440.1616	16	16	180	27
71.440.2020	20	20	250	34

Ref.	h1	b1	l1	d1 min.
71.440.2525	25	25	300	43
71.440.3232	32	32	355	52

> **71.500**

NL HSS Mesbeitel, rechts  
 FR Outil couteau HSS, à droite  
 ES Herramienta para corte y acabado HSS, a derecha  
 DE HSS Seitendrehmeissel, Rechts



Ref.	h1	b1	l1
71.500.0808	8	8	80
71.500.1010	10	10	100

Ref.	h1	b1	l1
71.500.1212	12	12	125
71.500.1616	16	16	140

Ref.	h1	b1	l1
71.500.2020	20	20	175
71.500.2525	25	25	200

> **71.510**

NL HSS Vlakbeitel, recht  
 FR Outil pelle HSS, droit  
 ES Herramienta de torneado para acabados HSS, recto  
 DE HSS Flachdrehmeissel, Gerade



Ref.	h1	b1	l1
71.510.2012	20	12	125

Ref.	h1	b1	l1
71.510.2516	25	16	140

Ref.	h1	b1	l1
71.510.3220	32	20	170

> **71.520**

NL HSS Steekbeitel, rechts  
 FR Outil à saigner HSS, à droite  
 ES Herramienta de tronzar HSS, a derecha  
 DE HSS Stechdrehmeissel, Rechts



Ref.	h1	b1	l1	a
71.520.0808	8	8	100	3
71.520.1010	10	10	100	4
71.520.1208	12	8	110	3
71.520.1212	12	12	110	4

Ref.	h1	b1	l1	a
71.520.1610	16	10	125	4
71.520.1616	16	16	140	5
71.520.2012	20	12	140	5
71.520.2020	20	20	160	4

Ref.	h1	b1	l1	a
71.520.2516	25	16	180	6
71.520.3220	32	20	220	8

> **71.530**

NL HSS Binnensteekbeitel, rechts, DIN 4963  
 FR Outil à chambrer HSS, à droite, DIN 4963  
 ES Herramienta para tronzar interior HSS, a derecha, DIN 4963  
 DE HSS Innenhakenstechmeissel, Rechts, DIN 4963



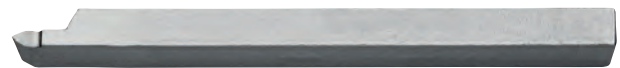
Ref.	h1	b1	l1	d1 min.	a
71.530.0606	6	6	125	12	2
71.530.0808	8	8	140	16	3
71.530.1010	10	10	160	22	3

Ref.	h1	b1	l1	d1 min.	a
71.530.1212	12	12	180	28	3
71.530.1616	16	16	220	32	3
71.530.2020	20	20	250	40	4

Ref.	h1	b1	l1	d1 min.	a
71.530.2525	25	25	315	53	5
71.530.3232	32	32	345	68	6

> **71.550**

NL HSS Buitendraadsnijbeitel, rechts, 60°  
 FR Outil à fileter extérieur HSS, à droite, 60°  
 ES Herramienta para roscado exterior HSS, a derecha, 60°  
 DE HSS Aussengewinde-Drehmeißel, Rechts, 60°



Ref.	h1	b1	l1
71.550.0808	8	8	80
71.550.1010	10	10	100
71.550.1212	12	12	125

Ref.	h1	b1	l1
71.550.1610	16	10	110
71.550.2012	20	12	125
71.550.2516	25	16	140

Ref.	h1	b1	l1
71.550.3220	32	20	170





## > 71.570

NL HSS Binnendraadsnijbeitel, rechts, 60°  
 FR Outil à fileter intérieur HSS, à droite, 60°  
 ES Herramienta para roscado interior HSS, a derecha, 60°  
 DE HSS Innengewinde-Drehmeißel, Rechts, 60°



Ref.	h1	b1	l1	d1 min.
71.570.0606	6	6	60	12
71.570.0808	8	8	140	16
71.570.1010	10	10	160	20

Ref.	h1	b1	l1	d1 min.
71.570.1212	12	12	180	24
71.570.1616	16	16	210	32
71.570.2020	20	20	250	38

Ref.	h1	b1	l1	d1 min.
71.570.2525	25	25	300	44



1 SC



1 HSS-E



2



3 SC



3 HSS-E



4



5



6



7



> **71.600**



NL **HM-tip Rechte Ruwbeitel, rechts**  
 FR **Outil à charioter droit pointe carb. mét., à droite**  
 ES **Herramienta de torneado recto Punta MD , a derecha**  
 DE **HM-Schneiden Gerader Schruppdrehmeissel, Rechts**

HM-TIP	DIN	ISO
	4971	1

Ref.	h1	b1	l1	HM
71.600.1020	10	10	90	P20
71.600.1030	10	10	90	P30
71.600.1090	10	10	90	K10
71.600.1220	12	12	100	P20
71.600.1230	12	12	100	P30
71.600.1290	12	12	100	K10

Ref.	h1	b1	l1	HM
71.600.1620	16	16	110	P20
71.600.1630	16	16	110	P30
71.600.1690	16	16	110	K10
71.600.2020	20	20	125	P20
71.600.2030	20	20	125	P30
71.600.2090	20	20	125	K10

Ref.	h1	b1	l1	HM
71.600.2520	25	25	140	P20
71.600.2530	25	25	140	P30
71.600.2590	25	25	140	K10
71.600.3230	32	32	170	P30
71.600.3290	32	32	170	K10

> **71.605**



NL **HM-tip Rechte Ruwbeitel, links**  
 FR **Outil à charioter droit pointe carb. mét., gauche**  
 ES **Herramienta de torneado recto Punta MD , a la izquierda**  
 DE **HM-Schneiden Gerader Schruppdrehmeissel, Links**

HM-TIP	DIN	ISO
	4971	1

Ref.	h1	b1	l1	HM
71.605.1020	10	10	90	P20
71.605.1030	10	10	90	P30
71.605.1090	10	10	90	K10
71.605.1220	12	12	100	P20
71.605.1230	12	12	100	P30
71.605.1290	12	12	100	K10

Ref.	h1	b1	l1	HM
71.605.1620	16	16	110	P20
71.605.1630	16	16	110	P30
71.605.1690	16	16	110	K10
71.605.2020	20	20	125	P20
71.605.2030	20	20	125	P30
71.605.2090	20	20	125	K10

Ref.	h1	b1	l1	HM
71.605.2520	25	25	140	P20
71.605.2530	25	25	140	P30
71.605.2590	25	25	140	K10
71.605.3290	32	32	170	K10

> **71.610**



NL **HM-tip Gebogen Ruwbeitel, rechts**  
 FR **Outil à charioter courbé pointe carb. mét., à droite**  
 ES **Herramienta de torneado curva Punta MD , a derecha**  
 DE **HM-Schneiden Gebogene Schruppdrehmeissel, Rechts**

HM-TIP	DIN	ISO
	4972	2

Ref.	h1	b1	l1	HM
71.610.1020	10	10	90	P20
71.610.1030	10	10	90	P30
71.610.1090	10	10	90	K10
71.610.1220	12	12	100	P20
71.610.1230	12	12	100	P30
71.610.1290	12	12	100	K10

Ref.	h1	b1	l1	HM
71.610.1620	16	16	110	P20
71.610.1630	16	16	110	P30
71.610.1690	16	16	110	K10
71.610.2020	20	20	125	P20
71.610.2030	20	20	125	P30
71.610.2090	20	20	125	K10

Ref.	h1	b1	l1	HM
71.610.2520	25	25	140	P20
71.610.2530	25	25	140	P30
71.610.2590	25	25	140	K10
71.610.3220	32	32	170	P20
71.610.3230	32	32	170	P30
71.610.3290	32	32	170	K10

> **71.615**



NL **HM-tip Gebogen Ruwbeitel, links**  
 FR **Outil à charioter courbé pointe carb. mét., gauche**  
 ES **Herramienta de torneado curva Punta MD , a la izquierda**  
 DE **HM-Schneiden Gebogene Schruppdrehmeissel, Links**

HM-TIP	DIN	ISO
	4972	2

Ref.	h1	b1	l1	HM
71.615.1020	10	10	90	P20
71.615.1030	10	10	90	P30
71.615.1090	10	10	90	K10
71.615.1220	12	12	100	P20
71.615.1230	12	12	100	P30
71.615.1290	12	12	100	K10

Ref.	h1	b1	l1	HM
71.615.1620	16	16	110	P20
71.615.1630	16	16	110	P30
71.615.1690	16	16	110	K10
71.615.2020	20	20	125	P20
71.615.2030	20	20	125	P30
71.615.2090	20	20	125	K10

Ref.	h1	b1	l1	HM
71.615.2530	25	25	140	P30
71.615.2590	25	25	140	K10
71.615.3230	32	32	170	P30
71.615.3290	32	32	170	K10





## > 71.620

NL HM-tip Boorbeitel, rechts, voor doorlopende gaten  
 FR Outil à aléser pointe carb. mét., à droite, pour trous débouchants  
 ES Herramienta de torneado interno Punta MD, a derecha, para agujeros pasantes  
 DE HM-Schneiden Bohrdrehmeissel, Rechts, für Durchgangslöcher



<b>HM-TIP</b>	<b>DIN</b> 4973	<b>ISO</b> 8	
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Ref.	h1	b1	l1	d1 min.	HM
71.620.0820	8	8	125	14	P20
71.620.0830	8	8	125	14	P30
71.620.0890	8	8	125	14	K10
71.620.1020	10	10	150	18	P20
71.620.1030	10	10	150	18	P30
71.620.1090	10	10	150	18	K10
71.620.1220	12	12	180	21	P20

Ref.	h1	b1	l1	d1 min.	HM
71.620.1230	12	12	180	21	P30
71.620.1290	12	12	180	21	K10
71.620.1620	16	16	210	27	P20
71.620.1630	16	16	210	27	P30
71.620.1690	16	16	210	27	K10
71.620.2020	20	20	250	34	P20
71.620.2030	20	20	250	34	P30

Ref.	h1	b1	l1	d1 min.	HM
71.620.2090	20	20	250	34	K10
71.620.2530	25	25	300	43	P30
71.620.2590	25	25	300	43	K10
71.620.3230	32	32	355	52	P30
71.620.3290	32	32	355	52	K10

## > 71.640

NL HM-tip Boorbeitel, rechts, voor doorlopende en blinde gaten  
 FR Outil à aléser pointe carb. mét., à droite, pour trous débouchants et borgnes  
 ES Herramienta de torneado interior Punta MD, a derecha, para agujeros pasantes y ciegos  
 DE HM-Schneiden Bohrdrehmeissel, Rechts, für Durchgangslöcher und Sacklöcher



<b>HM-TIP</b>	<b>DIN</b> 4974	<b>ISO</b> 9	
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Ref.	h1	b1	l1	d1 min.	HM
71.640.0820	8	8	125	14	P20
71.640.0830	8	8	125	14	P30
71.640.0890	8	8	125	14	K10
71.640.1020	10	10	150	18	P20
71.640.1030	10	10	150	18	P30
71.640.1090	10	10	150	18	K10
71.640.1220	12	12	180	21	P20

Ref.	h1	b1	l1	d1 min.	HM
71.640.1230	12	12	180	21	P30
71.640.1290	12	12	180	21	K10
71.640.1620	16	16	210	27	P20
71.640.1630	16	16	210	27	P30
71.640.1690	16	16	210	27	K10
71.640.2020	20	20	250	34	P20
71.640.2030	20	20	250	34	P30

Ref.	h1	b1	l1	d1 min.	HM
71.640.2090	20	20	250	34	K10
71.640.2520	25	25	300	43	P20
71.640.2530	25	25	300	43	P30
71.640.2590	25	25	300	43	K10
71.640.3220	32	32	355	52	P20
71.640.3230	32	32	355	52	P30
71.640.3290	32	32	355	52	K10

## > 71.650

NL HM-tip Boorbeitel, rechts, voor doorlopende en blinde gaten  
 FR Outil à aléser pointe carb. mét., à droite, pour trous débouchants et borgnes  
 ES Herramienta de torneado interior Punta MD, a derecha, para agujeros pasantes y ciegos  
 DE HM-Schneiden Bohrdrehmeissel, Rechts, für Durchgangslöcher und Sacklöcher



<b>HM-TIP</b>	<b>DIN</b> 4974	<b>ISO</b> 9	
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Ref.	h1	l1	d1 min.	HM
71.650.0830	8	125	14	P30
71.650.0890	8	125	14	K10
71.650.1030	10	150	18	P30
71.650.1090	10	150	18	K10

Ref.	h1	l1	d1 min.	HM
71.650.1230	12	180	21	P30
71.650.1290	12	180	21	K10
71.650.1630	16	210	27	P30
71.650.1690	16	210	27	K10

Ref.	h1	l1	d1 min.	HM
71.650.2030	20	250	34	P30
71.650.2090	20	250	34	K10
71.650.2530	25	300	43	P30
71.650.2590	25	300	43	K10

> **71.670**

NL **HM-tip Puntbeitel, 80°**  
 FR **Outil à retoucher pointe carb. mét. , 80°**  
 ES **Herramienta de cilindrar y afinar Punta MD, 80°**  
 DE **HM-Schneiden Spitzdrehmeissel, 80°**



HM-TIP	DIN	ISO
	4975	10

Ref.	h1	b1	l1	HM
71.670.1620	16	10	110	P20
71.670.1630	16	10	110	P30
71.670.1690	16	10	110	K10
71.670.2020	20	12	125	P20

Ref.	h1	b1	l1	HM
71.670.2030	20	12	125	P30
71.670.2090	20	12	125	K10
71.670.2520	25	16	140	P20
71.670.2530	25	16	140	P30

Ref.	h1	b1	l1	HM
71.670.2590	25	16	140	K10
71.670.3230	32	20	170	P30
71.670.3290	32	20	170	K10

> **71.680**

NL **HM-tip Vlakbeitel, recht**  
 FR **Outil pelle pointe carb. mét., droit**  
 ES **Herramienta de torneado para acabados Punta MD, recto**  
 DE **HM-Schneiden Flachdrehmeissel, Gerade**



HM-TIP	DIN	ISO
	4976	4

Ref.	h1	b1	l1	HM
71.680.1020	10	10	90	P20
71.680.1030	10	10	90	P30
71.680.1090	10	10	90	K10
71.680.1220	12	12	100	P20
71.680.1230	12	12	100	P30

Ref.	h1	b1	l1	HM
71.680.1290	12	12	100	K10
71.680.1620	16	16	110	P20
71.680.1630	16	16	110	P30
71.680.1690	16	16	110	K10
71.680.2020	20	20	125	P20

Ref.	h1	b1	l1	HM
71.680.2030	20	20	125	P30
71.680.2090	20	20	125	K10
71.680.2530	25	25	140	P30
71.680.2590	25	25	140	K10

> **71.690**

NL **HM-tip Gebogen Vlakbeitel, rechts**  
 FR **Outil pelle courbé pointe carb. mét., à droite**  
 ES **Herramienta de torneado curva Punta MD para acabados, a derecha**  
 DE **HM-Schneiden Gebogene Flachdrehmeissel, Rechts**



HM-TIP	DIN	ISO
	4977	5

Ref.	h1	b1	l1	HM
71.690.1620	16	16	110	P20
71.690.1630	16	16	110	P30
71.690.1690	16	16	110	K10
71.690.2020	20	20	125	P20

Ref.	h1	b1	l1	HM
71.690.2030	20	20	125	P30
71.690.2090	20	20	125	K10
71.690.2530	25	25	140	P30
71.690.2590	25	25	140	K10

Ref.	h1	b1	l1	HM
71.690.3230	32	32	170	P30
71.690.3290	32	32	170	K10

> **71.695**

NL **HM-tip Gebogen Vlakbeitel, links**  
 FR **Outil pelle courbé pointe carb. mét. , gauche**  
 ES **Herramienta de torneado curva Punta MD para acabados, a la izquierda**  
 DE **HM-Schneiden Gebogene Flachdrehmeissel, Links**



HM-TIP	DIN	ISO
	4977	5

Ref.	h1	b1	l1	HM
71.695.1630	16	16	110	P30
71.695.1690	16	16	110	K10

Ref.	h1	b1	l1	HM
71.695.2030	20	20	125	P30
71.695.2090	20	20	125	K10

Ref.	h1	b1	l1	HM





## > 71.700

NL HM-tip Mesbeitel, rechts  
 FR Outil couteau pointe carb. mét., à droite  
 ES Herramienta para corte y acabado Punta MD, a derecha  
 DE HM-Schneiden Seitendrehmeissel, Rechts



HM-TIP	DIN	ISO
	4980	6

Ref.	h1	b1	l1	HM
71.700.1020	10	10	90	P20
71.700.1030	10	10	90	P30
71.700.1090	10	10	90	K10
71.700.1220	12	12	100	P20
71.700.1230	12	12	100	P30
71.700.1290	12	12	100	K10

Ref.	h1	b1	l1	HM
71.700.1620	16	16	110	P20
71.700.1630	16	16	110	P30
71.700.1690	16	16	110	K10
71.700.2020	20	20	125	P20
71.700.2030	20	20	125	P30
71.700.2090	20	20	125	K10

Ref.	h1	b1	l1	HM
71.700.2530	25	25	140	P30
71.700.2590	25	25	140	K10
71.700.3230	32	32	170	P30
71.700.3290	32	32	170	K10

## > 71.705 *Phantom*

NL HM-tip Mesbeitel, links  
 FR Outil couteau pointe carb. mét., gauche  
 ES Herramienta para corte y acabado punta MD, a la izquierda  
 DE HM-Schneiden Seitendrehmeissel, Links



HM-TIP	DIN	ISO
	4980	6

Ref.	h1	b1	l1	HM
71.705.1020	10	10	90	P20
71.705.1030	10	10	90	P30
71.705.1090	10	12	90	K10
71.705.1220	12	12	100	P20
71.705.1230	12	12	100	P30
71.705.1290	12	16	100	K10

Ref.	h1	b1	l1	HM
71.705.1620	16	16	110	P20
71.705.1630	16	16	110	P30
71.705.1690	16	20	110	K10
71.705.2020	20	20	125	P20
71.705.2030	20	20	125	P30
71.705.2090	20	20	125	K10

Ref.	h1	b1	l1	HM
71.705.2520	25	25	140	P20
71.705.2530	25	25	140	P30
71.705.2590	25	25	140	K10
71.705.3230	32	32	170	P30
71.705.3290	32	32	170	K10

## > 71.710 *Phantom*

NL HM-tip Steekbeitel, rechts  
 FR Outil à saigner pointe carb. mét., à droite  
 ES Herramienta de tronzar Punta MD, a derecha  
 DE HM-Schneiden Stechdrehmeissel, Rechts



HM-TIP	DIN	ISO
	4981	7

Ref.	h1	b1	l1	a	HM
71.710.1220	12	8	100	3	P20
71.710.1230	12	8	100	3	P30
71.710.1290	12	8	100	3	K10
71.710.1620	16	10	110	4	P20
71.710.1630	16	10	110	4	P30

Ref.	h1	b1	l1	a	HM
71.710.1690	16	10	110	4	K10
71.710.2020	20	12	125	5	P20
71.710.2030	20	12	125	5	P30
71.710.2090	20	12	125	5	K10
71.710.2520	25	16	140	6	P20

Ref.	h1	b1	l1	a	HM
71.710.2530	25	16	140	6	P30
71.710.2590	25	16	140	6	K10
71.710.3230	32	20	170	8	P30
71.710.3290	32	20	170	8	K10

## > 71.715 *Phantom*

NL HM-tip Steekbeitel, links  
 FR Outil à saigner pointe carb. mét., gauche  
 ES Herramienta de tronzar Punta MD, a la izquierda  
 DE HM-Schneiden Stechdrehmeissel, Links



HM-TIP	DIN	ISO
	4981	7

Ref.	h1	b1	l1	a	HM
71.715.1220	12	8	100	3	P20
71.715.1230	12	8	100	3	P30
71.715.1290	12	8	100	3	K10
71.715.1620	16	10	110	4	P20
71.715.1630	16	10	110	4	P30

Ref.	h1	b1	l1	a	HM
71.715.1690	16	10	110	4	K10
71.715.2020	20	12	125	5	P20
71.715.2030	20	12	125	5	P30
71.715.2090	20	12	125	5	K10
71.715.2520	25	16	140	6	P20

Ref.	h1	b1	l1	a	HM
71.715.2530	25	16	140	6	P30
71.715.2590	25	16	140	6	K10
71.715.3230	32	20	170	8	P30
71.715.3290	32	20	170	8	K10

> **71.730**



NL **HM-tip Binnenkamerbeitel, rechts**  
 FR **Outil à chambrer intérieur pointe carb. mét., à droite**  
 ES **Herramienta para ranurar interior Punta MD, a derecha**  
 DE **HM-Schneiden Innenhakendrehmeißel, Rechts**

<b>HM-TIP</b>	<b>DIN 263</b>	<b>ISO 11</b>
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Ref.	h1	b1	l1	d1 min.	a	t max	HM
71.730.1020	10	10	150	28	3	8	P20
71.730.1030	10	10	140	28	3	8	P30
71.730.1090	10	10	150	28	3	8	K10
71.730.1220	12	10	180	32	4	10	P20
71.730.1230	12	12	180	32	4	10	P30
71.730.1290	12	12	180	32	4	10	K10

Ref.	h1	b1	l1	d1 min.	a	t max	HM
71.730.1620	16	12	210	40	5	12	P20
71.730.1630	16	16	210	40	5	12	P30
71.730.1690	16	16	210	40	5	12	K10
71.730.2020	20	16	250	50	6	16	P20
71.730.2030	20	20	250	50	6	16	P30
71.730.2090	20	20	250	50	6	16	K10

Ref.	h1	b1	l1	d1 min.	a	t max	HM
71.730.2520	25	20	300	63	8	20	P20
71.730.2530	25	25	300	63	8	20	P30
71.730.2590	25	25	300	63	8	20	K10
71.730.3230	32	32	355	80	10	25	P20
71.730.3290	32	32	355	80	10	25	K10

> **71.750**



NL **HM-tip Buitendraadsnijbeitel, 60°, rechts**  
 FR **Outil à fileter extérieur pointe carb. mét., 60°, à droite**  
 ES **Herramienta para roscado exterior Punta MD, 60°, a derecha**  
 DE **HM-Schneiden Aussengewinde-Drehmeißel, 60°, Rechts**

<b>HM-TIP</b>	<b>DIN 282</b>	<b>ISO 12</b>
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Ref.	h1	b1	l1	HM
71.750.1020	10	10	90	P20
71.750.1030	10	10	90	P30
71.750.1090	10	10	90	K10
71.750.1220	12	12	100	P20
71.750.1230	12	12	100	P30

Ref.	h1	b1	l1	HM
71.750.1290	12	12	100	K10
71.750.1620	16	16	110	P20
71.750.1630	16	16	110	P30
71.750.1690	16	16	125	K10
71.750.2020	20	20	125	P20

Ref.	h1	b1	l1	HM
71.750.2030	20	20	125	P30
71.750.2090	20	20	125	K10
71.750.2530	25	25	140	P30
71.750.2590	25	25	140	K10

> **71.760**



NL **HM-tip Buitendraadsnijbeitel, 55°, rechts**  
 FR **Outil à fileter extérieur pointe carb. mét., 55°, à droite**  
 ES **Herramienta para roscado exterior Punta MD, 55°, a derecha**  
 DE **HM-Schneiden Aussengewinde-Drehmeißel, 55°, Rechts**

<b>HM-TIP</b>	<b>DIN 282</b>
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Ref.	h1	b1	l1	HM
71.760.1020	10	10	90	P20
71.760.1030	10	10	90	P30
71.760.1090	10	10	90	K10
71.760.1220	12	12	100	P20
71.760.1230	12	12	100	P30

Ref.	h1	b1	l1	HM
71.760.1290	12	12	100	K10
71.760.1620	16	16	110	P20
71.760.1630	16	16	110	P30
71.760.1690	16	16	110	K10
71.760.2020	20	20	125	P20

Ref.	h1	b1	l1	HM
71.760.2030	20	20	125	P30
71.760.2520	25	25	140	P20
71.760.2530	25	25	140	P30
71.760.2590	25	25	140	K10

> **71.770**



NL **HM-tip Binnendraadsnijbeitel, 60°, rechts**  
 FR **Outil à fileter intérieur pointe carb. mét., 60°, à droite**  
 ES **Herramienta para roscado interior Punta MD, 60°, a derecha**  
 DE **HM-Schneiden Innengewinde-Drehmeißel, 60°, Rechts**

<b>HM-TIP</b>	<b>DIN 283</b>
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Ref.	h1	b1	l1	d1 min.	HM
71.770.1020	10	10	150	28	P20
71.770.1030	10	10	150	28	P30
71.770.1090	10	10	150	28	K10
71.770.1220	12	12	180	32	P20
71.770.1230	12	12	180	32	P30

Ref.	h1	b1	l1	d1 min.	HM
71.770.1290	12	12	180	32	K10
71.770.1620	16	16	210	40	P20
71.770.1630	16	16	210	40	P30
71.770.1690	16	16	210	40	K10
71.770.2020	20	20	250	50	P20

Ref.	h1	b1	l1	d1 min.	HM
71.770.2030	20	20	250	50	P30
71.770.2090	20	20	250	50	K10
71.770.2530	25	25	300	63	P30
71.770.2590	25	25	300	63	K10





## > 71.780

NL HM-tip Binnendraadsnijbeitel, 55°, rechts  
 FR Outil à fileter intérieur pointe carb. mét., 55°, à droite  
 ES Herramienta para roscado interior Punta MD, 55°, a derecha  
 DE HM-Schneiden Innengewinde-Drehmeißel, 55°, Rechts



HM-TIP  
 DIN  
 345

Ref.	h1	b1	l1	d1 min.	HM	Ref.	h1	b1	l1	d1 min.	HM	Ref.	h1	b1	l1	d1 min.	HM
71.780.1020	10	10	140	28	P20	71.780.1290	12	12	160	32	K10	71.780.2030	20	20	210	50	P30
71.780.1030	10	10	140	28	P30	71.780.1620	16	16	180	40	P20	71.780.2090	20	20	210	50	K10
71.780.1090	10	10	140	28	K10	71.780.1630	16	16	180	40	P30	71.780.2530	25	25	250	63	P30
71.780.1220	12	12	160	32	P20	71.780.1690	16	16	180	40	K10	71.780.2590	25	25	250	63	K10
71.780.1230	12	12	160	32	P30	71.780.2020	20	20	210	50	P20						



SP 1



HSS-E 1



2



SP 3



HSS-E 3



4



5



6



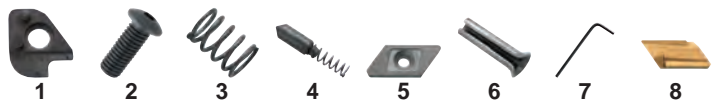
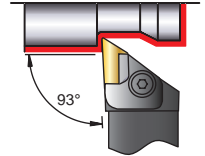
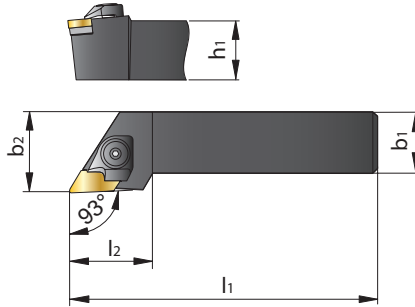
7





## > 72.121 Phantom

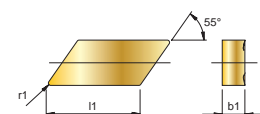
NL WISSELPLAATHOUDER CKJNR/L  
 FR PORTE-PLAQUETTE CKJNR/L  
 ES PORTAPLAQUITA CKJNR/L  
 DE KLEMMHALTER CKJNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 incl.	6 incl.	7 incl.	8 excl.
72.121.1250	CKJNR 2525-M16	25	25	32	150	35	73.998.0025	73.998.0065	73.998.0190	73.998.0335	73.998.0285	73.998.0345	SW4	KNUX 1604..
72.121.2250	CKJNL 2525-M16	25	25	32	150	35	73.998.0026	73.998.0065	73.998.0190	73.998.0335	73.998.0286	73.998.0345	SW4	KNUX 1604..

> **73.105** **KNUX** **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



KN..	l1(mm)	b1(mm)	r1(mm)
16	16,0	4,76	0,5-1,0

**P** **K**

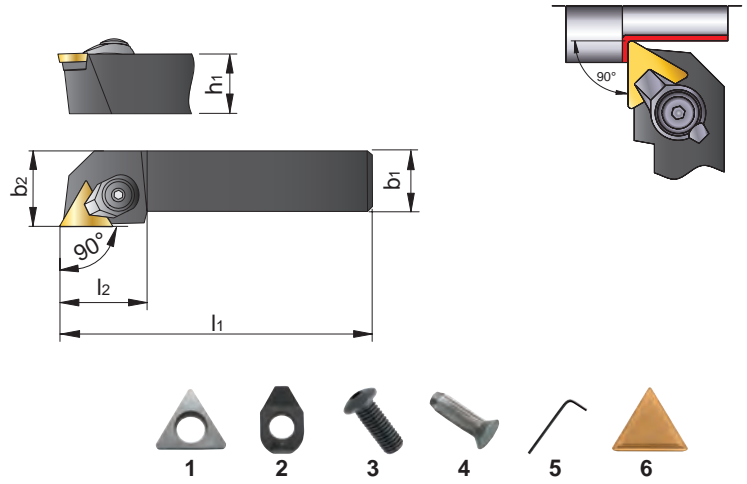
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.105.0155	1604	0,5	ER 11	PC20	1-4	0,2-0,5		✓		✓	✓		
73.105.0205	1604	0,5	EL 11	PC20	1-4	0,2-0,5		✓		✓	✓		
73.105.0455	1604	1,0	ER 12	PC20	3-6	0,2-0,5		✓	✓	✓	✓	✓	
73.105.0465	1604	1,0	EL 12	PC20	3-6	0,2-0,5		✓	✓	✓	✓	✓	





## > 72.156 Phantom

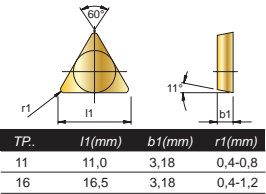
NL WISSELPLAATHOUDER CTGPR/L  
 FR PORTE-PLAQUETTE CTGPR/L  
 ES PORTAPLAQUITA CTGPR/L  
 DE KLEMMHALTER CTGPR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.
72.156.1120	CTGPR 1212-F11	12	12	16	80	16,5	73.998.0020(B)/73.998.0022(S)	73.998.0060(B)/-(S)	T15(B)/SW2,5(S)	TP. 1103..	
72.156.1150	CTGPR 1616-H11	16	16	20	100	20	73.998.0020(B)/73.998.0022(S)	73.998.0060(B)/-(S)	T15(B)/SW2,5(S)	TP. 1103..	
72.156.1204	CTGPR 2020-K16	20	20	25	125	28	73.998.0017	-	SW3	TP. 1603..	73.998.0345
72.156.1254	CTGPR 2525-M16	25	25	32	150	28	73.998.0017	-	SW3	TP. 1603..	73.998.0345

> **73.171** **TPMR** **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.171.0150	1103	0,4	EN	PC10	0,5-2	0,05-0,15		✓		✓	✓		
73.171.0200	1103	0,8	EN	PC20	0,5-3	0,1-0,25		✓		✓	✓		
73.171.0300	1603	0,4	EN	PC10	0,5-3	0,1-0,25		✓		✓	✓		
73.171.0350	1603	0,8	EN	PC20	0,5-3	0,1-0,25		✓		✓	✓		

> **73.175** **TPUN** **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.175.0450	1603	0,4	EN	PC20	0,5-3	0,1-0,25		✓		✓	✓		
73.175.0550	1603	0,8	EN	PC20	1-4	0,2-0,5		✓		✓	✓		
73.175.0650	1603	1,2	EN	PC20	1,5-5	0,1-0,3		✓	✓	✓	✓	✓	

> **73.180** **TPUX** **Phantom**

**P M K N**

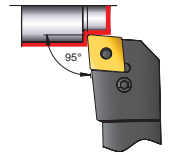
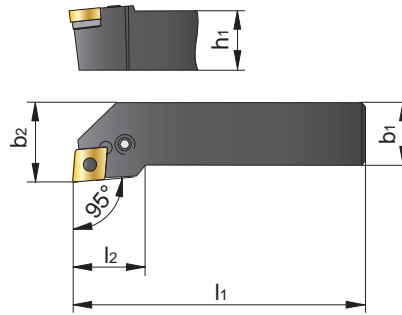
Ref.	lxd	r (mm)	Geo	Kwaliteit	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.180.0100	1103	0,4	FR	P25	0,5-2	0,05-0,15	✓	✓		✓			
73.180.0150	1103	0,4	FL	P25	0,5-2	0,05-0,15	✓	✓		✓			
73.180.0500	1603	0,4	FR	P25	0,5-3	0,05-0,15	✓	✓		✓			
73.180.0550	1603	0,4	FL	P25	0,5-3	0,05-0,15	✓	✓		✓			
73.180.0700	1603	0,8	FR	P25	1-4	0,2-0,5		✓		✓	✓		
73.180.0750	1603	0,8	FL	P25	1-4	0,2-0,5		✓		✓	✓		





## > 72.240 Phantom

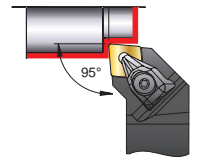
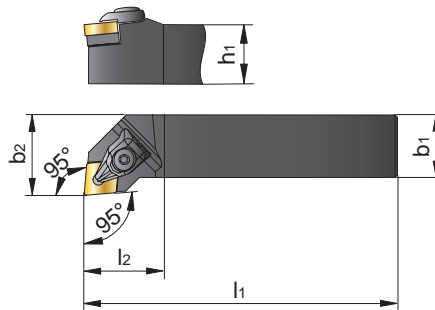
NL WISSELPLAATHOUDER PCLNR/L  
FR PORTE-PLAQUETTE PCLNR/L  
ES PORTAPLAQUITA PCLNR/L  
DE KLEMMHALTER PCLNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.	6 incl.	7 excl.
72.240.1150	PCLNR 1616-H12	16	16	20	100	26,1	73.998.0230	73.998.0100	73.998.0155	73.998.0365	73.998.0200	SW3	CN.. 1204..
72.240.1200	PCLNR 2020-K12	20	20	25	125	27,4	73.998.0230	73.998.0100	73.998.0150	73.998.0365	73.998.0200	SW3	CN.. 1204..
72.240.1250	PCLNR 2525-M12	25	25	32	150	28	73.998.0230	73.998.0100	73.998.0150	73.998.0365	73.998.0200	SW3	CN.. 1204..
72.240.2200	PCLNL 2020-K12	20	20	25	125	27,4	73.998.0230	73.998.0100	73.998.0150	73.998.0365	73.998.0200	SW3	CN.. 1204..
72.240.2250	PCLNL 2525-M12	25	25	32	150	28	73.998.0230	73.998.0100	73.998.0150	73.998.0365	73.998.0200	SW3	CN.. 1204..

## > 72.245 Phantom

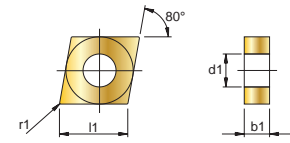
NL WISSELPLAATHOUDER DCLNR/L  
FR PORTE-PLAQUETTE DCLNR/L  
ES PORTAPLAQUITA DCLNR/L  
DE KLEMMHALTER DCLNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.245.1200	DCLNR 2020-K12	20	20	25	125	32	73.998.0450(B) 73.998.0451(S)	73.998.0455(B) 73.998.0456(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	CN.. 1204..
72.245.1250	DCLNR 2525-M12	25	25	32	150	32	73.998.0450(B) 73.998.0451(S)	73.998.0455(B) 73.998.0456(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	CN.. 1204..
72.245.2200	DCLNL 2020-K12	20	20	25	125	32	73.998.0450(B) 73.998.0451(S)	73.998.0455(B) 73.998.0456(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	CN.. 1204..
72.245.2250	DCLNL 2525-M12	25	25	32	150	32	73.998.0450(B) 73.998.0451(S)	73.998.0455(B) 73.998.0456(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	CN.. 1204..

> **73.200** **CNMG** **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



CN..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
12	12,7	5,15	4,76	0,4-1,2
19	19,5	7,92	6,35	0,8-1,6

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.200.1347	1204	0,4	UF	UI20	0,6-3	0,1-0,23	✓			✓	✓		
73.200.4367	1204	0,8	UM	UI20	0,2-3	0,1-0,35		✓		✓	✓	✓	

> **73.201** **CNMG** **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.201.1346	1204	0,4	PF	PC20	0,2-1,5	0,05-0,25	✓			✓	✓		
73.201.1364	1204	0,8	PF	PC10	0,25-1,5	0,1-0,4	✓			✓	✓		
73.201.1366	1204	0,8	PF	PC20	0,25-1,5	0,1-0,4	✓			✓	✓		
73.201.4366	1204	0,8	PM	PC20	0,5-5,5	0,15-0,5		✓		✓	✓		
73.201.4368	1204	0,8	PM	PC30	0,5-5,5	0,15-0,5		✓		✓	✓	✓	
73.201.4376	1204	1,2	PM	PC20	0,8-5,5	0,18-0,6		✓		✓	✓	✓	
73.201.4378	1204	1,2	PM	PC30	0,8-5,5	0,18-0,6		✓		✓	✓	✓	
73.201.7368	1204	0,8	PR	PC30	1-7	0,2-0,55			✓	✓	✓	✓	

> **73.203** **CNMG** **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.203.1347	1204	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.203.1367	1204	0,8	MF	MSI20	0,6-3	0,12-0,38	✓			✓	✓	✓	
73.203.4347	1204	0,4	MM	MSI20	0,15-2,5	0,1-0,3		✓		✓	✓		
73.203.4367	1204	0,8	MM	MSI20	0,2-3	0,1-0,35		✓		✓	✓	✓	

> **73.204** **CNMA** **Phantom**

**P K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.204.0364	1204	0,8	EN	KC10	0,2-8	0,15-0,6		✓	✓	✓	✓		

> **73.206** **CNMG** **Phantom**

**P M S**

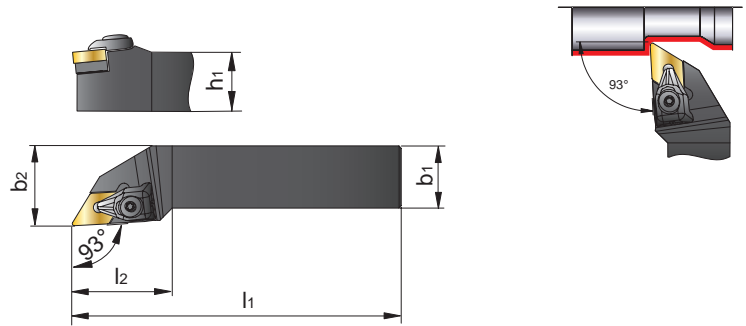
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.206.4347	1204	0,4	SM	MSI20	0,2-3,6	0,1-0,2	✓	✓		✓	✓		





## > 72.265 Phantom

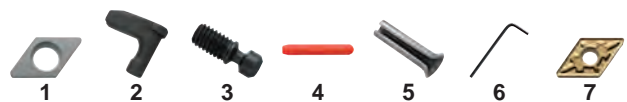
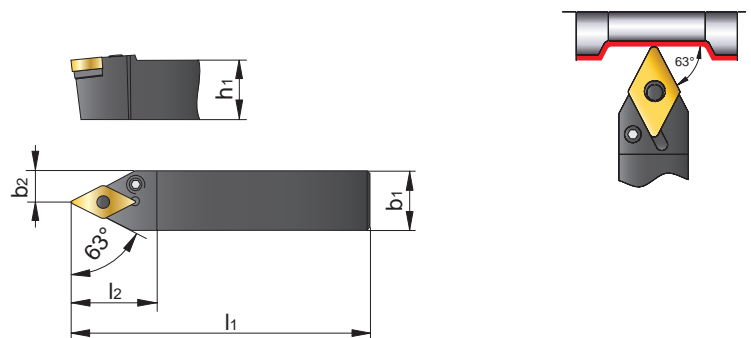
NL WISSELPLAATHOUDER DDJNR/L  
FR PORTE-PLAQUETTE DDJNR/L  
ES PORTAPLAQUITA DDJNR/L  
DE KLEMMHALTER DDJNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.
72.265.1170	DDJNR 2020-K11	20	20	25	125	40	73.998.0445(B) 73.998.0446(S)	73.998.0460(B) 73.998.0461(S)	T9IP(B)/SW4(S)	73.998.0496(B) 73.998.0030(S)	DN.. 1104..
72.265.1200	DDJNR 2020-K15	20	20	25	125	40	73.998.0450(B) 73.998.0451(S)	73.998.0465(B) 73.998.0466(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	DN.. 1506..
72.265.1250	DDJNR 2525-M15	25	25	32	150	40	73.998.0450(B) 73.998.0451(S)	73.998.0465(B) 73.998.0466(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	DN.. 1506..
72.265.2200	DDJNL 2020-K15	20	20	25	125	40	73.998.0450(B) 73.998.0451(S)	73.998.0465(B) 73.998.0466(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	DN.. 1506..
72.265.2250	DDJNL 2525-M15	25	25	32	150	40	73.998.0450(B) 73.998.0451(S)	73.998.0465(B) 73.998.0466(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	DN.. 1506..

## > 72.280 Phantom

NL WISSELPLAATHOUDER PDNNR/L  
FR PORTE-PLAQUETTE PDNNR/L  
ES PORTAPLAQUITA PDNNR/L  
DE KLEMMHALTER PDNNR/L

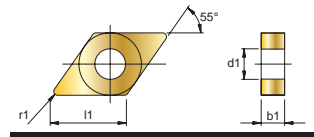


Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.	6 incl.	7 excl.
72.280.1250	PDNNR 2525-M15	25	25	12,5	150	36,5	73.998.0265	73.998.0120	73.998.0150	73.998.0365	73.998.0200	SW3	DN.. 1506..
72.280.2250	PDNNL 2525-M15	25	25	12,5	150	36,5	73.998.0265	73.998.0120	73.998.0150	73.998.0365	73.998.0200	SW3	DN.. 1506..



> **73.211** DNMG **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



DN...	l1(mm)	d1(mm)	b1(mm)	r1(mm)
11	11,6	3,81	4,76	0,4-1,2
15	15,5	5,16	6,35	0,4-1,2

**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.211.1246	1104	0,4	PF	PC20	0,1-1,5	0,05-0,25	✓			✓	✓		
73.211.1446	1506	0,4	PF	PC20	0,1-1,5	0,05-0,25	✓			✓	✓		
73.211.4266	1104	0,8	PM	PC20	0,4-5	0,1-0,3		✓		✓	✓		
73.211.4466	1506	0,8	PM	PC20	0,5-6	0,15-0,5		✓		✓	✓		
73.211.4468	1506	0,8	PM	PC30	0,5-6	0,15-0,5		✓		✓	✓	✓	
73.211.7568	1506	0,8	PR	PC30	0,8-6	0,2-0,55			✓	✓	✓	✓	

> **73.213** DNMG **Phantom**

**P M S**

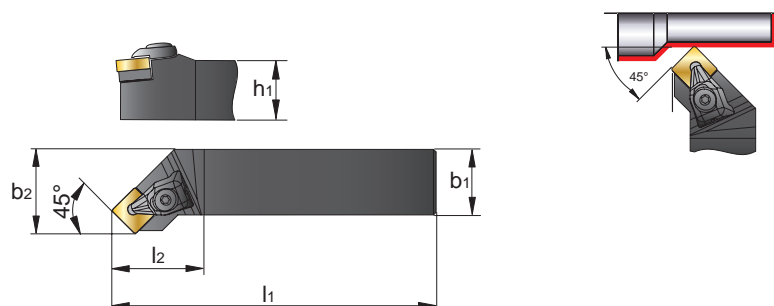
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.213.1247	1104	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.213.1447	1506	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.213.4447	1506	0,4	MM	MSI20	0,15-2	0,1-0,25		✓		✓	✓		
73.213.4467	1506	0,8	MM	MSI20	0,2-2,5	0,1-0,3		✓		✓	✓	✓	





## > 72.325 Phantom

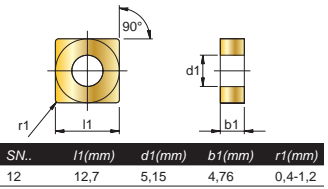
NL WISSELPLAATHOUDER DSSNR/L  
 FR PORTE-PLAQUETTE DSSNR/L  
 ES PORTAPLAQUITA DSSNR/L  
 DE KLEMMHALTER DSSNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.325.1200	DSSNR 2020 K12	20	20	25	125	35	73.998.0450(B) 73.998.0451(S)	73.998.0470(B) 73.998.0471(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	SN.. 1204..
72.325.1250	DSSNR 2525 M12	25	25	32	150	35	73.998.0450(B) 73.998.0451(S)	73.998.0470(B) 73.998.0471(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	SN.. 1204..
72.325.2200	DSSNL 2020 K12	20	20	25	125	35	73.998.0450(B) 73.998.0451(S)	73.998.0470(B) 73.998.0471(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	SN.. 1204..
72.325.2250	DSSNL 2525 M12	25	25	32	150	35	73.998.0450(B) 73.998.0451(S)	73.998.0470(B) 73.998.0471(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	SN.. 1204..

> **73.241** **SNMG** **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	⊙	
73.241.1346	1204	0,4	PF	PC20	0,15-1,5	0,05-0,25	✓			✓	✓		
73.241.4368	1204	0,8	PM	PC30	0,5-6	0,15-0,5		✓		✓	✓	✓	
73.241.4376	1204	1,2	PM	PC20	0,8-6	0,18-0,6		✓		✓	✓	✓	
73.241.7366	1204	0,8	PR	PC20	0,8-7	0,2-0,55			✓	✓	✓	✓	

> **73.243** **SNMG** **Phantom**

**P M S**

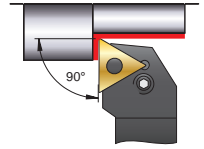
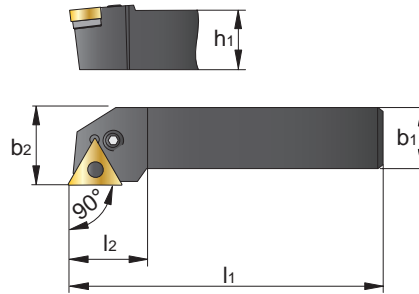
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	⊙	
73.243.4367	1204	0,8	MM	MSI20	0,2-3	0,15-0,4		✓		✓	✓	✓	





## > 72.340 Phantom

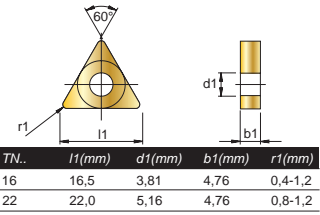
NL WISSELPLAATHOUDER PTGNR/L  
 FR PORTE-PLAQUETTE PTGNR/L  
 ES PORTAPLAQUITA PTGNR/L  
 DE KLEMMHALTER PTGNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.	6 incl.	7 excl.
72.340.1150	PTGNR 1616-H16	16	16	20	100	20	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.340.1200	PTGNR 2020-K16	20	20	25	125	20	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.340.1250	PTGNR 2525-M16	25	25	32	150	22,2	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.340.2200	PTGNL 2020-K16	20	20	25	125	20	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.340.2250	PTGNL 2525-M16	25	25	32	150	22,2	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..

> **73.250** TNMG **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.250.4567	1604	0,8	UF	UI20	0,6-3	0,12-0,38	✓			✓	✓	✓	

> **73.251** TNMG **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.251.1546	1604	0,4	PF	PC20	0,1-1,5	0,05-0,25	✓			✓	✓		
73.251.4548	1604	0,4	PM	PC30	0,4-5	0,1-0,3		✓		✓	✓	✓	
73.251.4566	1604	0,8	PM	PC20	0,5-5	0,15-0,5		✓		✓	✓		
73.251.4766	2204	0,8	PM	PC20	0,5-6,6	0,15-0,5		✓		✓	✓		
73.251.5546	1604	0,4	ER	PC20	1-3,5	0,12-0,3				✓	✓		
73.251.5566	1604	0,8	ER	PC20	1,3-3,5	0,15-0,5				✓	✓		

> **73.253** TNMG **Phantom**

**P M S**

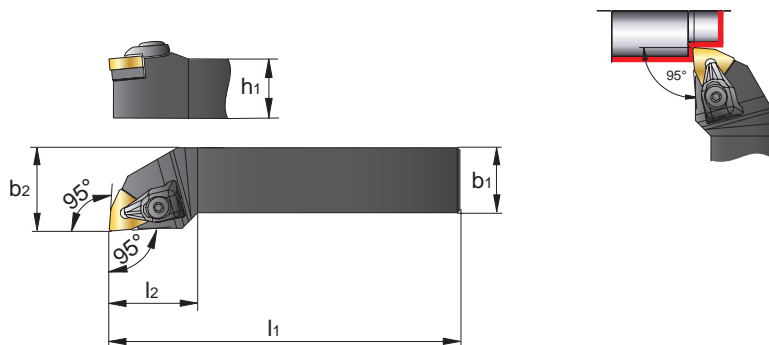
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.253.4547	1604	0,4	MM	MSI20	0,15-3	0,1-0,3		✓		✓	✓		
73.253.4567	1604	0,8	MM	MSI20	0,2-3	0,1-0,3		✓		✓	✓	✓	





## > 72.385 Phantom

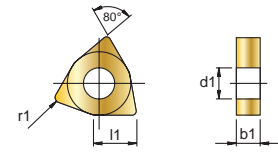
NL WISSELPLAATHOUDER DWLNR/L  
 FR PORTE-PLAQUETTE DWLNR/L  
 ES PORTAPLAQUITA DWLNR/L  
 DE KLEMMHALTER DWLNR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.385.1170	DWLNR 2020 K06	20	20	25	125	27	73.998.0445(B) 73.998.0446(S)	73.998.0480(B) 73.998.0481(S)	T9IP(B)/SW4(S)	73.998.0495(B) 73.998.0030(S)	WN.. 0604..
72.385.1200	DWLNR 2020 K08	20	20	25	125	34	73.998.0450(B) 73.998.0451(S)	73.998.0485(B) 73.998.0486(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	WN.. 0804..
72.385.1230	DWLNR 2525 M06	25	25	32	150	27	73.998.0445(B) 73.998.0446(S)	73.998.0480(B) 73.998.0481(S)	T9IP(B)/SW4(S)	73.998.0495(B) 73.998.0030(S)	WN.. 0604..
72.385.1250	DWLNR 2525 M08	25	25	32	150	34	73.998.0450(B) 73.998.0451(S)	73.998.0485(B) 73.998.0486(S)	T15IP(B)/SW4(S)	73.998.0497(B) 73.998.0032(S)	WN.. 0804..
72.385.2170	DWLNL 2020 K06	20	20	25	125	27	73.998.0445(B) 73.998.0446(S)	73.998.0480(B) 73.998.0481(S)	T9IP(B)/SW4(S)	73.998.0495(B) 73.998.0030(S)	WN.. 0604..
72.385.2250	DWLNL 2525 M08	25	25	32	150	34	73.998.0450(B) 73.998.0451(S)	73.998.0485(B) 73.998.0486(S)	T15IP(B)/SW4(S)	73.998.0497(B)/ 3.998.0032(S)	WN.. 0804..

> **73.291** WNMG **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



WN..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
06	6,6	3,81	4,76	0,4-0,8
08	8,7	5,16	4,76	0,4-1,2

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.291.1046	0604	0,4	PF	PC20	0,1-1,5	0,05-0,3	✓			✓	✓		
73.291.1146	0804	0,4	PF	PC20	0,1-2	0,05-0,3	✓			✓	✓		
73.291.4066	0604	0,8	PM	PC20	0,5-3	0,15-0,5		✓		✓	✓		
73.291.4166	0804	0,8	PM	PC20	0,5-4	0,15-0,5		✓		✓	✓		
73.291.4168	0804	0,8	PM	PC30	0,5-4	0,15-0,5		✓		✓	✓	✓	
73.291.4176	0804	1,2	PM	PC20	0,8-4	0,18-0,6		✓		✓	✓	✓	

> **73.293** WNMG **Phantom**

**P M S**

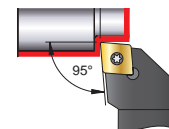
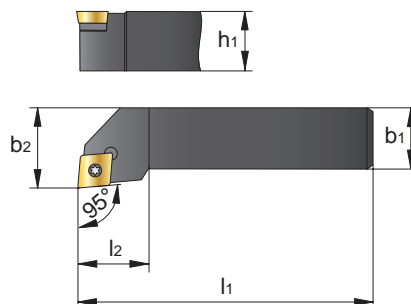
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.293.1047	0604	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.293.1147	0804	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.293.1167	0804	0,8	MF	MSI20	0,6-3	0,12-0,38	✓			✓	✓	✓	
73.293.4147	0804	0,4	MM	MSI20	0,15-2,5	0,1-0,3		✓		✓	✓		
73.293.4167	0804	0,8	MM	MSI20	0,25-3	0,1-0,35		✓		✓	✓	✓	






**> 72.420 Phantom**

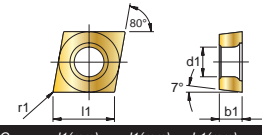
NL WISSELPLAATHOUDER SCLCR/L  
 FR PORTE-PLAQUETTE SCLCR/L  
 ES PORTAPLAQUITA SCLCR/L  
 DE KLEMMHALTER SCLCR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.420.1080	SCLCR 0808-D06	8	8	10	60	9	-	-	73.998.0080(B) 73.998.0081(S)	T8(B)/ T7(S)	CC.. 0602.
72.420.1100	SCLCR 1010-E06	10	10	12	70	9	-	-	73.998.0080(B) 73.998.0081(S)	T8(B)/ T7(S)	CC.. 0602.
72.420.1120	SCLCR 1212-F09	12	12	16	80	15	-	-	73.998.0070(B) 73.998.0096(S)	T15	CC.. 09T3..
72.420.1160	SCLCR 1616-H09	16	16	20	100	17	73.998.0320 (B)/ - (S)	73.998.0355	73.998.0070(B) 73.998.0096(S)	T15	CC.. 09T3..
72.420.1200	SCLCR 2020-K09	20	20	25	125	17	73.998.0320 (B)/ - (S)	73.998.0355	73.998.0070(B) 73.998.0096(S)	T15	CC.. 09T3..
72.420.1240	SCLCR 2020-K12	20	20	25	125	20	73.998.0325(B) 73.998.0326(S)	73.998.0356(B) 73.998.0357(S)	73.998.0072(B) 73.998.0092(S)	T15	CC.. 1204..
72.420.1300	SCLCR 2525-M12	25	25	32	150	20	73.998.0325(B) 73.998.0326(S)	73.998.0356(B) 73.998.0357(S)	73.998.0072(B) 73.998.0092(S)	T15	CC.. 1204..
72.420.2080	SCLCL 0808-D06	8	8	10	60	9	-	-	73.998.0080(B) 73.998.0081(S)	T8(B)/ T7(S)	CC.. 0602.
72.420.2100	SCLCL 1010-E06	10	10	12	70	9	-	-	73.998.0080(B) 73.998.0081(S)	T8(B)/ T7(S)	CC.. 0602.
72.420.2120	SCLCL 1212-F09	12	12	16	80	15	-	-	73.998.0070(B) 73.998.0096(S)	T15	CC.. 09T3..
72.420.2160	SCLCL 1616-H09	16	16	20	100	17	73.998.0320 (B)/ - (S)	73.998.0355	73.998.0070(B) 73.998.0096(S)	T15	CC.. 09T3..
72.420.2200	SCLCL 2020-K09	20	20	25	125	17	73.998.0320 (B)/ - (S)	73.998.0355	73.998.0070(B) 73.998.0096(S)	T15	CC.. 09T3..

> **73.500** CCGT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



CC..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
06	6,4	2,80	2,38	0,2-0,8
09	9,7	4,40	3,97	0,2-0,8
12	12,4	5,50	4,76	0,4-0,8

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.500.4045	0602	0,4	UM	UI10	0,2-2,4	0,06-0,17		✓		✓	✓		
73.500.4047	0602	0,4	UM	UI20	0,2-2,4	0,06-0,17		✓		✓	✓		
73.500.4145	09T3	0,4	UM	UI10	0,25-3	0,08-0,23		✓		✓	✓		
73.500.4147	09T3	0,4	UM	UI20	0,25-3	0,08-0,23		✓		✓	✓		
73.500.4167	09T3	0,8	UM	UI20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.500.4367	1204	0,8	UM	UI20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.501** CCGT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.501.1026	0602	0,2	PF	PC20	0,06-1,7	0,03-0,11	✓			✓	✓		
73.501.1046	0602	0,4	PF	PC20	0,1-1,7	0,05-0,17	✓			✓	✓		
73.501.1146	09T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.501.1166	09T3	0,8	PF	PC20	0,15-2	0,08-0,45	✓			✓	✓		
73.501.4046	0602	0,4	PM	PC20	0,2-2,4	0,06-0,17		✓		✓	✓		
73.501.4146	09T3	0,4	PM	PC20	0,25-3	0,08-0,23		✓		✓	✓		
73.501.4166	09T3	0,8	PM	PC20	0,5-3	0,1-0,4		✓		✓	✓		
73.501.4346	1204	0,4	PM	PC20	0,3-3,6	0,09-0,27		✓		✓	✓		
73.501.4366	1204	0,8	PM	PC20	0,6-3,6	0,12-0,45		✓		✓	✓		

> **73.503** CCGT **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.503.1047	0602	0,4	MF	MSI20	0,1-1,7	0,05-0,17	✓			✓	✓		
73.503.1147	09T3	0,4	MF	MSI20	0,11-2	0,06-0,23	✓			✓	✓		
73.503.1167	09T3	0,8	MF	MSI20	0,15-2	0,08-0,45	✓			✓	✓	✓	
73.503.4147	09T3	0,4	MM	MSI20	0,25-3	0,08-0,23		✓		✓	✓		
73.503.4167	09T3	0,8	MM	MSI20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.503.4367	1204	0,8	MM	MSI20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.505** CCGT **Phantom**

**N**

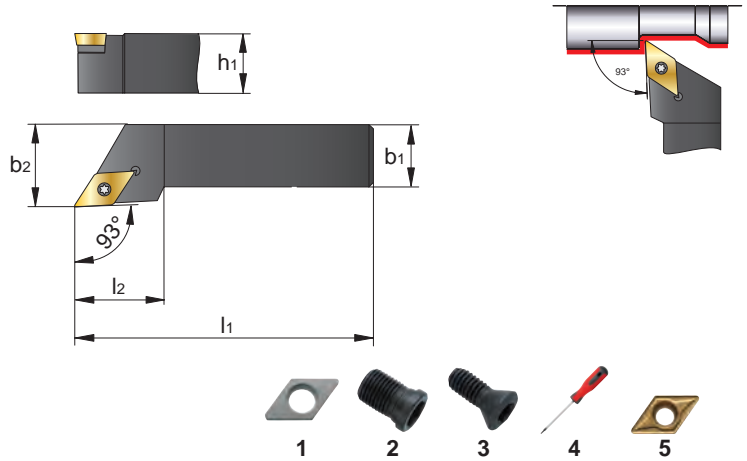
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.505.4020	0602	0,2	NM	K10	0,05-3	0,05-0,12	✓	✓		✓	✓		
73.505.4040	0602	0,4	NM	K10	0,1-3	0,1-0,2		✓		✓	✓		
73.505.4140	09T3	0,4	NM	K10	0,1-5	0,1-0,22		✓		✓	✓		
73.505.4160	09T3	0,8	NM	K10	0,1-5	0,15-0,45		✓	✓	✓	✓	✓	





## > 72.450 Phantom

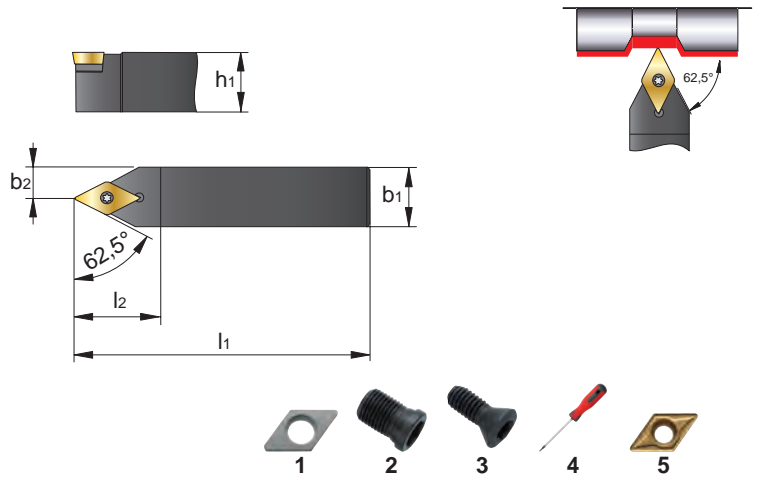
NL WISSELPLAATHOUDER SDJCR/L  
FR PORTE-PLAQUETTE SDJCR/L  
ES PORTAPLAQUITA SDJCR/L  
DE KLEMMHALTER SDJCR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.450.1100	SDJCR 1010-E07	10	10	12	70	13	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.450.1120	SDJCR 1212-F07	12	12	16	80	14,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.450.1160	SDJCR 1616-H11	16	16	20	100	20	73.998.0290(B)/73.998.0291(S)	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	DC.. 11T3..
72.450.1200	SDJCR 2020-K11	20	20	25	125	20,5	73.998.0290(B)/73.998.0291(S)	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	DC.. 11T3..
72.450.2100	SDJCL 1010-E07	10	10	12	70	13	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.450.2120	SDJCL 1212-F07	12	12	16	80	14,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.450.2160	SDJCL 1616-H11	16	16	20	100	20	73.998.0290(B)/73.998.0291(S)	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	DC.. 11T3..
72.450.2200	SDJCL 2020-K11	20	20	25	125	20,5	73.998.0290(B)/73.998.0291(S)	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	DC.. 11T3..

## > 72.455 Phantom

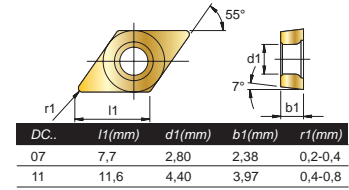
NL WISSELPLAATHOUDER SDNCN  
FR PORTE-PLAQUETTE SDNCN  
ES PORTAPLAQUITA SDNCN  
DE KLEMMHALTER SDNCN



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.455.1100	SDNCN 1010-E07	10	10	5	70	10	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.455.1120	SDNCN 1212-F07	12	12	6	80	12	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.455.1160	SDNCN 1616-H11	16	16	8	100	18	73.998.0290(B)/73.998.0291(S)	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	DC.. 11T3..
72.455.1200	SDNCN 2020-K11	20	20	10	125	21	73.998.0290(B)/73.998.0291(S)	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	DC.. 11T3..

> **73.510 DCMT Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.510.4047	0702	0,4	UM	UI20	0,19-2,25	0,06-0,17		✓		✓	✓		
73.510.4247	11T3	0,4	UM	UI20	0,25-3	0,08-0,23		✓		✓	✓		
73.510.4267	11T3	0,8	UM	UI20	0,5-3	0,1-0,4		✓		✓	✓	✓	

> **73.511 DCMT Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.511.1046	0702	0,4	PF	PC20	0,08-1,5	0,05-0,17	✓			✓	✓		
73.511.1246	11T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.511.4046	0702	0,4	PM	PC20	0,19-2,25	0,06-0,17		✓		✓	✓		
73.511.4066	0702	0,8	PM	PC20	0,38-2,25	0,08-0,35		✓		✓	✓		
73.511.4246	11T3	0,4	PM	PC20	0,25-3	0,08-0,23		✓		✓	✓		
73.511.4266	11T3	0,8	PM	PC20	0,5-3	0,1-0,4		✓		✓	✓		

> **73.513 DCMT Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.513.1247	11T3	0,4	MF	MSI20	0,11-2	0,06-0,23	✓			✓	✓		
73.513.4047	0702	0,4	MM	MSI20	0,19-2,25	0,06-0,17		✓		✓	✓		
73.513.4247	11T3	0,4	MM	MSI20	0,25-3	0,08-0,23		✓		✓	✓		
73.513.4267	11T3	0,8	MM	MSI20	0,5-3	0,1-0,4		✓		✓	✓	✓	

> **73.515 DCGT Phantom**

**N**

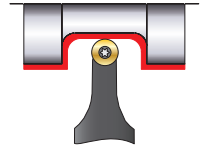
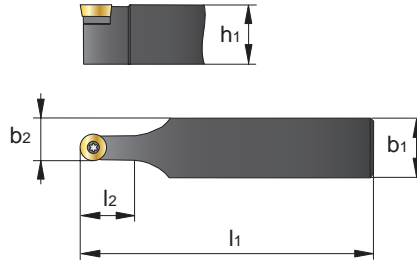
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.515.4020	0702	0,2	NM	K10	0,05-3	0,05-0,12	✓	✓		✓	✓		
73.515.4240	11T3	0,4	NM	K10	0,1-5	0,1-0,22		✓		✓	✓		
73.515.4260	11T3	0,8	NM	K10	0,1-5	0,15-0,5		✓	✓	✓	✓	✓	





## > 72.461 Phantom

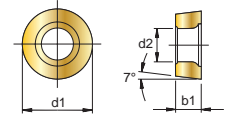
NL WISSELPLAATHOUDER SRDCN  
 FR PORTE-PLAQUETTE SRDCN  
 ES PORTAPLAQUITA SRDCN  
 DE KLEMMHALTER SRDCN



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.461.1200	SRDCN 2020-K08	20	20	15	125	20	-	-	73.998.0090	T8	RCMT 0803
72.461.1201	SRDCN 2020-K10	20	20	15	125	22	73.998.0292	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	RCMT 10T3
72.461.1250	SRDCN 2525-M10	25	25	17,5	150	22	73.998.0292	73.998.0355	73.998.0070(B)/73.998.0071(S)	T15	RCMT 10T3
72.461.1253	SRDCN 2525-M12	25	25	18,5	150	28	73.998.0293	73.998.0355	73.998.0071	T15	RCMT 1204

> **73.521** RCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



RC..	d1(mm)	d2(mm)	b1(mm)
08	8,0	3,40	3,18
10	10,0	4,00	3,18
12	12,0	4,90	4,76

**P M K**

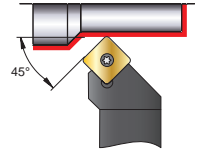
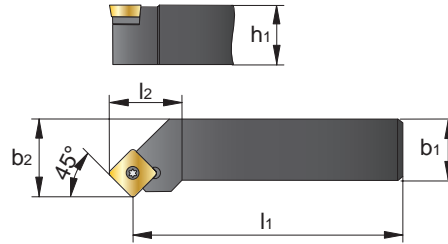
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	⊙	
73.521.4106	0803	4	PM	PC20	0,8-3,2	0,1-0,8		✓		✓	✓	✓	
73.521.4206	1003	5	PM	PC20	1-4	0,12-1		✓		✓	✓	✓	
73.521.4306	1204	6	PM	PC20	1,2-4,8	0,2-1,8		✓		✓	✓	✓	





## > 72.485 Phantom

NL WISSELPLAATHOUDER SSSCR  
 FR PORTE-PLAQUETTE SSSCR  
 ES PORTAPLAQUITA SSSCR  
 DE KLEMMHALTER SSSCR

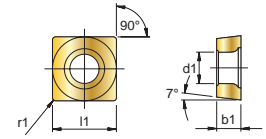


Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.485.1120	SSSCR 1212-F09	12	12	16	80	18	-	-	73.998.0070(B) 73.998.0096(S)	T15	SC.T 09T3..
72.485.1160	SSSCR 1616-H09	16	16	20	100	20	73.998.0295(B)/-(S)	73.998.0355	73.998.0070(B) 73.998.0096(S)	T15	SC.T 09T3..
72.485.1240	SSSCR 2020-K12	20	20	25	125	25	73.998.0296(B) 73.998.0297(S)	73.998.0356(B) 73.998.0357(S)	73.998.0072(B) 73.998.0092(S)	T15	SC.T 1204..
72.485.1300	SSSCR 2525-M12	25	25	32	150	25	73.998.0296(B) 73.998.0297(S)	73.998.0356(B) 73.998.0357(S)	73.998.0072(B) 73.998.0092(S)	T15	SC.T 1204..



> **73.530** SCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



SC..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
09	9,5	4,40	3,97	0,4-0,8
12	12,7	5,60	4,76	0,4-0,8

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.530.4147	09T3	0,4	UM	UI20	0,25-3	0,06-0,23		✓		✓	✓		
73.530.4167	09T3	0,8	UM	UI20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.530.4367	1204	0,8	UM	UI20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.531** SCMT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.531.1146	09T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.531.4166	09T3	0,8	PM	PC20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.531.4366	1204	0,8	PM	PC20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.535** SCGT **Phantom**

**N**

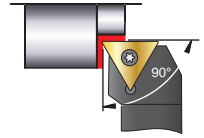
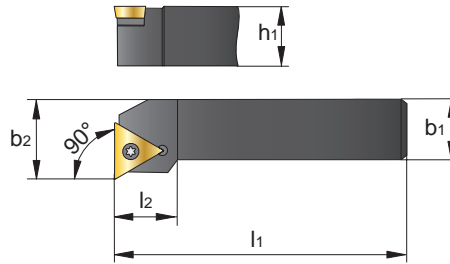
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.535.4140	09T3	0,4	NM	K10	0,1-4	0,1-0,26		✓		✓	✓		
73.535.4160	09T3	0,8	NM	K10	0,1-5	0,15-0,4		✓	✓	✓	✓	✓	





## > 72.500 Phantom

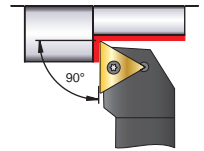
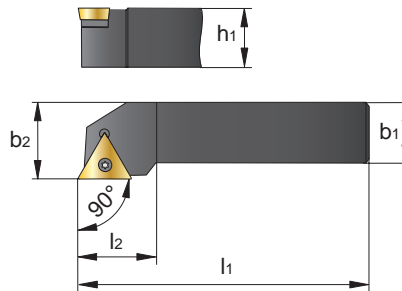
NL WISSELPLAATHOUDER STFCR  
FR PORTE-PLAQUETTE STFCR  
ES PORTAPLAQUITA STFCR  
DE KLEMMHALTER STFCR



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.500.1120	STFCR 1212-F11	12	12	16	80	15	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..
72.500.1160	STFCR 1616-H16	16	16	20	100	20	73.998.0300(B)/73.998.0301(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	TC.. 16T3..
72.500.1200	STFCR 2020-K16	20	20	25	125	20	73.998.0300(B)/73.998.0301(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	TC.. 16T3..

## > 72.505 Phantom

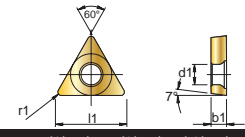
NL WISSELPLAATHOUDER STGCR/L  
FR PORTE-PLAQUETTE STGCR/L  
ES PORTAPLAQUITA STGCR/L  
DE KLEMMHALTER STGCR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.505.1120	STGCR 1212-F11	12	12	16	80	15	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..
72.505.1160	STGCR 1616-H16	16	16	20	100	22	73.998.0300(B)/73.998.0301(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	TC.. 16T3..
72.505.1200	STGCR 2020-K16	20	20	25	125	22	73.998.0300(B)/73.998.0301(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	TC.. 16T3..
72.505.1240	STGCR 2525-M16	25	25	32	150	22	73.998.0300(B)/73.998.0301(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	TC.. 16T3..
72.505.2160	STGCL 1616-H16	16	16	20	100	22	73.998.0300(B)/73.998.0301(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	TC.. 16T3..

> **73.540** TCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



TC..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
11	11,6	2,80	2,38	0,2-0,4
16	16,0	4,40	3,97	0,2-0,8

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.540.4567	16T3	0,8	UM	UI20	0,5-3	0,1-0,45		✓		✓	✓	✓	

> **73.541** TCMT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.541.1266	1102	0,8	PF	PC20	0,13-1,7	0,07-0,26	✓			✓	✓		
73.541.1546	16T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.541.4246	1102	0,4	PM	PC20	0,21-2,5	0,06-0,19		✓		✓	✓		
73.541.4566	16T3	0,8	PM	PC20	0,5-3	0,1-0,45		✓		✓	✓		

> **73.543** TCMT **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.543.1247	1102	0,4	MF	MSI20	0,1-1,7	0,05-0,19	✓			✓	✓		
73.543.1547	16T3	0,4	MF	MSI20	0,11-2	0,06-0,23	✓			✓	✓		
73.543.4247	1102	0,4	MM	MSI20	0,21-2,5	0,06-0,19		✓		✓	✓		
73.543.4567	16T3	0,8	MM	MSI20	0,5-3	0,1-0,45		✓		✓	✓	✓	

> **73.545** TCGT **Phantom**

**N**

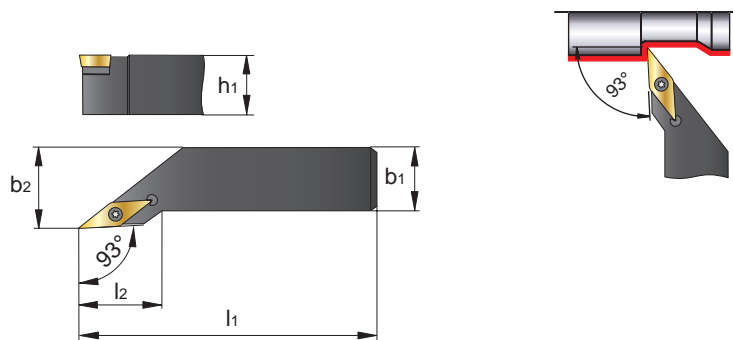
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.545.4240	1102	0,4	NM	K10	0,1-4	0,1-0,2		✓		✓	✓		
73.545.4540	16T3	0,4	NM	K10	0,1-5,5	0,1-0,2		✓		✓	✓		
73.545.4560	16T3	0,8	NM	K10	0,1-5,5	0,15-0,5		✓	✓	✓	✓	✓	





## > 72.515 Phantom

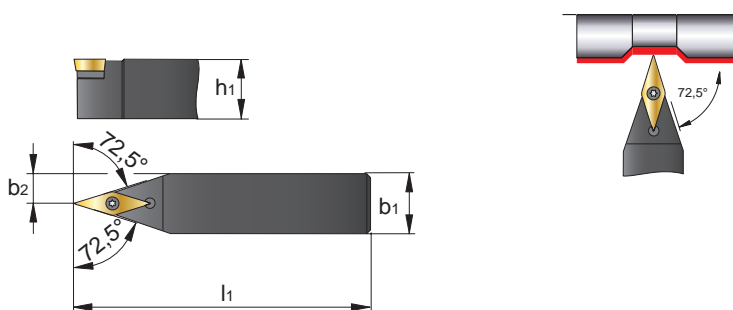
NL WISSELPLAATHOUDER SVJCR/L  
FR PORTE-PLAQUETTE SVJCR/L  
ES PORTAPLAQUITA SVJCR/L  
DE KLEMMHALTER SVJCR/L



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.515.1160	SVJCR 1616-H11	16	16	20	100	21,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.T 1103..
72.515.1200	SVJCR 2020-K11	20	20	25	125	23	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.T 1103..
72.515.1201	SVJCR 2020-K16	20	20	25	125	29,5	73.998.0305	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	VC.T 1604..
72.515.1250	SVJCR 2525-M16	25	25	32	150	32,5	73.998.0305	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	VC.T 1604..
72.515.2160	SVJCL 1616-H11	16	16	20	100	21,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.T 1103..
72.515.2200	SVJCL 2020-K11	20	20	25	125	23	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.T 1103..
72.515.2250	SVJCL 2525-M16	25	25	32	150	32,5	73.998.0305	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	VC.T 1604..

## > 72.520 Phantom

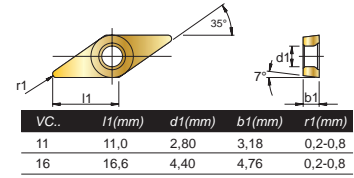
NL WISSELPLAATHOUDER SVVCN  
FR PORTE-PLAQUETTE SVVCN  
ES PORTAPLAQUITA SVVCN  
DE KLEMMHALTER SVVCN



Ref.	Type	h1	b1	b2	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.520.1160	SVVCN 1616-H11	16	16	8	100	25	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.T 1103..
72.520.1200	SVVCN 2020-K11	20	20	10	125	32	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.T 1103..
72.520.1250	SVVCN 2525-M16	25	25	12,5	150	40	73.998.0305	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	VC.T 1604..

> **73.591** VCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.591.1226	1103	0,2	PF	PC20	0,07-1,5	0,03-0,13	✓			✓	✓		
73.591.1246	1103	0,4	PF	PC20	0,1-1,5	0,05-0,2	✓			✓	✓		
73.591.1546	1604	0,4	PF	PC20	0,1-1,8	0,05-0,2	✓			✓	✓		
73.591.4546	1604	0,4	PM	PC20	0,23-2,7	0,07-0,2		✓		✓	✓		
73.591.4566	1604	0,8	PM	PC20	0,45-2,7	0,09-0,27		✓		✓	✓		

> **73.595** VCGT **Phantom**

**N**

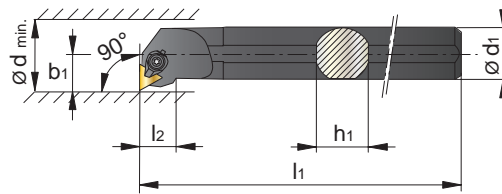
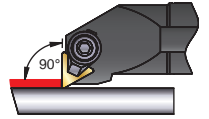
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.595.4220	1103	0,2	NM	K10	0,05-3	0,05-0,12	✓	✓		✓	✓		
73.595.4240	1103	0,4	NM	K10	0,05-3	0,1-0,25		✓		✓	✓		





## > 72.540 Phantom

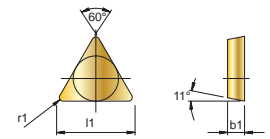
NL WISSELPLAATHOUDER S-CTFPR/L  
 FR PORTE-PLAQUETTE S-CTFPR/L  
 ES PORTAPLAQUITA S-CTFPR/L  
 DE KLEMMHALTER S-CTFPR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 incl.	6 excl.
72.540.1122	S12M-CTFPR 11	11	9	17	12	150	25	-	73.998.0020(B) 73.998.0022(S)	73.998.0060(B)/-(S)	-	T15(B)/SW2,5(S)	TP.. 1103..
72.540.1160	S16R-CTFPR 11	15	11	21	16	200	15	-	73.998.0020(B) 73.998.0022(S)	73.998.0060(B)/-(S)	-	T15(B)/SW2,5(S)	TP.. 1103..
72.540.1200	S20S-CTFPR 11	18	13	25	20	250	15	-	73.998.0020(B) 73.998.0022(S)	73.998.0060(B)/-(S)	-	T15(B)/SW2,5(S)	TP.. 1103..
72.540.1250	S25T-CTFPR 16	23	17	31,5	25	300	20	73.998.0280	73.998.0010(B) 73.998.0017(S) 73.998.0018(S)	73.998.0055(B)/-(S)	73.998.0345	T20(B)/SW3(S)	TP.. 1603..
72.540.1320	S32U-CTFPR 16	30	22	40	32	350	20	73.998.0280	73.998.0010(B) 73.998.0017(S)	73.998.0055(B)/-(S)	73.998.0345	T20(B)/SW3(S)	TP.. 1603..
72.540.2160	S16R-CTFPL 11	15	11	21	16	200	15	-	73.998.0020(B) 73.998.0022(S)	73.998.0060(B)/-(S)	-	T15(B)/SW2,5(S)	TP.. 1103..
72.540.2200	S20S-CTFPL 11	18	13	25	20	250	15	-	73.998.0020(B) 73.998.0022(S)	73.998.0060(B)/-(S)	-	T15(B)/SW2,5(S)	TP.. 1103..
72.540.2250	S25T-CTFPL 16	23	17	31,5	25	300	20	73.998.0280	73.998.0010(B) 73.998.0018(S)	73.998.0055(B)/-(S)	73.998.0345	T20(B)/SW3(S)	TP.. 1603..

> **73.171** TPMP **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



TP..	l1(mm)	b1(mm)	r1(mm)
11	11,0	3,18	0,4-0,8
16	16,5	3,18	0,4-1,2

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.171.0150	1103	0,4	EN	PC10	0,5-2	0,05-0,15		✓		✓	✓		
73.171.0200	1103	0,8	EN	PC20	0,5-3	0,1-0,25		✓		✓	✓		
73.171.0300	1603	0,4	EN	PC10	0,5-3	0,1-0,25		✓		✓	✓		
73.171.0350	1603	0,8	EN	PC20	0,5-3	0,1-0,25		✓		✓	✓		

> **73.175** TPUN **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.175.0450	1603	0,4	EN	PC20	0,5-3	0,1-0,25		✓		✓	✓		
73.175.0550	1603	0,8	EN	PC20	1-4	0,2-0,5		✓		✓	✓		
73.175.0650	1603	1,2	EN	PC20	1,5-5	0,1-0,3		✓	✓	✓	✓	✓	

> **73.180** TPUX **Phantom**

**P M K N**

Ref.	lxd	r (mm)	Geo	Kwaliteit	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.180.0100	1103	0,4	FR	P25	0,5-2	0,05-0,15	✓	✓		✓			
73.180.0150	1103	0,4	FL	P25	0,5-2	0,05-0,15	✓	✓		✓			
73.180.0500	1603	0,4	FR	P25	0,5-3	0,05-0,15	✓	✓		✓			
73.180.0550	1603	0,4	FL	P25	0,5-3	0,05-0,15	✓	✓		✓			
73.180.0700	1603	0,8	FR	P25	1-4	0,2-0,5		✓		✓	✓		
73.180.0750	1603	0,8	FL	P25	1-4	0,2-0,5		✓		✓	✓		

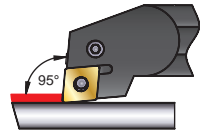
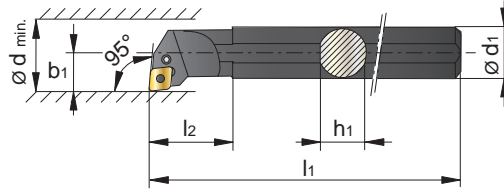






## > 72.545 Phantom

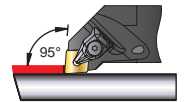
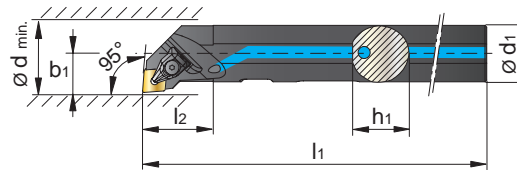
NL WISSELAATHOUDER S-PCLNR  
FR PORTE-PLAQUETTE S-PCLNR  
ES PORTAPLAQUITA S-PCLNR  
DE KLEMMHALTER S-PCLNR



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.	6 incl.	7 excl.
72.545.1250	S25T-PCLNR 12	23	17	32	25	300	40	73.998.0230	73.998.0100	73.998.0155	73.998.0365	73.998.0200	SW3	CN.. 1204..
72.545.1320	S32U-PCLNR 12	30	22	40	32	350	50	73.998.0230	73.998.0100	73.998.0150	73.998.0365	73.998.0200	SW3	CN.. 1204..
72.545.1400	S40V-PCLNR 12	38	27	50	40	400	60	73.998.0230	73.998.0100	73.998.0150	73.998.0365	73.998.0200	SW3	CN.. 1204..

## > 72.550 Phantom

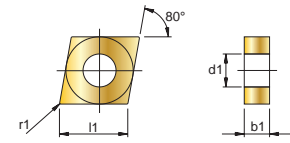
NL WISSELAATHOUDER A-DCLNR/L  
FR PORTE-PLAQUETTE A-DCLNR/L  
ES PORTAPLAQUITA A-DCLNR/L  
DE KLEMMHALTER A-DCLNR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.550.1250	A25R-PCLNR 12	23	17	31	25	200	40	73.998.0230	73.998.0100	73.998.0155	73.998.0365	CNM. 1204..
72.550.1320	A32S-PCLNR 12	30	22	39	32	250	50	73.998.0230	73.998.0100	73.998.0150	73.998.0365	CNM. 1204..

> **73.200** **CNMG** **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



CN..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
12	12,7	5,15	4,76	0,4-1,2
19	19,5	7,92	6,35	0,8-1,6

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.200.1347	1204	0,4	UF	UI20	0,6-3	0,1-0,23	✓			✓	✓		
73.200.4367	1204	0,8	UM	UI20	0,2-3	0,1-0,35		✓		✓	✓	✓	

> **73.201** **CNMG** **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.201.1346	1204	0,4	PF	PC20	0,2-1,5	0,05-0,25	✓			✓	✓		
73.201.1364	1204	0,8	PF	PC10	0,25-1,5	0,1-0,4	✓			✓	✓		
73.201.1366	1204	0,8	PF	PC20	0,25-1,5	0,1-0,4	✓			✓	✓		
73.201.4366	1204	0,8	PM	PC20	0,5-5,5	0,15-0,5		✓		✓	✓		
73.201.4368	1204	0,8	PM	PC30	0,5-5,5	0,15-0,5		✓		✓	✓	✓	
73.201.4376	1204	1,2	PM	PC20	0,8-5,5	0,18-0,6		✓		✓	✓	✓	
73.201.4378	1204	1,2	PM	PC30	0,8-5,5	0,18-0,6		✓		✓	✓	✓	
73.201.7368	1204	0,8	PR	PC30	1-7	0,2-0,55			✓	✓	✓	✓	

> **73.203** **CNMG** **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.203.1347	1204	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.203.1367	1204	0,8	MF	MSI20	0,6-3	0,12-0,38	✓			✓	✓	✓	
73.203.4347	1204	0,4	MM	MSI20	0,15-2,5	0,1-0,3		✓		✓	✓		
73.203.4367	1204	0,8	MM	MSI20	0,2-3	0,1-0,35		✓		✓	✓	✓	

> **73.204** **CNMA** **Phantom**

**P K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.204.0364	1204	0,8	EN	KC10	0,2-8	0,15-0,6		✓	✓	✓	✓		

> **73.206** **CNMG** **Phantom**

**P M S**

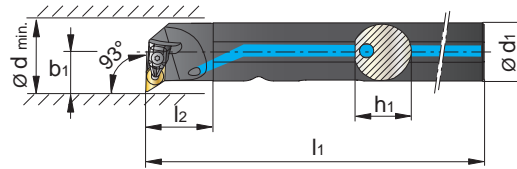
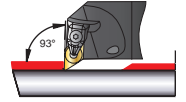
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.206.4347	1204	0,4	SM	MSI20	0,2-3,6	0,1-0,2	✓	✓		✓	✓		





## > 72.557 Phantom

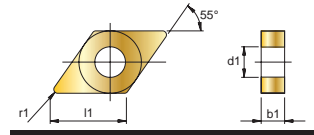
NL WISSELPLAATHOUDER A-DDUNR/L  
 FR PORTE-PLAQUETTE A-DDUNR/L  
 ES PORTAPLAQUITA A-DDUNR/L  
 DE KLEMMHALTER A-DDUNR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.	6 incl.	7 excl.
72.557.1252	A25R-PDUNR 11	23	17	31	25	200	40	73.998.0261	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	DN.. 1104..
72.557.1324	A32S-PDUNR 15	30	22	39	32	250	50	73.998.0265	73.998.0120	73.998.0155	73.998.0365	73.998.0200	SW3	DN.. 1506..
72.557.1404	A40T-PDUNR 15	37	27	48	40	300	60	73.998.0265	73.998.0120	73.998.0155	73.998.0365	73.998.0200	SW3	DN.. 1506..

> **73.211** DNMG **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



DN...	l1(mm)	d1(mm)	b1(mm)	r1(mm)
11	11,6	3,81	4,76	0,4-1,2
15	15,5	5,16	6,35	0,4-1,2

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.211.1246	1104	0,4	PF	PC20	0,1-1,5	0,05-0,25	✓			✓	✓		
73.211.1446	1506	0,4	PF	PC20	0,1-1,5	0,05-0,25	✓			✓	✓		
73.211.4266	1104	0,8	PM	PC20	0,4-5	0,1-0,3		✓		✓	✓		
73.211.4466	1506	0,8	PM	PC20	0,5-6	0,15-0,5		✓		✓	✓		
73.211.4468	1506	0,8	PM	PC30	0,5-6	0,15-0,5		✓		✓	✓	✓	
73.211.7568	1506	0,8	PR	PC30	0,8-6	0,2-0,55			✓	✓	✓	✓	

> **73.213** DNMG **Phantom**

**P M S**

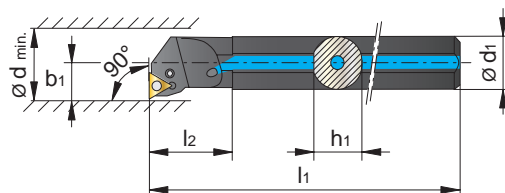
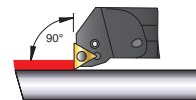
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.213.1247	1104	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.213.1447	1506	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.213.4447	1506	0,4	MM	MSI20	0,15-2	0,1-0,25		✓		✓	✓		
73.213.4467	1506	0,8	MM	MSI20	0,2-2,5	0,1-0,3		✓		✓	✓	✓	





## > 72.565 Phantom

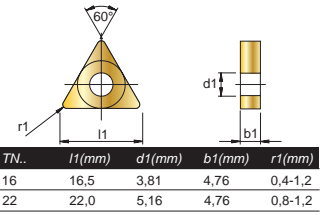
NL WISSELPLAATHOUDER A-PTFNR/L  
 FR PORTE-PLAQUETTE A-PTFNR/L  
 ES PORTAPLAQUITA A-PTFNR/L  
 DE KLEMMHALTER A-PTFNR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.	5 incl.	6 incl.	7 excl.
72.565.1250	A25R-PTFNR 16	23	17	32	25	200	17,5	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.565.1320	A32S-PTFNR 16	30	22	40	32	250	18	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.565.2250	A25R-PTFNL 16	23	17	32	25	200	17,5	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..
72.565.2320	A32S-PTFNL 16	30	22	40	32	250	18	73.998.0270	73.998.0125	73.998.0170	73.998.0380	73.998.0215	SW2,5	TNM. 1604..

> **73.250** TNMG **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.250.4567	1604	0,8	UF	UI20	0,6-3	0,12-0,38	✓			✓	✓	✓	

> **73.251** TNMG **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.251.1546	1604	0,4	PF	PC20	0,1-1,5	0,05-0,25	✓			✓	✓		
73.251.4548	1604	0,4	PM	PC30	0,4-5	0,1-0,3		✓		✓	✓	✓	
73.251.4566	1604	0,8	PM	PC20	0,5-5	0,15-0,5		✓		✓	✓		
73.251.4766	2204	0,8	PM	PC20	0,5-6,6	0,15-0,5		✓		✓	✓		
73.251.5546	1604	0,4	ER	PC20	1-3,5	0,12-0,3				✓	✓		
73.251.5566	1604	0,8	ER	PC20	1,3-3,5	0,15-0,5				✓	✓		

> **73.253** TNMG **Phantom**

**P M S**

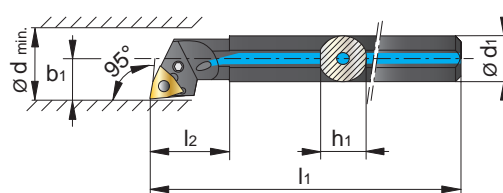
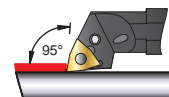
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.253.4547	1604	0,4	MM	MSI20	0,15-3	0,1-0,3		✓		✓	✓		
73.253.4567	1604	0,8	MM	MSI20	0,2-3	0,1-0,3		✓		✓	✓	✓	





## > 72.570 Phantom

NL WISSELPLAATHOUDER A-PWLNLR/L  
 FR PORTE-PLAQUETTE A-PWLNLR/L  
 ES PORTAPLAQUITA A-PWLNLR/L  
 DE KLEMMHALTER A-PWLNLR/L

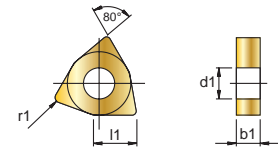


Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 excl.
72.570.1200	A20Q-PWLNLR 06	19	13	25	20	180	19,5	73.998.0135	73.998.0167	SW2	WN.. 0604..



> **73.291** WNMG **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



WN..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
06	6,6	3,81	4,76	0,4-0,8
08	8,7	5,16	4,76	0,4-1,2

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.291.1046	0604	0,4	PF	PC20	0,1-1,5	0,05-0,3	✓			✓	✓		
73.291.1146	0804	0,4	PF	PC20	0,1-2	0,05-0,3	✓			✓	✓		
73.291.4066	0604	0,8	PM	PC20	0,5-3	0,15-0,5		✓		✓	✓		
73.291.4166	0804	0,8	PM	PC20	0,5-4	0,15-0,5		✓		✓	✓		
73.291.4168	0804	0,8	PM	PC30	0,5-4	0,15-0,5		✓		✓	✓	✓	
73.291.4176	0804	1,2	PM	PC20	0,8-4	0,18-0,6		✓		✓	✓	✓	

> **73.293** WNMG **Phantom**

**P M S**

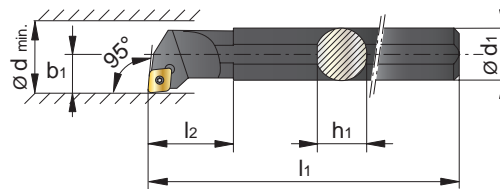
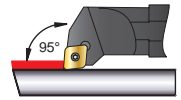
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.293.1047	0604	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.293.1147	0804	0,4	MF	MSI20	0,6-3	0,1-0,23	✓			✓	✓		
73.293.1167	0804	0,8	MF	MSI20	0,6-3	0,12-0,38	✓			✓	✓	✓	
73.293.4147	0804	0,4	MM	MSI20	0,15-2,5	0,1-0,3		✓		✓	✓		
73.293.4167	0804	0,8	MM	MSI20	0,25-3	0,1-0,35		✓		✓	✓	✓	





## > 72.585 Phantom

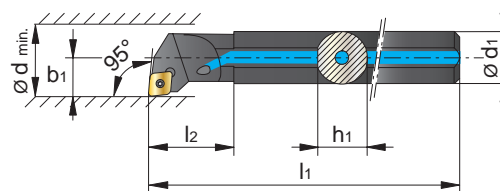
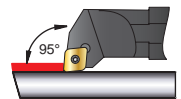
NL WISSELPLAATHOUDER S-SCLCR  
FR PORTE-PLAQUETTE S-SCLCR  
ES PORTAPLAQUITA S-SCLCR  
DE KLEMMHALTER S-SCLCR



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 excl.
72.585.1080	S08K-SCLCR 06	7	5	11	8	125	8	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.585.1100	S10M-SCLCR 06	9	7	13	10	150	10	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.585.1120	S12M-SCLCR 06	11	9	16	12	150	10	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.585.1160	S16R-SCLCR 09	15	11	20	16	200	16	73.998.0075(B)/73.998.0094(S)	T15	CC.. 09T3..
72.585.1200	S20S-SCLCR 09	18	13	25	20	250	16	73.998.0075(B)/73.998.0094(S)	T15	CC.. 09T3..
72.585.1250	S25T-SCLCR 09	23	17	32	25	300	16	73.998.0070(B)/73.998.0096(S)	T15	CC.. 09T3..

## > 72.590 Phantom

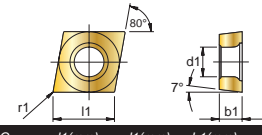
NL WISSELPLAATHOUDER A-SCLCR/L  
FR PORTE-PLAQUETTE A-SCLCR/L  
ES PORTAPLAQUITA A-SCLCR/L  
DE KLEMMHALTER A-SCLCR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 excl.
72.590.1080	A08F-SCLCR 06	7,5	5	11	8	80	8	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.590.1100	A10H-SCLCR 06	9,5	7	13	10	100	10	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.590.1120	A12K-SCLCR 06	11,5	9	16	12	125	10	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.590.1160	A16M-SCLCR 09	15,5	11	20	16	150	16	73.998.0075(B)/73.998.0094(S)	T15	CC.. 09T3..
72.590.1200	A20Q-SCLCR 09	19	13	25	20	180	16	73.998.0074(B)/73.998.0094(S)	T15	CC.. 09T3..
72.590.1250	A25R-SCLCR 09	24	17	31,5	25	200	16	73.998.0074(B)/73.998.0094(S)	T15	CC.. 09T3..
72.590.2080	A08F-SCLCL 06	7,5	5	11	8	80	8	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.590.2100	A10H-SCLCL 06	9,5	7	13	10	100	10	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.590.2120	A12K-SCLCL 06	11,5	9	16	12	125	10	73.998.0085(B)/73.998.0086(S)	T8(B)/ T7(S)	CC.. 0602.
72.590.2160	A16M-SCLCL 09	15,5	11	20	16	150	16	73.998.0075(B)/73.998.0094(S)	T15	CC.. 09T3..

> **73.500** CCGT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



CC..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
06	6,4	2,80	2,38	0,2-0,8
09	9,7	4,40	3,97	0,2-0,8
12	12,4	5,50	4,76	0,4-0,8

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.500.4045	0602	0,4	UM	UI10	0,2-2,4	0,06-0,17		✓		✓	✓		
73.500.4047	0602	0,4	UM	UI20	0,2-2,4	0,06-0,17		✓		✓	✓		
73.500.4145	09T3	0,4	UM	UI10	0,25-3	0,08-0,23		✓		✓	✓		
73.500.4147	09T3	0,4	UM	UI20	0,25-3	0,08-0,23		✓		✓	✓		
73.500.4167	09T3	0,8	UM	UI20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.500.4367	1204	0,8	UM	UI20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.501** CCGT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.501.1026	0602	0,2	PF	PC20	0,06-1,7	0,03-0,11	✓			✓	✓		
73.501.1046	0602	0,4	PF	PC20	0,1-1,7	0,05-0,17	✓			✓	✓		
73.501.1146	09T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.501.1166	09T3	0,8	PF	PC20	0,15-2	0,08-0,45	✓			✓	✓		
73.501.4046	0602	0,4	PM	PC20	0,2-2,4	0,06-0,17		✓		✓	✓		
73.501.4146	09T3	0,4	PM	PC20	0,25-3	0,08-0,23		✓		✓	✓		
73.501.4166	09T3	0,8	PM	PC20	0,5-3	0,1-0,4		✓		✓	✓		
73.501.4346	1204	0,4	PM	PC20	0,3-3,6	0,09-0,27		✓		✓	✓		
73.501.4366	1204	0,8	PM	PC20	0,6-3,6	0,12-0,45		✓		✓	✓		

> **73.503** CCGT **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.503.1047	0602	0,4	MF	MSI20	0,1-1,7	0,05-0,17	✓			✓	✓		
73.503.1147	09T3	0,4	MF	MSI20	0,11-2	0,06-0,23	✓			✓	✓		
73.503.1167	09T3	0,8	MF	MSI20	0,15-2	0,08-0,45	✓			✓	✓	✓	
73.503.4147	09T3	0,4	MM	MSI20	0,25-3	0,08-0,23		✓		✓	✓		
73.503.4167	09T3	0,8	MM	MSI20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.503.4367	1204	0,8	MM	MSI20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.505** CCGT **Phantom**

**N**

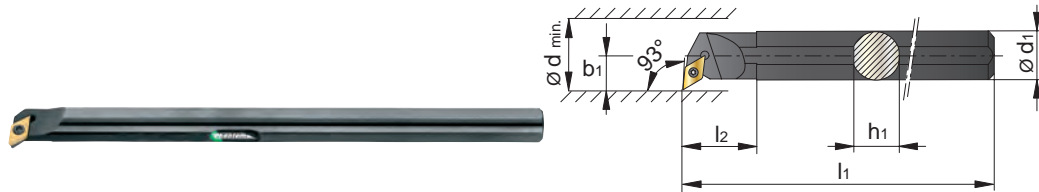
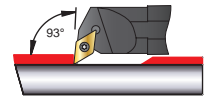
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.505.4020	0602	0,2	NM	K10	0,05-3	0,05-0,12	✓	✓		✓	✓		
73.505.4040	0602	0,4	NM	K10	0,1-3	0,1-0,2		✓		✓	✓		
73.505.4140	09T3	0,4	NM	K10	0,1-5	0,1-0,22		✓		✓	✓		
73.505.4160	09T3	0,8	NM	K10	0,1-5	0,15-0,45		✓	✓	✓	✓	✓	





## > 72.595 Phantom

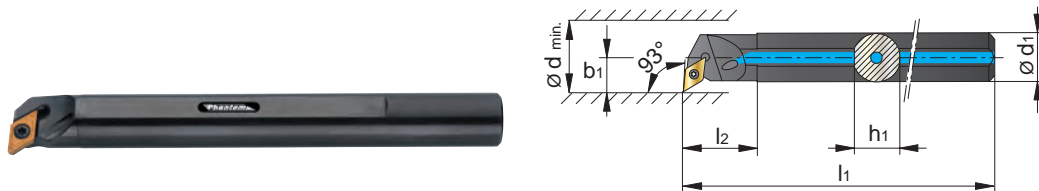
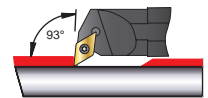
NL WISSELPLAATHOUDER S-SDUCR  
FR PORTE-PLAQUETTE S-SDUCR  
ES PORTAPLAQUITA S-SDUCR  
DE KLEMMHALTER S-SDUCR



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.595.1120	S12Q-SDUCR 07	11	9	16	12	180	12,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.595.1160	S16R-SDUCR 07	14,5	11	20	16	200	16,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.595.1200	S20S-SDUCR 11	18	13	25	20	250	20,5	-	-	73.998.0075(B)/73.998.0094(S)	T15	DC.. 11T3..
72.595.1250	S25T-SDUCR 11	23	17	32	25	300	26	73.998.0290(B)/-(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	DC.. 11T3..

## > 72.600 Phantom

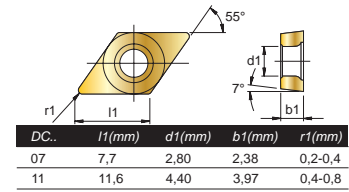
NL WISSELPLAATHOUDER A-SDUCR/L  
FR PORTE-PLAQUETTE A-SDUCR/L  
ES PORTAPLAQUITA A-SDUCR/L  
DE KLEMMHALTER A-SDUCR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.600.1120	A12K-SDUCR 07	11,5	9	17	12	125	12,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.600.1160	A16M-SDUCR 07	15,5	11	21	16	150	16,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.600.1200	A20Q-SDUCR 11	19	13	25	20	180	21	-	-	73.998.0075(B)/73.998.0094(S)	T15	DC.. 11T3..
72.600.1250	A25R-SDUCR 11	24	17	31,5	25	200	26	73.998.0290(B)/-(S)	73.998.0355	73.998.0070(B)/73.998.0096(S)	T15	DC.. 11T3..
72.600.2120	A12K-SDUCL 07	11,5	9	12	17	125	12,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.600.2160	A16M-SDUCL 07	15,5	11	16	21	150	16,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	DC.. 0702..
72.600.2200	A20Q-SDUCL 11	19	13	25	20	180	21	-	-	73.998.0075(B)/73.998.0094(S)	T15	DC.. 11T3..

> **73.510** DCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.510.4047	0702	0,4	UM	UI20	0,19-2,25	0,06-0,17		✓		✓	✓		
73.510.4247	11T3	0,4	UM	UI20	0,25-3	0,08-0,23		✓		✓	✓		
73.510.4267	11T3	0,8	UM	UI20	0,5-3	0,1-0,4		✓		✓	✓	✓	

> **73.511** DCMT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.511.1046	0702	0,4	PF	PC20	0,08-1,5	0,05-0,17	✓			✓	✓		
73.511.1246	11T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.511.4046	0702	0,4	PM	PC20	0,19-2,25	0,06-0,17		✓		✓	✓		
73.511.4066	0702	0,8	PM	PC20	0,38-2,25	0,08-0,35		✓		✓	✓		
73.511.4246	11T3	0,4	PM	PC20	0,25-3	0,08-0,23		✓		✓	✓		
73.511.4266	11T3	0,8	PM	PC20	0,5-3	0,1-0,4		✓		✓	✓		

> **73.513** DCMT **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.513.1247	11T3	0,4	MF	MSI20	0,11-2	0,06-0,23	✓			✓	✓		
73.513.4047	0702	0,4	MM	MSI20	0,19-2,25	0,06-0,17		✓		✓	✓		
73.513.4247	11T3	0,4	MM	MSI20	0,25-3	0,08-0,23		✓		✓	✓		
73.513.4267	11T3	0,8	MM	MSI20	0,5-3	0,1-0,4		✓		✓	✓	✓	

> **73.515** DCGT **Phantom**

**N**

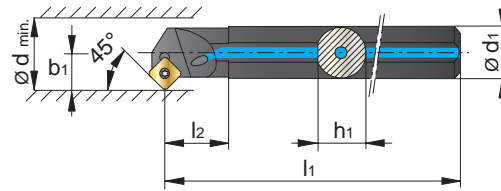
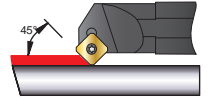
Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.515.4020	0702	0,2	NM	K10	0,05-3	0,05-0,12	✓	✓		✓	✓		
73.515.4240	11T3	0,4	NM	K10	0,1-5	0,1-0,22		✓		✓	✓		
73.515.4260	11T3	0,8	NM	K10	0,1-5	0,15-0,5		✓	✓	✓	✓	✓	





## > 72.610 Phantom

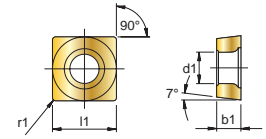
NL WISSELPLAATHOUDER A-SSSCR  
 FR PORTE-PLAQUETTE A-SSSCR  
 ES PORTAPLAQUITA A-SSSCR  
 DE KLEMMHALTER A-SSSCR



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 excl.
72.610.1160	A16M-SSSCR 09	16	11	21	16	150	129	73.998.0075(B)/73.998.0094(S)	T15	SC..09T3..
72.610.1200	A20Q-SSSCR 09	19	13	25	20	180	132	73.998.0075(B)/73.998.0094(S)	T15	SC..09T3..

> **73.530** SCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



SC..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
09	9,5	4,40	3,97	0,4-0,8
12	12,7	5,60	4,76	0,4-0,8

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	⊙	
73.530.4147	09T3	0,4	UM	UI20	0,25-3	0,06-0,23		✓		✓	✓		
73.530.4167	09T3	0,8	UM	UI20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.530.4367	1204	0,8	UM	UI20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.531** SCMT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	⊙	
73.531.1146	09T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.531.4166	09T3	0,8	PM	PC20	0,5-3	0,1-0,4		✓		✓	✓	✓	
73.531.4366	1204	0,8	PM	PC20	0,6-3,6	0,12-0,45		✓		✓	✓	✓	

> **73.535** SCGT **Phantom**

**N**

Ref.	lxd	r (mm)	Geo	HM	a <sub>p</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	⊙	
73.535.4140	09T3	0,4	NM	K10	0,1-4	0,1-0,26		✓		✓	✓		
73.535.4160	09T3	0,8	NM	K10	0,1-5	0,15-0,4		✓	✓	✓	✓	✓	

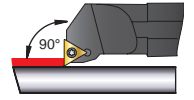
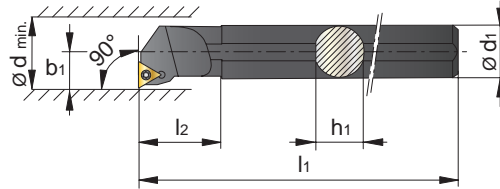






## > 72.615 Phantom

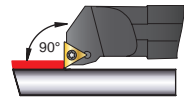
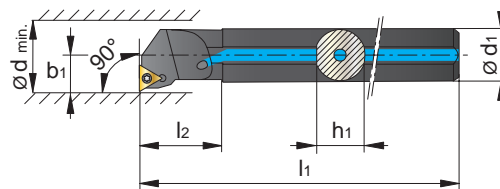
NL WISSELPLAATHOUDER S-STFCR  
FR PORTE-PLAQUETTE S-STFCR  
ES PORTAPLAQUITA S-STFCR  
DE KLEMMHALTER S-STFCR



Ref.	Type	h1	b1	d min.	d1	l1	l2	1	2	3
72.615.1160	S16R-STFCR 11	15	11	21	16	200	13	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..
72.615.1200	S20S-STFCR 11	18	13	25	20	250	13	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..

## > 72.620 Phantom

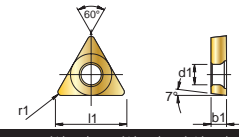
NL WISSELPLAATHOUDER A-STFCR/L  
FR PORTE-PLAQUETTE A-STFCR/L  
ES PORTAPLAQUITA A-STFCR/L  
DE KLEMMHALTER A-STFCR/L



Ref.	Type	h1	b1	d min.	d1	l1	l2	1	2	3
72.620.1120	A12K-STFCR 11	12	9	17	12	125	13	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..
72.620.1160	A16M-STFCR 11	16	11	21	16	150	13	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..
72.620.1200	A20Q-STFCR 11	19	13	25	20	180	13	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	TC.. 1102..

> **73.540** TCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



TC..	l1(mm)	d1(mm)	b1(mm)	r1(mm)
11	11,6	2,80	2,38	0,2-0,4
16	16,0	4,40	3,97	0,2-0,8

**P M K S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.540.4567	16T3	0,8	UM	UI20	0,5-3	0,1-0,45		✓		✓	✓	✓	

> **73.541** TCMT **Phantom**

**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.541.1266	1102	0,8	PF	PC20	0,13-1,7	0,07-0,26	✓			✓	✓		
73.541.1546	16T3	0,4	PF	PC20	0,11-2	0,06-0,23	✓			✓	✓		
73.541.4246	1102	0,4	PM	PC20	0,21-2,5	0,06-0,19		✓		✓	✓		
73.541.4566	16T3	0,8	PM	PC20	0,5-3	0,1-0,45		✓		✓	✓		

> **73.543** TCMT **Phantom**

**P M S**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.543.1247	1102	0,4	MF	MSI20	0,1-1,7	0,05-0,19	✓			✓	✓		
73.543.1547	16T3	0,4	MF	MSI20	0,11-2	0,06-0,23	✓			✓	✓		
73.543.4247	1102	0,4	MM	MSI20	0,21-2,5	0,06-0,19		✓		✓	✓		
73.543.4567	16T3	0,8	MM	MSI20	0,5-3	0,1-0,45		✓		✓	✓	✓	

> **73.545** TCGT **Phantom**

**N**

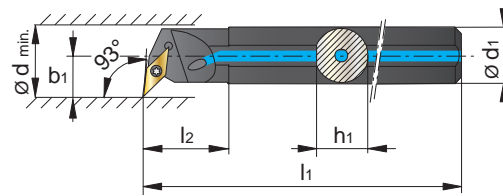
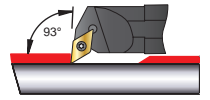
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.545.4240	1102	0,4	NM	K10	0,1-4	0,1-0,2		✓		✓	✓		
73.545.4540	16T3	0,4	NM	K10	0,1-5,5	0,1-0,2		✓		✓	✓		
73.545.4560	16T3	0,8	NM	K10	0,1-5,5	0,15-0,5		✓	✓	✓	✓	✓	





## > 72.630 Phantom

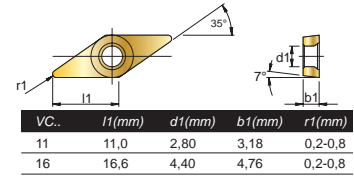
NL WISSELPLAATHOUDER A-SVUCR  
 FR PORTE-PLAQUETTE A-SVUCR  
 ES PORTAPLAQUITA A-SVUCR  
 DE KLEMMHALTER A-SVUCR



Ref.	Type	h1	b1	d min.	d1	l1	l2	1 incl.	2 incl.	3 incl.	4 incl.	5 excl.
72.623.1160	A16M-SVUCR 11	15,5	11	21	16	150	16,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.. 1103..
72.623.1200	A20Q-SVUCR 11	19	13	25	20	180	20,5	-	-	73.998.0080(B)/73.998.0081(S)	T8(B)/ T7(S)	VC.. 1103..
72.623.1254	A25R-SVUCR 16	23	17	31	25	200	40	73.998.0305	73.998.0335	73.998.0070(B)/73.998.0096(S)	T15	VC.. 1604..

> **73.591** VCMT **Phantom**

NL WISSELPLAAT  
FR PLAQUETTE  
ES PLAQUITA  
DE WENDEPLATTE



**P M K**

Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.591.1226	1103	0,2	PF	PC20	0,07-1,5	0,03-0,13	✓			✓	✓		
73.591.1246	1103	0,4	PF	PC20	0,1-1,5	0,05-0,2	✓			✓	✓		
73.591.1546	1604	0,4	PF	PC20	0,1-1,8	0,05-0,2	✓			✓	✓		
73.591.4546	1604	0,4	PM	PC20	0,23-2,7	0,07-0,2		✓		✓	✓		
73.591.4566	1604	0,8	PM	PC20	0,45-2,7	0,09-0,27		✓		✓	✓		

> **73.595** VCGT **Phantom**

**N**

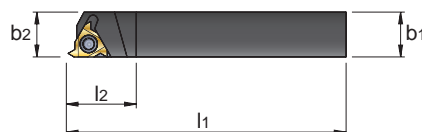
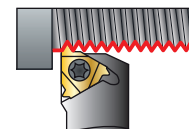
Ref.	lxd	r (mm)	Geo	HM	ap (mm)	fn (mm)	▽▽▽	▽▽	▽	○	◐	◑	
73.595.4220	1103	0,2	NM	K10	0,05-3	0,05-0,12	✓	✓		✓	✓		
73.595.4240	1103	0,4	NM	K10	0,05-3	0,1-0,25		✓		✓	✓		





## > 74.101 Phantom

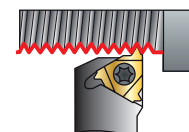
NL DRAADSNIJHOUDER, UITWENDIG, NL EN AL, RECHTS  
 FR OUTIL A FILETER, EXTERIEUR, NL ET AL, A DROITE  
 ES PORTAPLAQUITA PARA ROSCAR, EXTERIOR, NL Y AL, DCHA  
 DE KLEMMHALTER, AUSEN, NL UND AL, RECHTS



Ref.	Type	h1	h2	b1	b2	l1	l2	1 incl.	2 excl.	3 excl.	4 incl.	5 incl.	6 incl.	7 excl.
74.101.1230	NL 1212-16	12	12	12	16	83,2	22	-	-	-	-	74.398.0105	T10	16ER
74.101.1630	AL 1616-16	16	16	16	16	100	20,5	74.398.0165	74.398.0195	74.398.0400	74.398.0130	74.398.0115	T10	16ER
74.101.2030	AL 2020-16	20	20	20	20	128,6	30	74.398.0165	74.398.0195	74.398.0400	74.398.0130	74.398.0115	T10	16ER
74.101.2530	AL 2525-16	25	25	25	25	153,6	30	74.398.0165	74.398.0195	74.398.0400	74.398.0130	74.398.0115	T10	16ER
74.101.2540	AL 2525-22	25	25	25	25	175,7	36	74.398.0200	74.398.0225	-	74.398.0135	74.398.0120	T20	22ER
74.101.3230	AL 3232-16	32	32	32	32	173,6	30	74.398.0165	74.398.0195	74.398.0400	74.398.0130	74.398.0115	T10	16ER
74.101.3240	AL 3232-22	32	32	32	32	175,7	36	74.398.0200	74.398.0225	-	74.398.0135	74.398.0120	T20	22ER

## > 74.102 Phantom

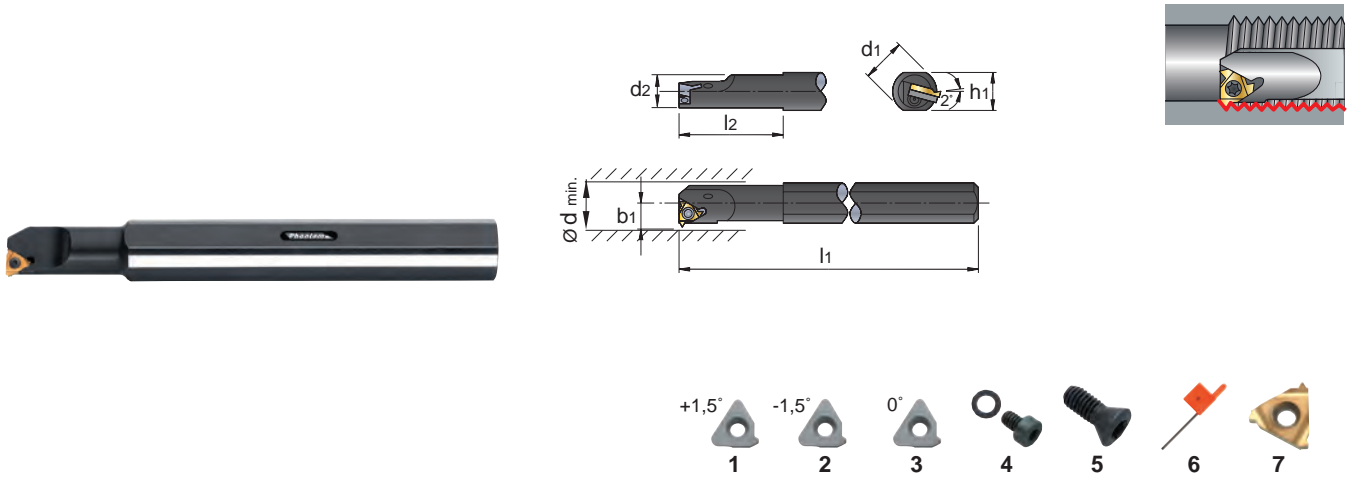
NL DRAADSNIJHOUDER, UITWENDIG, AL, LINKS  
 FR OUTIL A FILETER, EXTERIEUR, AL, À GAUCHE  
 ES PORTAPLAQUITA PARA ROSCAR, EXTERIOR, AL, LA IZQUIERDA  
 DE KLEMMHALTER, AUSEN, AL, LINKS



Ref.	Type	h1	h2	b1	b2	l1	l2	1 incl.	2 excl.	3 excl.	4 incl.	5 incl.	6 incl.	7 excl.
74.102.2030	AL 2020-16LH	20	20	20	20	128,6	30	74.398.0260	74.398.0285	74.398.0500	74.398.0130	74.398.0115	T10	16EL

› **74.125 Phantom**

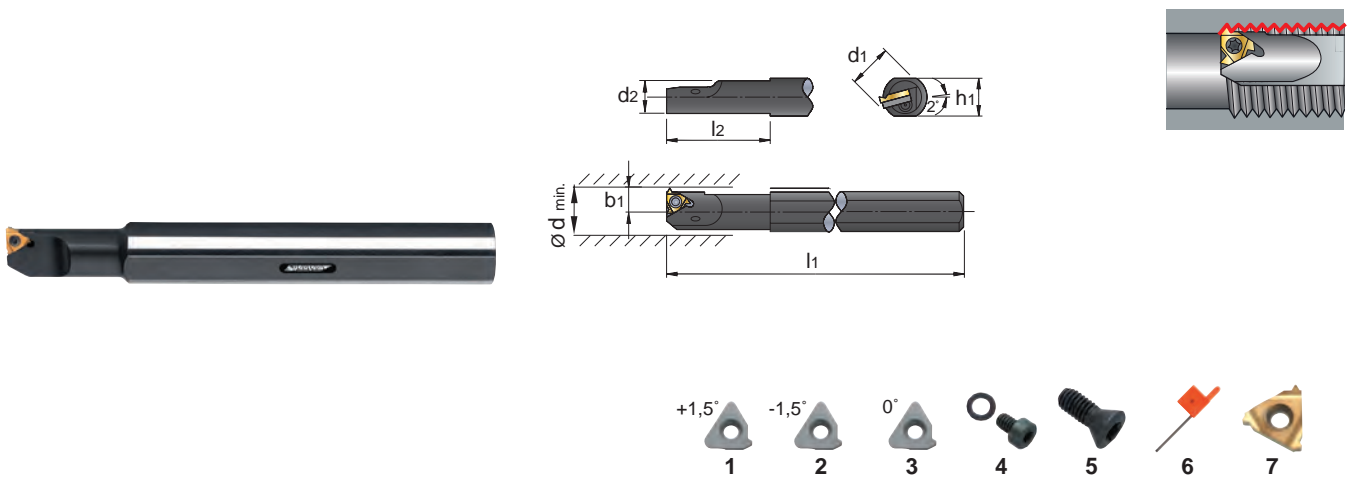
NL DRAADSNIJHOUDER, INWENDIG, NVR EN AVR, RECHTS  
 FR OUTIL A FILETER, INTERIEUR, NVR ET AVR, A DROITE  
 ES PORTAPLAQUITA PARA ROSCAR, INTERIOR, NVR Y AVR, DCHA  
 DE KLEMMHALTER, INNEN, NVR UND AVR, RECHTS



Ref.	Type	d1	h1	l1	d2	l2	b1	d min.	1 incl.	2 excl.	3 excl.	4 incl.	5 incl.	6 incl.	7 excl.
74.125.1020	NVR 10-11	20	18	180	10	25	7,3	13	-	-	-	-	74.398.0100	T8	11IR
74.125.1330	NVR 13-16	20	18	180	12,7	32	8,9	17	-	-	-	-	74.398.0105	T10	16IR
74.125.1630	NVR 16-16	20	18	180	16	40	11,5	20	-	-	-	-	74.398.0105	T10	16IR
74.125.2030	AVR 20-16	20	18	180	24,6	40	13,4	24	74.398.0260	74.398.0285	74.398.0500	74.398.0130	74.398.0115	T10	16IR
74.125.2230	AVR 25-16	25	22,6	200	25	45	16,1	29	74.398.0260	74.398.0285	74.398.0500	74.398.0130	74.398.0115	T10	16IR
74.125.2530	AVR 25-16	32	29	250	25	60	16,3	29	74.398.0260	74.398.0285	74.398.0500	74.398.0130	74.398.0115	T10	16IR
74.125.2540	AVR 25-22	32	29	250	32	60	17,4	32	74.398.0290	74.398.0315	-	74.398.0135	74.398.0120	T20	22IR
74.125.3230	AVR 32-16	32	29	250	32	60	19,6	36	74.398.0260	74.398.0285	74.398.0500	74.398.0130	74.398.0115	T10	16IR
74.125.3240	AVR 32-22	40	29	250	40	60	21,5	39	74.398.0290	74.398.0315	-	74.398.0135	74.398.0120	T20	22IR
74.125.4030	AVR 40-16	40	36	300	40	60	23,8	44	74.398.0260	74.398.0285	74.398.0500	74.398.0130	74.398.0115	T10	16IR

› **74.126 Phantom**

NL DRAADSNIJHOUDER, INWENDIG, NVR EN AVR, LINKS  
 FR OUTIL A FILETER, INTERIEUR, NVR ET AVR, À GAUCHE  
 ES PORTAPLAQUITA PARA ROSCAR, INTERIOR, NVR Y AVR, LA IZQUIERDA  
 DE KLEMMHALTER, INNEN, NVR UND AVR, LINKS

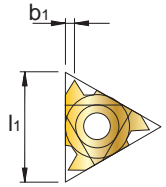


Ref.	Type	d1	h1	l1	d2	l2	b1	d min.	1 incl.	2 excl.	3 excl.	4 incl.	5 incl.	6 incl.	7 excl.
74.126.1630	NVR 16-16LH	20	18	180	16	40	11,5	20	-	-	-	-	74.398.0105	T10	16IL




**> 74.150 ER 60° UNI Phantom**

NL DRAADSNIJWISSELPLAAT, DEELPROFIEL  
 FR PLAQUETTE A FILETER, PROFIL PARTIEL  
 ES PLAQUITA PARA ROSCAR, PERFIL PARCIAL  
 DE GEWINDESCHNEIDPLATTE, TEILPROFIL


**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	P (Inch)	ap (mm)	
74.150.0220	16ER AG60	UI20	16	1,7	0,5-3	48-8	0,08-0,33	
74.150.0240	16ER G60	UI20	16	1,7	1,75-3	14-8	0,08-0,33	
74.150.0270	22ER N60	UI20	22	2,5	3,5-5	7-5	0,19-0,42	

**> 74.151 EL 60° UNI Phantom**
**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	P (Inch)	ap (mm)	
74.151.0220	16EL AG60	UI20	16	1,7	0,5-3	48-8	0,08-0,33	

**> 74.155 IR 60° UNI Phantom**
**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	P (Inch)	ap (mm)	
74.155.0070	11IR A60	UI20	11	0,9	0,5-1,5	48-16	0,08-0,25	
74.155.0220	16IR AG60	UI20	16	1,7	0,5-3	48-8	0,08-0,33	
74.155.0240	16IR G60	UI20	16	1,7	1,75-3	14-8	0,08-0,33	
74.155.0270	22IR N60	UI20	22	2,5	3,5-5	7-8	0,19-0,42	

**> 74.156 IL 60° UNI Phantom**
**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	P (Inch)	ap (mm)	
74.156.0220	16IL AG60	UI20	16	1,7	0,5-3	48-8	0,08-0,33	

**> 74.160 ER 55° UNI Phantom**
**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	P (Inch)	ap (mm)	
74.160.0220	16ER AG55	UI20	16	1,7	0,5-3	48-8	0,08-0,33	
74.160.0270	22ER N55	UI20	22	2,5	3,5-5	7-5	0,19-0,42	

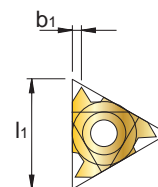
**> 74.165 IR 55° UNI Phantom**
**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	P (Inch)	ap (mm)	
74.165.0070	11IR A55	UI20	11	0,9	0,5-1,5	48-16	0,08-0,25	
74.165.0220	16IR AG55	UI20	16	1,7	0,5-3	48-8	0,08-0,33	
74.165.0270	22IR N55	UI20	22	2,5	3,5-5	7-5	0,19-0,42	



> **74.170** ER 60° M UNI-INOX **Phantom**

NL DRAADSNIJWISSELPLAAT, VOLPROFIEL  
 FR PLAQUETTE A FILETER, PROFIL PLEIN  
 ES PLAQUITA PARA ROSCAR, PERFIL COMPLET  
 DE GEWINDESCHNEIDPLATTE, VOLLPROFIL



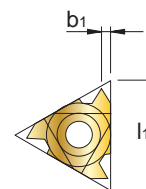
**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	ap [mm]	x ap (mm)
74.170.0720	16ER 0,5ISO	UI20	16	0,4	0,5	0,08-0,12	4-6
74.170.0730	16ER 0,5ISO	MSI20	16	0,4	0,5	0,08-0,12	4-6
74.170.0800	16ER 0,7ISO	UI20	16	0,6	0,7	0,1-0,18	4-7
74.170.0870	16ER 0,75ISO	UI20	16	0,6	0,75	0,1-0,18	4-7
74.170.0875	16ER 0,8ISO	UI20	16	0,7	0,8	0,1-0,18	4-6
74.170.0970	16ER 1,0ISO	UI20	16	0,7	1	0,12-0,25	4-8
74.170.0990	16ER 1,0ISO	MSI20	16	0,7	1	0,12-0,25	4-8
74.170.1020	16ER 1,25ISO	UI20	16	0,9	1,25	0,13-0,25	5-9
74.170.1040	16ER 1,25ISO	MSI20	16	0,9	1,25	0,13-0,25	5-9
74.170.1070	16ER 1,5ISO	UI20	16	1	1,5	0,15-0,25	6-10
74.170.1090	16ER 1,5ISO	MSI20	16	1	1,5	0,15-0,25	6-10
74.170.1120	16ER 1,75ISO	UI20	16	1,2	1,75	0,15-0,25	7-12
74.170.1140	16ER 1,75ISO	MSI20	16	1,2	1,75	0,15-0,25	7-12
74.170.1170	16ER 2,0ISO	UI20	16	1,3	2	0,16-0,28	7-12
74.170.1190	16ER 2,0ISO	MSI20	16	1,3	2	0,16-0,28	7-12
74.170.1220	16ER 2,5ISO	UI20	16	1,5	2,5	0,18-0,32	8-14
74.170.1240	16ER 2,5ISO	MSI20	16	1,5	2,5	0,19-0,33	8-14
74.170.1270	16ER 3,0ISO	UI20	16	1,6	3	0,19-0,33	9-16
74.170.1290	16ER 3,0ISO	MSI20	16	1,6	3	0,19-0,33	9-16
74.170.1320	22ER 3,5ISO	UI20	22	2,3	3,5	0,2-0,35	10-18
74.170.1370	22ER 4,0ISO	UI20	22	2,3	4	0,22-0,36	11-18
74.170.1420	22ER 4,5ISO	UI20	22	2,4	4,5	0,24-0,4	11-19
74.170.1470	22ER 5,0ISO	UI20	22	2,5	5	0,25-0,42	12-20
74.170.1520	22ER 6,0ISO	UI20	22	2,7	6	0,3-0,5	12-20




**> 74.175 IR 60° M UNI-INOX Phantom**

NL DRAADSNIJWISSELPLAAT, VOLPROFIEL  
 FR PLAQUETTE A FILETER, PROFIL PLEIN  
 ES PLAQUITA PARA ROSCAR, PERFIL COMPLET  
 DE GEWINDESCHNEIDPLATTE, VOLLPROFIL

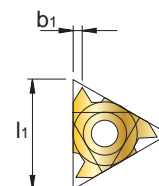

**P M K N S**

Ref.	Type	HM	l1	b1	P (mm)	ap [mm]	x ap (mm)
74.175.0175	11IR 0,5ISO	UI20	11	0,4	0,5	0,08-0,12	4-6
74.175.0320	11IR 0,75ISO	UI20	11	0,6	0,75	0,1-0,18	4-7
74.175.0420	11IR 1,0ISO	UI20	11	0,7	1	0,12-0,25	4-8
74.175.0470	11IR 1,25ISO	UI20	11	0,9	1,25	0,14-0,25	5-9
74.175.0520	11IR 1,5ISO	UI20	11	1	1,5	0,15-0,25	6-10
74.175.0530	11IR 1,5ISO	MSI20	11	1	1,5	0,15-0,25	6-9
74.175.0570	11IR 1,75ISO	UI20	11	1,1	1,75	0,15-0,25	7-12
74.175.0610	11IR 2,0ISO	UI20	11	1,1	2	0,16-0,28	7-12
74.175.0650	11IR 2,5ISO	UI20	11	1,1	2,5	0,18-0,32	8-14
74.175.0720	16IR 0,5ISO	UI20	16	0,4	0,5	0,08-0,12	4-6
74.175.0970	16IR 1,0ISO	UI20	16	0,7	1	0,12-0,25	4-8
74.175.0990	16IR 1,0ISO	MSI20	16	0,7	1	0,12-0,25	4-7
74.175.1020	16IR 1,25ISO	UI20	16	0,9	1,25	0,12-0,25	5-9
74.175.1040	16IR 1,25ISO	MSI20	16	0,9	1,25	0,14-0,25	5-8
74.175.1070	16IR 1,5ISO	UI20	16	1	1,5	0,14-0,25	6-10
74.175.1090	16IR 1,5ISO	MSI20	16	1	1,5	0,15-0,25	6-9
74.175.1120	16IR 1,75ISO	UI20	16	1,2	1,75	0,15-0,25	7-12
74.175.1140	16IR 1,75ISO	MSI20	16	1,2	1,75	0,15-0,25	7-11
74.175.1175	16IR 2,0ISO	UI20	16	1,3	2	0,16-0,28	7-12
74.175.1190	16IR 2,0ISO	MSI20	16	1,3	2	0,16-0,28	7-11
74.175.1220	16IR 2,5ISO	UI20	16	1,5	2,5	0,18-0,32	8-14
74.175.1240	16IR 2,5ISO	MSI20	16	1,5	2,5	0,18-0,32	8-12
74.175.1270	16IR 3,0ISO	UI20	16	1,6	3	0,19-0,33	9-16
74.175.1300	16IR 3,5ISO	UI20	16	1,9	3,5	0,2-0,35	10-18
74.175.1320	22IR 3,5ISO	UI20	22	2,3	3,5	0,2-0,35	10-18
74.175.1370	22IR 4,0ISO	UI20	22	2,3	4	0,22-0,36	11-18
74.175.1420	22IR 4,5ISO	UI20	22	2,4	4,5	0,24-0,4	11-19
74.175.1470	22IR 5,0ISO	UI20	22	2,3	5	0,25-0,42	12-20



> **74.180** ER 55° UN **Phantom**

NL DRAADSNIJWISSELPLAAT, VOLPROFIEL  
 FR PLAQUETTE A FILETER, PROFIL PLEIN  
 ES PLAQUITA PARA ROSCAR, PERFIL COMPLET  
 DE GEWINDESCHNEIDPLATTE, VOLLPROFIL



**P M K N S**

Ref.	Type	HM	l1	b1	P (Inch)	ap [mm]	x ap (mm)	
74.180.1370	16ER 20UN	UI20	16	0,9	20	0,12-0,25	5-9	
74.180.1420	16ER 18UN	UI20	16	1	18	0,12-0,25	5-9	
74.180.1470	16ER 16UN	UI20	16	1,1	16	0,14-0,25	6-10	
74.180.1520	16ER 14UN	UI20	16	1,2	14	0,15-0,25	7-12	
74.180.1570	16ER 13UN	UI20	16	1,3	13	0,15-0,25	7-12	
74.180.1620	16ER 12UN	UI20	16	1,4	12	0,15-0,25	7-12	
74.180.1770	16ER 10UN	UI20	16	1,5	10	0,16-0,28	8-14	
74.180.1870	16ER 8UN	UI20	16	1,7	8	0,18-0,32	8-14	

> **74.185** IR 55° UN **Phantom**

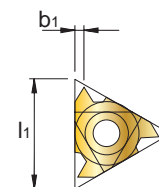
**P M K N S**

Ref.	Type	HM	l1	b1	P (Inch)	ap [mm]	x ap (mm)	
74.185.0620	11IR 20UN	UI20	16	0,9	20	0,12-0,25	5-9	
74.185.0670	11IR 18UN	UI20	16	1	18	0,12-0,25	5-9	
74.185.1470	16IR 16UN	UI20	16	1,1	16	0,14-0,25	6-10	
74.185.1520	16IR 14UN	UI20	16	1,2	14	0,15-0,25	7-12	
74.185.1570	16IR 13UN	UI20	16	1,3	13	0,15-0,25	7-12	
74.185.1620	16IR 12UN	UI20	16	1,4	12	0,15-0,25	7-12	
74.185.1770	16IR 10UN	UI20	16	1,5	10	0,16-0,28	8-14	
74.185.1870	16IR 8UN	UI20	16	1,7	8	0,18-0,32	8-14	




**> 74.190 ER 55° BSP-BSW Phantom**

NL DRAADSNIJWISSELPLAAT, VOLPROFIEL  
 FR PLAQUETTE A FILETER, PROFIL PLEIN  
 ES PLAQUITA PARA ROSCAR, PERFIL COMPLET  
 DE GEWINDESCHNEIDPLATTE, VOLLPROFIL


**P M K N S**

Ref.	Type	HM	l1	b1	P (Inch)	ap [mm]	x ap (mm)
74.190.1270	16ER 28W	UI20	16	0,7	28	0,1-0,18	4-7
74.190.1520	16ER 19W	UI20	16	1	19	0,12-0,25	5-9
74.190.1570	16ER 18W	UI20	16	1	18	0,14-0,25	5-9
74.190.1620	16ER 16W	UI20	16	1,1	16	0,15-0,25	5-9
74.190.1670	16ER 14W	UI20	16	1,2	14	0,15-0,25	7-12
74.190.1690	16ER 14W	MSI20	16	1,2	14	0,15-0,25	7-12
74.190.1720	16ER 12W	UI20	16	1,4	12	0,15-0,25	7-12
74.190.1770	16ER 11W	UI20	16	1,5	11	0,16-0,28	7-12
74.190.1780	16ER 11W	MSI20	16	1,5	11	0,16-0,28	7-12
74.190.1820	16ER 10W	UI20	16	1,5	10	0,16-0,28	8-14
74.190.1870	16ER 9W	UI20	16	1,7	9	0,16-0,28	8-14

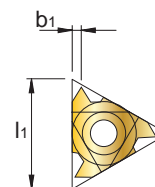

**> 74.195 IR 55° BSP-BSW Phantom**
**P M K N S**

Ref.	Type	HM	l1	b1	P (Inch)	ap [mm]	x ap (mm)
74.195.0420	11IR 28W	UI20	11	0,7	28	0,1-0,18	4-7
74.195.0670	11IR 19W	UI20	11	1	19	0,12-0,25	5-9
74.195.0720	11IR 18W	UI20	11	1	18	0,14-0,25	5-9
74.195.0770	11IR 16W	UI20	11	1,1	16	0,15-0,25	6-10
74.195.0820	11IR 14W	UI20	11	1,1	14	0,15-0,25	7-12
74.195.1470	16IR 19W	UI20	16	1	19	0,12-0,25	5-9
74.195.1520	16IR 18W	UI20	16	1	18	0,14-0,25	5-9
74.195.1570	16IR 16W	UI20	16	1,1	16	0,15-0,25	6-10
74.195.1620	16IR 14W	UI20	16	1,2	14	0,15-0,25	7-12
74.195.1670	16IR 12W	UI20	16	1,4	12	0,15-0,25	7-12
74.195.1720	16IR 11W	UI20	16	1,5	11	0,16-0,28	7-12
74.195.1770	16IR 10W	UI20	16	1,5	10	0,16-0,28	8-14
74.195.1820	16IR 9W	UI20	16	1,7	9	0,16-0,28	8-14



> **74.240** ER 55° TR **Phantom**

NL DRAADSNIJWISSELPLAAT, VOLPROFIEL  
 FR PLAQUETTE A FILETER, PROFIL PLEIN  
 ES PLAQUITA PARA ROSCAR, PERFIL COMPLET  
 DE GEWINDESCHNEIDPLATTE, VOLLPROFIL



**P**

Ref.	Type	HM	l1	b1	P (Inch)	ap [mm]	x ap (mm)	
74.240.1050	16ER 1,5TR	P30	16	1,1	1,5	0,15-0,25	6	
74.240.1150	16ER 2,0TR	P30	16	1,3	2	0,16-0,28	8	
74.240.1250	16ER 3,0TR	P30	16	1,5	3	0,19-0,33	12	
74.240.1370	22ER 4,0TR	P30	22	1,9	4	0,22-0,36	13	
74.240.1450	22ER 5,0TR	P30	22	2,5	5	0,25-0,42	14	

> **74.245** IR 55° TR **Phantom**

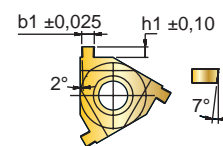
**P**

Ref.	Type	HM	l1	b1	P (Inch)	ap [mm]	x ap (mm)	
74.245.1050	16IR 1,5TR	P30	16	1,1	1,5	0,15-0,25	6	
74.245.1150	16IR 2,0TR	P30	16	1,3	2	0,16-0,28	8	
74.245.1250	16IR 3,0TR	P30	16	1,5	3	0,19-0,33	12	
74.245.1370	22IR 4,0TR	P30	22	1,9	4	0,22-0,36	13	
74.245.1450	22IR 5,0TR	P30	22	2,5	5	0,25-0,42	14	




**> 74.390 ER DIN 471 Phantom**

NL BORGRINGWISSELPLAAT  
 FR PLAQUETTE POUR GORGES DE CIRCLIPS  
 ES PLAQUITA PARA ARANDELAS DE RETENCION  
 DE SCHNEIDPLATTE


**P M K N**

Ref.	Type	HM	l1	h1	b1	m H13	
74.390.0070	16ER 1,10-1,30 UI20	UI20	16	1,3	1,19	1,1	
74.390.0170	16ER 1,30-1,50 UI20	UI20	16	1,5	1,39	1,3	
74.390.0220	16ER 1,60-1,85 UI20	UI20	16	1,8	1,69	1,6	
74.390.0270	16ER 1,85-2,00 UI20	UI20	16	2	1,94	1,85	
74.390.0320	16ER 2,15-1,50 UI20	UI20	16	1,5	2,24	2,15	

**> 74.395 IR DIN 472 Phantom**

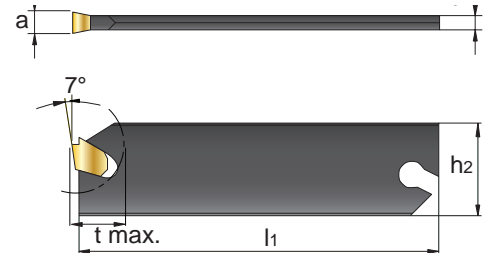
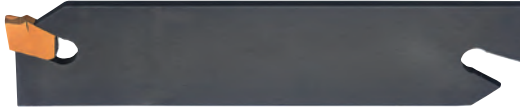
NL BORGRINGWISSELPLAAT  
 FR PLAQUETTE POUR GORGES DE CIRCLIPS  
 ES PLAQUITA PARA ARANDELAS DE RETENCION  
 DE SCHNEIDPLATTE

**P M K N**

Ref.	Type	HM	l1	h1	b1	m H13	
74.395.0070	16IR 1,10-1,30 UI20	UI20	16	1,3	1,19	1,1	
74.395.0170	16IR 1,30-1,50 UI20	UI20	16	1,5	1,39	1,3	
74.395.0220	16IR 1,60-1,85 UI20	UI20	16	1,8	1,69	1,6	
74.395.0270	16IR 1,85-2,00 UI20	UI20	16	2	1,94	1,85	
74.395.0320	16IR 2,15-1,50 UI20	UI20	16	1,5	2,24	2,15	

> **74.410** **Phantom**

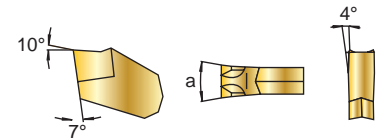
NL STEEKPLAATHOUDER FX, UITWENDIG  
 FR LAME A TRONCONNER FX, EXTERIEUR  
 ES PORTAPLAQUITA DE TRONZADO FX, EXTERIOR  
 DE STECHKLINGE FX, AUSSEN



Ref.	h2	b1	l1	t max	1 excl.
74.4100300	26	2,4	110	40	FX3
74.4100400	26	3,2	110	40	FX4
74.4101300	32	2,4	150	40	FX3
74.4101400	32	3,2	150	40	FX4

> **74.480** **FX** **Phantom**

NL STEEKPLAAT  
 FR PLAQUETTE A TRONCONNER  
 ES PLAQUITA PARA TRONZAR  
 DE STECHPLATTE



**P M K**

Ref.	a [mm]	r	Geo	HM	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
74.480.3001	3,1	0,2	UM	UI30	0,05-0,12		✓		✓	✓	✓	
74.480.4001	4,1	0,2	UM	UI30	0,05-0,15		✓		✓	✓	✓	
74.480.5001	5,1	0,2	UM	UI30	0,05-0,18		✓		✓	✓		

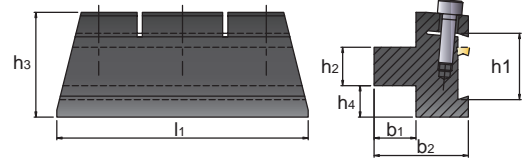






## > 74.500 Phantom

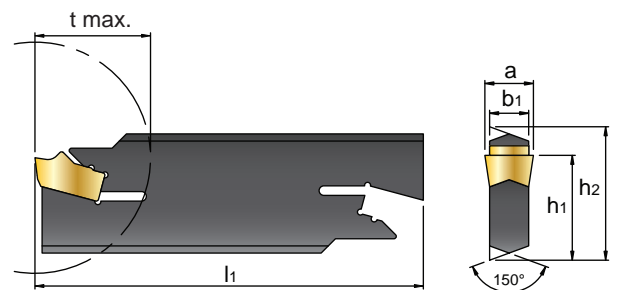
NL BASISHOUDER PTNZ  
FR BLOC PTNZ  
ES BLOQUE PTNZ  
DE GRUNDHALTER PTNZ



Ref.	Type	h1	h2	h3	h4	b1	b2	l1	1 incl.	2 incl.
74.500.1626	PTNZ 16-26	26	16	39	12	16	29	90	74.998.0005	SW5
74.500.2026	PTNZ 20-26	26	20	39	8	20	33	90	74.998.0005	SW5
74.500.2532	PTNZ 25-32	32	25	48	8	20	36	110	74.998.0005	SW5

## > 74.510 Phantom

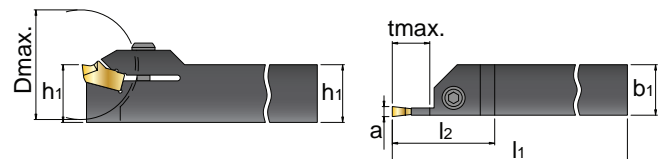
NL STEEKPLAATHOUDER EXN, UITWENDIG  
FR LAME A TRONCONNER EXN, EXTERIEUR  
ES PORTAPLAQUITA DE TRONZADO EXN, EXTERIOR  
DE STECHKLINGE EXN, AUSEN



Ref.	Type	h2	l1	a	b1	t max.	1 incl.	2 excl.
74.5100200	26-2,2	26	110	2,2	1,8	25	74.998.0016	EXN 2,2
74.5100300	26-3	26	110	3	2,4	40	74.998.0016	EX . 3 - RXN 3
74.5100400	26-4	26	110	4	3	40	74.998.0016	EX . 4 - RXN 4
74.5101300	32-3	32	150	3	2,4	50	74.998.0016	EX . 3 - RXN 3
74.5101400	32-4	32	150	4	3	50	74.998.0016	EX . 4 - RXN 4
74.5101500	32-5	32	110	5	4,4	60	74.998.0016	EX . 5 - RXN 5

## > 74.517 Phantom

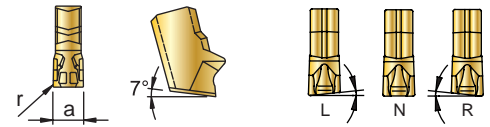
NL STEEKPLAATHOUDER EXN, UITWENDIG  
FR LAME A TRONCONNER EXN, EXTERIEUR  
ES PORTAPLAQUITA DE TRONZADO EXN, EXTERIOR  
DE STECHHALTER EXN, AUSEN



Ref.	Type	l1	a	t max.	h1	b1	l2	d max.	1 incl.	2 incl.	3 excl.
74.5171122	R1212-2,2	91	2,2	11	12	12	25	22	74.998.0019	SW5	EXN 2,2
74.5171162	R1616-2,2	95	2,2	16	16	12	29	32	74.998.0019	SW5	EXN 2,2
74.5171163	R1616-3	95	3	16	16	12	29	32	74.998.0019	SW5	EX . 3 - RXN 3
74.5171203	R2020-3	150	3	21	20	16	35	42	74.998.0021	SW5	EX . 3 - RXN 3
74.5171204	R2020-4	150	4	21	20	16	35	42	74.998.0021	SW5	EX . 4 - RXN 4
74.5171253	R2525-3	150	3	21	25	20	35	42	74.998.0021	SW5	EX . 3 - RXN 3
74.5171254	R2525-4	150	4	21	25	20	35	42	74.998.0021	SW5	EX . 4 - RXN 4
74.5172203	L2020-3	150	3	21	20	16	35	42	74.998.0021	SW5	EX . 3 - RXN 3
74.5172253	L2525-3	150	3	21	25	20	35	42	74.998.0021	SW5	EX . 3 - RXN 3

> **74.582** **EX** **Phantom**

NL STEEKPLAAT, ENKEL  
 FR PLAQUETTE A TRONCONNER, SIMPLE  
 ES PLAQUITA PARA TRONZAR, SIMPLE  
 DE STECHPLATTE, NUR



**P M K**

Ref.	Type	a [mm]	r	Geo	HM	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
74.582.2000	EXN	2,2	0,2	NM	K10	0,05-0,09		✓		✓			
74.582.2003	EXN	2,2	0,2	PM	UI30	0,05-0,09		✓		✓			
74.582.3000	EXN	3	0,2	NM	K10	0,05-0,12		✓		✓			
74.582.3001	EXN	3	0,2	MM	UI30	0,05-0,12		✓		✓			
74.582.3003	EXN	3	0,2	PM	UI30	0,05-0,12		✓		✓			
74.582.3008	EXR	3	0,2	PM	UI30	0,05-0,12		✓		✓			
74.582.3012	EXL	3	0,2	PM	UI30	0,05-0,12		✓		✓			
74.582.4001	EXN	4	0,2	MM	UI30	0,05-0,15		✓		✓			
74.582.4003	EXN	4	0,2	PM	UI30	0,05-0,15		✓		✓			
74.582.4008	EXR	4	0,2	PM	UI30	0,05-0,15		✓		✓			
74.582.4012	EXL	4	0,2	PM	UI30	0,05-0,15		✓		✓			
74.582.5003	EXN	5	0,3	PM	UI30	0,05-0,18		✓		✓			

> **74.599** **RXN** **Phantom**

**P M K**

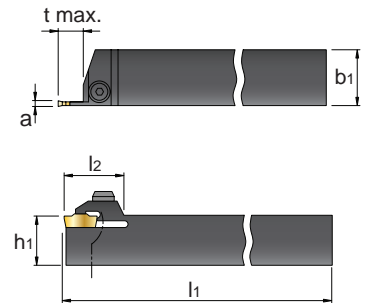
Ref.	Type	a [mm]	r	Geo	HM	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
74.599.3003	RXN	3	1,5	PM	UI30	0,05-0,09		✓		✓			
74.599.4003	RXN	4	2	PM	UI30	0,05-0,09		✓		✓			
74.599.5003	RXN	5	2,5	PM	UI30	0,05-0,09		✓		✓			





### > 74.522 Phantom

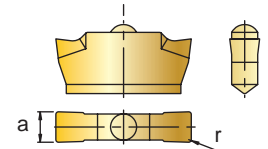
NL STEEKPLAATHOUDER EJN, UITWENDIG  
FR LAME A TRONCONNER EJN, EXTERIEUR  
ES PORTAPLAQUITA DE TRONZADO EJN, EXTERIOR  
DE STECHHALTER EJN, AUSSEN



Ref.	Type	h1	b1	l1	l2	a	t max	1 incl.	2 incl.	3 excl.
74.522.1163	R1616-3-4	16	16	100	30	3-4	12	74.998.0019	SW5	DXN 3 - DXN 4
74.522.1203	R2020-3	20	20	120	30	3-4	12	74.998.0021	SW5	DXN 3 - DXN 4
74.522.1253	R2525-3	25	25	120	30	3-4	12	74.998.0021	SW5	DXN 3 - DXN 4

### > 74.596 DXN Phantom

NL STEEKPLAAT, DUBBEL  
FR PLAQUETTE A TRONCONNER, DOUBLE  
ES PLAQUITA PARA TRONZAR, DOBLE  
DE STECHPLATTE, DOPPELSEITIG

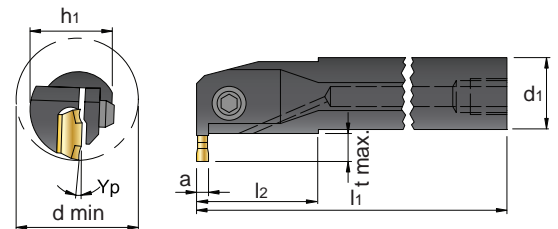


**P M**

Ref.	a [mm]	r	HM	f <sub>n</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
75.596.3003	3	0,15	PC30	0,05-0,12	0,05-0,09		✓		✓			
75.596.4003	4	0,2	PC30	0,05-0,15	0,05-0,09		✓		✓			

### > 74.540 Phantom

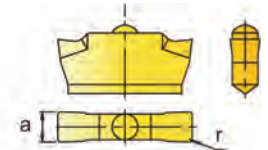
NL STEEKPLAATHOUDER EJN, INWENDIG  
FR LAME A TRONCONNER EJN, INTERIEUR  
ES PORTAPLAQUITA DE TRONZADO EJN, INTERIOR  
DE STECHHALTER EJN, INNEN



Ref.	Type	h1	d1	l1	l2	a	t max	d min	1 incl.	2 incl.	3 excl.
74.540.2003	R20-3-4	18	20	200	30	3-4	5	16,5	74.998.0031	T20	EJN 3 - EJN 4
74.540.2503	R25-3-4	23	25	200	50	3-4	5	25	74.998.0032	SW5+Rivet	EJN 3 - EJN 4

### > 74.560 Phantom

NL STEEKPLAAT, DUBBEL  
FR PLAQUETTE A TRONCONNER, DOUBLE  
ES PLAQUITA PARA TRONZAR, DOBLE  
DE STECHPLATTE, DOPPELSEITIG

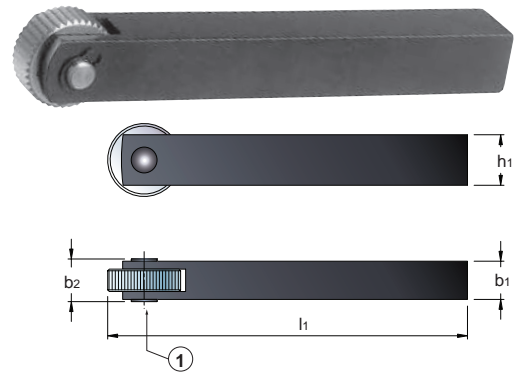


**P M**

Ref.	a [mm]	r	HM	f <sub>n</sub> (mm)	f <sub>n</sub> (mm)	▽▽▽	▽▽	▽	○	◐	◑	
74.560.3003	3	0,15	PC30	0,05-0,12	0,05-0,09		✓		✓			
74.560.4003	4	0,2	PC30	0,05-0,15	0,05-0,09		✓		✓			

> **75.100** **Phantom**

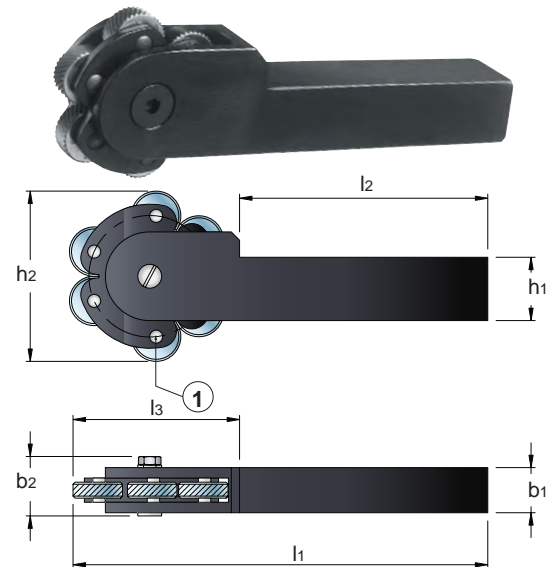
NL Drukkartelrolhouder, type M1  
 FR Outils de moletage par déformation, type M1  
 ES Moleteadores por deformación, tipo M1  
 DE Rändelhalter zur Verformung, Typ M1



Ref.	Type	Ø mm	l1	b1	b2	h1	1
75.100.1000	M1	8-200	112	14	19	14	75.290.0100
75.100.1160	M1	8-200	112	16	19	16	75.290.0100

> **75.103** **Phantom**

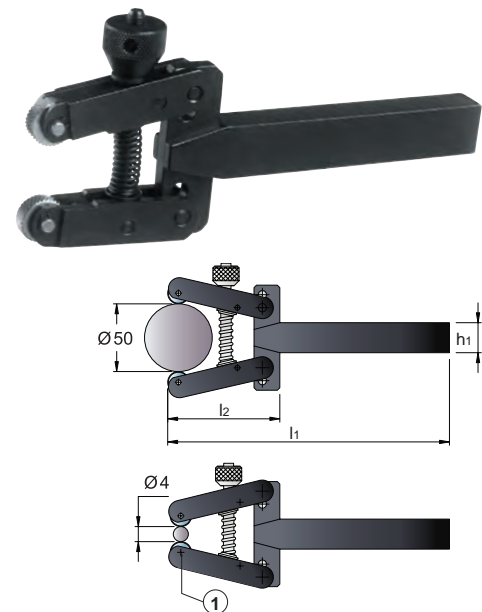
NL Drukkartelrolhouder, type M2  
 FR Outils de moletage par déformation, type M2  
 ES Moleteadores por deformación, tipo M2  
 DE Rändelhalter zur Verformung, Typ M2



Ref.	Type	Ø mm	l1	l2	l3	b1	b2	h1	h2	1
75.103.1000	M2	8-200	180	72	108	25	30	25	62	75.290.0201

> **75.106** **Phantom**

NL Drukkartelrolhouder, type M3  
 FR Outils de moletage par déformation, type M3  
 ES Moleteadores por deformación, tipo M3  
 DE Rändelhalter zur Verformung, Typ M3



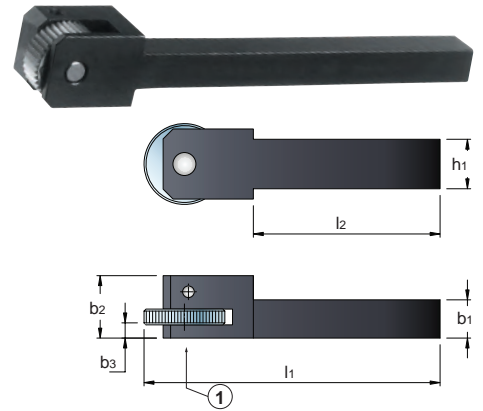
Ref.	Type	Ø mm	l1	l2	b2	h1	1
75.106.1000	M3	4-50	220	87	25	18	75.290.0301





### > 75.109 Phantom

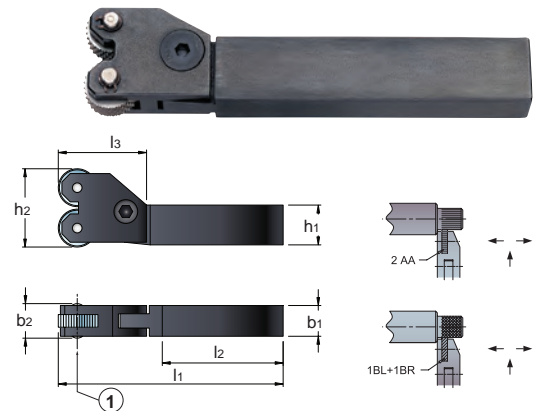
NL Drukkartelrolhouder, type M6  
 FR Outils de moletage par déformation, type M6  
 ES Moleteadores por deformación, tipo M6  
 DE Rändelhalter zur Verformung, Typ M6



Ref.	Type	Ø mm	l1	l2	b1	b2	b3	h1	1
75.109.1010	M6-2008-10	5-200	108	80	10	20	2.5	10	75.290.0600
75.109.1212	M6-2008-12	5-200	108	80	12	20	2.5	12	75.290.0600
75.109.1414	M6-2008-14	5-200	108	80	14	20	2.5	14	75.290.0600
75.109.1616	M6-2008-16	5-200	108	80	16	20	2.5	16	75.290.0600
75.109.2020	M6-2008-20	5-200	108	80	20	20	2.5	20	75.290.0600

### > 75.115 Phantom

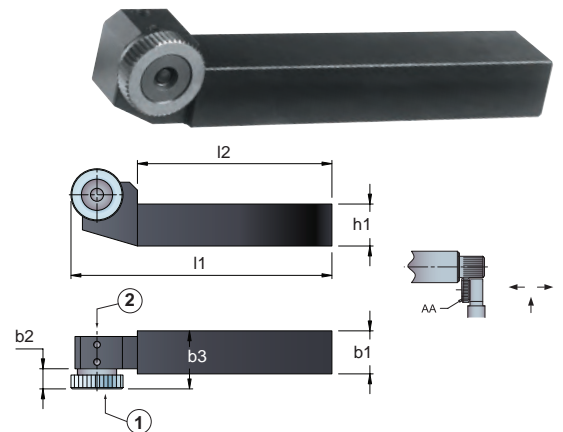
NL Drukkartelrolhouder, type M7  
 FR Outils de moletage par déformation, type M7  
 ES Moleteadores por deformación, tipo M7  
 DE Rändelhalter zur Verformung, Typ M7



Ref.	Type	Ø mm	l1	l2	l3	b1	b2	h1	h2	1
75.115.1000	M7	8-200	162	115	42	18	18	25	42	75.290.0301

### > 75.121 Phantom

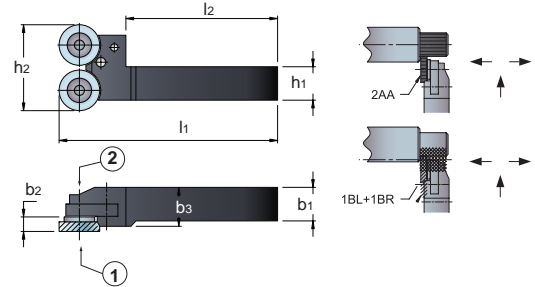
NL Drukkartelrolhouder, type MCNCS  
 FR Outils de moletage par déformation, type MCNCS  
 ES Moleteadores por deformación, tipo MCNCS  
 DE Rändelhalter zur Verformung, Typ MCNCS



Ref.	Type	Ø mm	l1	l2	b1	b3	b2	h1	1	2
75.121.2520	MCNCS	8-200	150	125	25	32	10	20	75.290.0902	75.290.1001
75.121.2532	MCNCS	8-200	150	125	25	32	10	25	75.290.0902	75.290.1001

> **75.125 Phantom**

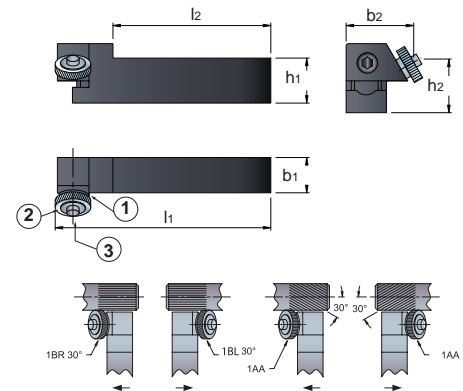
NL Drukkartelrolhouder, type MCNC  
 FR Outils de moletage par déformation, type MCNC  
 ES Moleteadores por deformación, tipo MCNC  
 DE Rändelhalter zur Verformung, Typ MCNC



Ref.	Type	Ø mm	l1	l2	b1	b2	b3	h1	h2	1	2
75.125.2025	MCNC	8-200	150	112	25	32	55	20	55	75.290.1002	75.290.1001
75.125.2525	MCNC	8-200	150	112	25	32	55	25	55	75.290.1002	75.290.1001

> **75.129 Phantom**

NL Freeskartelrolhouder, type MFCNCS  
 FR Outils de moletage par coupe, type MFCNCS  
 ES Moleteadores por corte, tipo MFCNCS  
 DE Rändelfräshalter, Typ MFCNCS



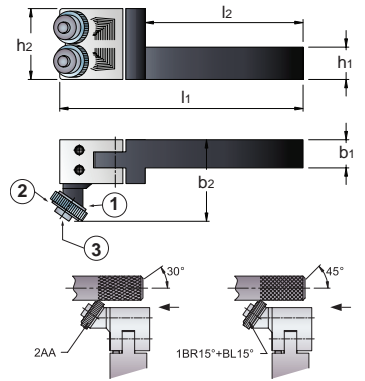
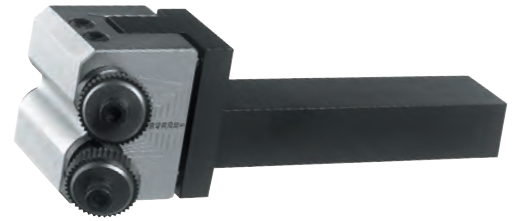
Ref.	Type	Ø mm	l1	l2	b1	b2	h1	h2	1	2	3
75.129.2025	MFCNCS	5-250	150	114	25	39	20	20	75.290.1101	75.290.1400	75.290.1600
75.129.2525	MFCNCS	5-250	150	114	25	39	25	25	75.290.1101	75.290.1400	75.290.1600





## > 75.133 Phantom

NL Freeskartelrolhouder, type MFCNC  
 FR Outils de moletage par coupe, type MFCNC  
 ES Moleteadores por corte, tipo MFCNC  
 DE Rändelfräshalter, Typ MFCNC

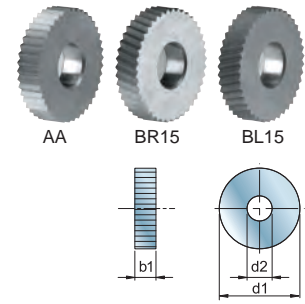


Ref.	Type	Ø mm	l1	l2	b1	b2	h1	h2	1	2	3
75.133.1616	MFCNC	4-50	120	78	16	44	16	35	75.290.1201	75.290.1300	75.290.1500
75.133.2025	MFCNC	5-250	165	112	25	63	20	50	75.290.1101	75.290.1400	75.290.1600
75.133.2525	MFCNC	5-250	165	112	25	63	25	50	75.290.1101	75.290.1400	75.290.1600



> **75.158 Phantom**

NL HSS-Co Frees Kartelrol, MFCNC 16x16  
 FR Molette de fraisage HSS-Co, MFCNC 16x16  
 ES Moleta de corte HSS-Co, MFCNC 16x16  
 DE HSS-Co Rändelfräsräder, MFCNC 16x16

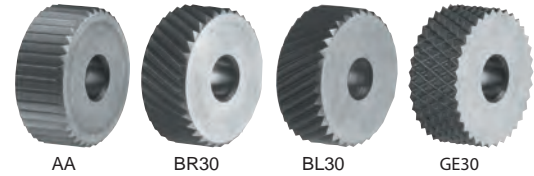


Ref.	Type	d1	d2	b1	t
75.158.1010	AA 14,5E3	14.5	5	3	1
75.158.2010	BL15 14,5E3	14.5	5	3	1

Ref.	Type	d1	d2	b1	t
75.158.3010	BR15 14,5E3	14.5	5	3	1

> **75.174 Phantom**

NL HSS-Co Druk-Kartelrol, M1, M2, M3, M6, M7  
 FR Molette pour moletage par déformation HSS-Co, M1, M2, M3, M6, M7  
 ES Moleta de deformación HSS-Co, M1, M2, M3, M6, M7  
 DE HSS-Co Rändelräder, M1, M2, M3, M6, M7

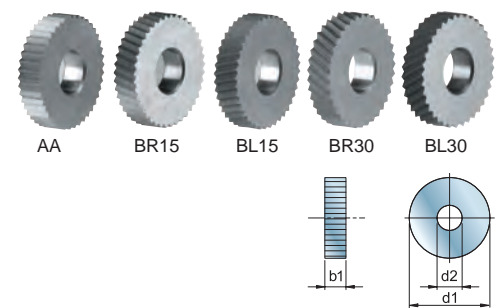


Ref.	Type	d1	d2	b1	t
75.174.1006	AA 20E8	20	6	8	0,6
75.174.1008	AA 20E8	20	6	8	0,8
75.174.1010	AA 20E8	20	6	8	1
75.174.1012	AA 20E8	20	6	8	1,2
75.174.1016	AA 20E8	20	6	8	1,6
75.174.1020	AA 20E8	20	6	8	2
75.174.4006	BR30 20E8	20	6	8	0,6
75.174.4008	BR30 20E8	20	6	8	0,8
75.174.4010	BR30 20E8	20	6	8	1
75.174.4012	BR30 20E8	20	6	8	1,2
75.174.4016	BR30 20E8	20	6	8	1,6
75.174.4018	BR30 20E8	20	6	8	1,8
75.174.4020	BR30 20E8	20	6	8	2

Ref.	Type	d1	d2	b1	t
75.174.5006	BL30 20E8	20	6	8	0,6
75.174.5008	BL30 20E8	20	6	8	0,8
75.174.5010	BL30 20E8	20	6	8	1
75.174.5012	BL30 20E8	20	6	8	1,2
75.174.5016	BL30 20E8	20	6	8	1,6
75.174.5018	BL30 20E8	20	6	8	1,8
75.174.5020	BL30 20E8	20	6	8	2
75.174.6006	GE30 20E8	20	6	8	0,6
75.174.6008	GE30 20E8	20	6	8	0,8
75.174.6010	GE30 20E8	20	6	8	1
75.174.6012	GE30 20E8	20	6	8	1,2
75.174.6016	GE30 20E8	20	6	8	1,6
75.174.6020	GE30 20E8	20	6	8	2

> **75.182 Phantom**

NL HSS-Co Frees Kartelrol, MFCNCS, MFCNC 20x25 - 25x25  
 FR Molette de fraisage HSS-Co, MFCNCS, MFCNC 20x25 - 25x25  
 ES Moleta de corte HSS-Co, MFCNCS, MFCNC 20x25 - 25x25  
 DE HSS-Co Rändelfräsräder, MFCNCS, MFCNC 20x25 - 25x25



Ref.	Type	d1	d2	b1	t
75.182.1005	AA 21,5E5	21.5	8	5	0,5
75.182.1006	AA 21,5E5	21.5	8	5	0,6
75.182.1008	AA 21,5E5	21.5	8	5	0,8
75.182.1010	AA 21,5E5	21.5	8	5	1
75.182.1012	AA 21,5E5	21.5	8	5	1,2
75.182.1016	AA 21,5E5	21.5	8	5	1,6
75.182.1020	AA 21,5E5	21.5	8	5	2
75.182.2006	BR15 21,5E5	21.5	8	5	0,6
75.182.2008	BR15 21,5E5	21.5	8	5	0,8
75.182.2010	BR15 21,5E5	21.5	8	5	1
75.182.2012	BR15 21,5E5	21.5	8	5	1,2
75.182.2016	BR15 21,5E5	21.5	8	5	1,6
75.182.2020	BR15 21,5E5	21.5	8	5	2
75.182.3006	BL15 21,5E5	21.5	8	5	0,6
75.182.3008	BL15 21,5E5	21.5	8	5	0,8
75.182.3010	BL15 21,5E5	21.5	8	5	1

Ref.	Type	d1	d2	b1	t
75.182.3012	BL15 21,5E5	21.5	8	5	1,2
75.182.3016	BL15 21,5E5	21.5	8	5	1,6
75.182.3020	BL15 21,5E5	21.5	8	5	2
75.182.4005	BR30 21,5E5	21.5	8	5	0,5
75.182.4006	BR30 21,5E5	21.5	8	5	0,6
75.182.4008	BR30 21,5E5	21.5	8	5	0,8
75.182.4010	BR30 21,5E5	21.5	8	5	1
75.182.4012	BR30 21,5E5	21.5	8	5	1,2
75.182.4016	BR30 21,5E5	21.5	8	5	1,6
75.182.4020	BR30 21,5E5	21.5	8	5	2
75.182.5006	BL30 21,5E5	21.5	8	5	0,6
75.182.5008	BL30 21,5E5	21.5	8	5	0,8
75.182.5010	BL30 21,5E5	21.5	8	5	1
75.182.5012	BL30 21,5E5	21.5	8	5	1,2
75.182.5016	BL30 21,5E5	21.5	8	5	1,6
75.182.5020	BL30 21,5E5	21.5	8	5	2





## > 75.197 Phantom

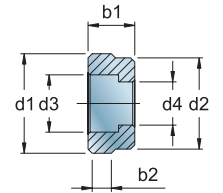
NL HSS-Co Druk-Kartelrol, MCNCS, MCNC  
 FR Molette pour moletage par déformation HSS-Co, MCNCS, MCNC  
 ES Moleta de deformación HSS-Co, MCNCS, MCNC  
 DE HSS-Co Rändelräder, MCNCS, MCNC



AA

BR30

BL30

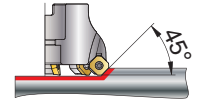
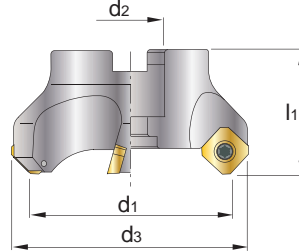


Ref.	Type	d1	d2	d3	d4	b1	t
75.197.1006	AA 25D11	25	22	15	11	10	6
75.197.1008	AA 25D11	25	22	15	11	10	0,8
75.197.1010	AA 25D11	25	22	15	11	10	1
75.197.1012	AA 25D11	25	22	15	11	10	1,2
75.197.1016	AA 25D11	25	22	15	11	10	1,6
75.197.1020	AA 25D11	25	22	15	11	10	2
75.197.4006	BR30 25D11	25	22	15	11	10	0,6
75.197.4008	BR30 25D11	25	22	15	11	10	0,8
75.197.4010	BR30 25D11	25	22	15	11	10	1

Ref.	Type	d1	d2	d3	d4	b1	t
75.197.4012	BR30 25D11	25	22	15	11	10	1,2
75.197.4016	BR30 25D11	25	22	15	11	10	1,6
75.197.4020	BR30 25D11	25	22	15	11	10	2
75.197.5006	BL30 25D11	25	22	15	11	10	0,6
75.197.5008	BL30 25D11	25	22	15	11	10	0,8
75.197.5010	BL30 25D11	25	22	15	11	10	1
75.197.5012	BL30 25D11	25	22	15	11	10	1,2
75.197.5016	BL30 25D11	25	22	15	11	10	1,6
75.197.5020	BL30 25D11	25	22	15	11	10	2

> **76.100 Phantom**

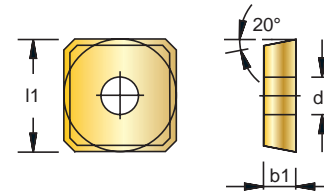
NL Vlakfrees, 45° SEHX 1204  
 FR Fraise à chanfreiner à 45° SEHX 1204  
 ES Fresa de planear, 45° SEHX 1204  
 DE Planfräser, 45° SEHX 1204



Ref.	d1	d2	d3	l1	z	1 incl.	2 incl.	3 excl.
76.100.0050	50	22	63	40	4	73.998.0650	T20	SEH.. 1204
76.100.0063	63	22	76	40	5	73.998.0650	T20	SEH.. 1204
76.100.0080	80	27	93	50	6	73.998.0650	T20	SEH.. 1204
76.100.0100	100	32	113	50	7	73.998.0650	T20	SEH.. 1204

> **76.615 Phantom**

NL Wisselplaat SEHT 1204  
 FR Plaquette SEHT 1204  
 ES Plaquita SEHT 1204  
 DE Wendeplatte SEHT 1204



SE..	l1(mm)	d1(mm)	b1(mm)
12	12,7	5,50	4,76

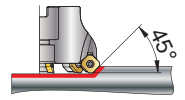
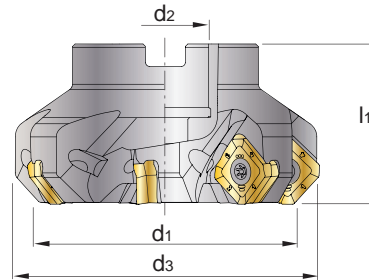
Ref.	lxb	Geo	HM		a <sub>p</sub> (mm)	f <sub>z</sub> (mm)	P	M	K	N	S	H
76.615.0150	1204	ALU	K10		6	0,1-0,5				N		
76.615.0200	1204	AFSN	PI20		6	0,1-0,35	P					
76.615.0250	1204	AFSN	UI30		6	0,1-0,35	P	M	K		S	





## > 76.125 Phantom

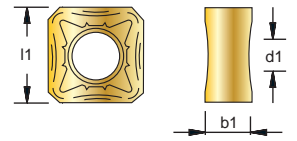
NL Vlakfrees, 45° SNHX 1205  
 FR Fraise à chanfreiner à 45° SNHX 1205  
 ES Fresa de planear, 45° SNHX 1205  
 DE Planfräser, 45° SNHX 1205






Ref.	d1	d2	d3	l1	z	1 incl.	2 incl.	3 excl.
76.125.0050	50	22	63	40	4	73.998.0640	T15	SNHX 1205
76.125.0063	63	22	76	40	6	73.998.0640	T15	SNHX 1205
76.125.0080	80	27	93	50	7	73.998.0640	T15	SNHX 1205
76.125.0100	100	32	113	50	8	73.998.0640	T15	SNHX 1205
76.125.0125	125	40	138	63	10	73.998.0640	T15	SNHX 1205

## > 76.500 Phantom

NL Wisselplaat SNHX 1205  
 FR Plaquette SNHX 1205  
 ES Plaquita SNHX 1205  
 DE Wendeplatte SNHX 1205

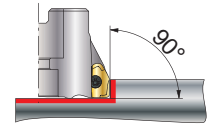
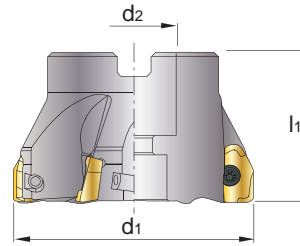


SN.X	l1(mm)	d1(mm)	b1(mm)
12	12,7	6,0	5,49

Ref.	lxb	Geo	HM		a <sub>p</sub> (mm)	f <sub>z</sub> (mm)	P	M	K	N	S	H
76.500.0200	1205	AN	PI20		6	0,15-0,45	<b>P</b>		<b>K</b>			
76.500.0250	1205	AN	UI30		6	0,15-0,45	<b>P</b>	<b>M</b>	<b>K</b>		<b>S</b>	

> **76.135 Phantom**

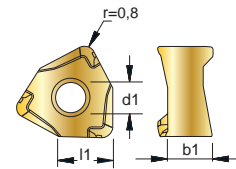
NL Hoekfrees, 90° XNEX 0806  
 FR Outil à surfer, 90° XNEX 0806  
 SP Fresa de Escuadrado, 90° XNEX 0806  
 DE Winkel 90° XNEX 0806



Ref.	d1	d2	l1	z	1 incl.	2 incl.	3 excl.
76.135.0055	50	22	40	5	73.998.0640	T15	XNEX 0806
76.135.0063	63	22	40	6	73.998.0640	T15	XNEX 0806
76.135.0080	80	27	50	7	73.998.0640	T15	XNEX 0806
76.135.0100	100	32	50	8	73.998.0640	T15	XNEX 0806

> **76.520 Phantom**

NL Wisselplaat XNEX 0806  
 FR Plaquette XNEX 0806  
 ES Plaquita XNEX 0806  
 DE Wendeplatte XNEX 0806



XN.X	l1(mm)	d1(mm)	b1(mm)
08	7,5	4,5	6,56

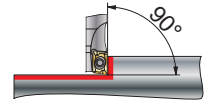
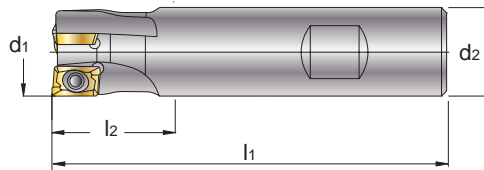
Ref.	lxb	Geo	HM	Image	a <sub>p</sub> (mm)	f <sub>z</sub> (mm)	P	M	K	N	S	H
76.520.0200	80608		Pl20		7	0,08-0,4	P		K			
76.520.0250	80608		Ul30		7	0,08-0,4	P	M	K		S	





### > 76.145 Phantom

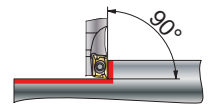
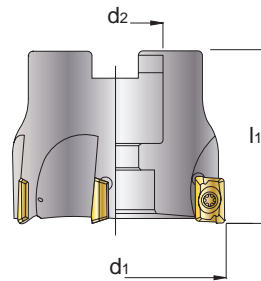
NL Schachtfrees, 90° APKT 1003  
 FR Fraise à plaquettes, 90° APKT 1003  
 ES Fresa integral, 90° APKT 1003  
 DE Schafffräser, 90° APKT 1003



Ref.	d1	d2	l1	l2	z	1 incl.	2 incl.	3 excl.
76.145.0016	16	16	85	26	2	73.998.0600	T8	APT 1003
76.145.0020	20	20	90	28	3	73.998.0600	T8	APT 1003
76.145.0025	25	25	95	30	4	73.998.0600	T8	APT 1003
76.145.0032	32	25	95	35	5	73.998.0600	T8	APT 1003

### > 76.146 Phantom

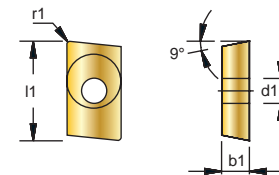
NL Hoekfrees, 90° APKT 1003  
 FR Outil à surfer, 90° APKT 1003  
 ES Fresa de Escuadrado, 90° APKT 1003  
 DE Winkel 90° APKT 1003



Ref.	d1	d2	l1	z	1 incl.	2 incl.	3 excl.
76.1460.040	40	16	40	6	73.998.0600	T8	APT 1003
76.1460.050	50	22	40	7	73.998.0600	T8	APT 1003

### > 76.365 Phantom

NL Wisselplaat APKT, APHT 1003  
 FR Plaquette APKT, APHT 1003  
 ES Plaquita APKT, APHT 1003  
 DE Wendepatte APKT, APHT 1003

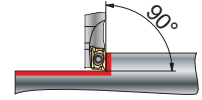
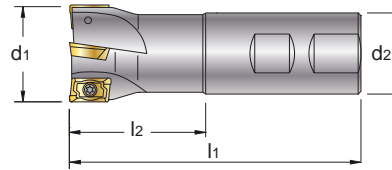


APKT	l1(mm)	d1(mm)	b1(mm)	r1(mm)
10	10,5	2,80	3,50	0,5

Ref.	lxb	Geo	HM		a <sub>p</sub> (mm)	f <sub>z</sub> (mm)	P	M	K	N	S	H
76.365.0150	1003	ALU	K10		10	0,1-0,5				N		
76.365.0200	1003	PDR	PI20		10	0,08-0,3	P		K			
76.365.0250	1003	PDR	UI30		10	0,08-0,3	P	M	K		S	

> **76.155** **Phantom**

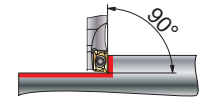
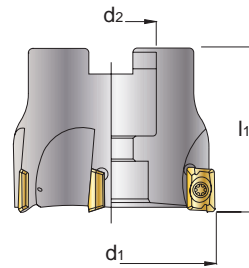
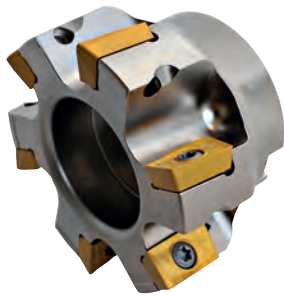
NL Schachtfrees, 90° APKT 1604  
 FR Fraise à plaquettes, 90° APKT 1604  
 ES Fresa integral, 90° APKT 1604  
 DE Schafffräser, 90° APKT 1604



Ref.	d1	d2	l1	l2	z	1 incl.	2 incl.	3 excl.
76.155.0025	25	20	100	44	2	73.998.0610	T15	APT 1604
76.155.0032	32	25	110	44	3	73.998.0630	T15	APT 1604

> **76.156** **Phantom**

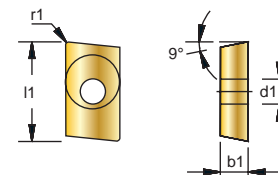
NL Hoekfrees, 90° APKT 1604  
 FR Outil à surfer, 90° APKT 1604  
 ES Fresa de Escuadrado, 90° APKT 1604  
 DE Winkel 90° APKT 1604



Ref.	d1	d2	l1	z	1 incl.	2 incl.	3 excl.
76.156.0040	40	16	40	4	73.998.0630	T15	APT 1604
76.156.0050	50	22	40	5	73.998.0630	T15	APT 1604
76.156.0063	63	22	40	6	73.998.0630	T15	APT 1604

> **76.366** **Phantom**

NL Wisselplaat APKT, APHT 1604  
 FR Plaquette APKT, APHT 1604  
 ES Plaquita APKT, APHT 1604  
 DE Wendeplatte APKT, APHT 1604



APKT	l1(mm)	d1(mm)	b1(mm)	r1(mm)
16	17,0	4,40	5,26	0,9

Ref.	lxb	Geo	HM		a <sub>p</sub> (mm)	f <sub>z</sub> (mm)	P	M	K	N	S	H
76.366.0150	1604	ALU	K10		15	0,1-0,5				N		
76.366.0200	1604	PDR	PI20		15	0,1-0,4	P		K			
76.366.0250	1604	PDR	UI30		15	0,1-0,4	P	M	K		S	







### > 79.510

NL Set Kartelen

FR Assortiment d'outils à moleter

ES Juego de herramientas para moletear

DE Satz Rändelwerkzeuge



Ref.	Type	Contents
79.510.1000	KM1-M7	1x M7 1x M12 1x BR30-BL30-AA (0.8) 1x BR30-BL30-AA (1.2) 1x BR30-BL30-AA(1.6)

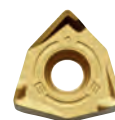
### > 79.613

NL Set, Hoekfrees, 90°, incl. wisselplaten XNEX 0806

FR Jeu, Outil à surfer, 90°, incl. plaquettes XNEX 0806

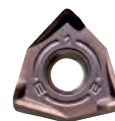
ES Juego de, Fresa de Escuadrado, 90°, incl. wisselplaten XNEX 0806

DE Satz, Winkel 90°, inkl. Wendeplatten XNEX 0806



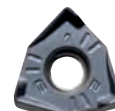
P

76.520.0200



PMS

76.520.0250



PM

76.520.0360

Ref.	Contents
79.613.1020	Ø100 mm + 80 x PI20
79.613.1025	Ø100 mm + 80 x UI30
79.613.1036	Ø100 mm + 80 x HC-M20
79.613.5020	Ø50 mm Z4 + 40 x PI20
79.613.5025	Ø50 mm Z4 + 40 x UI30
79.613.5036	Ø50 mm Z4 + 40 x HC-M20
79.613.5520	Ø50 mm Z5 + 50 x PI20
79.613.5525	Ø50 mm Z5 + 50 x UI30
79.613.5536	Ø50 mm Z5 + 50 x HC-M20
79.613.6320	Ø63 mm + 60 x PI20
79.613.6325	Ø63 mm + 60 x UI30
79.613.6336	Ø63 mm + 60 x HC-M20
79.613.8020	Ø80 mm + 70 x PI20
79.613.8025	Ø80 mm + 70 x UI30
79.613.8036	Ø80 mm + 70 x HC-M20

NL Snijnsnelheden draaien  
 FR Vitesse de coupe de tournage  
 ES Velocidades de corte para tornear  
 DE Schnittgeschwindigkeit Drehen

		HM								
ISO	Gr.	UI10	UI20	P25	PC10	PC20	PC30	MSI20	KC10	K10
		Vc (m/min)								
P	11	130-225	120-220	100-140	180-270	170-240	120-210	130-230	220-400	
	12	130-225	120-220	100-140	180-270	170-240	120-210	130-230	200-320	100-250
	13	130-225	120-220	100-140	180-270	170-240	120-210	130-230	200-320	100-250
	14			60-100	120-205	110-185	75-175			
H	15									
M	21	105-205	95-195					105-205		
	22	100-195	90-185					100-195		
K	31								190-330	
	32								135-265	
N	41									375-2400
	42									375-1500
	51									375-630
	52									375-630
	61									80-180
S	71	40-110	35-105					45-115		
	72	45-120	40-115					50-125		

NL Snijnsnelheden steken  
 FR Vitesse de coupe de tronçonnage  
 ES Velocidades de corte para tronzar  
 DE Schnittgeschwindigkeit Stechen

		HM		
ISO	Gr.	K10	PC30	UI30
		Vc (m/min)		
P	11	90-200	50-150	
	12	70-160	50-140	
	13	70-160	50-140	
	14	50-130	40-130	
H	15			
M	21	60-80	50-110	
	22		40-110	
K	31	50-140	70-150	
	32	40-120	50-140	
N	41	80-250		
	42	60-200		
	51	100-180		
	52	100-180		
	61	100-210		
S	71		15-50	
	72		20-80	

NL Snijnsnelheden draadsnijden  
 FR Vitesse de coupe de filetage  
 ES Velocidades de corte para roscar  
 DE Schnittgeschwindigkeit Gewindeschneiden

		HM		
ISO	Gr.	UI20	MSI20	P30
		Vc (m/min)		
P	11	115-190		70-130
	12	85-145		70-120
	13	85-145		70-120
	14	70-120		50-80
H	15	45-60		
M	21	70-140	70-160	75-110
	22	40-110	40-120	30-80
K	31	70-130		
	32	125-160		
N	41	100-365		
	42	200-400		
	51	80-225		70-170
	52	80-225		70-170
	61			
S	71	20-30	20-40	
	72	50-70	50-80	

NL Snijnsnelheden frezen  
 FR Vitesse de coupe de fraisage  
 ES Velocidades de corte para fresar  
 DE Schnittgeschwindigkeit Fräsen

		HM		
ISO	Gr.	K10	PI20	UI30
		Vc (m/min)		
P	11	150-230	130-160	
	12	140-220	120-150	
	13	140-220	120-150	
	14	130-180	100-130	
H	15			
M	21		80-110	
	22		70-100	
K	31		110-220	
	32		80-170	
N	41	100-2000		
	42			
	51			
	52			
	61	100-210		
S	71		30-80	
	72		40-100	



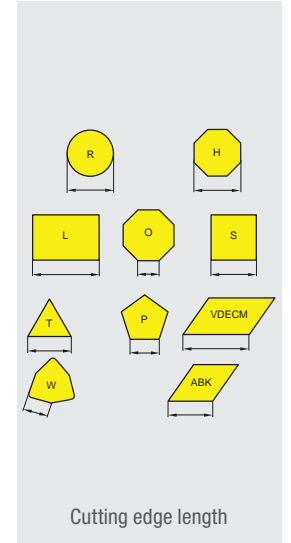
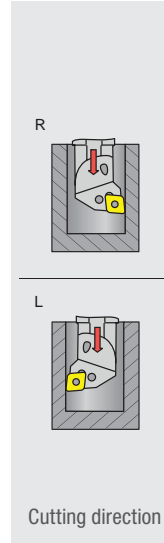
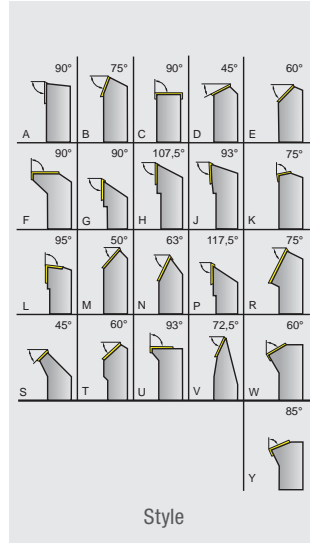
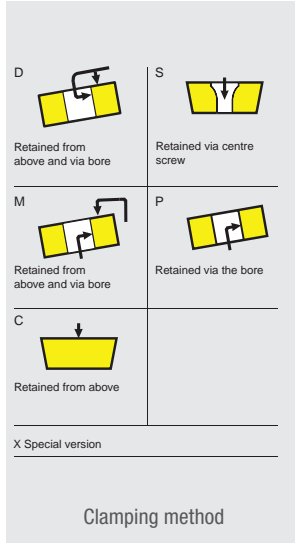


NL ISO Wisselplaatouder inwendig draaien  
 FR Porte-plaquette ISO tournage intérieur  
 ES Portaplaquita ISO torneado interior  
 DE ISO Klemmhalter innen drehen

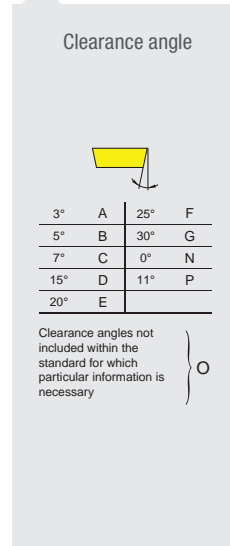
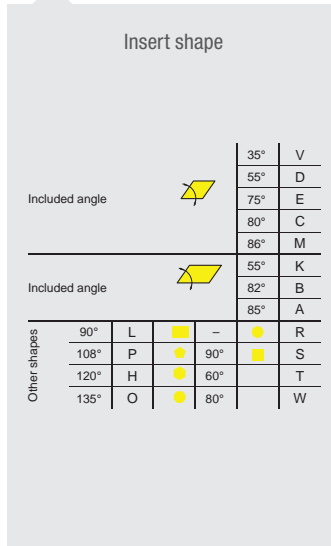
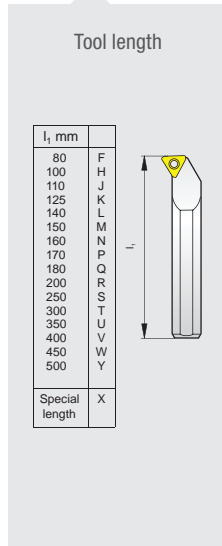
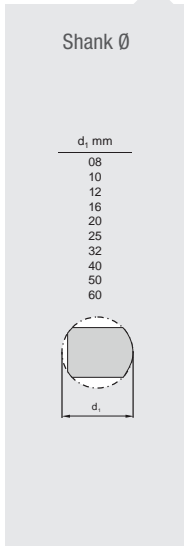


S	Steel shank	E	As C with coolant hole
A	Steel shank with coolant hole	F	As C with anti-vibration system
B	Steel shank with anti-vibration system	G	As C with coolant hole and anti-vibration system
D	Steel shank with coolant hole and anti-vibration system	H	Heavy metal
C	Carbide shank with steel head	J	Heavy metal with coolant hole

Shank version



**S 32 U - D C L N R 12**



NL ISO Wisselplaatouder uitwendig draaien  
 FR Porte-plaquette ISO tournage extérieur  
 ES Portaplaquita ISO torneado exterior  
 DE ISO Klemmhalter außen drehen



**D** Retained from above and via bore

**S** Retained via centre screw

**M** Retained from above and via bore

**P** Retained via the bore

**C** Retained from above

X Special version

Clamping method

Style

90° A	75° B	90° C	45° D	60° E
90° F	90° G	107.5° H	93° J	75° K
95° L	50° M	63° N	117.5° P	75° R
45° S	60° T	93° U	72.5° V	60° W
				85° Y

Cutting direction

**R**

**L**

**N**

Shank width

**B**

Cutting edge length

**R** **H**

**L** **O** **S**

**T** **P** **VDECM**

**W** **ABK**

**D C L N R 25 25 - M 12**

Insert shape

Included angle	35°	V
	55°	D
	75°	E
	80°	C
	86°	M
Included angle	55°	K
	82°	B
	85°	A
Other shapes	90°	L
	108°	P
	120°	H
	135°	O
	90°	R
	90°	S
	60°	T
	80°	W

Clearance angle

3°	A	25°	F
5°	B	30°	G
7°	C	0°	N
15°	D	11°	P
20°	E		

Clearance angles not included within the standard for which particular information is necessary } O

Shank height

Tool holder

Cartridge

Round shank

00

Tool length

$l_1$ mm	$l_1$ mm
32 A	160 N
40 B	170 P
50 C	180 Q
60 D	200 R
70 E	250 S
80 F	300 T
90 G	350 U
100 H	400 V
110 J	450 W
125 K	500 Y
140 L	Special X
150 M	





NL ISO Wisselplaten  
 FR Plaquettes ISO  
 ES Plaquetas ISO  
 DE ISO Wendepplatten



Included angle	35°	V
	55°	D
	75°	E
	80°	C
	86°	M
Included angle	55°	K
	82°	B
	85°	A
Other shapes	90°	L
	108°	P
	120°	H
	135°	O
	—	R
	90°	S
	60°	T
	80°	W

Insert shape

3°	A	25°	F
5°	B	30°	G
7°	C	0°	N
15°	D	11°	P
20°	E		

Clearance angles not included within the standard for which particular information is necessary

Clearance angle

	d ±	m ±	s ±
A	0,025	0,005	0,025
F	0,013	0,005	0,025
C	0,025	0,013	0,025
H	0,013	0,013	0,025
E	0,025	0,025	0,025
G	0,025	0,025	0,13
J	0,05-0,15°	0,005	0,025
K	0,05-0,15°	0,013	0,025
L	0,05-0,15°	0,025	0,025
M	0,05-0,15°	0,08-0,20	0,13
N	0,05-0,15°	0,08-0,20	0,025
U	0,08-0,25°	0,13-0,38	0,13

Tolerances

N	
R	
F	
A	
M, P	
G, P	
W	
T	
Q	
U	
B	
H	
C	
J	
X	Special version

Form of top surface

d mm			
		d mm	
	06	16	
	08	20	
	10	25	
	12	32	
	mm	Inch	mm
	06	5/32	3,96
	09	7/32	5,56
	11	1/4	6,35
	16	3/8	9,52
	22	1/2	12,7
	27	5/8	15,8
	33	3/4	19,0
	44	1	25,4

Cutting edge length

Insert thickness		
Inch	mm	Index
1/16	1,59	01
3/32	2,38	02
1/8	3,18	03
5/32	3,97	T3
3/16	4,76	04
7/32	5,56	05
1/4	6,35	06
5/16	7,94	07
3/8	9,52	09

Insert thickness

Corner radius	
Code	Corner radius mm
00	0,05
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
24	2,4
32	3,2

RN 00  
RC MO

Corner radius

<b>C</b>	<b>N</b>	<b>M</b>	<b>G</b>	<b>12</b>	<b>04</b>	<b>08</b>
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NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewindedrehen

<table border="1"> <thead> <tr> <th>mm</th> <th>Inch</th> <th>mm</th> </tr> </thead> <tbody> <tr> <td>09</td> <td>7/32</td> <td>5,56</td> </tr> <tr> <td>11</td> <td>1/4</td> <td>6,35</td> </tr> <tr> <td>16</td> <td>3/8</td> <td>9,52</td> </tr> <tr> <td>22</td> <td>1/2</td> <td>12,7</td> </tr> <tr> <td>27</td> <td>5/8</td> <td>15,8</td> </tr> </tbody> </table> <p>Insert size</p>	mm	Inch	mm	09	7/32	5,56	11	1/4	6,35	16	3/8	9,52	22	1/2	12,7	27	5/8	15,8	<table border="1"> <tr> <td>E</td> <td>External</td> </tr> <tr> <td>I</td> <td>Internal</td> </tr> <tr> <td>EI</td> <td>Ex- &amp; Internal</td> </tr> </table> <p>Type of Insert</p>	E	External	I	Internal	EI	Ex- & Internal	<table border="1"> <tr> <td>R</td> <td>Right Hand</td> </tr> <tr> <td>L</td> <td>Left Hand</td> </tr> </table> <p>RH/LH Insert</p>	R	Right Hand	L	Left Hand	<table border="1"> <thead> <tr> <th colspan="2">Full Profile - Pitch Range</th> </tr> <tr> <th>mm</th> <th>tpi</th> </tr> </thead> <tbody> <tr> <td>0.35-25.0</td> <td>72-1</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Partial Profile - Pitch Range</th> </tr> <tr> <th>mm</th> <th>tpi</th> </tr> </thead> <tbody> <tr> <td>A 0.5-1.5</td> <td>48-16</td> </tr> <tr> <td>AG 0.5-3.0</td> <td>48-8</td> </tr> <tr> <td>G 1.75-3.0</td> <td>14-8</td> </tr> <tr> <td>N 3.5-5.0</td> <td>7-5</td> </tr> </tbody> </table> <p>Pitch</p>	Full Profile - Pitch Range		mm	tpi	0.35-25.0	72-1	Partial Profile - Pitch Range		mm	tpi	A 0.5-1.5	48-16	AG 0.5-3.0	48-8	G 1.75-3.0	14-8	N 3.5-5.0	7-5	<table border="1"> <thead> <tr> <th colspan="2">Partial Profile</th> </tr> <tr> <td>60°</td> <td>60° Partial profile</td> </tr> <tr> <td>55°</td> <td>55° Partial profile</td> </tr> </thead> <tbody> <tr> <th colspan="2">Full Profile</th> </tr> <tr> <td>ISO</td> <td>ISO Metric</td> </tr> <tr> <td>UN</td> <td>American UN</td> </tr> <tr> <td>W</td> <td>Whitworth BSW/BSP</td> </tr> <tr> <td>TR</td> <td>Trapez</td> </tr> </tbody> </table> <p>Thread Standard</p>	Partial Profile		60°	60° Partial profile	55°	55° Partial profile	Full Profile		ISO	ISO Metric	UN	American UN	W	Whitworth BSW/BSP	TR	Trapez	<table border="1"> <tr> <td>B</td> <td>With chipbreaker</td> </tr> <tr> <td>-</td> <td>Without</td> </tr> </table> <p>Chipbreaker</p>	B	With chipbreaker	-	Without
mm	Inch	mm																																																																					
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B	With chipbreaker																																																																						
-	Without																																																																						

**16**

**E**

**R**

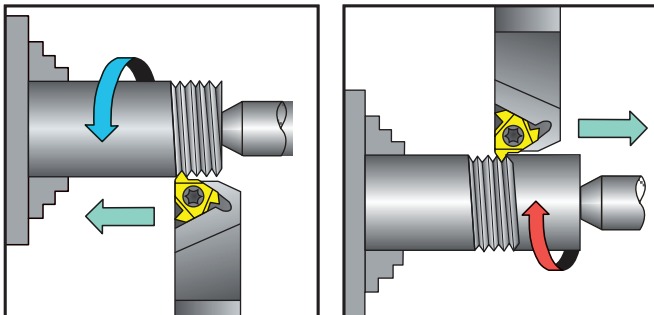
**175**

**ISO**

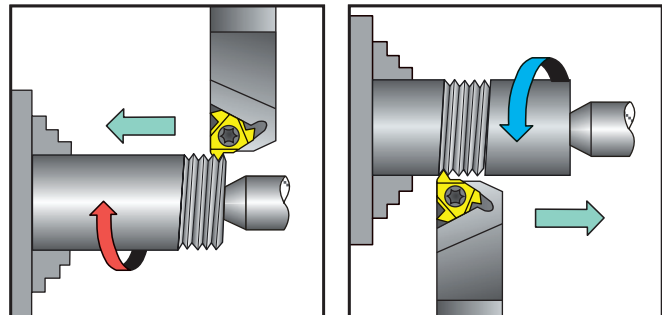
**B**

NL Schroefdraadsnij methodes  
 FR Méthodes de filetage en tournage  
 ES Métodos de torneado de roscas  
 DE Gewindedrehverfahren

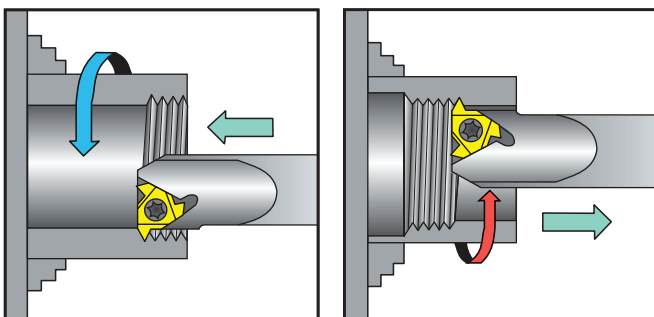
**External RH Thread**



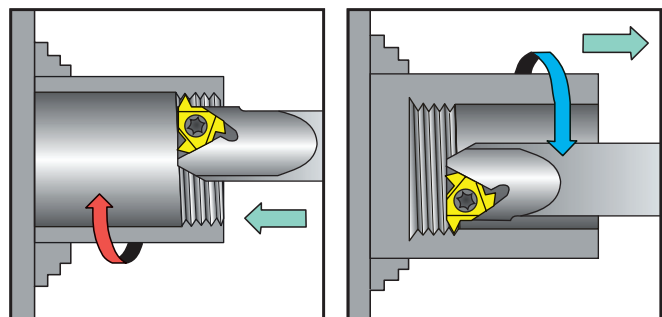
**External LH Thread**



**Internal RH Thread**

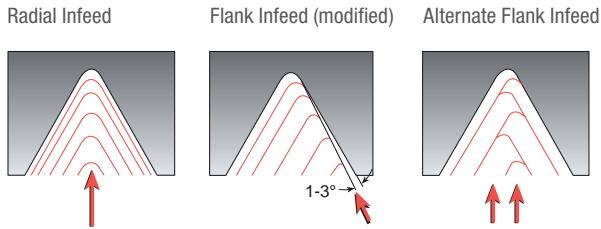


**Internal LH Thread**

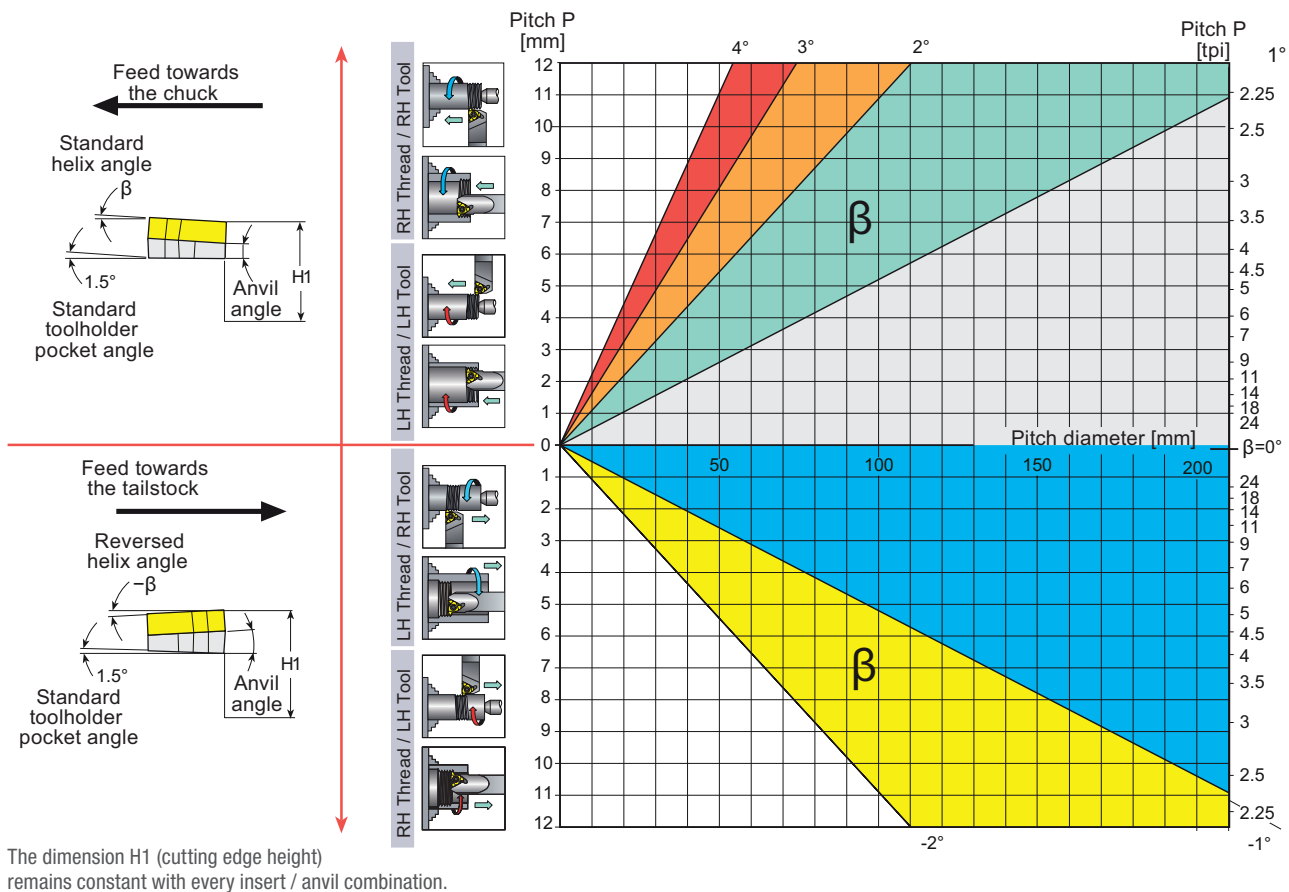




NL Invoer methoden  
 FR Méthode angle d'attaque  
 ES Métodos de ataque de la rosca  
 DE Gewindegstellverfahren



NL Schroefdraadhelingshoek diagram  
 FR Diagramme de l'angle d'hélice  
 ES Diagrama del ángulo de hélice  
 DE Teilungswinkel Diagramm



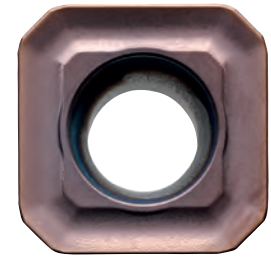
The dimension H1 (cutting edge height) remains constant with every insert / anvil combination.

NL Onderlegplaten  
 FR Sous-plaquettes  
 ES Placa base  
 DE Unterlegplatten

Resultant Helix Angle		$\beta$ Holder	3.5°	2.5°	1.5°	0.5°	0°	-0.5°	-1.5°
Insert Size	L mm		Ordering Code						
3/8"	16	ER / IL	743980170	743980175	743980165	74398180	-	743980190	743980195
		EL / IR	743980265	743980270	743980260	743980275	-	743980280	743980285
1/2"	22	ER / IL	743980205	743980210	743980200	743980215	-	743980220	743980225
		EL / IR	743980295	743980300	743980290	743980305	-	743980310	743980315
3/8" Groove	16	ER / IL	-	-	-	-	743980400	-	-
		EL / IR	-	-	-	-	743980500	-	-



NL ISO Wisselplatten  
FR Plaquettes ISO  
ES Plaquitas ISO  
DE ISO Wendepplatten



**Insert shape**

A	85°	
B	82°	
K	55°	
H	120°	
L	90°	
O	135°	
P	108°	
C	80°	
D	55°	
E	75°	
M	86°	
V	35°	
R	-	
S	90°	
T	60°	
W	80°	
X	Special shapes	

**Clearance angle**

A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special version

**Tolerances**

	d (±mm)	m (±mm)	s (±mm)	U=6,35/9,52	U=12,7	U=15,8/19,05
A	.025	.005	.025	●	●	●
C	.025	.013	.025	●	●	●
E	.025	.025	.025	●	●	●
F	.013	.005	.025	●	●	●
G	.025	.025	.13	●	●	●
H	.013	.013	.025	●	●	●
J	.08	.005	.025	●	●	●
K	.05	.013	.025	●	●	●
M	.10	.005	.025	●	●	●
N	.05	.013	.025	●	●	●
O	.08	.013	.025	●	●	●
U	.10	.013	.025	●	●	●
V	.10	.013	.025	●	●	●
W	.10	.013	.025	●	●	●
X	.18	.27	.13	●	●	●

**Form of top surface**

A	
F	
G	
M	
N	
Q	
R	
T	
U	
W	
X	Special shapes

**Cutting edge length**

d(mm)	A	T/V	C/S	H	L	R	W	O
5.00	-	-	-	-	05	-	-	-
5.56	-	09	05	-	08	-	03	-
6.00	-	-	-	-	06	-	-	-
6.35	-	11	06	03	10	-	04	02
6.65	10	-	-	-	-	-	-	-
7.94	-	-	07	-	-	-	-	-
8.00	-	-	-	-	08	-	-	-
9.00	-	-	-	-	12	-	-	-
9.52	-	16	09	05	15	-	06	04
9.57	15	-	-	-	-	-	-	-
10.00	-	-	-	-	10	-	-	-
12.00	-	-	-	-	12	-	-	-
12.70	22	12	07	20	08	05	-	-
15.87	27	15	09	-	-	10	06	-
16.00	-	-	-	-	16	-	-	-
16.74	-	-	16	-	-	-	-	-
19.05	33	19	11	-	-	13	07	-
20.00	-	-	-	-	20	-	-	-

**Insert thickness**

s (mm)	
01	1.59
T1	1.98
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

**Facet corner radius**

1st sign	2nd sign
A	A
B	B
C	C
D	D
E	E
F	F
P	P
Z	Z
Others	Others

**Cutting edge**

F	Sharp	
E	Honed	
S	Chamfered and honed	
T	Chamfered	

**S E H T 12 03 AE SN**





NL Slijtage soorten  
 FR Types d'usure  
 ES Tipos de desgaste  
 DE Verschleißarten

	<p>Built-up edge (Adhesive wear)</p>	
	<p>Notching (Adhesive/Mechanic)</p>	
	<p>Crater (Chemical wear)</p>	
	<p>Flank wear (Abrasive wear)</p>	
	<p>Plastic deformation (Thermal wear)</p>	
	<p>Thermal cracks (Thermal wear)</p>	
	<p>Breakage (Mechanic wear)</p>	

NL Maatregelen bij draaiproblemen  
 FR Problèmes de tournage et solutions  
 ES Problemas de torneado y soluciones  
 DE Maßnahmen bei Drehproblemen

Type of problem													
Build up edge	Notching	Cratering	Flank wear	Plastic deformation	Breakage	Edge chipping	Surface quality	Vibration	Formation of burrs and pips	Long chips ( tangled swarf)	Short chips ( fragmented chips)	Corrective measures	
↑	↓	↓	↓	↓			↑	↓				Cutting speed	
			■							↑	↓	Feed rate	
		↓				↓			↓			Feed - center area	
↓		↓	■	■		↑		■	↓	↓		Chip groove ↓ R M ↑ F	
			↑	↑		↑			↓			Corner radius Larger ↓ ↑ smaller	
		↑	↑	↑	↓	↓						Cutting material wear resistance ↓ ↑ toughness	
			■	■	■	■	■					Clamping of tool	
			■	■	■	■	■					Clamping of workpiece	
□			□	□			□		□	□		Coolant	

↑ Raise, increase      ↓ Avoid, reduce      ■ Check, optimize      □ Use





NL Maatregelen bij freesproblemen  
 FR Problèmes de fraisage et solutions  
 ES Problemas de fresado y soluciones  
 DE Maßnahmen bei Fräsproblemen

Type of problem											Corrective measures
Build up edge	Notching	Cratering	Flank wear	Plastic deformation	Thermal cracks	Breakage	Edge chipping	Bad workpiece surface	Chattering vibration	Edge chipping on the workpiece	
↑	↓	↓	↓	↓	↓		↑	↑	■		Cutting speed
↑	↓	↓	↑	↓	↓	↓	↓	↓	■		Feed rate per tooth
	↑				■	↑	↑				Toughness of cutting material
		↑	↑	↑							Wear resistance of cutting material
■	↓				↓				↓	↓	Approach angle
↑	■			↑		■	■		↑		Rake angle
■	↑						↑	↓		↓	Cutting edge facet
						↑	↑	↑			Stability
								↑	↑		Precision of axial & radial run-out
			■	■		■	■			■	Wear of cutting edge
↑	↑	↑		■	↑			■			Cooling, chipremoval
	■					■	■	■	■	↓	Dept of cut

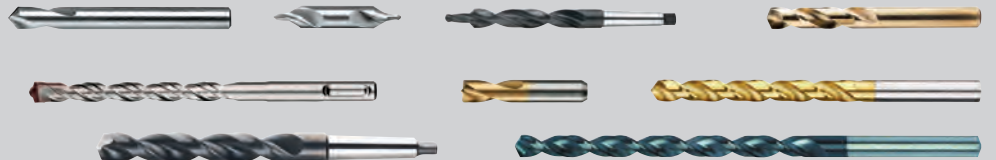
↑ Raise, increase      ↓ Lower, decrease      ■ Check, optimize

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



SP 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



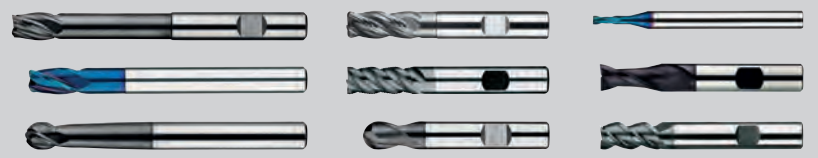
SP 2

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



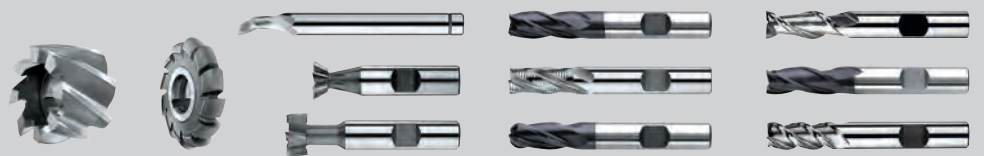
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



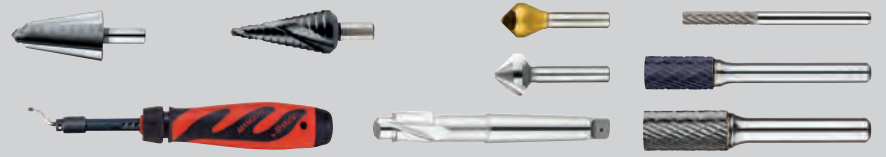
SP 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



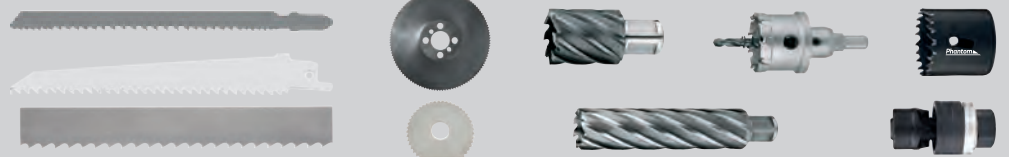
4

NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



5

NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



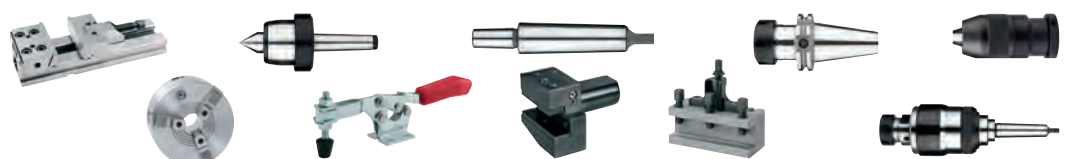
6

NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



7

NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



8

NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig



8



## ICONEN ICONES ICONOS PIKTOGRAMME

	NL	FR	ES	DE
<b>DIN 225</b>	DIN norm	Norme DIN	Norma DIN	DIN Norm
<b>NORM</b>	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
<b>DIN 1835-B</b>	Voor cilindrische schacht met Weldon vlak	Pour queue cylindrique avec méplat type Weldon	Para mango cilíndrico con plano de arrastre tipo Weldon	Für Zylinderschaft mit Mitnahmefläche Tyo Weldon
<b>DIN 6535-HA</b>	Cilindrische schacht	Queue cylindrique	Mango cilíndrico	Zylinderschaft
<b>DIN 228-B</b>	Morse Konus Opname	Cône morse	Mango cónico	Morsekegel
<b>ER</b>	ER Spantangen volgens DIN 6499	Pinces ER selon DIN 6499	Pinzas ER según DIN 6499	ER Spannzangen gemäss DIN 6499
<b>B1</b>	Uitvoering VDI-houder	Type Porte-Outils VDI	Tipo portaherramientas VDI	Ausführung VDI-Halter
<b>P</b>	Met pendelinrichting	Avec système pendulaire	Con sistema pendular	Mit Pendelsystem
<b>(AUTO) REVERSAL</b>	Omkeerinrichting	Avec dispositif d'inversion	Con dispositivo de inversión	Mit Umkehrvorrichtung
<b>C T</b>	Druk- en trekcompensatie	Compensation de pression et de traction	Compensación de presión y de tracción	Ausgleich für Druck und Zug
<b>Links-rechts-draaiend</b>	Links-rechts-draaiend	Rotation à droite et à gauche	Giro derechas e izquierdas	Links-Rechts drehen
<b>SECURITY LOCK</b>	Met spankracht-borging	Avec trou de serrage	Con agujero de fijación	Mit Spannkraftsicherung
<b>BAJONET</b>	Bajonet opname	Fixation baïonnette	Fijación bayoneta	Bajonet Aufnahme
<b>CAM-LOCK</b>	Camlock opname	Fixation Camlock	Fijación Camlock	Camlock Aufnahme
<b>TYPE XP</b>	Precisie uitvoering	Version de précision	Versión de precisión	Präzision-ausführung

	NL	FR	ES	DE
<b>SK</b>	Opname volgens DIN 2080	A queue selon DIN 2080	Con cono según DIN 2080	Aufnahme gemäß DIN 2080
<b>SK</b>	Opname volgens DIN 69871	A queue selon DIN 69871	Con cono según DIN 69871	Aufnahme gemäß DIN 69871
<b>MAS-BT</b>	Opname volgens MAS 403-BT	A queue selon MAS 403-BT	Con cono según MAS 403-BT	Aufnahme gemäß MAS 403-BT
<b>VDI</b>	Opname volgens DIN 69880	A queue selon DIN 69880	Con cono según DIN 69880	Aufnahme gemäß DIN 69880
<b>Cilindrische schacht</b>	Cilindrische schacht	Queue cylindrique	Mango cilíndrico	Zylinderschaft
<b>TYPE A</b>	Standaard uitvoering	Version standard	Versión estándar	Standard Ausführung
<b>AT3</b>	Tolerantieklasse AT3	Classe de tolérance AT3	Clase de tolerancia AT3	Toleranzklasse AT3
<b>0,005</b>	Rondloopnauwkeurig 0,005 mm	Concentricité 0,005 mm	Concentricidad 0,005 mm	Rundlaufgegaugtheit 0,005 mm
<b>Klopvaste uitvoering</b>	Klopvaste uitvoering	Tenue aux percussions	Resistente a percusiones	Schlagfester Ausführung
<b>110 Nm</b>	Maximale spankracht 110 Nm	Couple de serrage maximal 110 Nm	Fijación máxima 110 Nm	Maximalspannkraft 110 Nm
<b>Tandkransleutel</b>	Tandkransleutel	Clé pour mandrin porte-forets	Llave para portabrocas	Schlüssel für Zahnkranzbohrfutter
<b>Spansleutel</b>	Spansleutel	Clé de mandrin	Llave de apriete	Spannschlüssel
<b>G6,3 12.000 RPM</b>	Balancerklasse G6,3	Classe d'équilibrage G6,3	Clase de equilibración G6,3	Ausgewuchtet G6,3 bei 12.000 U/min
<b>F7</b>	Tolerantie boringsdiameter	Tolérance d'alésage	Tolerancia de escariado	Toleranz Borungsdurchmesser
<b>n6</b>	Tolerantie buitenmaat	Tolérance du diamètre externe	Tolerancia diámetro externo	Toleranz Aussen-durchmesser

NL Spannen  
FR Serrage et Bridage  
ES Fijar y Sujetar  
DE Spannwerkzeuge

**P** **K** Bij uitstek geschikt  
Très approprié  
**H** **N** Muy adecuado  
**M** **S** Ideal geeignet

**P** **K** Beperkt geschikt  
Approprié  
**H** **N** Adecuado  
**M** **S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

> 81.130	<b>Phantom</b>				P. 11
> 81.140	<b>Phantom</b>				P. 11
> 81.150	<b>Phantom</b>				P. 11
> 81.180	<b>Phantom</b>				P. 12
> 81.181	<b>Phantom</b>				P. 12
> 81.182	<b>Phantom</b>				P. 12
> 81.200	<b>Phantom</b>	TYPE A			P. 13
> 81.210	<b>Phantom</b>	TYPE A	SECURITY LOCK		P. 13
> 81.230	<b>Phantom</b>	TYPE P	0,04		P. 13
> 81.250	<b>Phantom</b>	TYPE XP	0,04		P. 14
> 81.300	<b>Phantom</b>	TYPE XP	DIN 228-B  0,04		P. 14
> 81.303	<b>Phantom</b>	TYPE XP	SK  0,04		P. 14
> 81.304	<b>Phantom</b>	TYPE XP	SK  0,04		P. 15
> 81.306	<b>Phantom</b>	TYPE XP	MAS-BT  0,04		P. 15
> 81.320	<b>Phantom</b>	TYPE XPF	SK  0,05		P. 15
> 81.330	<b>Phantom</b>	TYPE XPF	MAS-BT  0,05		P. 16
> 81.412	<b>Phantom</b>				P. 16
> 81.413	<b>Phantom</b>	TYPE XP			P. 16
> 81.414	<b>Phantom</b>	TYPE XP			P. 16
> 81.450	<b>BISON</b>		DIN 228-B		P. 17
> 81.460	<b>BISON</b>				P. 17
> 81.462	<b>BISON</b>				P. 17
> 81.463	<b>BISON</b>				P. 17
> 81.464	<b>BISON</b>				P. 18
> 81.510	<b>AKON</b>				P. 18
> 81.520	<b>AKON</b>				P. 18
> 81.530	<b>AKON</b>		DIN 228-B		P. 18
> 81.531	<b>AKON</b>		DIN 228-B		P. 19
> 81.532	<b>Phantom</b>		DIN 6535-HB		P. 20
> 81.540	<b>Phantom</b>		DIN 228-B		P. 20
> 81.545	<b>Phantom</b>		C T		P. 21
> 81.570	<b>Phantom</b>		DIN 228-B		P. 21
> 81.602	<b>Phantom</b>		DIN 6535-HB C T		P. 22

SC 1  
HSS-E 1  
2  
SC 3  
HSS-E 3  
4  
5  
6  
7  
8





1 SC

1 HSS(E)

2

3 SC

3 HSS-E

4
















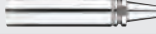



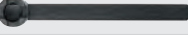



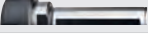











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











> 81.610	<b>Phantom</b>	DIN 228-B	C T			P. 22
> 81.613	<b>Phantom</b>	SK	C T			P. 23
> 81.614	<b>Phantom</b>	SK	C T			P. 23
> 81.616	<b>Phantom</b>	MAS-BT	C T			P. 24
> 81.625	<b>Phantom</b>					P. 24
> 81.631	<b>Phantom</b>					P. 24
> 81.633	<b>Phantom</b>					P. 25
> 81.634	<b>Phantom</b>					P. 25
> 81.636	<b>Phantom</b>					P. 25
> 81.637	<b>Phantom</b>					P. 26
> 81.639	<b>Phantom</b>					P. 26
> 81.641	<b>Phantom</b>					P. 26
> 81.651	<b>Phantom</b>					P. 27
> 81.653	<b>Phantom</b>					P. 27
> 81.654	<b>Phantom</b>					P. 27
> 81.655	<b>Phantom</b>					P. 28
> 81.656	<b>Phantom</b>					P. 28
> 81.657	<b>Phantom</b>					P. 28
> 81.684	<b>Phantom</b>	ER	SK			P. 29
> 81.686	<b>Phantom</b>	ER	MAS-BT			P. 29
> 81.687	<b>Phantom</b>	ER	HSK-A			P. 29
> 81.700	INTERNATIONAL TOOLS					P. 30
> 81.710	INTERNATIONAL TOOLS					P. 30
> 81.900						P. 31
> 81.905						P. 31
> 81.910						P. 31
> 81.930						P. 31
> 81.935						P. 32
> 81.938						P. 32
> 81.950						P. 32
> 82.153	<b>Phantom</b>	DIN 6359	SK			P. 33
> 82.154	<b>Phantom</b>	DIN 6359	SK	G6,3 15.000 RPM		P. 33
> 82.156	<b>Phantom</b>	DIN 6359	MAS-BT	G6,3 15.000 RPM		P. 34
> 82.157	<b>Phantom</b>	DIN 6359	HSK-A	G6,3 20.000 RPM		P. 35
> 82.159	<b>Phantom</b>	DIN 6359				P. 35

> 82.214	<b>Phantom</b>	SK	G2,5 25.000 RPM			P. 36
> 82.216	<b>Phantom</b>	MAS-BT	G2,5 25.000 RPM			P. 36
> 82.217	<b>Phantom</b>	HSK-A	G2,5 25.000 RPM			P. 37
> 82.251	INTERNATIONAL TOOLS	DIN 6537	DIN 228-A			P. 38
> 82.253	<b>Phantom</b>	DIN 6537	SK			P. 38
> 82.264	<b>Phantom</b>	DIN 6537	SK	G6,3 15.000 RPM		P. 39
> 82.266	<b>Phantom</b>	DIN 6537	MAS-BT	G6,3 15.000 RPM		P. 39
> 82.267	<b>Phantom</b>	DIN 6537	HSK-A	G6,3 20.000 RPM		P. 40
> 82.321	<b>Phantom</b>	DIN 6358	DIN 228-A		 <b>NEW</b>	P. 40
> 82.323	<b>Phantom</b>	DIN 6358	SK			P. 41
> 82.324	<b>Phantom</b>	DIN 6358	SK	G6,3 15.000 RPM		P. 41
> 82.326	<b>Phantom</b>	DIN 6358	MAS-BT	G6,3 15.000 RPM		P. 42
> 82.327	<b>Phantom</b>	DIN 6358	HSK-A	G6,3 20.000 RPM		P. 43
> 82.423	<b>Phantom</b>	SK				P. 43
> 82.424	<b>Phantom</b>	SK				P. 43
> 82.426	<b>Phantom</b>	MAS-BT				P. 44
> 82.427	<b>Phantom</b>	HSK-A				P. 44
> 82.450	<b>Phantom</b>	DIN 6367				P. 44
> 82.452	<b>Phantom</b>	DIN 6367				P. 44
> 82.460	<b>Phantom</b>	DIN 6368				P. 45
> 82.470	<b>Phantom</b>	DIN 6366				P. 45
> 82.480	<b>Phantom</b>	DIN 2084-B				P. 45
> 82.509	<b>Phantom</b>	ER			 <b>NEW</b>	P. 46
> 82.510	<b>Phantom</b>	ER				P. 46
> 82.511	INTERNATIONAL TOOLS	ER	DIN 228-A			P. 46
> 82.513	<b>Phantom</b>	ER	SK			P. 47
> 82.514	<b>Phantom</b>	ER	SK	G6,3 15.000 RPM		P. 47
> 82.516	<b>Phantom</b>	ER	MAS-BT	G6,3 15.000 RPM		P. 48
> 82.517	<b>Phantom</b>	ER	HSK-A	G6,3 20.000 RPM		P. 48
> 82.811	<b>Phantom</b>	ER-11	DIN 6499-B	$\pm 0,015$		P. 49
> 82.816	<b>Phantom</b>	ER-16	DIN 6499-B	$\pm 0,015$		P. 49
> 82.817	<b>Phantom</b>	ER-16	DIN 6499-B	$\pm 0,005$	 <b>NEW</b>	P. 49
> 82.820	<b>Phantom</b>	ER-20	DIN 6499-B	$\pm 0,015$		P. 50
> 82.825	<b>Phantom</b>	ER-25	DIN 6499-B	$\pm 0,015$		P. 50
> 82.826	<b>Phantom</b>	ER-25	DIN 6499-B	$\pm 0,005$	 <b>NEW</b>	P. 50








































1 SC	> 82.832	<b>Phantom</b>	ER-32	DIN 6499-B	0,015			P. 51
	> 82.833	<b>Phantom</b>	ER-32	DIN 6499-B	0,005		NEW	P. 51
	> 82.840	<b>Phantom</b>	ER-40	DIN 6499-B	0,015			P. 51
	> 82.841	<b>Phantom</b>	ER-40	DIN 6499-B	0,005		NEW	P. 52
	> 82.880	<b>Phantom</b>	ER-16	DIN 6499	0,015			P. 52
	> 82.885	<b>Phantom</b>	ER-25	DIN 6499	0,015			P. 52
	> 82.916	<b>Phantom</b>	ER-16	DIN 6499	0,008		NEW	P. 53
	> 82.917	<b>Phantom</b>	ER-16	DIN 6499	0,008		NEW	P. 53
	> 82.918	<b>Phantom</b>	ER-16	DIN 6499	0,008		NEW	P. 53
	> 82.925	<b>Phantom</b>	ER-25	DIN 6499	0,008		NEW	P. 53
	> 82.926	<b>Phantom</b>	ER-25	DIN 6499	0,008		NEW	P. 54
	> 82.927	<b>Phantom</b>	ER-25	DIN 6499	0,008		NEW	P. 54
	> 82.932	<b>Phantom</b>	ER-32	DIN 6499	0,008		NEW	P. 54
	> 82.933	<b>Phantom</b>	ER-32	DIN 6499	0,008		NEW	P. 55
	> 82.934	<b>Phantom</b>	ER-32	DIN 6499	0,008		NEW	P. 55
	> 82.940	<b>Phantom</b>	ER-40	DIN 6499	0,008		NEW	P. 55
	> 82.941	<b>Phantom</b>	ER-40	DIN 6499	0,008		NEW	P. 56
	> 82.942	<b>Phantom</b>	ER-40	DIN 6499	0,008		NEW	P. 56
	> 82.960	<b>Phantom</b>	ER	DIN 6499				P. 56
	> 82.962	<b>Phantom</b>	ER					P. 56
	> 82.963	<b>Phantom</b>	ER					P. 57
	> 82.965	<b>Phantom</b>	ER				NEW	P. 57
	> 82.990	<b>Phantom</b>	ER					P. 57
	> 82.993	<b>Phantom</b>	ER				NEW	P. 58
	> 83.624	<b>Phantom</b>	SK	G6,3	15.000 RPM			P. 58
	> 83.626	<b>Phantom</b>	MAS-BT	G6,3	15.000 RPM			P. 58
	> 83.627	<b>Phantom</b>	HSK-A	G6,3	20.000 RPM			P. 59
	> 83.629	<b>Phantom</b>						P. 59
	> 83.691	<b>Phantom</b>						P. 59
	> 84.100	INTERNATIONAL TOOLS		DIN 2185				P. 60
	> 84.110	INTERNATIONAL TOOLS		DIN 2187				P. 60
	> 84.120	INTERNATIONAL TOOLS						P. 60
	> 84.170	INTERNATIONAL TOOLS		DIN 238				P. 61
	> 84.171	INTERNATIONAL TOOLS						P. 61
	> 84.172	INTERNATIONAL TOOLS						P. 61

> 84.173	<b>Phantom</b>	DIN 238	SK						P. 62
> 84.174	<b>Phantom</b>	DIN 238	SK	G6,3	12.000	RPM			P. 62
> 84.176	<b>Phantom</b>	DIN 238	MAS-BT	G6,3	12.000	RPM			P. 62
> 84.203	<b>Phantom</b>	DIN 6383	SK						P. 63
> 84.204	<b>Phantom</b>		SK	G6,3	15.000	RPM			P. 63
> 84.206	<b>Phantom</b>		MAS-BT	G6,3	15.000	RPM			P. 63
> 84.410	<b>Phantom</b>	DIN 217							P. 64
> 84.411	<b>Phantom</b>								P. 64
> 84.412	<b>Phantom</b>								P. 64
> 84.413	<b>Phantom</b>								P. 64
> 84.600	INTERNATIONAL TOOLS								P. 64
> 84.610	INTERNATIONAL TOOLS	DIN 317							P. 65
> 84.620	INTERNATIONAL TOOLS								P. 65
> 84.745	INTERNATIONAL TOOLS								P. 65
> 84.750	<b>Phantom</b>		MAS-BT						P. 65
> 84.751	<b>Phantom</b>		MAS-BT						P. 65
> 84.752	<b>Phantom</b>		MAS-BT						P. 66
> 84.760	<b>Phantom</b>	DIN 69872-A							P. 66
> 84.770	<b>Phantom</b>	DIN 69872-B							P. 66
> 84.775	<b>Phantom</b>	ISO 7388/2-B							P. 66
> 84.780	<b>Phantom</b>	OTT-90°							P. 67
> 84.789	<b>Phantom</b>		HSK-A						P. 67
> 84.790	<b>Phantom</b>		HSK-A						P. 67
> 84.791	<b>Phantom</b>		HSK-A						P. 67
> 84.872	<b>Phantom</b>	DIN 172-A	n6	F7					P. 68
> 84.873	<b>Phantom</b>	DIN 172-A	n6	F7					P. 68
> 84.874	<b>Phantom</b>	DIN 172-A	n6	F7					P. 68
> 84.879	<b>Phantom</b>	DIN 179-A	n6	F7					P. 69
> 84.880	<b>Phantom</b>	DIN 179-A	n6	F7					P. 69
> 84.881	<b>Phantom</b>	DIN 179-A	n6	F7					P. 69
> 84.908	<b>Phantom</b>	TYPE XP		VDI	0,04				P. 70
> 84.910	<b>Phantom</b>	DIN 69880	B1	VDI					P. 70
> 84.911	<b>Phantom</b>	DIN 69880	B2	VDI					P. 71
> 84.912	<b>Phantom</b>	DIN 69880	B3	VDI					P. 71
> 84.913	<b>Phantom</b>	DIN 69880	B4	VDI					P. 72





> 84.920	<b>Phantom</b>	DIN 69880	C1	VDI		P. 72
> 84.921	<b>Phantom</b>	DIN 69880	C2	VDI		P. 73
> 84.922	<b>Phantom</b>	DIN 69880	C3	VDI		P. 73
> 84.923	<b>Phantom</b>	DIN 69880	C4	VDI		P. 74
> 84.950	<b>Phantom</b>	DIN 69880	E1	VDI		P. 74
> 84.951	<b>Phantom</b>	DIN 69880	E2	VDI		P. 75
> 84.955	<b>Phantom</b>	DIN 69880	F1	VDI		P. 75
> 84.958	<b>Phantom</b>	DIN 69880	E4	VDI		P. 76
> 84.961	<b>Phantom</b>	DIN 69880		VDI		P. 76
> 84.970	<b>Phantom</b>	DIN 69880				P. 76
> 85.050	<b>Phantom</b>					P. 77
> 85.051	<b>Phantom</b>					P. 77
> 85.052	<b>Phantom</b>					P. 78
> 85.053	<b>Phantom</b>					P. 78
> 85.058	<b>Phantom</b>					P. 78
> 85.059	<b>Phantom</b>					P. 79
> 85.062	<b>Phantom</b>					P. 79
> 85.100	INTERNATIONAL TOOLS					P. 80
> 85.110	INTERNATIONAL TOOLS					P. 80
> 85.120	INTERNATIONAL TOOLS					P. 80
> 85.130	INTERNATIONAL TOOLS					P. 81
> 85.140	INTERNATIONAL TOOLS					P. 81
> 85.150	INTERNATIONAL TOOLS					P. 81
> 85.210	<b>Phantom</b>					P. 82
> 85.215	<b>Phantom</b>					P. 82
> 85.220	<b>Phantom</b>					P. 82
> 85.225	<b>Phantom</b>					P. 83
> 85.230	<b>Phantom</b>					P. 83
> 85.232	<b>Phantom</b>					P. 83
> 85.280	<b>Phantom</b>					P. 84
> 85.410	<b>BISON</b>	DIN 6350				P. 85
> 85.420	<b>BISON</b>	DIN 6350				P. 85
> 85.421	<b>BISON</b>	DIN 55026-B				P. 86
> 85.422	<b>BISON</b>	DIN 55027		BAJO-NET		P. 86
> 85.423	<b>BISON</b>	DIN 55029		CAM-LOCK		P. 87
> 85.500	<b>BISON</b>	DIN 6350				P. 87





















































> 85.510	<b>BISON</b>	DIN 6350			P. 88
> 85.600	<b>BISON</b>				P. 88
> 85.602	<b>BISON</b>	DIN 55027	BAJO-NET		P. 89
> 85.603	<b>BISON</b>	DIN 55029	CAM-LOCK		P. 89
> 85.670	<b>BISON</b>	DIN 6351			P. 90
> 85.801	<b>BISON</b>				P. 90
> 85.802	<b>BISON</b>				P. 91
> 85.805	<b>BISON</b>				P. 91
> 85.811	<b>BISON</b>				P. 91
> 85.812	<b>BISON</b>				P. 92
> 85.813	<b>BISON</b>				P. 92
> 85.820	<b>BISON</b>				P. 92
> 85.821	<b>BISON</b>				P. 93
> 85.823	<b>BISON</b>				P. 93
> 85.840	<b>BISON</b>				P. 93
> 85.850	<b>BISON</b>				P. 94
> 85.851	<b>BISON</b>				P. 94
> 85.855	<b>BISON</b>				P. 94
> 85.856	<b>BISON</b>				P. 95
> 85.866	<b>BISON</b>				P. 95
> 85.868	<b>BISON</b>				P. 95
> 85.890	<b>BISON</b>				P. 95
> 85.961	<b>BISON</b>	DIN 55027	BAJO-NET		P. 96
> 85.962	<b>BISON</b>	DIN 55029	CAM-LOCK		P. 96
> 85.992	<b>BISON</b>				P. 96
> 85.993	<b>BISON</b>				P. 97
> 87.110	<b>BISON</b>				P. 98
> 87.250	<b>BISON</b>				P. 98
> 87.400	<b>BISON</b>				P. 99
> 88.150	<b>BISON</b>				P. 99
> 88.152	INTERNATIONAL TOOLS				P. 100
> 88.154	INTERNATIONAL TOOLS				P. 100
> 88.170	<b>BISON</b>				P. 101
> 88.200	<b>BISON</b>				P. 101
> 88.205	<b>BISON</b>				P. 102





> 88.230	<b>BISON</b>			P. 102
> 88.237	INTERNATIONAL TOOLS			P. 103
> 88.250	<b>BISON</b>			P. 103
> 88.260	<b>BISON</b>			P. 104
> 88.270	<b>BISON</b>			P. 104
> 88.318	<b>BISON</b>			P. 105
> 88.340	<b>Phantom</b>			P. 105
> 88.350	<b>Phantom</b>			P. 106
> 88.407	<b>BISON</b>			P. 106
> 88.430	<b>BISON</b>			P. 107
> 88.431	<b>BISON</b>			P. 107
> 88.432	<b>BISON</b>			P. 107
> 88.433	<b>BISON</b>			P. 108
> 88.434	<b>BISON</b>			P. 108
> 88.440	<b>TORAX</b>			P. 108
> 88.470	<b>TORAX</b>			P. 109
> 88.472	<b>TORAX</b>			P. 109
> 88.474	<b>TORAX</b>			P. 109
> 88.475	<b>TORAX</b>			P. 110
> 88.476	<b>TORAX</b>			P. 110
> 88.477	<b>TORAX</b>			P. 110
> 88.478	<b>TORAX</b>			P. 111
> 88.600		DIN 787		P. 112
> 88.605		DIN 6379		P. 112
> 88.610		DIN 508		P. 113
> 88.612		DIN 508-L		P. 113
> 88.613		DIN 508-R		P. 114
> 88.614				P. 114
> 88.615		DIN 6323		P. 114
> 88.616		DIN 6322-A		P. 115
> 88.617		DIN 6322-B		P. 115
> 88.618				P. 115
> 88.630		DIN 6330-B		P. 116
> 88.631		DIN 6331		P. 116
> 88.632		DIN 6334		P. 116



> 88.640	DIN 6340			P. 117
> 88.641	DIN 6319-C			P. 117
> 88.642	DIN 6319-D			P. 117
> 88.643	DIN 6319-G			P. 117
> 88.650	DIN 6314			P. 118
> 88.655	DIN 6314-Z			P. 118
> 88.660	DIN 6315-B			P. 118
> 88.665	DIN 6315-GN			P. 119
> 88.670	DIN 6315-C			P. 119
> 88.675	DIN 6316			P. 120
> 88.700	DIN 6314-T			P. 120
> 88.705	DIN 6314-AT			P. 121
> 88.710	DIN 6316-T			P. 121
> 88.750	DIN 6318			P. 122
> 88.780				P. 122
> 88.800				P. 122
> 88.805				P. 123
> 88.810				P. 123
> 88.900				P. 124
> 88.902				P. 124
> 88.904				P. 125
> 88.910				P. 125
> 88.912				P. 126
> 88.914				P. 126
> 88.920				P. 127
> 88.921				P. 127
> 88.924				P. 128
> 88.928				P. 128
> 88.935				P. 129
> 88.936				P. 129
> 88.940				P. 129
> 88.965				P. 130
> 88.966				P. 130
> 88.991				P. 130
> 88.994				P. 131





> 88.860	INTERNATIONAL TOOLS								P. 132
> 88.870	INTERNATIONAL TOOLS								P. 132
> 89.250	<b>Phantom</b>	DIN 6499-B	ER	0,015				P. 132	
> 89.252	<b>Phantom</b>	DIN 6499-B	ER	0,005				P. 133	
> 89.260	<b>Phantom</b>	DIN 6499	ER	0,008				P. 133	
> 89.262	<b>Phantom</b>	DIN 6499	ER	0,008				P. 133	
> 89.264	<b>Phantom</b>	DIN 6499	ER	0,008				P. 134	
> 89.282	<b>Phantom</b>	DIN 6499-B	ER					P. 134	
> 89.878	<b>Phantom</b>							P. 134	



1 SC



1 HSS(E)



2



3 SC



3 HSS-E



4



5



6



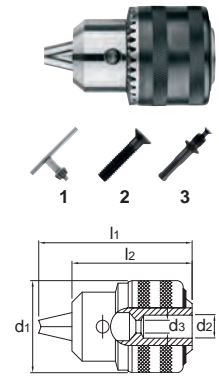
7



8

> **81.130 Phantom**

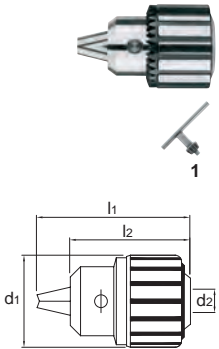
NL Tandkransboorhouder, met sleutel  
 FR Mandrin de perçage à couronne dentée, avec clé  
 ES Portabroca, con llave  
 DE Zahnkranzbohrfutter, mit Schlüssel



Ref.	Ø mm	d2	d1	d3	l1	l2	1	2	3
81.130.0810	0,8-6,5	B10	30		55	44	81.150.1400		
81.130.0820	0,8-6,5	3/8"-24 UNF	30	5.5	55	44	81.150.1400	81.182.0510	
81.130.1020	1-10	3/8"-24 UNF	33	5.5	60	50	81.150.1400	81.182.0510	
81.130.1025	1-10	1/2"-20 UNF	33	6.5	60	50	81.150.1400	81.182.0610	81.182.1330
81.130.1312	1,5-13	B12	43		73	59	81.150.0200		
81.130.1320	1,5-13	3/8"-24 UNF	43	5.5	73	59	81.150.0200	81.182.0510	
81.130.1325	1,5-13	1/2"-20 UNF	43	6.5	73	59	81.150.0200	81.182.0610	81.182.1330
81.130.1616	3-16	B16	54		85	66	81.150.0300		
81.130.1625	3-16	1/2"-20 UNF	54	6.5	85	66	81.150.0300	81.182.0610	81.182.1330
81.130.1630	3-16	5/8"-16 UN	54		85	66	81.150.0300		

> **81.140 Phantom**

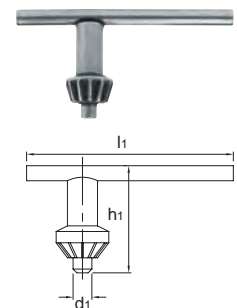
NL Tandkransboorhouder, met sleutel, verzwaarde uitvoering  
 FR Mandrin de perçage à couronne dentée, avec clé, version extra renforcée  
 ES Portabroca, con llave, versión extra macizo  
 DE Zahnkranzbohrfutter, mit Schlüssel, extra stabile Ausführung



Ref.	Ø mm	d2	d1	l1	l2	1
81.140.0812	0,8-6,5	B12	32	51	39	81.150.2100
81.140.1016	1-10	B16	43	68	53	81.150.0200
81.140.1091	1-10	J1	37	60	51	81.150.0200
81.140.1092	1-10	J2	37	60	51	81.150.0200
81.140.1316	1-13	B16	46	77	62	81.150.2200
81.140.1396	1-13	J6	46	77	62	81.150.2200
81.140.1618	1-16	B18	57	95	77	81.150.0300
81.140.1693	1-16	J3	57	95	77	81.150.0300
81.140.2022	5-19	B22	65	110	85	81.150.2300
81.140.2093	5-19	J3	65	110	85	81.150.2300

> **81.150 Phantom**

NL Sleutel voor Tandkransboorhouder  
 FR Clé pour Mandrin de perçage à couronne dentée  
 ES Llave para Portabroca  
 DE Schlüssel für Zahnkranzbohrfutter



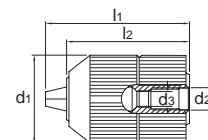
Ref.	Type	d1	z	h1	l1
81.150.0200	S2/K34	6	12	40	80
81.150.0300	S10/K3	8	11	47	85
81.150.1400	S14/KG	6	11	32	55

Ref.	Type	d1	z	h1	l1
81.150.2100	CK4	5.5	12	35	60
81.150.2200	S17/K2	6.3	11	45	90
81.150.2300	S13/K4	9.5	12	70	132



## > 81.180 Phantom

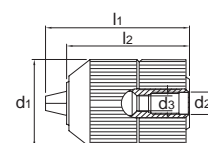
NL Snelspanboorhouder  
FR Mandrin porte-forets auto-serrant  
ES Portabroca cierre automático  
DE Schnellspannbohrfutter



Ref.	Ø mm	d2	d3	d1	l2	l1	Watt Max.	1	2
81.180.1020	1-10	3/8"-24 UNF	5.5	41	54	64	400	81.182.0510	
81.180.1035	1-10	1/4" BIT	6.5	41	54	64	400		
81.180.1325	2-13	1/2"-20 UNF	6.5	46	66	81	1000	81.182.0610	81.182.1330
81.180.1330	2-13	SDS+ 10 mm	6.5	46	66	81	1000	81.182.0610	81.182.1330

## > 81.181 Phantom

NL Snelspanboorhouder, in metalen uitvoering  
FR Mandrin porte-forets auto-serrant, en métal  
ES Portabroca cierre automático, en metal  
DE Schnellspannbohrfutter, in Metallausführung



Ref.	Ø mm	d2	d3	d1	l2	l1	Watt Max.	1	2
81.181.1020	1-10	3/8"-24 UNF	5.5	40.4	56	65.5	1000	81.182.0510	
81.181.1320	2-13	3/8"-24 UNF	5.5	42.5	68	75	1000	81.182.0510	
81.181.1325	2-13	1/2"-20 UNF	6.5	42.5	68	75	1000	81.182.0610	81.182.1330
81.181.1330	2-13	SDS+ 10 mm	6.5	42.5	68	75	1000	81.182.0610	81.182.1330

## > 81.182 Phantom

NL Toebehoren voor Boorhouders, bout voor boorhouders (links), SDS boorstift  
FR Accessoires pour Mandrins porte-forets, boulon (filetage à gauche), Adaptateur SDS  
ES Accesorios para Portabrocas, tornillo para portabrocas (a la izquierda), Adaptador SDS  
DE Zubehör für Bohrfutter, Schraube für Bohrkopf (links), SDS Bohrstift

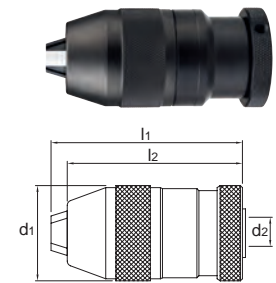


Ref.	Description
81.182.0510	M5 x 0.8
81.182.0610	M6 x 1

Ref.	Description
81.182.1330	SDS+ / 12" -20 UNF

> **81.200 Phantom**

- NL Zelfspannende Boorhouder, type A
- FR Mandrin de perçage auto-serrant, type A
- ES Portabroca cierre automático, tipo A
- DE Selbstspannende Bohrfutter, Typ A

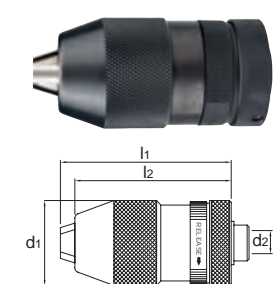


**TYPE A**

Ref.	Ø mm	d2	d1	l1	l2	Type
81.200.0810	0,8-8	B10	33	70	65	8A
81.200.0812	0,8-8	B12	33	70	65	8A
81.200.1012	0,8-10	B12	39	80	73	10A
81.200.1016	0,8-10	B16	39	80	73	10A
81.200.1020	0,8-10	3/8"-24 UNF	39	80	73	10A
81.200.1092	0,8-10	J2	39	80	73	10A
81.200.1312	1-13	B12	44	95	86	13A
81.200.1316	1-13	B16	47	102	92	13A
81.200.1320	2-13	3/8"-24 UNF	44	95	86	13A
81.200.1325	2-13	1/2"-20 UNF	44	95	86	13A
81.200.1392	1-13	J2	44	95	86	13A
81.200.1396	1-13	J6	44	95	86	13A
81.200.1616	3-16	B16	51	105	95	16A
81.200.1618	3-16	B18	51	115	102	16A
81.200.1625	3-16	1/2"-20 UNF	51	115	102	16A
81.200.1630	3-16	5/8"-16 UN	51	115	102	16A
81.200.1696	3-16	J6	51	115	102	16A
81.200.1762	5-20	B18	64	140	127	20A
81.200.1828	5-20	B22	64	140	127	20A
81.200.1894	5-20	J3	64	140	127	20A

> **81.210 Phantom**

- NL Zelfspannende Boorhouder, klopvast, met spankrachtborging, type A
- FR Mandrin de perçage auto-serrant, tenue aux percussions, avec trou de serrage, type A
- ES Portabroca cierre automático, para taladros de percusión, sistema de autoapriete, con cierre de seguridad, tipo A
- DE Selbstspannende Bohrfutter, schlagfest, mit Spannkraftsicherung, Typ A

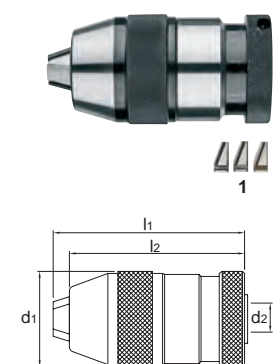


**TYPE A SECURITY LOCK**

Ref.	Ø mm	d2	d1	l1	l2	Type
81.210.1330	1,5-13	1/2"-20 UNF	44	100	92	13A

> **81.230 Phantom**

- NL Zelfspannende Precisieboorhouder, verzwaarde uitvoering, type P
- FR Mandrin de perçage de précision auto-serrant, version extra renforcée, type P
- ES Portabroca de precisión, cierre automático, versión extra macizo, tipo P
- DE Selbstspannende Präzisionsbohrfutter, extra stabile Ausführung, Typ P



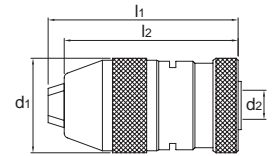
**TYPE P**

Ref.	Ø mm	d2	d1	l1	l2	Type	1
81.230.0812	0,3-8	B12	38	74	67	8P	81.412.0800
81.230.1016	0,5-10	B16	43	89	81	10P	81.412.1000
81.230.1316	1-13	B16	49	103	91	13P	81.412.1300
81.230.1616	3-16	B16	55	107	95	16P	81.412.1600
81.230.1618	3-16	B18	55	107	95	16P	81.412.1600



## > 81.250 Phantom

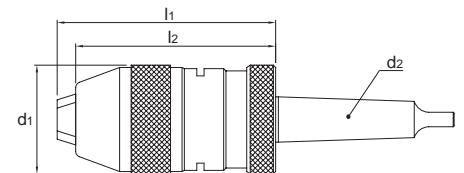
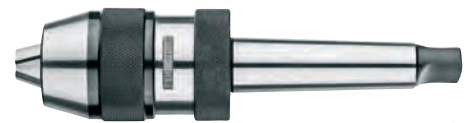
- NL Zelfspannende Precisieboorhouder, verzwaarde uitvoering, type XP  
 FR Mandrin de perçage de précision auto-serrant, version extra renforcée, type XP  
 ES Portabroca de precisión, cierre automático, versión extra macizo, tipo XP  
 DE Selbstspannende Präzisionsbohrfutter, extra stabile Ausführung, Typ XP



Ref.	Ø mm	d2	d1	l1	l2	Type	1	2
81.250.1316	1-13	B16	49	103	91	13XP	81.412.1300	81.413.1300
81.250.1616	3-16	B16	55	107	95	16XP	81.412.1600	81.413.1300
81.250.1618	3-16	B18	55	107	95	16XP	81.412.1600	81.413.1600

## > 81.300 Phantom

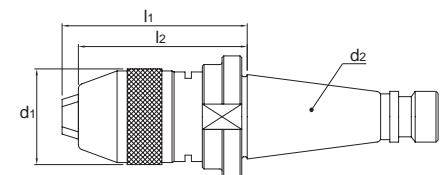
- NL Zelfspannende Precisieboorhouder, type XP, MK volgens DIN 228-B  
 FR Mandrin de perçage de précision auto-serrant, type XP, CM selon DIN 228-B  
 ES Portabroca de precisión, cierre automático, tipo XP, CM según DIN 228-B  
 DE Selbstspannende Präzisionsbohrfutter, Typ XP, MK nach DIN 228-B



Ref.	Ø mm	d2	d1	l1	l2	Type	1	2
81.300.0208	0,3-8	MK 2	38	72	65	8XP	81.412.0800	81.413.0800
81.300.0213	1-13	MK 2	48	92	80	13XP	81.412.1300	81.413.1300
81.300.0313	1-13	MK 3	48	92	80	13XP	81.412.1300	81.413.1300
81.300.0316	3-16	MK 3	54	96	85	16XP	81.412.1600	81.413.1600
81.300.0413	1-13	MK 4	48	92	80	13XP	81.412.1300	81.413.1300
81.300.0416	3-16	MK 4	54	96	85	16XP	81.412.1600	81.413.1600

## > 81.303 Phantom

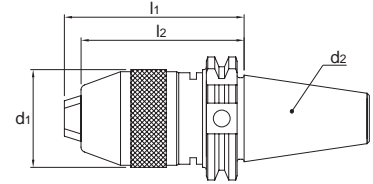
- NL Zelfspannende Precisieboorhouder, type XP, SK volgens DIN 2080  
 FR Mandrin de perçage de précision auto-serrant, type XP, SA selon DIN 2080  
 ES Portabroca de precisión, cierre automático, tipo XP, SK según DIN 2080  
 DE Selbstspannende Präzisionsbohrfutter, Typ XP, SK nach DIN 2080



Ref.	Ø mm	d2	d1	l1	l2	Type	1	2	3
81.303.4013	1-13	SK40	48	89	78	13XP	81.412.1300	81.413.1300	81.414.1300
81.303.4016	3-16	SK40	55	101	90	16XP	81.412.1600	81.413.1600	81.414.1640
81.303.5013	1-13	SK50	48	101	90	13XP	81.412.1300	81.413.1300	81.414.1300
81.303.5016	3-16	SK50	55	83	72	16XP	81.412.1600	81.413.1600	81.414.1650

> **81.304 Phantom**

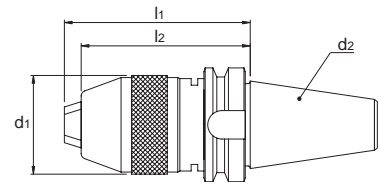
- NL Zelfspannende Precisieboorhouder, type XP, SK volgens DIN 69871
- FR Mandrin de perçage de précision auto-serrant, type XP, SA selon DIN 69871
- ES Portabroca de precisión, cierre automático, tipo XP, SK según DIN 69871
- DE Selbstspannende Präzisionsbohrfutter, Typ XP, SK nach DIN 69871



Ref.	Ø mm	d2	d1	l1	l2	Type	1	2	3
81.304.4013	1-13	SK40	48	91	80	13XP	81.412.1300	81.413.1300	81.414.1300
81.304.4016	3-16	SK40	55	108	97	16XP	81.412.1600	81.413.1600	81.414.1640
81.304.5013	1-13	SK50	48	89	78	13XP	81.412.1300	81.413.1300	81.414.1300
81.304.5016	3-16	SK50	55	89	76	16XP	81.412.1600	81.413.1600	81.414.1650

> **81.306 Phantom**

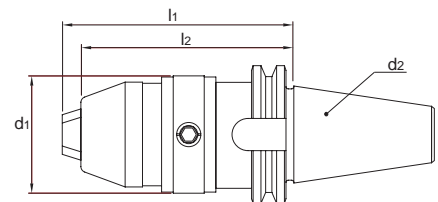
- NL Zelfspannende Precisieboorhouder, type XP, BT volgens MAS 403 BT
- FR Mandrin de perçage de précision auto-serrant, type XP, BT selon MAS 403 BT
- ES Portabroca de precisión, cierre automático, tipo XP, BT según MAS 403 BT
- DE Selbstspannende Präzisionsbohrfutter, Typ XP, BT nach MAS 403 BT



Ref.	Ø mm	d2	d1	l1	l2	Type	1	2	3
81.306.4013	1-13	BT40	48	97	86	13XP	81.412.1300	81.413.1300	81.414.1300
81.306.4016	3-16	BT40	55	116	105	16XP	81.412.1600	81.413.1600	81.414.1640
81.306.5013	1-13	BT50	48	108	97	13XP	81.412.1300	81.413.1300	81.414.1300
81.306.5016	3-16	BT50	55	106	95	16XP	81.412.1600	81.413.1600	81.414.1650

> **81.320 Phantom**

- NL Ultra Precisieboorhouder, type XPF, compleet met spansleutel, SK volgens DIN 69871
- FR Mandrin de perçage de ultra haute précision auto-serrant, type XPF, avec clé de serrage, SA selon DIN 69871
- ES Portabroca de precisión super alta, tipo XPF, se suministra con llave de apriete, SK según DIN 69871
- DE Ultra-Präzisionsbohrfutter, Typ XPF, Komplett mit Spannschlüssel, SK nach DIN 69871



Ref.	Ø mm	d2	d1	l1	l2	Type	1
81.320.0413	1-13	SK40	54	100	91	13XPF	81.412.1300
81.320.0416	3-16	SK40	57	101	94	16XPF	81.412.1600

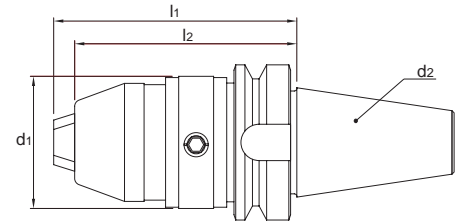
SC 1  
HSS-E 1  
2  
SC 3  
HSS-E 3  
4  
5  
6  
7  
8





## > 81.330 Phantom

- NL Ultra Precisieboorhouder, type XPF, compleet met spansleutel, BT volgens MAS 403 BT  
 FR Mandrin de perçage de ultra haute précision auto-serrant, type XPF, avec clé de serrage, BT selon MAS 403 BT  
 ES Portabroca de precisión super alta, tipo XPF, se suministra con llave de apriete, BT según MAS 403 BT  
 DE Ultra-Präzisionsbohrfutter, Typ XPF, Komplett mit Spannschlüssel, BT nach MAS 403 BT



Ref.	Ø mm	d2	d1	l1	l2	Type	1
81.330.0413	1-13	BT40	54	105	96	13XPF	81.412.1300
81.330.0416	3-16	BT40	57	106	99	16XPF	81.412.1600

## > 81.412 Phantom

- NL Reservebekken, voor type P, XP en XPF  
 FR Mors de rechange, pour type P, XP et XPF  
 ES Garras de recambio, para tipo P, XP y XPF  
 DE Ersatzbacken, für Typ P, XP und XPF



Ref.	Ø mm	Type	Ref.	Ø mm	Type
81.412.0600	0,3-6,5	6,5P-6,5XP	81.412.1300	1-13	13P-13XP-13XPF
81.412.0800	0,3-8	8P-8XP	81.412.1600	3-16	16P-16XP-16XPF
81.412.1000	0,5-10	10P-10XP			

## > 81.413 Phantom

- NL Spansleutel, voor XP  
 FR Clé pour vis de serrage, pour type XP  
 ES Llave para tornillo de fijación, para tipo XP  
 DE Spannschlüssel, für Typ XP



Ref.	Type	l1	d1	Ref.	Type	l1	d1
81.413.0600	6,5XP	140	27	81.413.1300	13XP	165	38
81.413.0800	8XP	165	28	81.413.1600	16XP	165	43
81.413.1000	10XP	165	34				

## > 81.414 Phantom

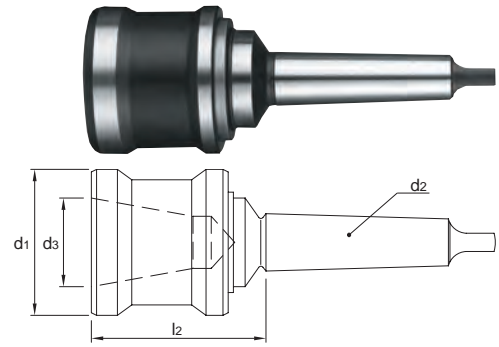
- NL Reserveboorhouder, XP voor 81.303, 81.304, 81.306 en 81.308  
 FR Mandrin de rechange, XP pour 81.303, 81.304, 81.306 et 81.308  
 ES Portabroca de recambio, XP para 81.303, 81.304, 81.306 y 81.308  
 DE Ersatzbohrfutter, XP für 81.303, 81.304, 81.306 und 81.308



Ref.	Ø mm	Type	Ref.	Ø mm	Type
81.414.0800	0,3-8	8XP	81.414.1640	3-16	16XP/40
81.414.1300	1-13	13XP	81.414.1650	3-16	16XP/50

> **81.450 BISON**

NL Snelwisselhouder, MK volgens DIN 228-B, BISON type 1721  
 FR Porte-douilles à changement rapide, CM selon DIN 228-B, BISON type 1721  
 ES Torreta de cambio rápido, CM según DIN 228-B, BISON tipo 1721  
 DE Schnellwechselfutter, MK nach DIN 228-B, BISON Typ 1721



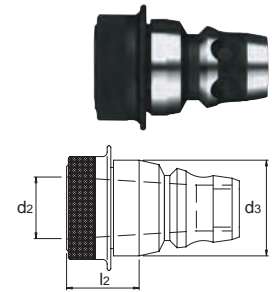
DIN  
228-B

Ref.	d2	d3	d1	l1
81.450.0240	MK 2	40	65	82.5
81.450.0340	MK 3	40	65	81
81.450.0440	MK 4	40	65	80

Ref.	d2	d3	d1	l1
81.450.0451	MK 4	51.5	83	102
81.450.0551	MK 5	51.5	83	98.5

> **81.460 BISON**

NL Inzethuls, met inwendige MK, voor 81.450  
 FR Douille d'accouplement, avec CM intérieur, pour 81.450  
 ES Manguito de unión, con CM interior, para 81.450  
 DE Einsätze, mit innerem MK, für 81.450

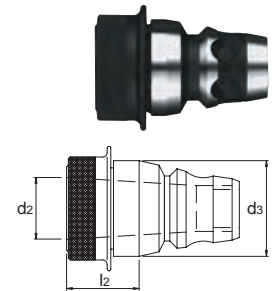


Ref.	d2	d3	l2
81.460.4001	MK 1	40	29
81.460.4002	MK 2	40	29
81.460.4003	MK 3	40	47
81.460.5101	MK 1	51.5	34

Ref.	d2	d3	l2
81.460.5102	MK 2	51.5	34
81.460.5103	MK 3	51.5	34
81.460.5104	MK 4	51.5	57

> **81.462 BISON**

NL Inzethuls, met inwendige MK en pendelsysteem voor ruimers, voor 81.450  
 FR Douille d'accouplement, avec CM intérieur et système pendulaire pour alésoirs, pour 81.450  
 ES Manguito de unión, con CM interior y sistema pendular para escariadores, para 81.450  
 DE Einsätze, mit innerem MK und Pendelsystem für Reibahlen, für 81.450



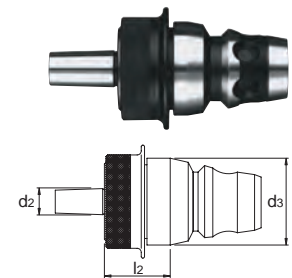
P

Ref.	d2	d3	l2
81.462.4002	MK 2	40	29

Ref.	d2	d3	l2
81.462.4003	MK 3	40	47

> **81.463 BISON**

NL Inzethuls, met uitwendige boorhouderopname, voor 81.450  
 FR Douille d'accouplement, avec connecteur porte-forets externe, pour 81.450  
 ES Manguito de unión, con conector portabrocas exterior, para 81.450  
 DE Einsätze, mit auswendige Bohrfutteraufnahme, für 81.450



Ref.	d2	d3	l2
81.463.4012	B12	40	32.5
81.463.4016	B16	40	34

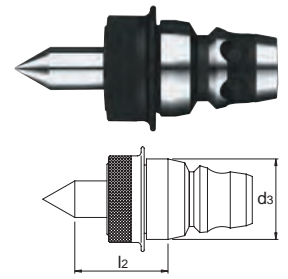
Ref.	d2	d3	l2
81.463.5116	B16	51.5	39





## > 81.464 BISON

- NL Inzethuls, met uitwendige 60° centreerpunt, voor 81.450  
 FR Douille d'accouplement, avec pointe à centrer externe de 60°, pour 81.450  
 ES Manguito de unión, con punta de centrado exterior de 60°, para 81.450  
 DE Einsätze, mit äußerer Zentrierspitze 60°, für 81.450



Ref.	d3	l2
81.464.4000	40	61

Ref.	d3	l2

## > 81.510 AKON

- NL Snijplaathouder set  
 FR Coffret porte-filières machine  
 ES Juego de portacojinetes  
 DE Schneideisenhaltersatz



Ref.	Nr.	1	2
81.510.0100	1	M1-M6	16x5, 20x5, 20x7
81.510.0200	2	M3-M14	20x7, 25x9, 30x11, 38x14

Ref.	Nr.	1	2
81.510.0300	3	M16-M24	45x14, 45x18, 55x16, 55x22

## > 81.520 AKON

- NL Tap- en Snijplaathouder set  
 FR Coffret porte-tarands et porte-filières machine  
 ES Juego de Portamachos y Portacojinetes  
 DE Gewindebohrer und Schneideisenhaltersatz



Ref.	Nr.	1	2	3
81.520.0100	1	M1-M6	M1-M6	16x5, 20x5, 20x7
81.520.0200	2	M3-M14	M3-M16	20x7, 25x9, 30x11, 38x14

Ref.	Nr.	1	2	3
81.520.0300	3	M16-M24	M4-M24	45x14, 45x18, 55x16, 55x22

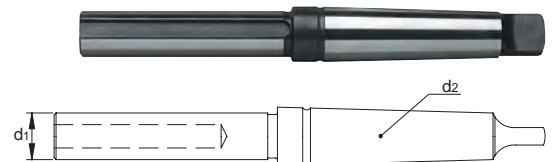
## > 81.530 AKON

- NL Opsteekdoorn, MK volgens DIN 228-B  
 FR Mandrin support pour porte-tarands et porte-filières, CM selon DIN 228-B  
 ES Espiga para portamachos y porta terrajas, CM según DIN 228-B  
 DE Aufsteckdorne, MK nach DIN 228-B

DIN  
228-B

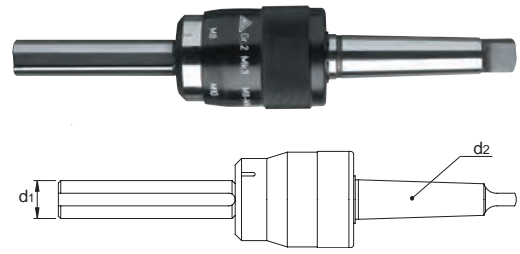
Ref.	Nr.	d2	d1
81.530.0101	1	MK 1	12
81.530.0102	1	MK 2	12
81.530.0103	1	MK 3	12
81.530.0202	2	MK 2	20

Ref.	Nr.	d2	d1
81.530.0203	2	MK 3	20
81.530.0204	2	MK 4	20
81.530.0303	3	MK 3	25
81.530.0304	3	MK 4	25



> **81.531 AKON**

- NL Opsteekdoorn, MK volgens DIN 228-B, met instelbare slipkoppeling
- FR Mandrin support pour porte-tarauds et porte-filières, CM selon DIN 228-B, à réglage de couple par friction
- ES Espiga para portamachos y porta terrajas, CM según DIN 228-B, con ajuste de par por fricción
- DE Aufsteckdorne, MK nach DIN 228-B, mit einstellbarer Rutschkupplung



DIN  
**228-B**

Ref.	Nr.	d2	d1
81.531.0202	2	MK 2	20
81.531.0203	2	MK 3	20

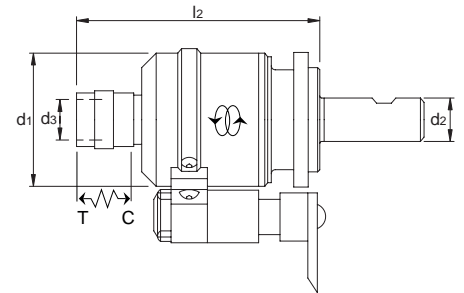
Ref.	Nr.	d2	d1
81.531.0304	3	MK 4	25





## > 81.532 Phantom

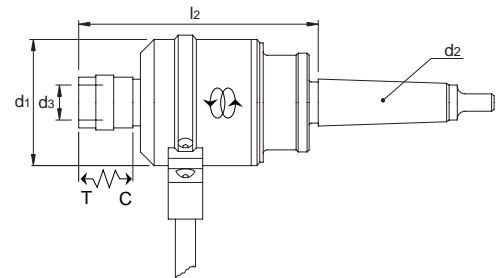
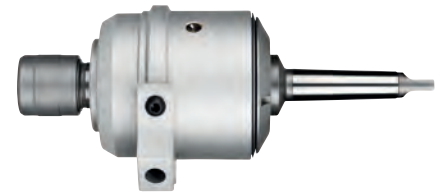
- NL Tapapparaat, met omkeerinrichting, met druk- en trekcompensatie, Weldon, voor gebruik met tapinzetstukken  
 FR Appareil à tarauder, dispositif d'inversion, à compensation de pression et de traction, Weldon, pour douilles porte-tarauds  
 ES Aparato roscador, con dispositivo de inversión, con compensación de presión y de tracción, Weldon, para casquillos de roscado  
 DE Gewindeschneidmaschinen, mit Umkehrvorrichtung, mit Zug- und Druckausgleich, Weldon, Für den Gebrauch mit Gewindebohrereinsatzstück



Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.532.2512	25	19	72	130	M2-M12	81.633/81.634	81.653/81.654	7	3

## > 81.540 Phantom

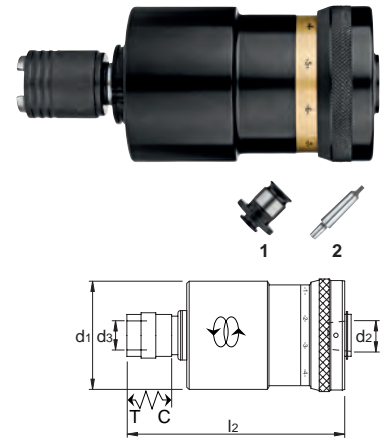
- NL Tapapparaat, met omkeerinrichting, met druk- en trekcompensatie, MK volgens DIN 228-B, voor gebruik met tapinzetstukken  
 FR Appareil à tarauder, dispositif d'inversion, à compensation de pression et de traction, CM selon DIN 228-B, pour douilles porte-tarauds  
 ES Aparato roscador, con dispositivo de inversión, con compensación de presión y de tracción, CM según DIN 228-B, para casquillos de roscado  
 DE Gewindeschneidmaschinen, mit Umkehrvorrichtung, mit Zug- und Druckausgleich, MK nach DIN 228-B, Für den Gebrauch mit Gewindebohrereinsatzstück



Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.540.0212	MK 2	19	72	135	M2-M12	81.633/81.634	81.653/81.654	7	3
81.540.0312	MK 3	19	78	133	M2-M12	81.633/81.634	81.653/81.654	7	3
81.540.0320	MK 3	31	83	171	M6-M27	81.636/81.637	81.656/81.657	10	4
81.540.0420	MK 4	31	83	172	M6-M27	81.636/81.637	81.656/81.657	10	4

› **81.545 Phantom**

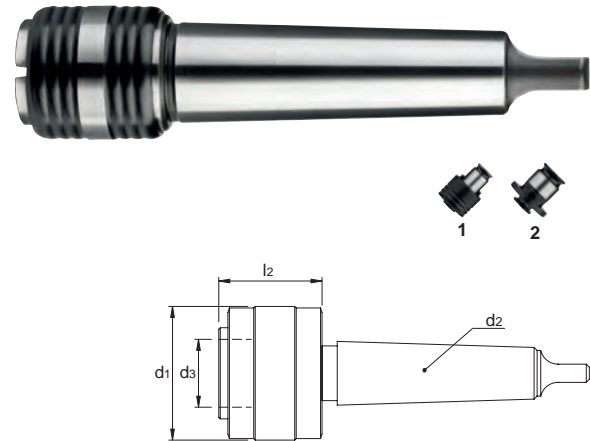
- NL Tapapparaat, met omkeerinrichting, met druk- en trekcompensatie, voor gebruik met tapinzetstukken
- FR Appareil à tarauder, dispositif d'inversion, à compensation de pression et de traction, pour douilles porte-tarauds
- ES Aparato roscador, con dispositivo de inversión, con compensación de presión y de tracción, para casquillos de roscado
- DE Gewindeschneidmaschinen, mit Umkehrvorrichtung, mit Zug- und Druckausgleich, Für den Gebrauch mit Gewindebohrereinsatzstück



Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.545.0007	J33	13	53		M2-M6	81.651	84.171	7	3
81.545.0012	J6	19	68		M2-M12	81.653/81.654	84.171	7	3
81.545.0020	M20	26	83		M8-M20	81.655	84.172	10	4

› **81.570 Phantom**

- NL Taphouder, MK volgens DIN 228-B, zonder axiale compensatie, voor gebruik met tapinzetstukken
- FR Mandrin à tarauder porte-douilles, CM selon DIN 228-B, sans compensation axiale, pour douilles porte-tarauds
- ES Portamachos de cambio rápido, CM según DIN 228-B, sin compensación axial, para casquillos de roscado
- DE Gewindeschneidfutter, MK nach DIN 228-B, Ohne axialen Ausgleich, Für den Gebrauch mit Gewindebohrereinsatzstück



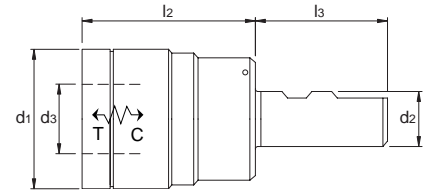
Ref.	d2	d3	d1	l2	Ø mm	1	2
81.570.0212	MK 2	19	33	45	M2-M12	81.633/81.634	81.653/81.654
81.570.0220	MK 2	31	50	61	M6-M27	81.636/81.637	81.656/81.657
81.570.0312	MK 3	19	33	45	M2-M12	81.633/81.634	81.653/81.654
81.570.0320	MK 3	31	50	61	M6-M27	81.636/81.637	81.656/81.657





## > 81.602 Phantom

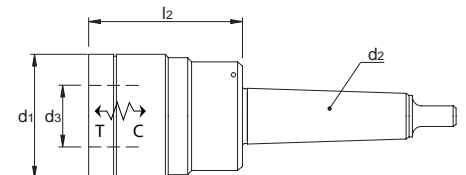
- NL** Taphouder, met druk- en trekcompensatie, Weldon, voor gebruik met tapinzetstukken  
**FR** Mandrin à tarauder porte-douilles, à compensation de pression et de traction, Weldon, pour douilles porte-tarauds  
**ES** Portamachos de cambio rápido, con compensación de presión y de tracción, Weldon, para casquillos de roscado  
**DE** Gewindeschneidfutter, mit Zug- und Druckausgleich, Weldon, Für den Gebrauch mit Gewindebohrereinsatzstück



Ref.	d2	d3	d1	l2	l3	Ø mm	1	2	T	C
81.602.2012	20	19	38	41	50	M2-M12	81.633/81.634	81.653/81.654	9	9
81.602.2512	25	19	38	41	56	M2-M12	81.633/81.634	81.653/81.654	9	9
81.602.2520	25	31	55	63	56	M6-M27	81.636/81.637	81.656/81.657	15	15
81.602.3212	32	19	38	41	61	M2-M12	81.633/81.634	81.653/81.654	9	9
81.602.3220	32	31	55	63	61	M6-M27	81.636/81.637	81.656/81.657	15	15
81.602.3233	32	48	79	97	61	M14-M45	81.639		24	24
81.602.4012	40	19	38	41	72	M2-M12	81.633/81.634	81.653/81.654	9	9
81.602.4020	40	31	55	63	72	M6-M27	81.636/81.637	81.656/81.657	15	15
81.602.4033	40	48	79	97	72	M14-M45	81.639		24	24

## > 81.610 Phantom

- NL** Taphouder, met druk- en trekcompensatie, MK volgens DIN 228-B, voor gebruik met tapinzetstukken  
**FR** Mandrin à tarauder porte-douilles, à compensation de pression et de traction, CM selon DIN 228-B, pour douilles porte-tarauds  
**ES** Portamachos de cambio rápido, con compensación de presión y de tracción, CM según DIN 228-B, para casquillos de roscado  
**DE** Gewindeschneidfutter, mit Zug- und Druckausgleich, MK nach DIN 228-B, Für den Gebrauch mit Gewindebohrereinsatzstück

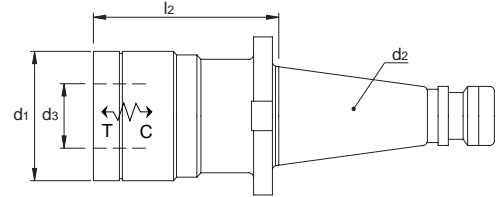


Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.610.0212	MK 2	19	38	47	M2-M12	81.633/81.634	81.653/81.654	7.5	7.5
81.610.0312	MK 3	19	38	47	M2-M12	81.633/81.634	81.653/81.654	7.5	7.5
81.610.0320	MK 3	31	55	71	M6-M27	81.636/81.637	81.656/81.657	12.5	12.5
81.610.0420	MK 4	31	55	72	M6-M27	81.636/81.637	81.656/81.657	12.5	12.5
81.610.0433	MK 4	48	79	105	M14-M45	81.639		20	20
81.610.0533	MK 5	48	79	105.5	M14-M45	81.639		20	20
81.610.0548	MK 5	60	96	117	M39-M60	81.641		22.5	22.5



> **81.613 Phantom**

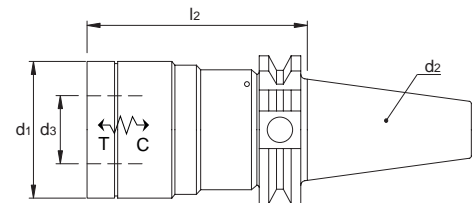
- NL Taphouder, met druk- en trekcompensatie, SK volgens DIN 2080, voor gebruik met tapinzetstukken
- FR Mandrin à tarauder porte-douilles, à compensation de pression et de traction, SA selon DIN 2080, pour douilles porte-tarouds
- ES Portamachos de cambio rápido, con compensación de presión y de tracción, SK según DIN 2080, para casquillos de roscado
- DE Gewindeschneidfutter, mit Zug- und Druckausgleich, SK nach DIN 2080, Für den Gebrauch mit Gewindebohrereinsatzstück



Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.613.4012	SK40	19	38	53	M2-M12	81.633/81.634	81.653/81.654	9	9
81.613.4020	SK40	31	55	77	M6-M27	81.636/81.637	81.656/81.657	15	15
81.613.4033	SK40	48	79	118	M14-M45	81.639		24	24
81.613.5020	SK50	31	55	79	M6-M27	81.636/81.637	81.656/81.657	15	15
81.613.5033	SK50	48	79	125	M14-M45	81.639		24	24

> **81.614 Phantom**

- NL Taphouder, met druk- en trekcompensatie, SK volgens DIN 69871, voor gebruik met tapinzetstukken
- FR Mandrin à tarauder porte-douilles, à compensation de pression et de traction, SA selon DIN 69871, pour douilles porte-tarouds
- ES Portamachos de cambio rápido, con compensación de presión y de tracción, SK según DIN 69871, para casquillos de roscado
- DE Gewindeschneidfutter, mit Zug- und Druckausgleich, SK nach DIN 69871, Für den Gebrauch mit Gewindebohrereinsatzstück



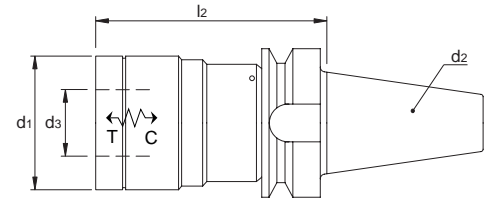
Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.614.4012	SK40	19	38	60	M2-M12	81.633/81.634	81.653/81.654	7.5	7.5
81.614.4020	SK40	31	55	98	M6-M27	81.636/81.637	81.656/81.657	12.5	12.5
81.614.4033	SK40	48	79	151	M14-M45	81.639		20	20
81.614.5012	SK50	19	38	60	M2-M12	81.633/81.634	81.653/81.654	7.5	7.5
81.614.5020	SK50	31	55	84	M6-M27	81.636/81.637	81.656/81.657	12.5	12.5
81.614.5033	SK50	48	79	139	M14-M45	81.639		20	20
81.614.5048	SK50	60	96	152	M39-M60	81.641		22.5	22.5





## > 81.616 Phantom

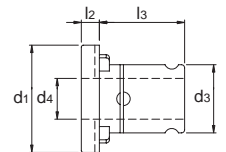
- NL Taphouder, met druk- en trekcompensatie, BT volgens MAS 403 BT, voor gebruik met tapinzetstukken  
 FR Mandrin à tarauder porte-douilles, à compensation de pression et de traction, BT selon MAS 403 BT, pour douilles porte-tarands  
 ES Portamachos de cambio rápido, con compensación de presión y de tracción, BT según MAS 403 BT, para casquillos de roscado  
 DE Gewindeschneidfutter, mit Zug- und Druckausgleich, BT nach MAS 403 BT, Für den Gebrauch mit Gewindebohrereinsatzstück



Ref.	d2	d3	d1	l2	Ø mm	1	2	T	C
81.616.4012	BT40	19	38	67.5	M2-M12	81.633/81.634	81.653/81.654	7.5	7.5
81.616.4020	BT40	31	55	94.5	M6-M27	81.636/81.637	81.656/81.657	12.5	12.5
81.616.4033	BT40	48	79	164.5	M14-M45	81.639		22.5	22.5
81.616.5012	BT50	19	38	77	M2-M12	81.633/81.634	81.653/81.654	7.5	7.5
81.616.5020	BT50	31	55	102.5	M6-M27	81.636/81.637	81.656/81.657	12.5	12.5
81.616.5033	BT50	48	79	142.5	M14-M45	81.639		20	20
81.616.5048	BT50	60	96	164.5	M39-M60	81.641		22.5	22.5

## > 81.625 Phantom

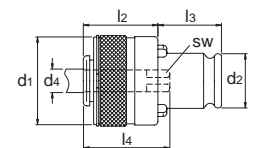
- NL Reduceerbus, voor het reduceren van tapinzetstukken  
 FR Douille de réduction, pour réduction de douilles  
 ES Casquillo de reducción, para la reducción de casquillos de roscado  
 DE Reduzierhülse, zur Reduzierung- Gewindeeinsatz



Ref.	d3	d4	d1	l2	l3
81.625.0201	31	19	48	5	35
81.625.0302	48	31	70	6	55.5
81.625.0402	60	31	92	13	63
81.625.0403	60	48	92	13	63

## > 81.631 Phantom

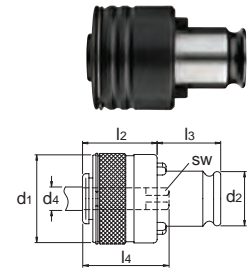
- NL Tapinzetstuk met ratel, DIN, type 13/0 Gr. 0  
 FR Douille porte-tarands avec limiteur de couple, DIN, type 13/0 Taille 0  
 ES Casquillo de roscado con embrague de seguridad, DIN, tipo 13/0 Tam. 0  
 DE Gewindebohrereinsatzstück mit Sicherheitskupplung, DIN, Typ 13/0 Gr. 0



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.631.0201	M2	DIN 371	2.8	2.1	23	13	21	19.5	21
81.631.0251	M2,5	DIN 371	2.8	2.1	23	13	21	19.5	21
81.631.0301	M3	DIN 371	3.5	2.7	23	13	21	19.5	21
81.631.0351	M3,5	DIN 371	4	3	23	13	21	19.5	21
81.631.0401	M4	DIN 371	4.5	3.4	23	13	21	19.5	21
81.631.0406	M4	DIN 376	2.8	2.1	23	13	21	19.5	21
81.631.0501	M5	DIN 371	6	4.9	23	13	21	19.5	21
81.631.0601	M6	DIN 371	6	4.9	23	13	21	19.5	21

> **81.633 Phantom**

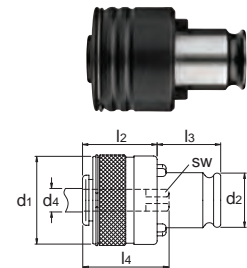
- NL Tapinzetstuk met ratel, DIN, type 19/1 Gr. 1
- FR Douille porte-tarands avec limiteur de couple, DIN, type 19/1 Taille 1
- ES Casquillo de roscado con embrague de seguridad, DIN, tipo 19/1 Tam. 1
- DE Gewindebohrereinsatzstück mit Sicherheitskupplung, DIN, Typ 19/1 Gr. 1



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.633.0201	M2	DIN 371	2.8	2.1	32	19	25	21.5	25
81.633.0301	M3	DIN 371	3.5	2.7	32	19	25	21.5	25
81.633.0351	M3,5	DIN 371	4	3	32	19	25	21.5	25
81.633.0401	M4	DIN 371	4.5	3.4	32	19	25	21.5	25
81.633.0406	M4	DIN 376	2.8	2.1	32	19	25	21.5	25
81.633.0501	M5	DIN 371	6	4.9	32	19	25	21.5	25
81.633.0506	M5	DIN 376	3.5	2.7	32	19	25	21.5	25
81.633.0601	M6	DIN 371	6	4.9	32	19	25	21.5	25
81.633.0606	M6	DIN 376	4.5	3.4	32	19	25	21.5	25
81.633.0801	M8	DIN 371	8	6.2	32	19	25	21.5	25
81.633.0806	M8	DIN 376	6	4.9	32	19	25	21.5	25
81.633.1001	M10	DIN 371	10	8	32	19	25	21.5	25
81.633.1006	M10	DIN 376	7	5.5	32	19	25	21.5	25
81.633.1206	M12	DIN 376	9	7	32	19	25	21.5	25
81.633.1406	M14	DIN 376	11	9	32	19	25	21.5	25

> **81.634 Phantom**

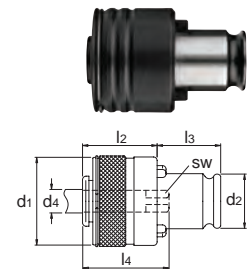
- NL Tapinzetstuk met ratel, ISO, type 19/1 Gr. 1
- FR Douille porte-tarands avec limiteur de couple, ISO, type 19/1 Taille 1
- ES Casquillo de roscado con embrague de seguridad, ISO, tipo 19/1 Tam. 1
- DE Gewindebohrereinsatzstück mit Sicherheitskupplung, ISO, Typ 19/1 Gr. 1



Ref.	M	d4	sw	d1	d2	l2	l3	l4
81.634.0300	M3	3.15	2.5	32	19	25	21.5	25
81.634.0400	M4	4	3.15	32	19	25	21.5	25
81.634.0500	M5	5	4	32	19	25	21.5	25
81.634.0600	M6	6.3	5	32	19	25	21.5	25

> **81.636 Phantom**

- NL Tapinzetstuk met ratel, DIN, type 31/2 Gr. 2
- FR Douille porte-tarands avec limiteur de couple, DIN, type 31/2 Taille 2
- ES Casquillo de roscado con embrague de seguridad, DIN, tipo 31/2 Tam. 2
- DE Gewindebohrereinsatzstück mit Sicherheitskupplung, DIN, Typ 31/2 Gr. 2



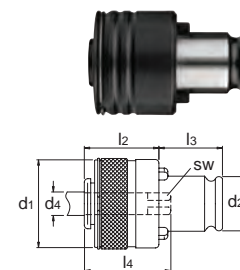
Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.636.0601	M6	DIN 371	6	4.9	50	31	34	35	34
81.636.0801	M8	DIN 371	8	6.2	50	31	34	35	34
81.636.0806	M8	DIN 376	6	4.9	50	31	34	35	34
81.636.1001	M10	DIN 371	10	8	50	31	34	35	34
81.636.1006	M10	DIN 376	7	5.5	50	31	34	35	34
81.636.1206	M12	DIN 376	9	7	50	31	34	35	34
81.636.1406	M14	DIN 376	11	9	50	31	34	35	34
81.636.1606	M16	DIN 376	12	9	50	31	34	35	34
81.636.1806	M18	DIN 376	14	11	50	31	34	35	34
81.636.2006	M20	DIN 376	16	12	50	31	34	35	34
81.636.2206	M22	DIN 376	18	14.5	50	31	34	35	34
81.636.2406	M24	DIN 376	18	14.5	50	31	34	35	34
81.636.2706	M27	DIN 376	20	16	50	31	34	35	34





### > 81.637 Phantom

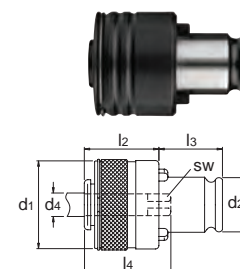
- NL Tapinsetstuk met ratel, ISO, type 31/2 Gr. 2  
 FR Douille porte-tarands avec limiteur de couple, ISO, type 31/2  
 Taille 2  
 ES Casquillo de roscado con embrague de seguridad, ISO, tipo 31/2  
 Tam. 2  
 DE Gewindebohrereinsatzstück mit Sicherheitskupplung, ISO,  
 Typ 31/2 Gr. 2



Ref.	M	d4	sw	d1	d2	l2	l3	l4
81.637.0600	M6	6.3	5	50	31	34	35	34
81.637.1206	M12	9	7.1	50	31	34	35	34
81.637.1400	M14	11.2	9	50	31	34	35	34
81.637.1600	M16	12.5	10	50	31	34	35	34
81.637.1800	M18	14	11.2	50	31	34	35	34
81.637.2000	M20	14	11.2	50	31	34	35	34
81.637.2200	M22	16	12.5	50	31	34	35	34

### > 81.639 Phantom

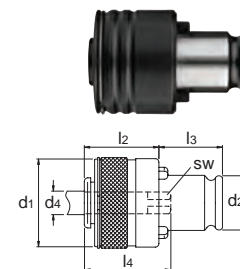
- NL Tapinsetstuk met ratel, DIN, type 48/3 Gr. 3  
 FR Douille porte-tarands avec limiteur de couple, DIN, type 48/3  
 Taille 3  
 ES Casquillo de roscado con embrague de seguridad, DIN, tipo 48/3  
 Tam. 3  
 DE Gewindebohrereinsatzstück mit Sicherheitskupplung, DIN,  
 Typ 48/3 Gr. 3



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.639.1406	M14	DIN 376	11	9	72	48	45	55.5	45
81.639.1606	M16	DIN 376	12	9	72	48	45	55.5	45
81.639.1806	M18	DIN 376	14	11	72	48	45	55.5	45
81.639.2006	M20	DIN 376	16	12	72	48	45	55.5	45
81.639.2206	M22	DIN 376	18	14.5	72	48	45	55.5	45
81.639.2406	M24	DIN 376	18	14.5	72	48	45	55.5	45
81.639.2706	M27	DIN 376	20	16	72	48	45	55.5	45
81.639.3006	M30	DIN 376	22	18	72	48	45	55.5	45
81.639.3306	M33	DIN 376	25	20	72	48	45	55.5	45
81.639.3606	M36	DIN 376	28	22	72	48	45	55.5	45
81.639.3906	M39	DIN 376	32	24	72	48	45	55.5	45
81.639.4206	M42	DIN 376	32	24	72	48	45	55.5	45
81.639.4506	M45	DIN 376	36	29	72	48	45	55.5	45

### > 81.641 Phantom

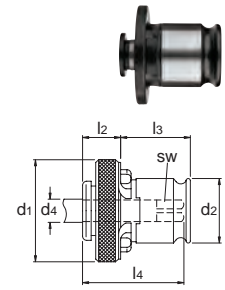
- NL Tapinsetstuk met ratel, DIN, type 60/4 Gr. 4  
 FR Douille porte-tarands avec limiteur de couple, DIN, type 60/4  
 Taille 4  
 ES Casquillo de roscado con embrague de seguridad, DIN, tipo 60/4  
 Tam. 4  
 DE Gewindebohrereinsatzstück mit Sicherheitskupplung, DIN,  
 Typ 60/4 Gr. 4



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.641.3906	M39	DIN 376	32	24	95	60	68	63	68
81.641.4206	M42	DIN 376	32	26	95	60	68	63	68
81.641.4506	M45	DIN 376	36	29	95	60	68	63	68
81.641.4806	M48	DIN 376	36	29	95	60	68	63	68
81.641.5206	M52	DIN 376	40	32	95	60	68	63	68
81.641.5606	M56	DIN 376	45	35	95	60	68	63	68
81.641.6006	M60	DIN 376	45	35	95	60	68	63	68

> **81.651 Phantom**

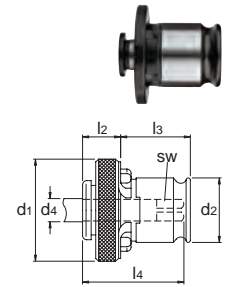
- NL Tapinzetstuk zonder ratel, DIN, type 13/10 Gr. 0
- FR Douille porte-tarauds sans limiteur de couple, DIN, type 13/10  
Taille 0
- ES Casquillo de roscado sin embrague de seguridad, DIN, tipo 13/10  
Tam. 0
- DE Gewindebohrereinsatzstück ohne Sicherheitskupplung, DIN,  
Typ 13/10 Gr. 0



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.651.0201	M2	DIN 371	2.8	2.1	22	13	7	19.5	8
81.651.0251	M2,5	DIN 371	2.8	2.1	22	13	7	19.5	8
81.651.0301	M3	DIN 371	3.5	2.7	22	13	7	19.5	8
81.651.0351	M3,5	DIN 371	4	3	22	13	7	19.5	8
81.651.0401	M4	DIN 371	4.5	3.4	22	13	7	19.5	8
81.651.0501	M5	DIN 371	6	4.9	22	13	7	19.5	8
81.651.0601	M6	DIN 371	6	4.9	22	13	7	19.5	8

> **81.653 Phantom**

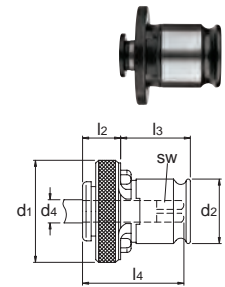
- NL Tapinzetstuk zonder ratel, DIN, type 19/11 Gr. 1
- FR Douille porte-tarauds sans limiteur de couple, DIN, type 19/11  
Taille 1
- ES Casquillo de roscado sin embrague de seguridad, DIN, tipo 19/11  
Tam. 1
- DE Gewindebohrereinsatzstück ohne Sicherheitskupplung, DIN,  
Typ 19/11 Gr. 1



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.653.0301	M3	DIN 371	3.5	2.7	30	19	7	21.5	10
81.653.0351	M3,5	DIN 371	4	3	30	19	7	21.5	10
81.653.0401	M4	DIN 371	4.5	3.4	30	19	7	21.5	10
81.653.0506	M5	DIN 376	3.5	2.7	30	19	7	21.5	10
81.653.0601	M5+M6	DIN 371	6	4.9	30	19	7	21.5	10
81.653.0606	M6	DIN 376	4.5	3.4	30	19	7	21.5	10
81.653.0801	M8	DIN 371	8	6.2	30	19	7	21.5	10
81.653.0806	M8	DIN 376	6	4.9	30	19	7	21.5	10
81.653.1001	M10	DIN 371	10	8	30	19	7	21.5	10
81.653.1006	M10	DIN 376	7	5.5	30	19	7	21.5	10
81.653.1206	M12	DIN 376	9	7	30	19	7	21.5	10

> **81.654 Phantom**

- NL Tapinzetstuk zonder ratel, ISO, type 19/11 Gr. 1
- FR Douille porte-tarauds sans limiteur de couple, ISO, type 19/11  
Taille 1
- ES Casquillo de roscado sin embrague de seguridad, ISO, tipo 19/11  
Tam. 1
- DE Gewindebohrereinsatzstück ohne Sicherheitskupplung, ISO,  
Typ 19/11 Gr. 1



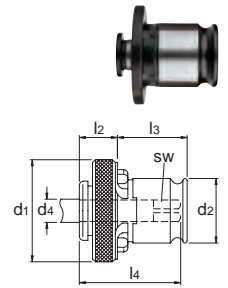
Ref.	M	d4	sw	d1	d2	l2	l3	l4
81.654.0300	M3	3.15	2.5	30	19	7	21.5	10
81.654.0400	M4	4	3.15	30	19	7	21.5	10
81.654.0500	M5	5	4	30	19	7	21.5	10
81.654.0600	M6	6.3	5	30	19	7	21.5	10





### > 81.655 Phantom

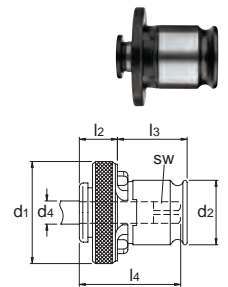
- NL Tapinzetstuk zonder ratel, DIN, type 26/12 Gr. 1  
 FR Douille porte-tarauts sans limiteur de couple, DIN, type 26/12  
 Taille 1  
 ES Casquillo de roscado sin embrague de seguridad, DIN, tipo 26/12  
 Tam. 1  
 DE Gewindebohrereinsatzstück ohne Sicherheitskupplung, DIN,  
 Typ 26/12 Gr. 1



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.655.0801	M8	DIN 371	8	6.2	40	26	15	32	23
81.655.0806	M8	DIN 376	6	4.9	40	26	15	32	23
81.655.1001	M10	DIN 371	10	8	40	26	15	32	23
81.655.1006	M10	DIN 376	7	5.5	40	26	15	32	23
81.655.1206	M12	DIN 376	9	7	40	26	15	32	23
81.655.1406	M14	DIN 376	11	9	40	26	15	32	23
81.655.1606	M16	DIN 376	12	9	40	26	15	32	23
81.655.1806	M18	DIN 376	14	11	40	26	15	32	23
81.655.2006	M20	DIN 376	16	12	40	26	15	32	23

### > 81.656 Phantom

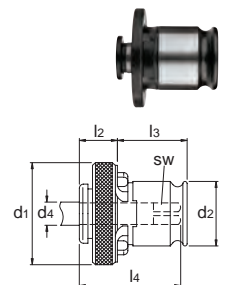
- NL Tapinzetstuk zonder ratel, DIN, type 31/2 Gr. 2  
 FR Douille porte-tarauts sans limiteur de couple, DIN, type 31/2  
 Taille 2  
 ES Casquillo de roscado sin embrague de seguridad, DIN, tipo 31/2  
 Tam. 2  
 DE Gewindebohrereinsatzstück ohne Sicherheitskupplung, DIN,  
 Typ 31/2 Gr. 2



Ref.	M	DIN	d4	sw	d1	d2	l2	l3	l4
81.656.0501	M5	DIN 371	6	4.9	46	31	11	35	19
81.656.0601	M6	DIN 371	6	4.9	46	31	11	35	19
81.656.0801	M8	DIN 371	8	6.2	46	31	11	35	19
81.656.0806	M8	DIN 376	6	4.9	46	31	11	35	19
81.656.1001	M10	DIN 371	10	8	46	31	11	35	19
81.656.1006	M10	DIN 376	7	5.5	46	31	11	35	19
81.656.1206	M12	DIN 376	9	7	46	31	11	35	19
81.656.1406	M14	DIN 376	11	9	46	31	11	35	19
81.656.1606	M16	DIN 376	12	9	46	31	11	35	19
81.656.1806	M18	DIN 376	14	11	46	31	11	35	19
81.656.2006	M20	DIN 376	16	12	46	31	11	35	19

### > 81.657 Phantom

- NL Tapinzetstuk zonder ratel, ISO, type 31/12 Gr. 2  
 FR Douille porte-tarauts sans limiteur de couple, ISO, type 31/12  
 Taille 2  
 ES Casquillo de roscado sin embrague de seguridad, ISO, tipo 31/12  
 Tam. 2  
 DE Gewindebohrereinsatzstück ohne Sicherheitskupplung, ISO,  
 Typ 31/12 Gr. 2



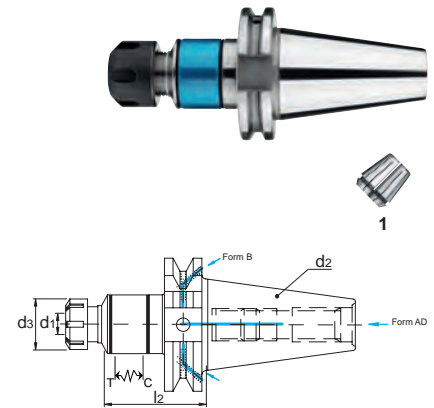
Ref.	M	d4	sw	d1	d2	l2	l3	l4
81.657.0600	M6	6.3	5	46	31	11	35	19
81.657.1400	M14	11.2	9	46	31	11	35	19
81.657.1600	M16	12.5	10	46	31	11	35	19
81.657.1800	M18	14	11.2	46	31	11	35	19
81.657.2000	M20	14	11.2	46	31	11	35	19

> **81.684 Phantom**

- NL Synchro Taphouder SK volgens DIN 69871-AD/B, voor ER spantangen (met vierkant)
- FR Mandrin à tarauder Synchro SA selon DIN 69871-AD/B, pour utilisation avec pinces ER (avec carré d'entraînement)
- ES Portamachos Synchro SK según DIN 69871-AD/B, para uso con ER pinzas (con cuadrado interior)
- DE Synchro Gewindeschneidfutter SK nach DIN 69871-AD/B, für ER-Spannzangen (mit Vierkant)



Ref.	d2	d1	Ø mm	l2	d3	T	C	1
81.684.4016	SK40	ER16	1-10	79	32	0.5	0.5	82.880
81.684.4025	SK40	ER25	3,5-16	84	42	0.5	0.5	82.885
81.684.5025	SK50	ER25	3,5-16	84	42	0.5	0.5	82.885

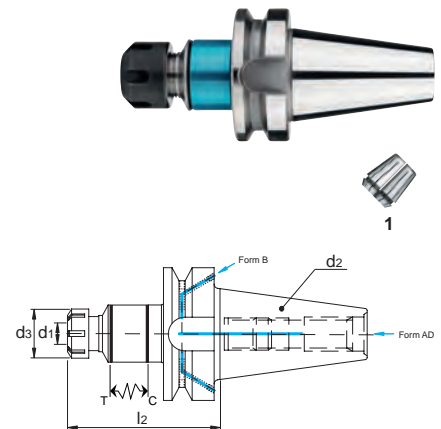


> **81.686 Phantom**

- NL Synchro Taphouder BT volgens MAS 403-BT AD/B, voor ER spantangen (met vierkant)
- FR Mandrin à tarauder Synchro BT selon MAS 403-BT AD/B, pour utilisation avec pinces ER (avec carré d'entraînement)
- ES Portamachos Synchro BT según MAS 403-BT AD/B, para uso con ER pinzas (con cuadrado interior)
- DE Synchro Gewindeschneidfutter BT nach MAS 403-BT AD/B, für ER-Spannzangen (mit Vierkant)



Ref.	d2	d1	Ø mm	l2	d3	T	C	1
81.686.4016	BT40	ER16	1-10	79	32	0.5	0.5	82.880
81.686.4025	BT40	ER25	3,5-16	89	42	0.5	0.5	82.885
81.686.5025	BT50	ER25	3,5-16	110	42	0.5	0.5	82.885

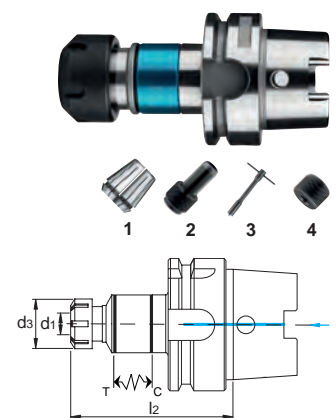


> **81.687 Phantom**

- NL Synchro Taphouder HSK-A volgens DIN 69893, voor ER spantangen (met vierkant)
- FR Mandrin à tarauder Synchro HSK-A selon DIN 69893, pour utilisation avec pinces ER (avec carré d'entraînement)
- ES Portamachos Synchro HSK-A según DIN 69893, para uso con ER pinzas (con cuadrado interior)
- DE Synchro Gewindeschneidfutter HSK-A nach DIN 69893, für ER-Spannzangen (mit Vierkant)



Ref.	d2	d1	Ø mm	l2	d3	T	C	1	2	3	4
81.687.0631	HSK63A	ER16	1-10	89	32	0.5	0.5	82.880	84.790.1800	84.791.1800	84.789.1800
81.687.0632	HSK63A	ER25	3,5-16	94	42	0.5	0.5	82.885	84.790.1800	84.791.1800	84.789.1800
81.687.1002	HSK100A	ER25	3,5-16	101	42	0.5	0.5	82.885	84.790.1800	84.791.1800	84.789.1800

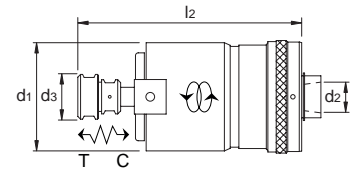
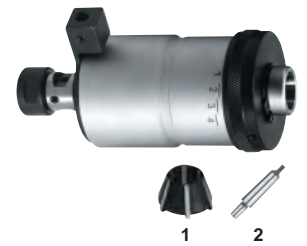






## > 81.700 INTERNATIONAL TOOLS

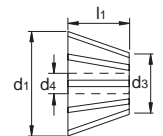
- NL ECO PRO Tapapparaat met druk- en trekcompensatie, met instelbare slipkoppeling, met omkeerinrichting  
 FR Appareil à tarauder ECO PRO à compensation de pression et de traction, à réglage de couple par friction, dispositif d'inversion  
 ES Aparato roscador ECO PRO, con ajuste de par por fricción, con compensación de presión y de tracción, con dispositivo de inversión  
 DE ECO PRO Gewindeschneidmaschinen, mit einstellbarer Rutschkupplung, mit Umkehrvorrichtung, mit Zug- und Druckausgleich



Ref.	Ø mm	d1	d2	d3	l2	x:y	RPM	Release	1	2
81.700.0070	M2-M7	54	B16	23	129.5	01:02.4	1500	3.5	81.710	84.170
81.700.0120	M5-M12	74	B16	28	156	01:02.2	1000	4	81.710	84.170
81.700.0200	M8-M20	89	B22	38	205.5	01:02.3	600	6	81.710	84.170

## > 81.710 INTERNATIONAL TOOLS

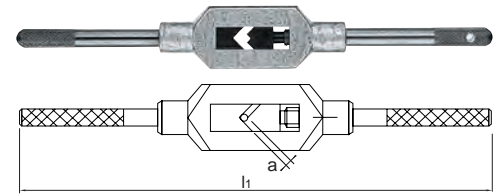
- NL ECO PRO Rubberflex spantang, voor 81.700  
 FR Pince de serrage Rubberflex ECO PRO, pour 81.700  
 ES Pinza de sujeción Rubberflex ECO PRO, para 81.700  
 DE ECO PRO Rubberflex-Spannzangen, für 81.700



Ref.	d1	d3	d4	l1	M	Ø mm	Ref.	d1	d3	d4	l1	M	Ø mm
81.710.0204	13.3	4.5	2.5	11	M2-M4	2,5-4,5	81.710.0712	20.5	10	6.5	13	M7-M12	6,5-10
81.710.0407	13.3	6.5	4.5	11	M4-M7	4,5-6,5	81.710.0814	28.5	10	4.5	15	M8-M14	4,5-10
81.710.0510	20.5	6.5	3.5	13	M5-M10	3,5-6,5	81.710.1620	28.5	13	7	15	M16-M20	7,0-13

> 81.900

NL Verstelbaar Wringijzer, standaard kwaliteit, Zink-legering  
 FR Tourne à gauche expansible, qualité standard, alliage de zinc  
 ES Giramacho extensible, calidad estándar, aleación de cinc  
 DE Verstellbare Windeisen, Standard-Qualität, Zinkdruckgu



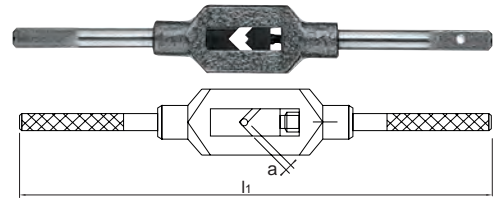
DIN  
1814

Ref.	Nr.	M	BSW	BSP	l1	a
81.900.0000	0	M1-M8	1/16-1/4	-	125	2,1-4,9
81.900.0100	1	M1-M10	1/16-3/8	1/8	180	2,1-5,5
81.900.0150	1,5	M1-M12	1/16-1/2	1/8	200	2,1-7
81.900.0200	2	M3,5-M12	5/32-1/2	1/8	280	3-8

Ref.	Nr.	M	BSW	BSP	l1	a
81.900.0300	3	M5-M20	7/32-3/4	1/8-1/2	375	4,9-12
81.900.0400	4	M11-M27	7/16-1	1/4-3/4	500	6,2-16
81.900.0500	5L	M13-M32	1/2-1.1/4	1/4-1	750	7-20

> 81.905

NL Verstelbaar Wringijzer, extra kwaliteit, staal  
 FR Tourne à gauche expansible, qualité supérieure, acier  
 ES Giramacho extensible, calidad superior, acero  
 DE Verstellbare Windeisen, Extra-Qualität, Stahl



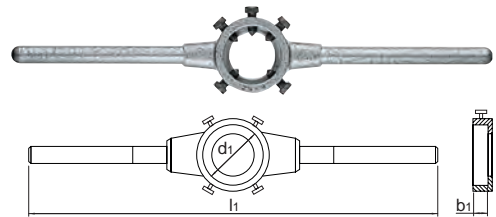
DIN  
1814

Ref.	Nr.	M	BSW	BSP	l1	a
81.905.0000	0	M1-M8	1/16-1/4	-	130	2,1-4,9
81.905.0100	1	M1-M10	1/16-3/8	1/8	180	2,1-5,5
81.905.0150	1,5	M1-M12	1/16-1/2	1/8	200	2,1-7
81.905.0200	2	M3,5-M12	5/32-1/2	1/8	280	3-8
81.905.0300	3	M5-M20	7/32-3/4	1/8-1/2	375	4,9-12

Ref.	Nr.	M	BSW	BSP	l1	a
81.905.0400	4	M11-M27	7/16-1	1/4-3/4	500	6,2-16
81.905.0500	5S	M13-M32	1/2-1.1/4	1/4-1	750	7-20
81.905.0600	6L	M18-M42	3/4-1.1/2	1/2-1.1/4	1000	11-24
81.905.0800	8	M25-M64	1-2.1/2	3/4-3	1250	16-40

> 81.910

NL Snijplaatouder  
 FR Porte-filières  
 ES Portateraja  
 DE Schneideisenhalter



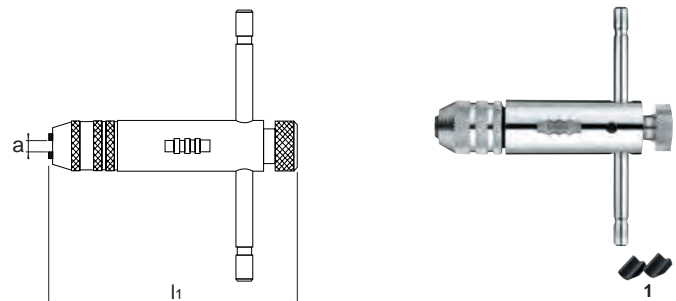
DIN  
225

Ref.	d1	b1	l1
81.910.1605	16	5	160
81.910.2005	20	5	200
81.910.2007	20	7	200
81.910.2509	25	9	224
81.910.3011	30	11	280
81.910.3810	38	10	315
81.910.3814	38	14	315
81.910.4514	45	14	450
81.910.4518	45	18	450
81.910.5516	55	16	560
81.910.5522	55	22	560
81.910.6518	65	18	630
81.910.6525	65	25	630

Ref.	d1	b1	l1
81.910.7520	75	20	800
81.910.7530	75	30	800
81.910.9022	90	22	900
81.910.9036	90	36	900
81.910.9122	105	22	1000
81.910.9136	105	36	1000
81.910.9222	120	22	1100
81.910.9236	120	36	1100
81.910.9322	130	22	1100
81.910.9336	130	36	1100
81.910.9422	140	22	1200
81.910.9522	150	22	1200
81.910.9622	160	22	1300

> 81.930

NL Rateltapkrukje  
 FR Porte-tarauds à cliquet  
 ES Giromacho en T con carraca  
 DE Werkzeughalter mit Knarre



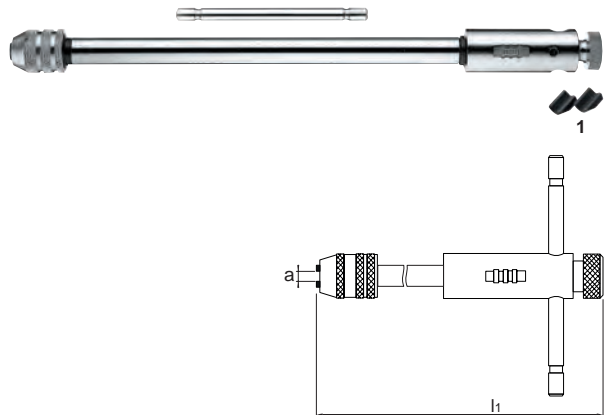
Ref.	Nr.	M	BSW	BSP	a	l1	1
81.930.0100	1	M3-M10	1/8-3/8		2,4-5,5	85	81.938.0100
81.930.0200	2	M5-M12	7/32-1/2	1/8	4,5-7	100	81.938.0200





### > 81.935

NL Rateltapkrukje, lang  
FR Porte-tarands à cliquet, version longue  
ES Giromacho en T con carraca, larga  
DE Werkzeughalter mit Knarre, lang



Ref.	Nr.	M	BSW	BSP	a	l1	1
81.935.1000	10	M3-M10	1/8-3/8		2,4-5,5	250	81.938.0100
81.935.2000	20	M5-M12	7/32-1/2	1/8	4,5-7	300	81.938.0200

### > 81.938

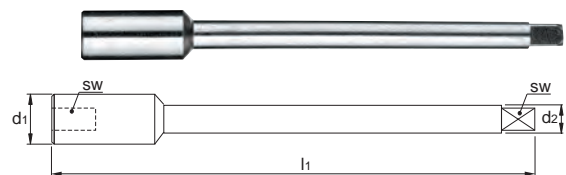
NL set Reservebekken voor Rateltapkrukje  
FR Jeu de Becs de rechange pour Porte-tarands à cliquet  
ES juego de Mordazas de recambio para Giromacho en T con carraca  
DE Satz Ersatzbacken für Werkzeughalter mit Knarre



Ref.	Nr.	Type
81.938.0100	1	Nr.1 + Nr.10
81.938.0200	2	Nr.2 + Nr.20

### > 81.950

NL Tapverlengstuk  
FR Rallonge pour tarauds  
ES Prolongador de machos  
DE Gewindebohrer Verlängerung

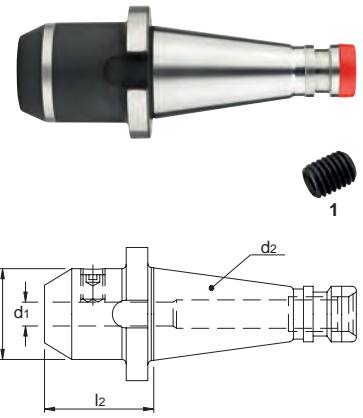


DIN  
377

Ref.	sw	M	BSW	BSP	l1	d1	d2
81.950.0210	2.1	M1-M2,6	1/16-3/32		60	5	2.5
81.950.0240	2.4				70	6	3
81.950.0270	2.7	M3	1/8		80	7	3.5
81.950.0300	3	M3,5			90	7	4
81.950.0340	3.4	M4	5/32		95	8	4.5
81.950.0380	3.8				100	9	5
81.950.0430	4.3				105	10	5.5
81.950.0490	4.9	M4,5-M8	3/16-5/16		110	11	6.5
81.950.0550	5.5	M9-M10	3/8	1/16-1/8	115	12	7
81.950.0620	6.2	M11	7/16		120	14	8
81.950.0700	7	M12	1/2		125	15	9
81.950.0800	8				125	17	10
81.950.0900	9	M13-M16	9/16-5/8	1/4-3/8	130	19	11.2
81.950.1000	10				140	21	12.5
81.950.1100	11	M18	11/16-3/4		150	23	14
81.950.1200	12	M20		1/2	155	25	16
81.950.1300	13				165	27	17
81.950.1450	14.5	M22-M24	7/8-15/16	5/8	175	29	19
81.950.1600	16	M27	1	3/4	180	30	20
81.950.1800	18	M30	1.1/8	7/8	200	33	22.4
81.950.2000	20	M33	1.1/4	-	210	36	25
81.950.2200	22	M36	1.3/8	1.1/8	220	38	29
81.950.2400	24	M39-M42	1.1/2-1.5/8	1.1/4	235	42	32
81.950.2600	26				250	45	34.5
81.950.2900	29	M45-M48	1.3/4-1.7/8	1.3/8-2	265	50	38.5
81.950.3200	32	M52	2	2.1/4	285	55	42.5

> **82.153 Phantom**

NL Weldonhouder, SK volgens DIN 2080  
 FR Porte-outils, SA selon DIN 2080  
 ES Portaherramientas Weldon, SK según DIN 2080  
 DE Weldon-Halter, SK nach DIN 2080



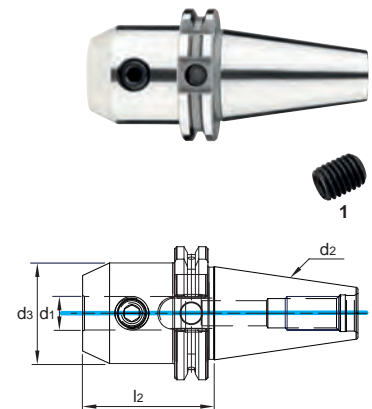
DIN 6359 DIN 1835-B SK AT3  $\pm 0,005$

Ref.	d2	d1	l2	d3	M	1
82.153.3006	SK30	6	40	25	M12	82.159.0600
82.153.3008	SK30	8	40	28	M12	82.159.0800
82.153.3010	SK30	10	40	35	M12	82.159.1000
82.153.3012	SK30	12	40	42	M12	82.159.1200
82.153.3016	SK30	16	50	48	M12	82.159.1400
82.153.3020	SK30	20	63	52	M12	82.159.1600
82.153.4006	SK40	6	50	25	M16	82.159.0600
82.153.4008	SK40	8	50	28	M16	82.159.0800
82.153.4010	SK40	10	50	35	M16	82.159.1000
82.153.4012	SK40	12	50	42	M16	82.159.1200
82.153.4014	SK40	14	50	44	M16	82.159.1200
82.153.4016	SK40	16	63	48	M16	82.159.1400
82.153.4020	SK40	20	63	52	M16	82.159.1600

Ref.	d2	d1	l2	d3	M	1
82.153.4025	SK40	25	80	65	M16	82.159.1800
82.153.4032	SK40	32	80	72	M16	82.159.2000
82.153.5006	SK50	6	63	25	M24	82.159.0600
82.153.5008	SK50	8	63	28	M24	82.159.0800
82.153.5010	SK50	10	63	35	M24	82.159.1000
82.153.5012	SK50	12	63	42	M24	82.159.1200
82.153.5014	SK50	14	63	44	M24	82.159.1200
82.153.5016	SK50	16	63	48	M24	82.159.1400
82.153.5020	SK50	20	63	52	M24	82.159.1600
82.153.5025	SK50	25	80	65	M24	82.159.1800
82.153.5032	SK50	32	80	72	M24	82.159.2000
82.153.5040	SK50	40	90	80	M24	82.159.2001

> **82.154 Phantom**

NL Weldonhouder, SK volgens DIN 69871  
 FR Porte-outils, SA selon DIN 69871  
 ES Portaherramientas Weldon, SK según DIN 69871  
 DE Weldon-Halter, SK nach DIN 69871



DIN 6359 AD DIN 1835-B SK AT3  $\pm 0,005$  G6,3 15.000 RPM

Ref.	d2	d1	l2	d3	M	1
82.154.4061	SK40	6	50	25	M16	82.159.0600
82.154.4062	SK40	6	100	25	M16	82.159.0600
82.154.4066	SK40	6	160	25	M16	82.159.0600
82.154.4081	SK40	8	50	28	M16	82.159.0800
82.154.4082	SK40	8	100	28	M16	82.159.0800
82.154.4086	SK40	8	160	28	M16	82.159.0800
82.154.4101	SK40	10	50	35	M16	82.159.1000
82.154.4102	SK40	10	100	35	M16	82.159.1000
82.154.4106	SK40	10	160	35	M16	82.159.1000
82.154.4121	SK40	12	50	42	M16	82.159.1200
82.154.4122	SK40	12	100	42	M16	82.159.1200
82.154.4126	SK40	12	160	42	M16	82.159.1200
82.154.4141	SK40	14	50	44	M16	82.159.1200
82.154.4142	SK40	14	100	44	M16	82.159.1200
82.154.4146	SK40	14	160	44	M16	82.159.1200
82.154.4161	SK40	16	63	48	M16	82.159.1400
82.154.4162	SK40	16	100	48	M16	82.159.1400
82.154.4166	SK40	16	160	48	M16	82.159.1400
82.154.4181	SK40	18	63	50	M16	82.159.1400
82.154.4182	SK40	18	100	50	M16	82.159.1400
82.154.4186	SK40	18	160	50	M16	82.159.1400
82.154.4201	SK40	20	63	52	M16	82.159.1600
82.154.4202	SK40	20	100	52	M16	82.159.1600
82.154.4206	SK40	20	160	52	M16	82.159.1600
82.154.4252	SK40	25	100	65	M16	82.159.1800
82.154.4256	SK40	25	160	65	M16	82.159.1800
82.154.4322	SK40	32	100	72	M16	82.159.2000
82.154.4326	SK40	32	160	72	M16	82.159.2000

Ref.	d2	d1	l2	d3	M	1
82.154.4402	SK40	40	115	80	M16	82.159.2001
82.154.5061	SK50	6	63	25	M24	82.159.0600
82.154.5062	SK50	6	100	25	M24	82.159.0600
82.154.5066	SK50	6	160	25	M24	82.159.0600
82.154.5081	SK50	8	63	28	M24	82.159.0800
82.154.5082	SK50	8	100	28	M24	82.159.0800
82.154.5086	SK50	8	160	28	M24	82.159.0800
82.154.5101	SK50	10	63	35	M24	82.159.1000
82.154.5102	SK50	10	100	35	M24	82.159.1000
82.154.5106	SK50	10	160	35	M24	82.159.1000
82.154.5121	SK50	12	63	42	M24	82.159.1200
82.154.5122	SK50	12	100	42	M24	82.159.1200
82.154.5126	SK50	12	160	42	M24	82.159.1200
82.154.5141	SK50	14	63	44	M24	82.159.1200
82.154.5142	SK50	14	100	44	M24	82.159.1200
82.154.5146	SK50	14	160	44	M24	82.159.1200
82.154.5161	SK50	16	63	48	M24	82.159.1400
82.154.5162	SK50	16	100	48	M24	82.159.1400
82.154.5166	SK50	16	160	48	M24	82.159.1400
82.154.5181	SK50	18	63	50	M24	82.159.1400
82.154.5182	SK50	18	100	50	M24	82.159.1400
82.154.5186	SK50	18	160	50	M24	82.159.1400
82.154.5201	SK50	20	63	52	M24	82.159.1600
82.154.5202	SK50	20	100	52	M24	82.159.1600
82.154.5206	SK50	20	160	52	M24	82.159.1600
82.154.5251	SK50	25	80	65	M24	82.159.1800
82.154.5252	SK50	25	100	65	M24	82.159.1800
82.154.5256	SK50	25	160	65	M24	82.159.1800



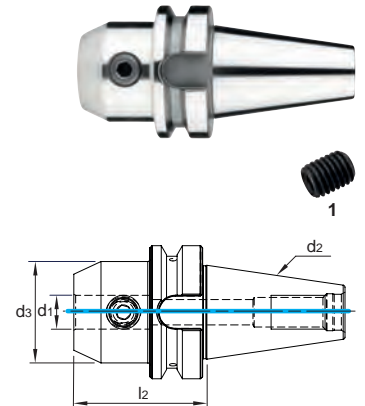
## > 82.154 Phantom

Ref.	d2	d1	l2	d3	M	1
82.154.5322	SK50	32	100	72	M24	82.159.2000
82.154.5326	SK50	32	160	72	M24	82.159.2000

Ref.	d2	d1	l2	d3	M	1
82.154.5404	SK50	40	120	80	M24	82.159.2001
82.154.5406	SK50	40	160	80	M24	82.159.2001

## > 82.156 Phantom

NL Weldonhouder, BT volgens MAS 403 BT  
 FR Porte-outils, BT selon MAS 403 BT  
 ES Portaherramientas Weldon, BT según MAS 403 BT  
 DE Weldon-Halter, BT nach MAS 403 BT



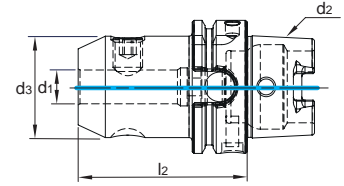
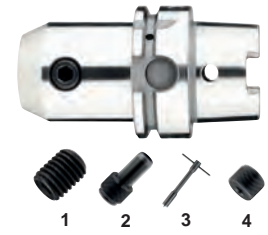
DIN 6359	AD	DIN 1835-B	MAS-BT	AT3	0,005	G6.3 15.000 RPM
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Ref.	d2	d1	l2	d3	M	1
82.156.4061	BT40	6	50	25	M16	82.159.0600
82.156.4062	BT40	6	100	25	M16	82.159.0600
82.156.4066	BT40	6	160	25	M16	82.159.0600
82.156.4081	BT40	8	50	28	M16	82.159.0800
82.156.4082	BT40	8	100	28	M16	82.159.0800
82.156.4086	BT40	8	160	28	M16	82.159.0800
82.156.4101	BT40	10	63	35	M16	82.159.1000
82.156.4102	BT40	10	100	35	M16	82.159.1000
82.156.4106	BT40	10	160	35	M16	82.159.1000
82.156.4121	BT40	12	63	42	M16	82.159.1200
82.156.4122	BT40	12	100	42	M16	82.159.1200
82.156.4126	BT40	12	160	42	M16	82.159.1200
82.156.4141	BT40	14	63	44	M16	82.159.1200
82.156.4142	BT40	14	100	44	M16	82.159.1200
82.156.4146	BT40	14	160	44	M16	82.159.1200
82.156.4161	BT40	16	63	48	M16	82.159.1400
82.156.4162	BT40	16	100	48	M16	82.159.1400
82.156.4166	BT40	16	160	48	M16	82.159.1400
82.156.4181	BT40	18	63	50	M16	82.159.1400
82.156.4182	BT40	18	100	50	M16	82.159.1400
82.156.4186	BT40	18	160	50	M16	82.159.1400
82.156.4201	BT40	20	63	52	M16	82.159.1600
82.156.4202	BT40	20	100	52	M16	82.159.1600
82.156.4206	BT40	20	160	52	M16	82.159.1600
82.156.4252	BT40	25	90	65	M16	82.159.1800
82.156.4256	BT40	25	160	65	M16	82.159.1800
82.156.4322	BT40	32	100	72	M16	82.159.2000
82.156.4326	BT40	32	160	72	M16	82.159.2000
82.156.4402	BT40	40	105	80	M16	82.159.2001
82.156.5061	BT50	6	63	25	M24	82.159.0600

Ref.	d2	d1	l2	d3	M	1
82.156.5062	BT50	6	100	25	M24	82.159.0600
82.156.5066	BT50	6	160	25	M24	82.159.0600
82.156.5081	BT50	8	63	28	M24	82.159.0800
82.156.5082	BT50	8	100	28	M24	82.159.0800
82.156.5086	BT50	8	160	28	M24	82.159.0800
82.156.5101	BT50	10	80	35	M24	82.159.1000
82.156.5102	BT50	10	100	35	M24	82.159.1000
82.156.5106	BT50	10	160	35	M24	82.159.1000
82.156.5121	BT50	12	80	42	M24	82.159.1200
82.156.5122	BT50	12	100	42	M24	82.159.1200
82.156.5126	BT50	12	160	42	M24	82.159.1200
82.156.5141	BT50	14	80	44	M24	82.159.1200
82.156.5142	BT50	14	100	44	M24	82.159.1200
82.156.5146	BT50	14	160	44	M24	82.159.1200
82.156.5161	BT50	16	80	48	M24	82.159.1400
82.156.5162	BT50	16	100	48	M24	82.159.1400
82.156.5166	BT50	16	160	48	M24	82.159.1400
82.156.5181	BT50	18	80	50	M24	82.159.1400
82.156.5182	BT50	18	100	50	M24	82.159.1400
82.156.5186	BT50	18	160	50	M24	82.159.1400
82.156.5201	BT50	20	80	52	M24	82.159.1600
82.156.5202	BT50	20	100	52	M24	82.159.1600
82.156.5206	BT50	20	160	52	M24	82.159.1600
82.156.5252	BT50	25	100	65	M24	82.159.1800
82.156.5256	BT50	25	160	65	M24	82.159.1800
82.156.5322	BT50	32	105	72	M24	82.159.2000
82.156.5326	BT50	32	160	72	M24	82.159.2000
82.156.5402	BT50	40	115	80	M24	82.159.2001
82.156.5406	BT50	40	160	80	M24	82.159.2001

> **82.157 Phantom**

NL Weldonhouder, HSK-A volgens DIN 69893  
 FR Porte-outils, HSK-A selon DIN 69893  
 ES Portaherramientas Weldon, HSK-A según DIN 69893  
 DE Weldon-Halter, HSK-A nach DIN 69893



DIN 6359	HSK-A	DIN 1835-B	AT3	0,005	G6,3 20,000 RPM
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Ref.	d2	d1	l2	d3	M	1	2	3	4
82.157.6061	HSK63A	6	65	25	M18X1	82.159.0600	84.790.1800	84.791.1800	84.789.1800
82.157.6062	HSK63A	6	100	25	M18X1	82.159.0600	84.790.1800	84.791.1800	84.789.1800
82.157.6066	HSK63A	6	160	25	M18X1	82.159.0600	84.790.1800	84.791.1800	84.789.1800
82.157.6081	HSK63A	8	65	28	M18X1	82.159.0800	84.790.1800	84.791.1800	84.789.1800
82.157.6082	HSK63A	8	100	28	M18X1	82.159.0800	84.790.1800	84.791.1800	84.789.1800
82.157.6086	HSK63A	8	160	28	M18X1	82.159.0800	84.790.1800	84.791.1800	84.789.1800
82.157.6101	HSK63A	10	65	35	M18X1	82.159.1000	84.790.1800	84.791.1800	84.789.1800
82.157.6102	HSK63A	10	100	35	M18X1	82.159.1000	84.790.1800	84.791.1800	84.789.1800
82.157.6106	HSK63A	10	160	35	M18X1	82.159.1000	84.790.1800	84.791.1800	84.789.1800
82.157.6121	HSK63A	12	80	42	M18X1	82.159.1200	84.790.1800	84.791.1800	84.789.1800
82.157.6122	HSK63A	12	100	42	M18X1	82.159.1200	84.790.1800	84.791.1800	84.789.1800
82.157.6126	HSK63A	12	160	42	M18X1	82.159.1200	84.790.1800	84.791.1800	84.789.1800
82.157.6141	HSK63A	14	80	44	M18X1	82.159.1200	84.790.1800	84.791.1800	84.789.1800
82.157.6142	HSK63A	14	100	44	M18X1	82.159.1200	84.790.1800	84.791.1800	84.789.1800
82.157.6146	HSK63A	14	160	44	M18X1	82.159.1200	84.790.1800	84.791.1800	84.789.1800
82.157.6161	HSK63A	16	80	48	M18X1	82.159.1400	84.790.1800	84.791.1800	84.789.1800
82.157.6162	HSK63A	16	100	48	M18X1	82.159.1400	84.790.1800	84.791.1800	84.789.1800
82.157.6166	HSK63A	16	160	48	M18X1	82.159.1400	84.790.1800	84.791.1800	84.789.1800
82.157.6181	HSK63A	18	80	50	M18X1	82.159.1400	84.790.1800	84.791.1800	84.789.1800
82.157.6201	HSK63A	20	80	52	M18X1	82.159.1600	84.790.1800	84.791.1800	84.789.1800
82.157.6202	HSK63A	20	100	52	M18X1	82.159.1600	84.790.1800	84.791.1800	84.789.1800
82.157.6206	HSK63A	20	160	52	M18X1	82.159.1600	84.790.1800	84.791.1800	84.789.1800
82.157.6252	HSK63A	25	110	65	M18X1	82.159.1800	84.790.1800	84.791.1800	84.789.1800
82.157.6254	HSK63A	25	125	65	M18X1	82.159.1800	84.790.1800	84.791.1800	84.789.1800
82.157.6256	HSK63A	25	160	65	M18X1	82.159.1800	84.790.1800	84.791.1800	84.789.1800
82.157.6322	HSK63A	32	110	72	M18X1	82.159.2000	84.790.1800	84.791.1800	84.789.1800
82.157.6326	HSK63A	32	160	72	M18X1	82.159.2000	84.790.1800	84.791.1800	84.789.1800

> **82.159 Phantom**

NL Spanbout, voor Weldonhouder  
 FR Vis Allen, pour porte-outils Weldon  
 ES Tornillo de fijación, para portaherramientas Weldon  
 DE Spannschrauben, für Weldon-Halter



DIN  
6359

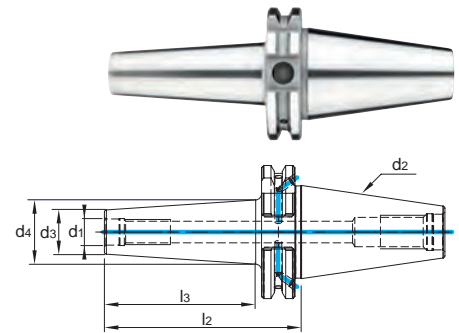
Ref.	Type	M
82.159.0600	6	M6
82.159.0800	8	M8
82.159.1000	10	M10
82.159.1200	12+14	M12
82.159.1400	16+18	M14

Ref.	Type	M
82.159.1600	20	M16
82.159.1800	25	M18x2
82.159.2000	32	M20x2x20
82.159.2001	40	M20x2x25



## > 82.214 Phantom

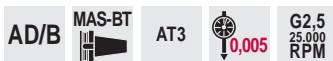
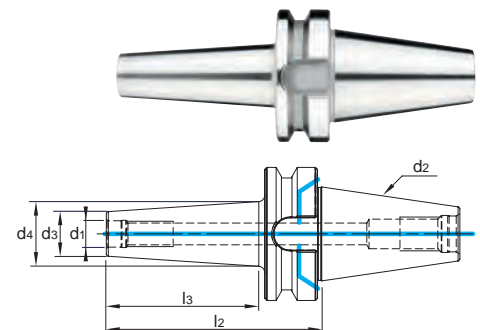
- NL Opschroef opname, met SK-opname volgens DIN 69871-AD/B  
 FR Mandrin pour fraises à queue fileté, à queue cône SA selon DIN 69871-AD/B  
 ES Portafresas con mango roscado, con sujeción SK según DIN 69871-AD/B  
 DE Einschraubfräseraufnahme, mit SK-Aufnahme nach DIN 69871-AD/B



Ref.	d2	d1	l2	l3	d3	d4	M
82.214.4061	SK40	M6	44	25	10	13	M16
82.214.4062	SK40	M6	69	50	10	20	M16
82.214.4063	SK40	M6	94	75	10	23	M16
82.214.4081	SK40	M8	44	25	13	15	M16
82.214.4082	SK40	M8	69	50	13	23	M16
82.214.4083	SK40	M8	94	75	13	23	M16
82.214.4084	SK40	M8	119	100	13	25	M16
82.214.4101	SK40	M10	44	25	18	20	M16
82.214.4102	SK40	M10	69	50	18	23	M16
82.214.4103	SK40	M10	94	75	18	28	M16
82.214.4104	SK40	M10	119	100	18	32	M16
82.214.4121	SK40	M12	44	25	21	24	M16
82.214.4122	SK40	M12	69	50	21	24	M16
82.214.4123	SK40	M12	94	75	21	31	M16
82.214.4124	SK40	M12	119	100	21	33	M16
82.214.4125	SK40	M12	144	125	21	36	M16
82.214.4161	SK40	M16	44	25	29	29	M16
82.214.4162	SK40	M16	69	50	29	34	M16
82.214.4163	SK40	M16	94	75	29	34	M16
82.214.4164	SK40	M16	119	100	29	36	M16
82.214.4165	SK40	M16	144	125	29	40	M16
82.214.5082	SK50	M08	69	50	13	23	M24
82.214.5084	SK50	M08	119	100	13	25	M24
82.214.5086	SK50	M08	169	150	13	30	M24
82.214.5102	SK50	M10	69	50	18	23	M24
82.214.5104	SK50	M10	119	100	18	32	M24
82.214.5106	SK50	M10	169	150	18	36.5	M24
82.214.5122	SK50	M12	69	50	21	24	M24
82.214.5124	SK50	M12	119	100	21	33	M24
82.214.5126	SK50	M12	169	150	21	40	M24
82.214.5162	SK50	M16	69	50	29	34	M24
82.214.5164	SK50	M16	119	100	29	36	M24
82.214.5166	SK50	M16	169	150	29	42.5	M24

## > 82.216 Phantom

- NL Opschroef opname, BT volgens MAS 403-BT AD/B  
 FR Mandrin pour fraises à queue fileté, BT selon MAS 403-BT AD/B  
 ES Portafresas con mango roscado, BT según MAS 403-BT AD/B  
 DE Einschraubfräseraufnahme, BT nach MAS 403-BT AD/B



Ref.	d2	d1	l2	l3	d3	d4	M
82.216.4061	BT40	M6	52	25	10	13	M16
82.216.4062	BT40	M6	77	50	10	20	M16
82.216.4063	BT40	M6	102	75	10	23	M16
82.216.4081	BT40	M8	52	25	13	15	M16
82.216.4082	BT40	M8	77	50	13	23	M16
82.216.4083	BT40	M8	102	75	13	23	M16
82.216.4084	BT40	M8	127	100	13	25	M16
82.216.4101	BT40	M10	52	25	18	20	M16
82.216.4102	BT40	M10	77	50	18	23	M16
82.216.4103	BT40	M10	102	75	18	28	M16
82.216.4104	BT40	M10	127	100	18	32	M16
82.216.4121	BT40	M12	52	25	21	24	M16
82.216.4122	BT40	M12	77	50	21	24	M16
82.216.4123	BT40	M12	102	75	21	31	M16
82.216.4124	BT40	M12	127	100	21	33	M16

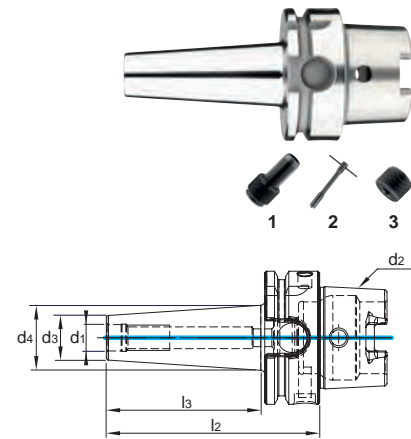


> **82.216** **Phantom**

Ref.	d2	d1	l2	l3	d3	d4	M
82.216.4125	BT40	M12	152	125	21	36	M16
82.216.4161	BT40	M16	52	25	29	29	M16
82.216.4162	BT40	M16	77	50	29	34	M16
82.216.4163	BT40	M16	102	75	29	34	M16
82.216.4164	BT40	M16	127	100	29	36	M16
82.216.4165	BT40	M16	152	125	29	40	M16
82.216.4166	BT40	M16	177	150	29	42.5	M16
82.216.5082	BT50	M8	88	50	13	23	M24
82.216.5084	BT50	M8	138	100	13	25	M24
82.216.5086	BT50	M8	188	150	13	30	M24
82.216.5102	BT50	M10	88	50	18	23	M24
82.216.5104	BT50	M10	138	100	18	32	M24
82.216.5106	BT50	M10	188	150	18	36.5	M24
82.216.5122	BT50	M12	88	50	21	24	M24
82.216.5124	BT50	M12	138	100	21	33	M24
82.216.5126	BT50	M12	188	150	21	40	M24
82.216.5162	BT50	M16	88	50	29	34	M24
82.216.5164	BT50	M16	138	100	29	36	M24
82.216.5166	BT50	M16	188	150	29	42.5	M24

> **82.217** **Phantom**

NL Opschroef opname, HSK-A volgens DIN 69893  
 FR Mandrin pour fraises à queue fileté, HSK-A selon DIN 69893  
 ES Portafresas con mango roscado, HSK-A según DIN 69893  
 DE Einschraubfräseraufnahme, HSK-A nach DIN 69893



**HSK-A**  
**AT3**  
**0,005**  
**G2.5**  
**25.000**  
**RPM**

Ref.	d2	d1	l2	l3	d3	d4	M	1	2	3
82.217.6061	HSK63A	M6	51	25	10	13	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6081	HSK63A	M8	51	25	13	15	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6082	HSK63A	M8	76	50	13	23	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6083	HSK63A	M8	101	75	13	23	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6084	HSK63A	M8	126	100	13	25	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6102	HSK63A	M10	76	50	18	23	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6103	HSK63A	M10	101	75	18	28	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6104	HSK63A	M10	126	100	18	32	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6122	HSK63A	M12	76	50	21	24	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6123	HSK63A	M12	101	75	21	31	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6124	HSK63A	M12	126	100	21	33	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6162	HSK63A	M16	76	50	29	34	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6163	HSK63A	M16	101	75	29	34	M18X1	84.790.1800	84.791.1800	84.789.1800
82.217.6164	HSK63A	M16	126	100	29	36	M18X1	84.790.1800	84.791.1800	84.789.1800



## > 82.251 INTERNATIONAL TOOLS

- NL ECO PRO Opsteekfreeshouder voor frezen met dwarsspiebaan MK volgens DIN 228-A  
 FR Mandrin porte-fraises ECO PRO pour fraises avec tenons CM selon DIN 228-A  
 ES Portafresa ECO PRO para fresas con chavetas frontales CM según DIN 228-A  
 DE ECO PRO Aufsteckfräserdorne für Fräser mit Quernut MK nach DIN 228-A



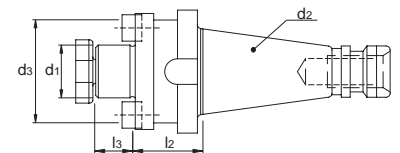
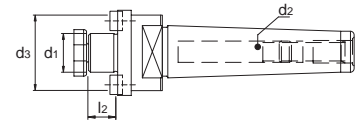
Ref.	d2	d1	l2	M	1
82.251.0216	MK 2	16	17	M10	82.452.0800
82.251.0222	MK 2	22	19	M10	82.452.1000
82.251.0316	MK 3	16	17	M12	82.452.0800
82.251.0322	MK 3	22	19	M12	82.452.1000
82.251.0416	MK 4	16	17	M16	82.452.0800
82.251.0422	MK 4	22	19	M16	82.452.1000
82.251.0427	MK 4	27	21	M16	82.452.1200

## > 82.253 Phantom

- NL Opsteekfreeshouder voor frezen met dwarsspiebaan, SK volgens DIN 2080  
 FR Mandrin porte-fraises pour fraises avec tenons, SA selon DIN 2080  
 ES Portafresa para fresas con chavetas frontales, SK según DIN 2080  
 DE Aufsteckfräserdorne für Fräser mit Quernut, SK nach DIN 2080

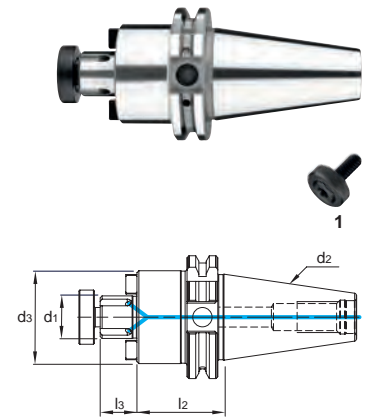


Ref.	d2	d1	l2	l3	M	1	2
82.253.4161	SK40	16	30	17	M16	82.450.0800	82.460.0800
82.253.4221	SK40	22	30	19	M16	82.450.1000	82.460.1000
82.253.4271	SK40	27	30	21	M16	82.450.1200	82.460.1200
82.253.4321	SK40	32	30	24	M16	82.450.1600	82.460.1600
82.253.4401	SK40	40	30	27	M16	82.450.2000	82.460.2000
82.253.5221	SK50	22	35	19	M24	82.450.1000	82.460.1000
82.253.5271	SK50	27	35	21	M24	82.450.1200	82.460.1200
82.253.5321	SK50	32	40	24	M24	82.450.1600	82.460.1600
82.253.5401	SK50	40	33	27	M24	82.450.2000	82.460.2000



> **82.264 Phantom**

- NL Opsteekfreeshouder voor frezen met dwarsspiebaan, SK volgens DIN 69871
- FR Mandrin porte-fraises pour fraises avec tenons, SA selon DIN 69871
- ES Portafresa para fresas con chavetas frontales, SK según DIN 69871
- DE Aufsteckfräserdorne für Fräser mit Quernut, SK nach DIN 69871

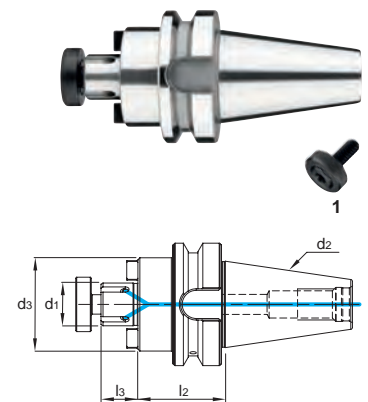


DIN 6537 AD/B SK AT3  $\pm 0,005$  G6,3 15.000 RPM

Ref.	d2	d1	l2	l3	M	1
82.264.4161	SK40	16	45	17	M16	82.452.0800
82.264.4162	SK40	16	100	17	M16	82.452.0800
82.264.4166	SK40	16	160	17	M16	82.452.0800
82.264.4221	SK40	22	45	19	M16	82.452.1000
82.264.4222	SK40	22	100	19	M16	82.452.1000
82.264.4226	SK40	22	160	19	M16	82.452.1000
82.264.4271	SK40	27	50	21	M16	82.452.1200
82.264.4272	SK40	27	100	21	M16	82.452.1200
82.264.4276	SK40	27	160	21	M16	82.452.1200
82.264.4321	SK40	32	55	24	M16	82.452.1600
82.264.4322	SK40	32	100	24	M16	82.452.1600
82.264.4326	SK40	32	160	24	M16	82.452.1600
82.264.4401	SK40	40	55	27	M16	82.452.2000
82.264.5161	SK50	16	45	17	M24	82.452.0800
82.264.5162	SK50	16	100	17	M24	82.452.0800
82.264.5166	SK50	16	160	17	M24	82.452.0800
82.264.5221	SK50	22	45	19	M24	82.452.1000
82.264.5222	SK50	22	100	19	M24	82.452.1000
82.264.5226	SK50	22	160	19	M24	82.452.1000
82.264.5271	SK50	27	45	21	M24	82.452.1200
82.264.5272	SK50	27	100	21	M24	82.452.1200
82.264.5276	SK50	27	160	21	M24	82.452.1200
82.264.5321	SK50	32	50	24	M24	82.452.1600
82.264.5322	SK50	32	100	24	M24	82.452.1600
82.264.5326	SK50	32	160	24	M24	82.452.1600
82.264.5401	SK50	40	55	27	M24	82.452.2000
82.264.5402	SK50	40	100	27	M24	82.452.2000
82.264.5406	SK50	40	160	27	M24	82.452.2000

> **82.266 Phantom**

- NL Opsteekfreeshouder voor frezen met dwarsspiebaan, BT volgens MAS 403 BT
- FR Mandrin porte-fraises pour fraises avec tenons, BT selon MAS 403 BT
- ES Portafresa para fresas con chavetas frontales, BT según MAS 403 BT
- DE Aufsteckfräserdorne für Fräser mit Quernut, BT nach MAS 403 BT



DIN 6537 AD/B MAS-BT AT3  $\pm 0,005$  G6,3 15.000 RPM

Ref.	d2	d1	l2	l3	M	1
82.266.4161	BT40	16	45	17	M16	82.452.0800
82.266.4162	BT40	16	100	17	M16	82.452.0800
82.266.4166	BT40	16	160	17	M16	82.452.0800
82.266.4221	BT40	22	45	19	M16	82.452.1000
82.266.4222	BT40	22	100	19	M16	82.452.1000
82.266.4226	BT40	22	160	19	M16	82.452.1000
82.266.4271	BT40	27	45	21	M16	82.452.1200
82.266.4272	BT40	27	100	21	M16	82.452.1200
82.266.4276	BT40	27	160	21	M16	82.452.1200
82.266.4321	BT40	32	50	24	M16	82.452.1600
82.266.4322	BT40	32	100	24	M16	82.452.1600
82.266.4326	BT40	32	160	24	M16	82.452.1600



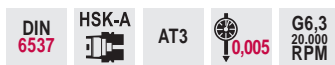
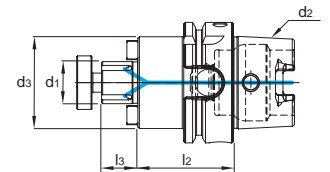
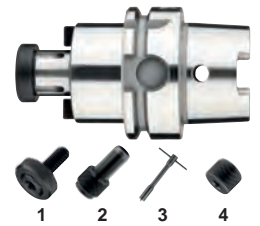


## > 82.266 Phantom

Ref.	d2	d1	l2	l3	M	1
82.266.4401	BT40	40	55	27	M16	82.452.2000
82.266.4402	BT40	40	100	27	M16	82.452.2000
82.266.4406	BT40	40	160	27	M16	82.452.2000
82.266.5161	BT50	16	60	17	M24	82.452.0800
82.266.5162	BT50	16	100	17	M24	82.452.0800
82.266.5166	BT50	16	160	17	M24	82.452.0800
82.266.5221	BT50	22	60	19	M24	82.452.1000
82.266.5222	BT50	22	100	19	M24	82.452.1000
82.266.5226	BT50	22	160	19	M24	82.452.1000
82.266.5271	BT50	27	60	21	M24	82.452.1200
82.266.5272	BT50	27	100	21	M24	82.452.1200
82.266.5276	BT50	27	160	21	M24	82.452.1200
82.266.5321	BT50	32	60	24	M24	82.452.1600
82.266.5322	BT50	32	100	24	M24	82.452.1600
82.266.5326	BT50	32	160	24	M24	82.452.1600
82.266.5401	BT50	40	60	27	M24	82.452.2000
82.266.5402	BT50	40	100	27	M24	82.452.2000

## > 82.267 Phantom

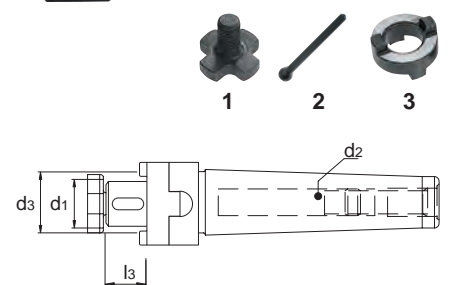
- NL** Opsteekfreeshouder voor frezen met dwarspiebaan, HSK-A volgens DIN 69893  
**FR** Mandrin porte-fraises pour fraises avec tenons, HSK-A selon DIN 69893  
**ES** Portafresa para fresas con chavetas frontales, HSK-A según DIN 69893  
**DE** Aufsteckfräserdorne für Fräser mit Quernut, HSK-A nach DIN 69893



Ref.	d2	d1	l2	l3	M	1	2	3	4
82.267.6161	HSK63A	16	45	17	M18X1	82.452.0800	84.790.1800	84.791.1800	84.789.1800
82.267.6162	HSK63A	16	100	17	M18X1	82.452.0800	84.790.1800	84.791.1800	84.789.1800
82.267.6166	HSK63A	16	160	17	M18X1	82.452.0800	84.790.1800	84.791.1800	84.789.1800
82.267.6221	HSK63A	22	50	19	M18X1	82.452.1000	84.790.1800	84.791.1800	84.789.1800
82.267.6222	HSK63A	22	100	19	M18X1	82.452.1000	84.790.1800	84.791.1800	84.789.1800
82.267.6226	HSK63A	22	160	19	M18X1	82.452.1000	84.790.1800	84.791.1800	84.789.1800
82.267.6271	HSK63A	27	55	21	M18X1	82.452.1200	84.790.1800	84.791.1800	84.789.1800
82.267.6272	HSK63A	27	100	21	M18X1	82.452.1200	84.790.1800	84.791.1800	84.789.1800
82.267.6276	HSK63A	27	160	21	M18X1	82.452.1200	84.790.1800	84.791.1800	84.789.1800
82.267.6321	HSK63A	32	60	24	M18X1	82.452.1600	84.790.1800	84.791.1800	84.789.1800
82.267.6401	HSK63A	40	65	27	M18X1	82.452.2000	84.790.1800	84.791.1800	84.789.1800

## > 82.321 Phantom

- NL** Combi-Opsteekfreeshouder voor frezen met langs- en dwarspiebaan, MK volgens DIN 228-A  
**FR** Mandrin porte-fraises combiné pour fraises avec rainure de clavette et tenons, CM selon DIN 228-A  
**ES** Portafresa combinado para fresas con ranura longitudinal y transversal, CM según DIN 228-A  
**DE** Kombi-Aufsteckfräsdorn für Fräser mit Längs- und Quernut, MK nach DIN 228-A

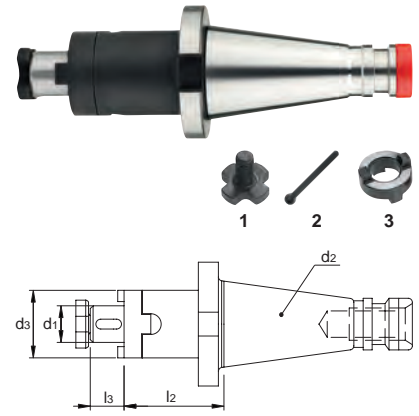


**NIUW / NOUVEAU / NUEVO / NEU**

Ref.	d2	d1	M	1	2	3
82.321.3131	MK 3	13	M12	-	-	-
82.321.3161	MK 3	16	M12	82.450.0800	82.460.0800	82.470.1600
82.321.3221	MK 3	22	M12	82.450.1000	82.460.1000	82.470.2200

> **82.323 Phantom**

- NL Combi-Opsteekfreeshouder voor frezen met langs- en dwarsspiebaan, SK volgens DIN 2080
- FR Mandrin porte-fraises combiné pour fraises avec rainure de clavette et tenons, SA selon DIN 2080
- ES Portafresa combinado para fresas con ranura longitudinal y transversal, SK según DIN 2080
- DE Kombi-Aufsteckfräsdorn für Fräser mit Längs- und Quernut, SK nach DIN 2080

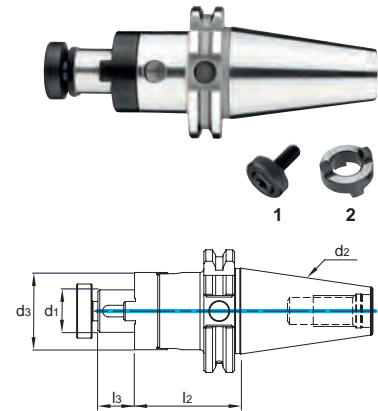


DIN 6358 SK AT3  $\pm 0,005$

Ref.	d2	d1	l2	l3	M	1	2	3
82.323.3016	SK30	16	35	17	M12	82.450.0800	82.460.0800	82.470.1600
82.323.3022	SK30	22	35	19	M12	82.450.1000	82.460.1000	82.470.2200
82.323.3027	SK30	27	35	21	M12	82.450.1200	82.460.1200	82.470.2700
82.323.3032	SK30	32	50	24	M12	82.450.1600	82.460.1600	82.470.3200
82.323.4016	SK40	16	52	17	M16	82.450.0800	82.460.0800	82.470.1600
82.323.4022	SK40	22	52	19	M16	82.450.1000	82.460.1000	82.470.2200
82.323.4027	SK40	27	52	21	M16	82.450.1200	82.460.1200	82.470.2700
82.323.4032	SK40	32	52	24	M16	82.450.1600	82.460.1600	82.470.3200
82.323.4040	SK40	40	52	27	M16	82.450.2000	82.460.2000	82.470.4000
82.323.5016	SK50	16	55	17	M24	82.450.0800	82.460.0800	82.470.1600
82.323.5022	SK50	22	55	19	M24	82.450.1000	82.460.1000	82.470.2200
82.323.5027	SK50	27	55	21	M24	82.450.1200	82.460.1200	82.470.2700
82.323.5032	SK50	32	55	24	M24	82.450.1600	82.460.1600	82.470.3200
82.323.5040	SK50	40	55	27	M24	82.450.2000	82.460.2000	82.470.4000

> **82.324 Phantom**

- NL Combi-Opsteekfreeshouder voor frezen met langs- en dwarsspiebaan, SK volgens DIN 69871
- FR Mandrin porte-fraises combiné pour fraises avec rainure de clavette et tenons, SA selon DIN 69871
- ES Portafresa combinado para fresas con ranura longitudinal y transversal, SK según DIN 69871
- DE Kombi-Aufsteckfräsdorn für Fräser mit Längs- und Quernut, SK nach DIN 69871



DIN 6358 AD SK AT3  $\pm 0,005$  G6.3 15.000 RPM

Ref.	d2	d1	l2	l3	M	1	2
82.324.4161	SK40	16	55	17	M16	82.452.0800	82.470.1600
82.324.4162	SK40	16	100	17	M16	82.452.0800	82.470.1600
82.324.4166	SK40	16	160	17	M16	82.452.0800	82.470.1600
82.324.4221	SK40	22	55	19	M16	82.452.1000	82.470.2200
82.324.4222	SK40	22	100	19	M16	82.452.1000	82.470.2200
82.324.4226	SK40	22	160	19	M16	82.452.1000	82.470.2200
82.324.4271	SK40	27	55	21	M16	82.452.1200	82.470.2700
82.324.4272	SK40	27	100	21	M16	82.452.1200	82.470.2700
82.324.4276	SK40	27	160	21	M16	82.452.1200	82.470.2700
82.324.4321	SK40	32	60	24	M16	82.452.1600	82.470.3200
82.324.4322	SK40	32	100	24	M16	82.452.1600	82.470.3200
82.324.4326	SK40	32	160	24	M16	82.452.1600	82.470.3200
82.324.4401	SK40	40	60	27	M16	82.452.2000	82.470.4000
82.324.4402	SK40	40	100	27	M16	82.452.2000	82.470.4000
82.324.4406	SK40	40	160	27	M16	82.452.2000	82.470.4000
82.324.5161	SK50	16	55	17	M24	82.452.0800	82.470.1600
82.324.5162	SK50	16	100	17	M24	82.452.0800	82.470.1600
82.324.5166	SK50	16	160	17	M24	82.452.0800	82.470.1600
82.324.5221	SK50	22	55	19	M24	82.452.1000	82.470.2200
82.324.5222	SK50	22	100	19	M24	82.452.1000	82.470.2200
82.324.5226	SK50	22	160	19	M24	82.452.1000	82.470.2200
82.324.5271	SK50	27	55	21	M24	82.452.1200	82.470.2700
82.324.5272	SK50	27	100	21	M24	82.452.1200	82.470.2700
82.324.5276	SK50	27	160	21	M24	82.452.1200	82.470.2700
82.324.5321	SK50	32	55	24	M24	82.452.1600	82.470.3200
82.324.5322	SK50	32	100	24	M24	82.452.1600	82.470.3200

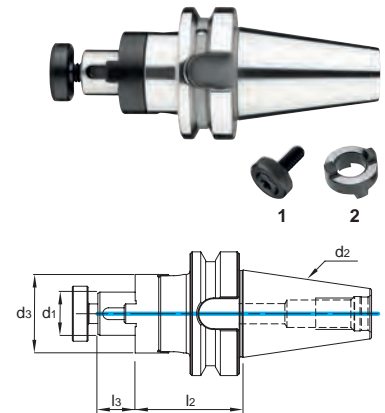


## > 82.324 Phantom

Ref.	d2	d1	l2	l3	M	1	2
82.324.5326	SK50	32	160	24	M24	82.452.1600	82.470.3200
82.324.5401	SK50	40	55	27	M24	82.452.2000	82.470.4000
82.324.5402	SK50	40	100	27	M24	82.452.2000	82.470.4000
82.324.5406	SK50	40	160	27	M24	82.452.2000	82.470.4000

## > 82.326 Phantom

- NL** Combi-Opsteekfreeshouder voor frezen met langs- en dwarspiebaan, BT volgens MAS 403 BT  
**FR** Mandrin porte-fraises combiné pour fraises avec rainure de clavette et tenons, BT selon MAS 403 BT  
**ES** Portafresa combinado para fresas con ranura longitudinal y transversal, BT según MAS 403 BT  
**DE** Kombi-Aufsteckfräsdorn für Fräser mit Längs- und Quernut, BT nach MAS 403 BT



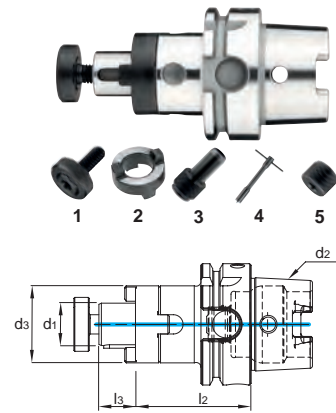
DIN 6358 AD MAS-BT AT3  $\sigma_{0.005}$  G6,3 15.000 RPM

Ref.	d2	d1	l2	l3	M	1	2
82.326.4161	BT40	16	55	17	M16	82.452.0800	82.470.1600
82.326.4162	BT40	16	100	17	M16	82.452.0800	82.470.1600
82.326.4166	BT40	16	160	17	M16	82.452.0800	82.470.1600
82.326.4221	BT40	22	55	19	M16	82.452.1000	82.470.2200
82.326.4222	BT40	22	100	19	M16	82.452.1000	82.470.2200
82.326.4226	BT40	22	160	19	M16	82.452.1000	82.470.2200
82.326.4271	BT40	27	55	21	M16	82.452.1200	82.470.2700
82.326.4272	BT40	27	100	21	M16	82.452.1200	82.470.2700
82.326.4276	BT40	27	160	21	M16	82.452.1200	82.470.2700
82.326.4321	BT40	32	60	24	M16	82.452.1600	82.470.3200
82.326.4322	BT40	32	100	24	M16	82.452.1600	82.470.3200
82.326.4326	BT40	32	160	24	M16	82.452.1600	82.470.3200
82.326.4401	BT40	40	60	27	M16	82.452.2000	82.470.4000
82.326.5161	BT50	16	70	17	M24	82.452.0800	82.470.1600
82.326.5162	BT50	16	100	17	M24	82.452.0800	82.470.1600
82.326.5166	BT50	16	160	17	M24	82.452.0800	82.470.1600
82.326.5221	BT50	22	70	19	M24	82.452.1000	82.470.2200
82.326.5222	BT50	22	100	19	M24	82.452.1000	82.470.2200
82.326.5226	BT50	22	160	19	M24	82.452.1000	82.470.2200
82.326.5271	BT50	27	70	21	M24	82.452.1200	82.470.2700
82.326.5272	BT50	27	100	21	M24	82.452.1200	82.470.2700
82.326.5276	BT50	27	160	21	M24	82.452.1200	82.470.2700
82.326.5321	BT50	32	70	24	M24	82.452.1600	82.470.3200
82.326.5322	BT50	32	100	24	M24	82.452.1600	82.470.3200
82.326.5326	BT50	32	160	24	M24	82.452.1600	82.470.3200
82.326.5401	BT50	40	70	27	M24	82.452.2000	82.470.4000
82.326.5402	BT50	40	100	27	M24	82.452.2000	82.470.4000
82.326.5406	BT50	40	160	27	M24	82.452.2000	82.470.4000



> **82.327 Phantom**

- NL Combi-Opsteekfreeshouder voor frezen met langs- en dwarspiebaan, HSK-A volgens DIN 69893
- FR Mandrin porte-fraises combiné pour fraises avec rainure de clavette et tenons, HSK-A selon DIN 69893
- ES Portafresa combinado para fresas con ranura longitudinal y transversal, HSK-A según DIN 69893
- DE Kombi-Aufsteckfräsdorn für Fräser mit Längs- und Quernut, HSK-A nach DIN 69893

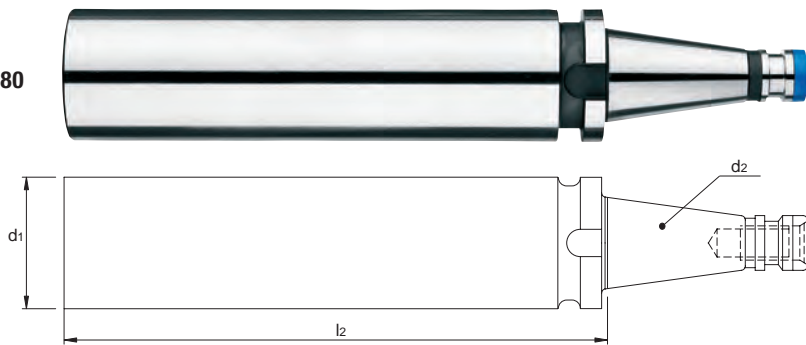


**DIN 6358** **HSK-A** **AT3** **G6,3**  
**20,000 RPM**

Ref.	d2	d1	l2	l3	M	1	2	3	4	5
82.327.6161	HSK63A	16	60	17	M18X1	82.452.0800	82.470.1600	84.790.1800	84.791.1800	84.789.1800
82.327.6162	HSK63A	16	100	17	M18X1	82.452.0800	82.470.1600	84.790.1800	84.791.1800	84.789.1800
82.327.6166	HSK63A	16	160	17	M18X1	82.452.0800	82.470.1600	84.790.1800	84.791.1800	84.789.1800
82.327.6221	HSK63A	22	60	19	M18X1	82.452.1000	82.470.2200	84.790.1800	84.791.1800	84.789.1800
82.327.6222	HSK63A	22	100	19	M18X1	82.452.1000	82.470.2200	84.790.1800	84.791.1800	84.789.1800
82.327.6226	HSK63A	22	160	19	M18X1	82.452.1000	82.470.2200	84.790.1800	84.791.1800	84.789.1800
82.327.6271	HSK63A	27	60	21	M18X1	82.452.1200	82.470.2700	84.790.1800	84.791.1800	84.789.1800
82.327.6272	HSK63A	27	100	21	M18X1	82.452.1200	82.470.2700	84.790.1800	84.791.1800	84.789.1800
82.327.6276	HSK63A	27	160	21	M18X1	82.452.1200	82.470.2700	84.790.1800	84.791.1800	84.789.1800
82.327.6321	HSK63A	32	65	24	M18X1	82.452.1600	82.470.3200	84.790.1800	84.791.1800	84.789.1800
82.327.6401	HSK63A	40	70	27	M18X1	82.452.2000	82.470.4000	84.790.1800	84.791.1800	84.789.1800

> **82.423 Phantom**

- NL Halfbewerkte gereedschapshouder, SK volgens DIN 2080
- FR Mandrin porte-outils non fini, SA selon DIN 2080
- ES Pieza en bruto, SK según DIN 2080
- DE Werkzeughalter-Rohling, SK nach DIN 2080

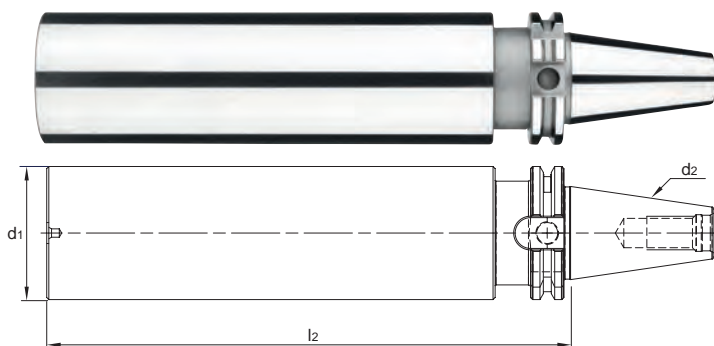


**SK** **AT3**

Ref.	d2	d1	l2	M	Ref.	d2	d1	l2	M
82.423.4063	SK40	63	250	M16	82.423.5080	SK50	97	315	M24

> **82.424 Phantom**

- NL Halfbewerkte gereedschapshouder, SK volgens DIN 69871
- FR Mandrin porte-outils non fini, SA selon DIN 69871
- ES Pieza en bruto, SK según DIN 69871
- DE Werkzeughalter-Rohling, SK nach DIN 69871



**SK** **AT3**

Ref.	d2	d1	l2	M	Ref.	d2	d1	l2	M
82.424.4063	SK40	63	250	M16	82.424.5080	SK50	97	315	M24

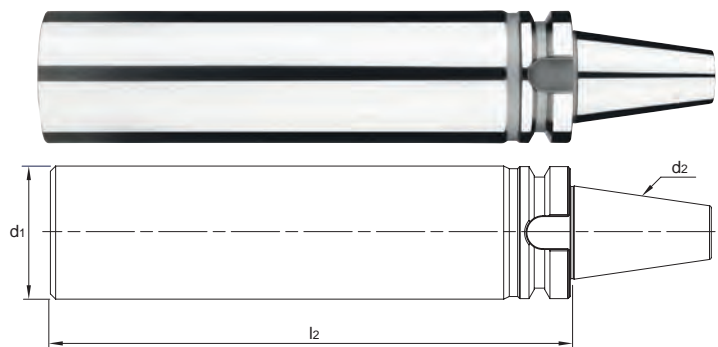






### > 82.426 Phantom

NL Halfbewerkte gereedschapshouder, BT volgens MAS 403 BT  
 FR Mandrin porte-outils non fini, BT selon MAS 403 BT  
 ES Pieza en bruto, BT según MAS 403 BT  
 DE Werkzeughalter-Rohling, BT nach MAS 403 BT

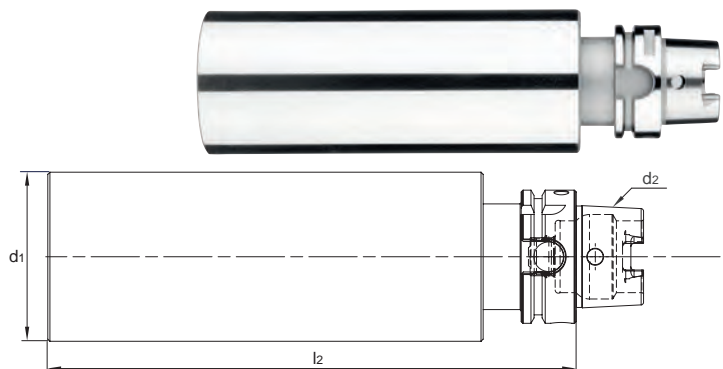


Ref.	d2	d1	l2	M
82.426.4063	BT40	63	250	M16

Ref.	d2	d1	l2	M
82.426.5080	BT50	97	315	M24

### > 82.427 Phantom

NL Halfbewerkte gereedschapshouder, HSK-A volgens DIN 69893  
 FR Mandrin porte-outils non fini, HSK-A selon DIN 69893  
 ES Pieza en bruto, HSK-A según DIN 69893  
 DE Werkzeughalter-Rohling, HSK-A nach DIN 69893

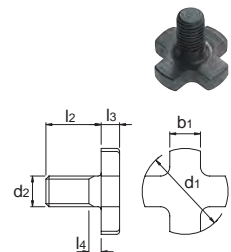


Ref.	d2	d1	l2	M
82.427.6080	HSK63A	80	250	M18X1

Ref.	d2	d1	l2	M

### > 82.450 Phantom

NL Aantrekschroef, type Kruis, voor opsteekhouder  
 FR Vis de serrage, type Croix, pour arbre de montage  
 ES Tornillo de fijación, tipo Cruz, para adaptador morse  
 DE Anzugsschrauben, Typ Kreuz, für Aufsteckhalter



DIN  
6367

Ref.	M	l4	b1	d1	l3	l2	Type
82.450.0800	M8	3	8	20	6	16	16
82.450.1000	M10	3.6	10	28	7	18	22
82.450.1200	M12	4.5	12	35	8	22	27

Ref.	M	l4	b1	d1	l3	l2	Type
82.450.1600	M16	5.5	16	42	9	26	32
82.450.2000	M20	6	20	52	10	30	40

### > 82.452 Phantom

NL Aantrekschroef, voor opsteekhouder  
 FR Vis de serrage, pour arbre de montage  
 ES Tornillo de fijación, para adaptador morse  
 DE Anzugsschrauben, für Aufsteckhalter



DIN  
6367

Ref.	M	d1
82.452.0800	M8	20
82.452.1000	M10	28
82.452.1200	M12	35

Ref.	M	d1
82.452.1600	M16	42
82.452.2000	M20	52

> **82.460 Phantom**



NL Spansleutel, voor opsteekhouder  
 FR Clé pour vis de serrage, pour arbre de montage  
 ES Llave para tornillo de fijación, para adaptador morse  
 DE Spanschlüssel, für Aufsteckhalter

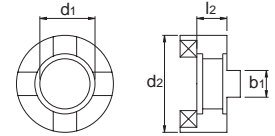
DIN  
 6368

Ref.	M	Type	l1
82.460.0800	M8	16	180
82.460.1000	M10	22	200
82.460.1200	M12	27	225

Ref.	M	Type	l1
82.460.1600	M16	32	250
82.460.2000	M20	40	280
82.460.2400	M24	50	315

> **82.470 Phantom**

NL Meeneemring, voor opsteekhouder  
 FR Bague de déblocage, pour arbre de montage  
 ES Arandela de arrastre, para adaptador morse  
 DE Mitnehmerringe, für Aufsteckhalter



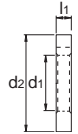
DIN  
 6366

Ref.	d1	l2	b1	d2
82.470.1600	16	10	8	32
82.470.2200	22	12	10	40
82.470.2700	27	12	12	48

Ref.	d1	l2	b1	d2
82.470.3200	32	14	14	58
82.470.4000	40	14	16	70

> **82.480 Phantom**

NL Freesdoorring  
 FR Entretoise pour mandrins porte-fraises  
 ES Separador para portafresas  
 DE Fräsdorring



DIN  
 2084-B

Ref.	d1	d2	l1
82.480.1601	16	25	1
82.480.1602	16	25	2
82.480.1603	16	25	3
82.480.1606	16	25	6
82.480.1610	16	25	10
82.480.1620	16	25	20
82.480.1630	16	25	30
82.480.2201	22	33	1
82.480.2202	22	33	2
82.480.2203	22	33	3
82.480.2206	22	33	6
82.480.2210	22	33	10
82.480.2220	22	33	20
82.480.2230	22	33	30
82.480.2701	27	39	1
82.480.2702	27	39	2
82.480.2703	27	39	3
82.480.2706	27	39	6
82.480.2710	27	39	10
82.480.2720	27	39	20
82.480.2730	27	39	30

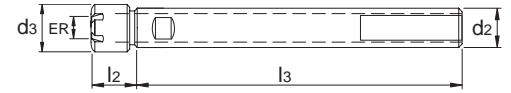
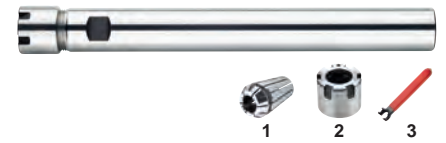
Ref.	d1	d2	l1
82.480.3201	32	45	1
82.480.3202	32	45	2
82.480.3203	32	45	3
82.480.3206	32	45	6
82.480.3210	32	45	10
82.480.3220	32	45	20
82.480.3230	32	45	30
82.480.4001	40	54	1
82.480.4002	40	54	2
82.480.4003	40	54	3
82.480.4006	40	54	6
82.480.4010	40	54	10
82.480.4020	40	54	20
82.480.4030	40	54	30
82.480.5001	50	67	1
82.480.5002	50	67	2
82.480.5003	50	67	3
82.480.5006	50	67	6
82.480.5010	50	67	10
82.480.5020	50	67	20
82.480.5030	50	67	30





## > 82.509 Phantom

NL ER Spantanghouder, cilindrisch, Mini-moer  
 FR Mandrin porte-pinces ER, forme cylindrique, Mini-écrou  
 ES Portapinzas ER, cilíndrico, Mini-tuerca  
 DE ER-Spannzangenfutter, Zylinderform, Mini-spannmutter



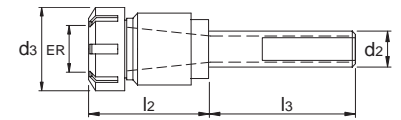
**NIEUW / NOUVEAU / NUEVO / NEU**

DIN  
6499-B ER

Ref.	d2	Type	Ø mm	l2	l3	d3	1 excl.	2 incl.	3 excl.
82.509.1611	16 mm	ER11	1-7	19	160	16	82.811	82.965.1100	82.993.1100
82.509.2016	20 mm	ER16	1-12	31	160	22	82.816	82.965.1600	82.993.1600
82.509.2520	25 mm	ER20	1-14	28	160	28	82.820	82.965.2000	82.993.2000
82.509.2525	25 mm	ER25	1-20	40	160	42	82.825	82.965.2500	82.993.2500

## > 82.510 Phantom

NL ER Spantanghouder, cilindrisch  
 FR Mandrin porte-pinces ER, forme cylindrique  
 ES Portapinzas ER, cilíndrico  
 DE ER-Spannzangenfutter, Zylinderform

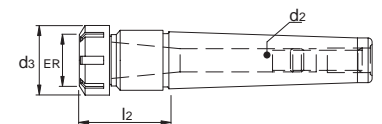
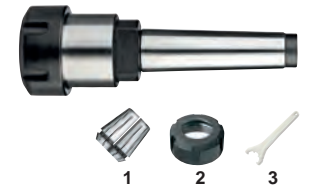


DIN  
6499-B ER

Ref.	d2	Type	Ø mm	l2	l3	d3	1 excl.	2 incl.	3 excl.
82.510.3232	32 mm	ER32	2-20	48	70	50	82.832	82.960.3200	82.990.3200

## > 82.511 INTERNATIONAL TOOLS

NL ECO PRO ER Spantanghouder, MK volgens DIN 228-A  
 FR Mandrin porte-pinces ER ECO PRO, CM selon DIN 228-A  
 ES Portapinzas ER ECO PRO, CM según DIN 228-A  
 DE ECO PRO ER-Spannzangenfutter, MK nach DIN 228-A

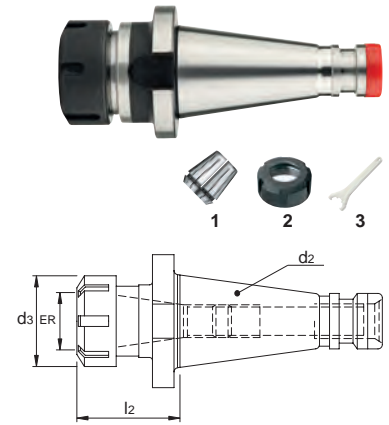


DIN  
228-A ER ECO PRO

Ref.	d2	Type	Ø mm	l2	d3	M	1 excl.	2 incl.	3 excl.
82.511.0225	MK 2	ER25	1-20	50	42	M10	82.825	82.960.2500	82.990.2500
82.511.0332	MK 3	ER32	2-20	70	50	M12	82.832	82.960.3200	82.990.3200
82.511.0432	MK 4	ER32	2-20	65	50	M16	82.832	82.960.3200	82.990.3200

> **82.513 Phantom**

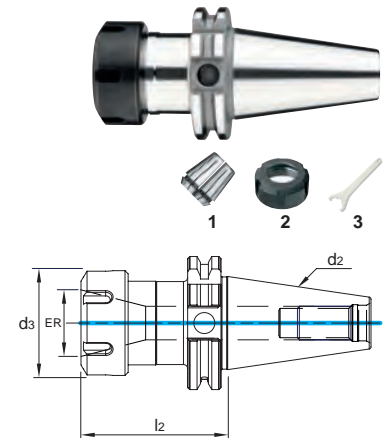
NL ER Spantanghouder, SK volgens DIN 2080  
 FR Mandrin porte-pinces ER, SA selon DIN 2080  
 ES Portapinzas ER, SK según DIN 2080  
 DE ER-Spannzangenfutter, SK nach DIN 2080



Ref.	d2	Type	Ø mm	l2	d3	M	1 excl.	2 incl.	3 excl.
82.513.3065	SK30	ER32	2-20	50	50	M12	82.832	82.960.3200	82.990.3200
82.513.4053	SK40	ER25	1-20	50	42	M16	82.825	82.960.2500	82.990.2500
82.513.4063	SK40	ER32	2-20	50	50	M16	82.832	82.960.3200	82.990.3200
82.513.4071	SK40	ER40	3-30	80	63	M16	82.840	82.960.4000	82.990.4000
82.513.5061	SK50	ER32	2-20	63	50	M24	82.832	82.960.3200	82.990.3200
82.513.5071	SK50	ER40	3-30	63	63	M24	82.840	82.960.4000	82.990.4000

> **82.514 Phantom**

NL ER Spantanghouder, SK volgens DIN 69871  
 FR Mandrin porte-pinces ER, SA selon DIN 69871  
 ES Portapinzas ER, SK según DIN 69871  
 DE ER-Spannzangenfutter, SK nach DIN 69871

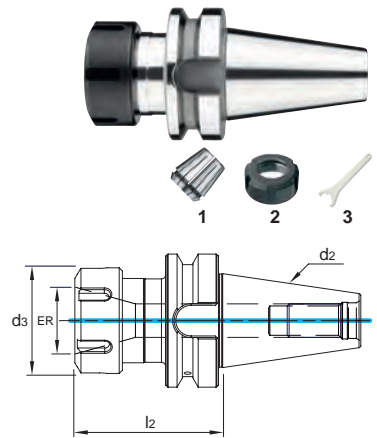


Ref.	d2	Type	Ø mm	l2	d3	M	1 excl.	2 incl.	3 excl.
82.514.4161	SK40	ER16	1-12	70	32	M16	82.816	82.960.1600	82.990.1600
82.514.4162	SK40	ER16	1-12	100	32	M16	82.816	82.960.1600	82.990.1600
82.514.4166	SK40	ER16	1-12	160	32	M16	82.816	82.960.1600	82.990.1600
82.514.4251	SK40	ER25	1-20	70	42	M16	82.825	82.960.2500	82.990.2500
82.514.4252	SK40	ER25	1-20	100	42	M16	82.825	82.960.2500	82.990.2500
82.514.4256	SK40	ER25	1-20	160	42	M16	82.825	82.960.2500	82.990.2500
82.514.4321	SK40	ER32	2-20	70	50	M16	82.832	82.960.3200	82.990.3200
82.514.4322	SK40	ER32	2-20	100	50	M16	82.832	82.960.3200	82.990.3200
82.514.4326	SK40	ER32	2-20	160	50	M16	82.832	82.960.3200	82.990.3200
82.514.4401	SK40	ER40	3-30	70	63	M16	82.840	82.960.4000	82.990.4000
82.514.4402	SK40	ER40	3-30	100	63	M16	82.840	82.960.4000	82.990.4000
82.514.4406	SK40	ER40	3-30	160	63	M16	82.840	82.960.4000	82.990.4000
82.514.5162	SK50	ER16	1-12	100	32	M24	82.816	82.960.1600	82.990.1600
82.514.5166	SK50	ER16	1-12	160	32	M24	82.816	82.960.1600	82.990.1600
82.514.5251	SK50	ER25	1-20	70	42	M24	82.825	82.960.2500	82.990.2500
82.514.5252	SK50	ER25	1-20	100	42	M24	82.825	82.960.2500	82.990.2500
82.514.5256	SK50	ER25	1-20	160	42	M24	82.825	82.960.2500	82.990.2500
82.514.5321	SK50	ER32	2-20	70	50	M24	82.832	82.960.3200	82.990.3200
82.514.5322	SK50	ER32	2-20	100	50	M24	82.832	82.960.3200	82.990.3200
82.514.5326	SK50	ER32	2-20	160	50	M24	82.832	82.960.3200	82.990.3200
82.514.5401	SK50	ER40	3-30	80	63	M24	82.840	82.960.4000	82.990.4000
82.514.5402	SK50	ER40	3-30	100	63	M24	82.840	82.960.4000	82.990.4000
82.514.5406	SK50	ER40	3-30	160	63	M24	82.840	82.960.4000	82.990.4000



## > 82.516 Phantom

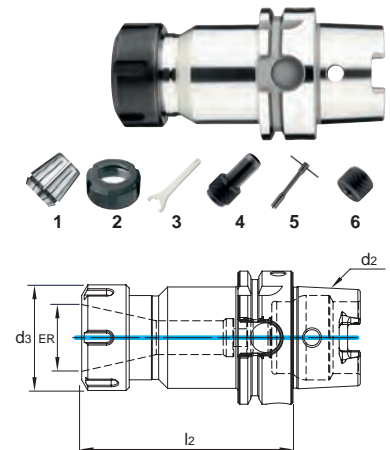
NL ER Spantanghouder, BT volgens MAS 403 BT  
 FR Mandrin porte-pinces ER, BT selon MAS 403 BT  
 ES Portapinzas ER, BT según MAS 403 BT  
 DE ER-Spannzangenfutter, BT nach MAS 403 BT



Ref.	d2	Type	Ø mm	l2	d3	M	1 excl.	2 incl.	3 excl.
82.516.4161	BT40	ER16	1-12	70	32	M16	82.816	82.960.1600	82.990.1600
82.516.4162	BT40	ER16	1-12	100	32	M16	82.816	82.960.1600	82.990.1600
82.516.4166	BT40	ER16	1-12	160	32	M16	82.816	82.960.1600	82.990.1600
82.516.4251	BT40	ER25	1-20	70	42	M16	82.825	82.960.2500	82.990.2500
82.516.4252	BT40	ER25	1-20	100	42	M16	82.825	82.960.2500	82.990.2500
82.516.4256	BT40	ER25	1-20	160	42	M16	82.825	82.960.2500	82.990.2500
82.516.4321	BT40	ER32	2-20	70	50	M16	82.832	82.960.3200	82.990.3200
82.516.4322	BT40	ER32	2-20	100	50	M16	82.832	82.960.3200	82.990.3200
82.516.4326	BT40	ER32	2-20	160	50	M16	82.832	82.960.3200	82.990.3200
82.516.4401	BT40	ER40	3-30	70	63	M16	82.840	82.960.4000	82.990.4000
82.516.4402	BT40	ER40	3-30	100	63	M16	82.840	82.960.4000	82.990.4000
82.516.4406	BT40	ER40	3-30	160	63	M16	82.840	82.960.4000	82.990.4000
82.516.5162	BT50	ER16	1-12	100	32	M24	82.816	82.960.1600	82.990.1600
82.516.5166	BT50	ER16	1-12	160	32	M24	82.816	82.960.1600	82.990.1600
82.516.5251	BT50	ER25	1-20	80	42	M24	82.825	82.960.2500	82.990.2500
82.516.5252	BT50	ER25	1-20	100	42	M24	82.825	82.960.2500	82.990.2500
82.516.5256	BT50	ER25	1-20	160	42	M24	82.825	82.960.2500	82.990.2500
82.516.5321	BT50	ER32	2-20	80	50	M24	82.832	82.960.3200	82.990.3200
82.516.5322	BT50	ER32	2-20	100	50	M24	82.832	82.960.3200	82.990.3200
82.516.5326	BT50	ER32	2-20	160	50	M24	82.832	82.960.3200	82.990.3200
82.516.5401	BT50	ER40	3-30	80	63	M24	82.840	82.960.4000	82.990.4000
82.516.5402	BT50	ER40	3-30	100	63	M24	82.840	82.960.4000	82.990.4000
82.516.5406	BT50	ER40	3-30	160	63	M24	82.840	82.960.4000	82.990.4000

## > 82.517 Phantom

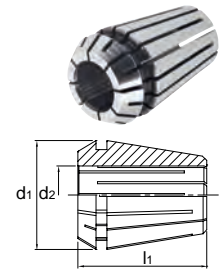
NL ER Spantanghouder, HSK-A volgens DIN 69893  
 FR Mandrin porte-pinces ER, HSK-A selon DIN 69893  
 ES Portapinzas ER, HSK-A según DIN 69893  
 DE ER-Spannzangenfutter, HSK-A nach DIN 69893



Ref.	d2	Type	Ø mm	l2	d3	1 excl.	2 incl.	3 excl.	4	5	6
82.517.6252	HSK63A	ER25	1-20	100	42	82.825	82.960.2500	82.990.2500	84.790.1800	84.791.1800	84.789.1800
82.517.6256	HSK63A	ER25	1-20	160	42	82.825	82.960.2500	82.990.2500	84.790.1800	84.791.1800	84.789.1800
82.517.6322	HSK63A	ER32	2-20	100	50	82.832	82.960.3200	82.990.3200	84.790.1800	84.791.1800	84.789.1800
82.517.6326	HSK63A	ER32	2-20	160	50	82.832	82.960.3200	82.990.3200	84.790.1800	84.791.1800	84.789.1800
82.517.6404	HSK63A	ER40	3-30	120	63	82.840	82.960.4000	82.990.4000	84.790.1800	84.791.1800	84.789.1800
82.517.6406	HSK63A	ER40	3-30	160	63	82.840	82.960.4000	82.990.4000	84.790.1800	84.791.1800	84.789.1800

> **82.811 Phantom**

NL Spantang ER 11 4008E, standaard, 15 µm  
 FR Pince ER 11 4008E, standard, 15 µm  
 ES Pinza ER 11 4008E, estándar, 15 µm  
 DE Spannzange ER 11 4008E, standard, 15 µm

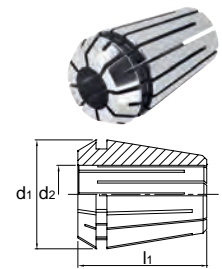


Ref.	Type	d2	Ø mm	d1	l1
82.811.0100	ER11	1	0,5-1	11,6	18
82.811.0150	ER11	1,5	1-1,5	11,6	18
82.811.0200	ER11	2	1,5-2	11,6	18
82.811.0250	ER11	2,5	2-2,5	11,6	18
82.811.0300	ER11	3	2,5-3	11,6	18
82.811.0350	ER11	3,5	3-3,5	11,6	18
82.811.0400	ER11	4	3,5-4	11,6	18

Ref.	Type	d2	Ø mm	d1	l1
82.811.0450	ER11	4,5	4-4,5	11,6	18
82.811.0500	ER11	5	4,5-5	11,6	18
82.811.0550	ER11	5,5	5-5,5	11,6	18
82.811.0600	ER11	6	5,5-6	11,6	18
82.811.0650	ER11	6,5	6-6,5	11,6	18
82.811.0700	ER11	7	6,5-7	11,6	18

> **82.816 Phantom**

NL Spantang ER 16 426E, standaard, 15 µm  
 FR Pince ER 16 426E, standard, 15 µm  
 ES Pinza ER 16 426E, estándar, 15 µm  
 DE Spannzange ER 16 426E, standard, 15 µm

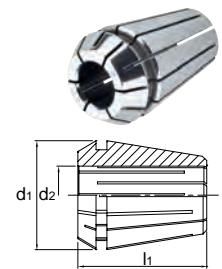


Ref.	Type	d2	Ø mm	d1	l1
82.816.0100	ER16	1	0,5-1	17	27
82.816.0150	ER16	1,5	1-1,5	17	27
82.816.0200	ER16	2	1,5-2	17	27
82.816.0250	ER16	2,5	2-2,5	17	27
82.816.0300	ER16	3	2-3	17	27
82.816.0400	ER16	4	3-4	17	27
82.816.0500	ER16	5	4-5	17	27

Ref.	Type	d2	Ø mm	d1	l1
82.816.0600	ER16	6	5-6	17	27
82.816.0700	ER16	7	6-7	17	27
82.816.0800	ER16	8	7-8	17	27
82.816.0900	ER16	9	8-9	17	27
82.816.1000	ER16	10	9-10	17	27
82.816.1200	ER16	12	11-12	17	27

> **82.817 Phantom**

NL Spantang ER 16 426E, Ultra precies, 5 µm  
 FR Pince ER 16 426E, Ultra précis, 5 µm  
 ES Pinza ER 16 426E, Ultrapreciso, 5 µm  
 DE Spannzange ER 16 426E, Ultrapräzise, 5 µm



**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.817.0100	ER16	1	0,5-1	17	27
82.817.0150	ER16	1,5	1-1,5	17	27
82.817.0200	ER16	2	1,5-2	17	27
82.817.0300	ER16	3	2-3	17	27
82.817.0400	ER16	4	3-4	17	27
82.817.0500	ER16	5	4-5	17	27

Ref.	Type	d2	Ø mm	d1	l1
82.817.0600	ER16	6	5-6	17	27
82.817.0700	ER16	7	6-7	17	27
82.817.0800	ER16	8	7-8	17	27
82.817.0900	ER16	9	8-9	17	27
82.817.1000	ER16	10	9-10	17	27





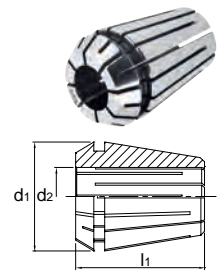
## > 82.820 Phantom

NL Spantang ER 20 428E, standaard, 15 µm  
 FR Pince ER 20 428E, standard, 15 µm  
 ES Pinza ER 20 428E, estándar, 15 µm  
 DE Spannzange ER 20 428E, standard, 15 µm



Ref.	Type	d2	Ø mm	d1	l1
82.820.0100	ER20	1	0,5-1	21	31
82.820.0150	ER20	1,5	1-1,5	21	31
82.820.0200	ER20	2	1,5-2	21	31
82.820.0250	ER20	2,5	2-2,5	21	31
82.820.0300	ER20	3	2-3	21	31
82.820.0400	ER20	4	3-4	21	31
82.820.0500	ER20	5	4-5	21	31
82.820.0600	ER20	6	5-6	21	31

Ref.	Type	d2	Ø mm	d1	l1
82.820.0700	ER20	7	6-7	21	31
82.820.0800	ER20	8	7-8	21	31
82.820.0900	ER20	9	8-9	21	31
82.820.1000	ER20	10	9-10	21	31
82.820.1100	ER20	11	10-11	21	31
82.820.1200	ER20	12	11-12	21	31
82.820.1300	ER20	13	12-13	21	31



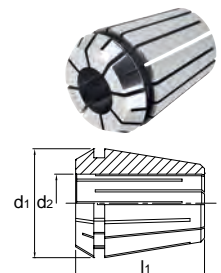
## > 82.825 Phantom

NL Spantang ER 25 430E, standaard, 15 µm  
 FR Pince ER 25 430E, standard, 15 µm  
 ES Pinza ER 25 430E, estándar, 15 µm  
 DE Spannzange ER 25 430E, standard, 15 µm



Ref.	Type	d2	Ø mm	d1	l1
82.825.0100	ER25	1	0,5-1	26	35
82.825.0150	ER25	1,5	1-1,5	26	35
82.825.0200	ER25	2	1,5-2	26	35
82.825.0250	ER25	2,5	2-2,5	26	35
82.825.0300	ER25	3	2-3	26	35
82.825.0400	ER25	4	3-4	26	35
82.825.0500	ER25	5	4-5	26	35
82.825.0600	ER25	6	5-6	26	35
82.825.0700	ER25	7	6-7	26	35
82.825.0800	ER25	8	7-8	26	35
82.825.0900	ER25	9	8-9	26	35

Ref.	Type	d2	Ø mm	d1	l1
82.825.1000	ER25	10	9-10	26	35
82.825.1100	ER25	11	10-11	26	35
82.825.1200	ER25	12	11-12	26	35
82.825.1300	ER25	13	12-13	26	35
82.825.1400	ER25	14	13-14	26	35
82.825.1500	ER25	15	14-15	26	35
82.825.1600	ER25	16	15-16	26	35
82.825.1700	ER25	17	16-17	26	35
82.825.1800	ER25	18	17-18	26	35
82.825.1900	ER25	19	18-19	26	35
82.825.2000	ER25	20	19-20	26	35



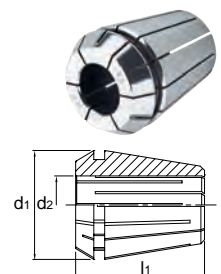
## > 82.826 Phantom

NL Spantang ER 25 430E, Ultra precies, 5 µm  
 FR Pince ER 25 430E, Ultra précis, 5 µm  
 ES Pinza ER 25 430E, Ultrapreciso, 5 µm  
 DE Spannzange ER 25 430E, Ultrapräzise, 5 µm



Ref.	Type	d2	Ø mm	d1	l1
82.826.0100	ER25	1	0,5-1	26	35
82.826.0150	ER25	1,5	1-1,5	26	35
82.826.0200	ER25	2	1,5-2	26	35
82.826.0300	ER25	3	2-3	26	35
82.826.0400	ER25	4	3-4	26	35
82.826.0500	ER25	5	4-5	26	35
82.826.0600	ER25	6	5-6	26	35
82.826.0700	ER25	7	6-7	26	35
82.826.0800	ER25	8	7-8	26	35

Ref.	Type	d2	Ø mm	d1	l1
82.826.0900	ER25	9	8-9	26	35
82.826.1000	ER25	10	9-10	26	35
82.826.1100	ER25	11	10-11	26	35
82.826.1200	ER25	12	11-12	26	35
82.826.1300	ER25	13	12-13	26	35
82.826.1400	ER25	14	13-14	26	35
82.826.1500	ER25	15	14-15	26	35
82.826.1600	ER25	16	15-16	26	35

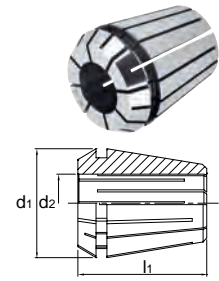


**NIEUW / NOUVEAU / NUEVO / NEU**



> **82.832 Phantom**

NL Spantang ER 32 470E, standaard, 15 µm  
 FR Pince ER 32 470E, standard, 15 µm  
 ES Pinza ER 32 470E, estándar, 15 µm  
 DE Spannzange ER 32 470E, standard, 15 µm

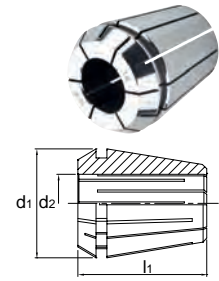


Ref.	Type	d2	Ø mm	d1	l1
82.832.0200	ER32	2	1,5-2	33	40
82.832.0300	ER32	3	2-3	33	40
82.832.0400	ER32	4	3-4	33	40
82.832.0500	ER32	5	4-5	33	40
82.832.0600	ER32	6	5-6	33	40
82.832.0700	ER32	7	6-7	33	40
82.832.0800	ER32	8	7-8	33	40
82.832.0900	ER32	9	8-9	33	40
82.832.1000	ER32	10	9-10	33	40
82.832.1100	ER32	11	10-11	33	40

Ref.	Type	d2	Ø mm	d1	l1
82.832.1200	ER32	12	11-12	33	40
82.832.1300	ER32	13	12-13	33	40
82.832.1400	ER32	14	13-14	33	40
82.832.1500	ER32	15	14-15	33	40
82.832.1600	ER32	16	15-16	33	40
82.832.1700	ER32	17	16-17	33	40
82.832.1800	ER32	18	17-18	33	40
82.832.1900	ER32	19	18-19	33	40
82.832.2000	ER32	20	19-20	33	40

> **82.833 Phantom**

NL Spantang ER 32 470E, Ultra precies, 5 µm  
 FR Pince ER 32 470E, Ultra précis, 5 µm  
 ES Pinza ER 32 470E, Ultrapreciso, 5 µm  
 DE Spannzange ER 32 470E, Ultrapräzise, 5 µm



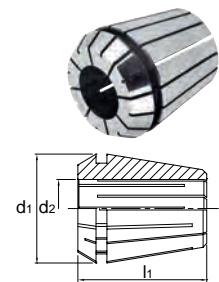
**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.833.0200	ER32	2	1,5-2	33	40
82.833.0300	ER32	3	2-3	33	40
82.833.0400	ER32	4	3-4	33	40
82.833.0500	ER32	5	4-5	33	40
82.833.0600	ER32	6	5-6	33	40
82.833.0700	ER32	7	6-7	33	40
82.833.0800	ER32	8	7-8	33	40
82.833.0900	ER32	9	8-9	33	40
82.833.1000	ER32	10	9-10	33	40
82.833.1100	ER32	11	10-11	33	40

Ref.	Type	d2	Ø mm	d1	l1
82.833.1200	ER32	12	11-12	33	40
82.833.1300	ER32	13	12-13	33	40
82.833.1400	ER32	14	13-14	33	40
82.833.1500	ER32	15	14-15	33	40
82.833.1600	ER32	16	15-16	33	40
82.833.1700	ER32	17	16-17	33	40
82.833.1800	ER32	18	17-18	33	40
82.833.1900	ER32	19	18-19	33	40
82.833.2000	ER32	20	19-20	33	40

> **82.840 Phantom**

NL Spantang ER 40 472E, standaard, 15 µm  
 FR Pince ER 40 472E, standard, 15 µm  
 ES Pinza ER 40 472E, estándar, 15 µm  
 DE Spannzange ER 40 472E, standard, 15 µm



Ref.	Type	d2	Ø mm	d1	l1
82.840.0300	ER40	3	2-3	41	46
82.840.0400	ER40	4	3-4	41	46
82.840.0500	ER40	5	4-5	41	46
82.840.0600	ER40	6	5-6	41	46
82.840.0700	ER40	7	6-7	41	46
82.840.0800	ER40	8	7-8	41	46
82.840.0900	ER40	9	8-9	41	46
82.840.1000	ER40	10	9-10	41	46
82.840.1100	ER40	11	10-11	41	46
82.840.1200	ER40	12	11-12	41	46
82.840.1300	ER40	13	12-13	41	46
82.840.1400	ER40	14	13-14	41	46
82.840.1500	ER40	15	14-15	41	46
82.840.1600	ER40	16	15-16	41	46

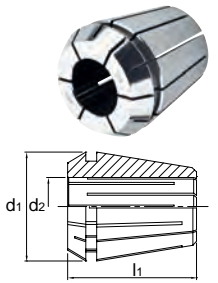
Ref.	Type	d2	Ø mm	d1	l1
82.840.1700	ER40	17	16-17	41	46
82.840.1800	ER40	18	17-18	41	46
82.840.1900	ER40	19	18-19	41	46
82.840.2000	ER40	20	19-20	41	46
82.840.2100	ER40	21	20-21	41	46
82.840.2200	ER40	22	21-22	41	46
82.840.2300	ER40	23	22-23	41	46
82.840.2400	ER40	24	23-24	41	46
82.840.2500	ER40	25	24-25	41	46
82.840.2600	ER40	26	25-26	41	46
82.840.2700	ER40	27	26-27	41	46
82.840.2800	ER40	28	27-28	41	46
82.840.2900	ER40	29	28-29	41	46
82.840.3000	ER40	30	29-30	41	46





## > 82.841 Phantom

NL Spantang ER 40 472E, Ultra precies, 5 µm  
 FR Pince ER 40 472E, Ultra précis, 5 µm  
 ES Pinza ER 40 472E, Ultrapreciso, 5 µm  
 DE Spannzange ER 40 472E, Ultrapräzise, 5 µm



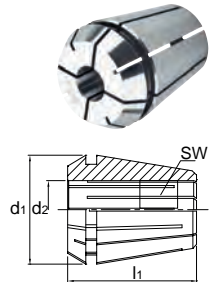
**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.841.0300	ER40	3	2-3	41	46
82.841.0400	ER40	4	3-4	41	46
82.841.0500	ER40	5	4-5	41	46
82.841.0600	ER40	6	5-6	41	46
82.841.0700	ER40	7	6-7	41	46
82.841.0800	ER40	8	7-8	41	46
82.841.0900	ER40	9	8-9	41	46
82.841.1000	ER40	10	9-10	41	46
82.841.1100	ER40	11	10-11	41	46
82.841.1200	ER40	12	11-12	41	46
82.841.1300	ER40	13	12-13	41	46
82.841.1400	ER40	14	13-14	41	46
82.841.1500	ER40	15	14-15	41	46
82.841.1600	ER40	16	15-16	41	46

Ref.	Type	d2	Ø mm	d1	l1
82.841.1700	ER40	17	16-17	41	46
82.841.1800	ER40	18	17-18	41	46
82.841.1900	ER40	19	18-19	41	46
82.841.2000	ER40	20	19-20	41	46
82.841.2100	ER40	21	20-21	41	46
82.841.2200	ER40	22	21-22	41	46
82.841.2300	ER40	23	22-23	41	46
82.841.2400	ER40	24	23-24	41	46
82.841.2500	ER40	25	24-25	41	46
82.841.2600	ER40	26	25-26	41	46
82.841.2700	ER40	27	26-27	41	46
82.841.2800	ER40	28	27-28	41	46
82.841.2900	ER40	29	28-29	41	46
82.841.3000	ER40	30	29-30	41	46

## > 82.880 Phantom

NL Spantang ER 16G 426G, voor tappen, 15 µm  
 FR Pince ER 16G 426G, pour tarauds, 15 µm  
 ES Pinza ER 16G 426G, para machos, 15 µm  
 DE Spannzange ER 16G 426G, für Maschinengewindebohrer, 15 µm

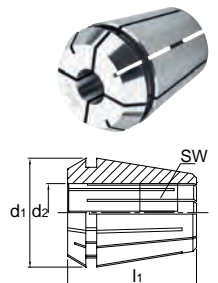


Ref.	Type	d2	sw	d1	l1
82.880.0350	ER16G	3.5	2.7	17	27
82.880.0400	ER16G	4	3	17	27
82.880.0450	ER16G	4.5	3.4	17	27
82.880.0500	ER16G	5	4	17	27
82.880.0600	ER16G	6	4.9	17	27

Ref.	Type	d2	sw	d1	l1
82.880.0630	ER16G	6.3	5	17	27
82.880.0700	ER16G	7	5.5	17	27
82.880.0800	ER16G	8	6.2	17	27
82.880.0900	ER16G	9	7.1	17	27
82.880.1000	ER16G	10	8	17	27

## > 82.885 Phantom

NL Spantang ER 25G 430G, voor tappen, 15 µm  
 FR Pince ER 25G 430G, pour tarauds, 15 µm  
 ES Pinza ER 25G 430G, para machos, 15 µm  
 DE Spannzange ER 25G 430G, für Maschinengewindebohrer, 15 µm

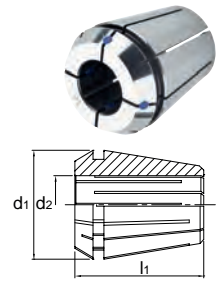


Ref.	Type	d2	sw	d1	l1
82.885.0350	ER25G	3.5	2.7	26	35
82.885.0400	ER25G	4	3	26	35
82.885.0450	ER25G	4.5	3.4	26	35
82.885.0500	ER25G	5	4	26	35
82.885.0550	ER25G	5.5	4.3	26	35
82.885.0600	ER25G	6	4.9	26	35
82.885.0630	ER25G	6.3	5	26	35

Ref.	Type	d2	sw	d1	l1
82.885.0700	ER25G	7	5.5	26	35
82.885.0800	ER25G	8	6.2	26	35
82.885.0900	ER25G	9	7	26	35
82.885.1000	ER25G	10	8	26	35
82.885.1100	ER25G	11	9	26	35
82.885.1120	ER25G	11.2	9	26	35
82.885.1200	ER25G	12	9	26	35

> **82.916 Phantom**

NL Spantang ER 16 425E, rubber afgedicht, 8 µm  
 FR Pince ER 16 425E, joint d'étanchéité en caoutchouc, 8 µm  
 ES Pinza ER 16 425E, sellado de goma, 8 µm  
 DE Spannzange ER 16 425E, Gummi abgedichtet, 8 µm



**NIEUW NOUVEAU NUEVO NEU**

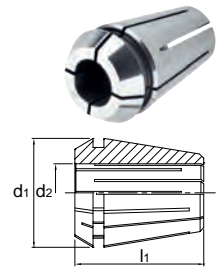
ER-16 DIN 6499 0,008 40 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.916.0300	ER16	3	3h10	17	27
82.916.0400	ER16	4	4h10	17	27
82.916.0600	ER16	6	6h10	17	27

Ref.	Type	d2	Ø mm	d1	l1
82.916.0800	ER16	8	8h10	17	27
82.916.1000	ER16	10	10h10	17	27

> **82.917 Phantom**

NL Spantang ER 16 425E, staal afgedicht, 8 µm  
 FR Pince ER 16 425E, acier scellé, 8 µm  
 ES Pinza ER 16 425E, acero sellado, 8 µm  
 DE Spannzange ER 16 425E, Stahl versiegelt, 8 µm



**NIEUW NOUVEAU NUEVO NEU**

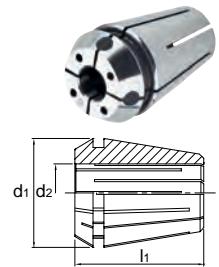
ER-16 DIN 6499 0,008 120 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.917.0300	ER16	3	3h10	17	27
82.917.0400	ER16	4	4h10	17	27
82.917.0600	ER16	6	6h10	17	27

Ref.	Type	d2	Ø mm	d1	l1
82.917.0800	ER16	8	8h10	17	27
82.917.1000	ER16	10	10h10	17	27

> **82.918 Phantom**

NL Spantang ER 16 425E, Coolant Jet, 8 µm  
 FR Pince ER 16 425E, Coolant Jet, 8 µm  
 ES Pinza ER 16 425E, Coolant Jet, 8 µm  
 DE Spannzange ER 16 425E, Coolant Jet, 8 µm



**NIEUW NOUVEAU NUEVO NEU**

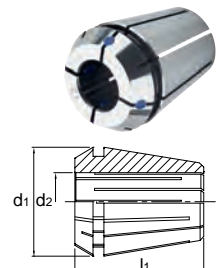
ER-16 DIN 6499 0,008 40 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.918.0300	ER16	3	3h10	17	27
82.918.0400	ER16	4	4h10	17	27
82.918.0500	ER16	5	5h10	17	27

Ref.	Type	d2	Ø mm	d1	l1
82.918.0600	ER16	6	6h10	17	27
82.918.0700	ER16	7	7h10	17	27

> **82.925 Phantom**

NL Spantang ER 25 429E, rubber afgedicht, 8 µm  
 FR Pince ER 25 429E, joint d'étanchéité en caoutchouc, 8 µm  
 ES Pinza ER 25 429E, sellado de goma, 8 µm  
 DE Spannzange ER 25 429E, Gummi abgedichtet, 8 µm



**NIEUW NOUVEAU NUEVO NEU**

ER-25 DIN 6499 0,008 40 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.925.0300	ER25	3	3h10	26	35
82.925.0400	ER25	4	4h10	26	35
82.925.0600	ER25	6	6h10	26	35
82.925.0800	ER25	8	8h10	26	35

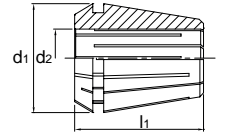
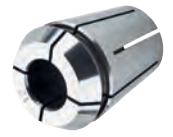
Ref.	Type	d2	Ø mm	d1	l1
82.925.1000	ER25	10	10h10	26	35
82.925.1200	ER25	12	12h10	26	35
82.925.1400	ER25	14	14h10	26	35
82.925.1600	ER25	16	16h10	26	35





## > 82.926 Phantom

NL Spantang ER 25 429E, staal afgedicht, 8 µm  
 FR Pince ER 25 429E, acier scellé, 8 µm  
 ES Pinza ER 25 429E, acero sellado, 8 µm  
 DE Spannzange ER 25 429E, Stahl versiegelt, 8 µm



ER-25	DIN 6499	0,008	120 BAR
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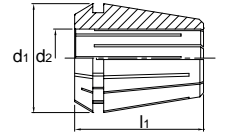
**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.926.0300	ER25	3	3h10	26	35
82.926.0400	ER25	4	4h10	26	35
82.926.0600	ER25	6	6h10	26	35
82.926.0800	ER25	8	8h10	26	35

Ref.	Type	d2	Ø mm	d1	l1
82.926.1000	ER25	10	10h10	26	35
82.926.1200	ER25	12	12h10	26	35
82.926.1400	ER25	14	14h10	26	35
82.926.1600	ER25	16	16h10	26	35

## > 82.927 Phantom

NL Spantang ER 25 429E, Coolant Jet, 8 µm  
 FR Pince ER 25 429E, Coolant Jet, 8 µm  
 ES Pinza ER 25 429E, Coolant Jet, 8 µm  
 DE Spannzange ER 25 429E, Coolant Jet, 8 µm



ER-25	DIN 6499	0,008	40 BAR
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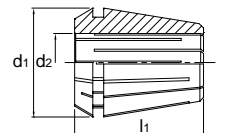
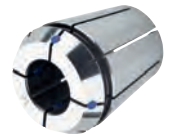
**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.927.0300	ER25	3	3h10	26	35
82.927.0400	ER25	4	4h10	26	35
82.927.0500	ER25	5	5h10	26	35
82.927.0600	ER25	6	6h10	26	35
82.927.0700	ER25	7	7h10	26	35
82.927.0800	ER25	8	8h10	26	35

Ref.	Type	d2	Ø mm	d1	l1
82.927.0900	ER25	9	9h10	26	35
82.927.1000	ER25	10	10h10	26	35
82.927.1100	ER25	11	11h10	26	35
82.927.1200	ER25	12	12h10	26	35
82.927.1300	ER25	13	13h10	26	35
82.927.1400	ER25	14	14h10	26	35

## > 82.932 Phantom

NL Spantang ER 32 469E, rubber afgedicht, 8 µm  
 FR Pince ER 32 469E, d'étanchéité en caoutchouc, 8 µm  
 ES Pinza ER 32 469E, sellado de goma, 8 µm  
 DE Spannzange ER 32 469E, Gummi abgedichtet, 8 µm



ER-32	DIN 6499	0,008	40 BAR
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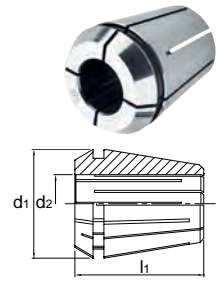
**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.932.0300	ER32	3	3h10	33	40
82.932.0400	ER32	4	4h10	33	40
82.932.0600	ER32	6	6h10	33	40
82.932.0800	ER32	8	8h10	33	40
82.932.1000	ER32	10	10h10	33	40

Ref.	Type	d2	Ø mm	d1	l1
82.932.1200	ER32	12	12h10	33	40
82.932.1400	ER32	14	14h10	33	40
82.932.1600	ER32	16	16h10	33	40
82.932.1800	ER32	18	18h10	33	40
82.932.2000	ER32	20	20h10	33	40

> **82.933 Phantom**

NL Spantang ER 32 469E, staal afgedicht, 8 µm  
 FR Pince ER 32 469E, acier scellé, 8 µm  
 ES Pinza ER 32 469E, acero sellado, 8 µm  
 DE Spannzange ER 32 469E, Stahl versiegelt, 8 µm



**NIEUW / NOUVEAU / NUEVO / NEU**

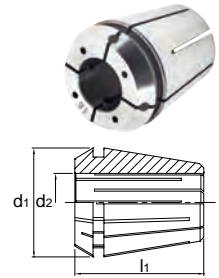
ER-32 DIN 6499 0,008 120 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.933.0300	ER32	3	3h10	33	40
82.933.0400	ER32	4	4h10	33	40
82.933.0600	ER32	6	6h10	33	40
82.933.0800	ER32	8	8h10	33	40
82.933.1000	ER32	10	10h10	33	40

Ref.	Type	d2	Ø mm	d1	l1
82.933.1200	ER32	12	12h10	33	40
82.933.1400	ER32	14	14h10	33	40
82.933.1600	ER32	16	16h10	33	40
82.933.1800	ER32	18	18h10	33	40
82.933.2000	ER32	20	20h10	33	40

> **82.934 Phantom**

NL Spantang ER 32 469E, Coolant Jet, 8 µm  
 FR Pince ER 32 469E, Coolant Jet, 8 µm  
 ES Pinza ER 32 469E, Coolant Jet, 8 µm  
 DE Spannzange ER 32 469E, Coolant Jet, 8 µm



**NIEUW / NOUVEAU / NUEVO / NEU**

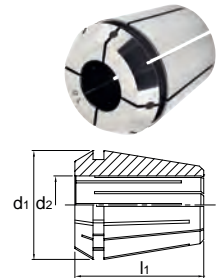
ER-32 DIN 6499 0,008 40 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.934.0300	ER32	3	3h10	33	40
82.934.0400	ER32	4	4h10	33	40
82.934.0500	ER32	5	5h10	33	40
82.934.0600	ER32	6	6h10	33	40
82.934.0700	ER32	7	7h10	33	40
82.934.0800	ER32	8	8h10	33	40
82.934.0900	ER32	9	9h10	33	40
82.934.1000	ER32	10	10h10	33	40
82.934.1100	ER32	11	11h10	33	40

Ref.	Type	d2	Ø mm	d1	l1
82.934.1200	ER32	12	12h10	33	40
82.934.1300	ER32	13	13h10	33	40
82.934.1400	ER32	14	14h10	33	40
82.934.1500	ER32	15	15h10	33	40
82.934.1600	ER32	16	16h10	33	40
82.934.1700	ER32	17	17h10	33	40
82.934.1800	ER32	18	18h10	33	40
82.934.1900	ER32	19	19h10	33	40
82.934.2000	ER32	20	20h10	33	40

> **82.940 Phantom**

NL Spantang ER 40 471E, rubber afgedicht, 8 µm  
 FR Pince ER 40 471E, joint d'étanchéité en caoutchouc, 8 µm  
 ES Pinza ER 40 471E, sellado de goma, 8 µm  
 DE Spannzange ER 40 471E, Gummi abgedichtet, 8 µm



**NIEUW / NOUVEAU / NUEVO / NEU**

ER-40 DIN 6499 0,008 40 BAR

Ref.	Type	d2	Ø mm	d1	l1
82.940.0300	ER40	3	3h10	41	46
82.940.0400	ER40	4	4h10	41	46
82.940.0600	ER40	6	6h10	41	46
82.940.0800	ER40	8	8h10	41	46
82.940.1000	ER40	10	10h10	41	46

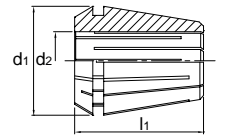
Ref.	Type	d2	Ø mm	d1	l1
82.940.1200	ER40	12	12h10	41	46
82.940.1400	ER40	14	14h10	41	46
82.940.1600	ER40	16	16h10	41	46
82.940.1800	ER40	18	18h10	41	46
82.940.2000	ER40	20	20h10	41	46





## > 82.941 Phantom

NL Spantang ER 40 471E, staal afgedicht, 8 µm  
 FR Pince ER 40 471E, acier scellé, 8 µm  
 ES Pinza ER 40 471E, acero sellado, 8 µm  
 DE Spannzange ER 40 471E, Stahl versiegelt, 8 µm



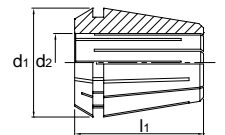
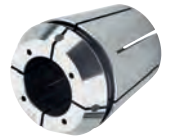
**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.941.0300	ER40	3	3h10	41	46
82.941.0400	ER40	4	4h10	41	46
82.941.0600	ER40	6	6h10	41	46
82.941.0800	ER40	8	8h10	41	46
82.941.1000	ER40	10	10h10	41	46

Ref.	Type	d2	Ø mm	d1	l1
82.941.1200	ER40	12	12h10	41	46
82.941.1400	ER40	14	14h10	41	46
82.941.1600	ER40	16	16h10	41	46
82.941.1800	ER40	18	18h10	41	46
82.941.2000	ER40	20	20h10	41	46

## > 82.942 Phantom

NL Spantang ER 40 471E, Coolant Jet, 8 µm  
 FR Pince ER 40 471E, Coolant Jet, 8 µm  
 ES Pinza ER 40 471E, Coolant Jet, 8 µm  
 DE Spannzange ER 40 471E, Coolant Jet, 8 µm



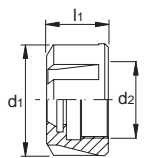
**NIEUW NOUVEAU NUEVO NEU**

Ref.	Type	d2	Ø mm	d1	l1
82.942.0400	ER40	4	4h10	41	46
82.942.0500	ER40	5	5h10	41	46
82.942.0600	ER40	6	6h10	41	46
82.942.0700	ER40	7	7h10	41	46
82.942.0800	ER40	8	8h10	41	46
82.942.0900	ER40	9	9h10	41	46
82.942.1000	ER40	10	10h10	41	46
82.942.1100	ER40	11	11h10	41	46
82.942.1200	ER40	12	12h10	41	46
82.942.1300	ER40	13	13h10	41	46
82.942.1400	ER40	14	14h10	41	46

Ref.	Type	d2	Ø mm	d1	l1
82.942.1500	ER40	15	15h10	41	46
82.942.1600	ER40	16	16h10	41	46
82.942.1700	ER40	17	17h10	41	46
82.942.1800	ER40	18	18h10	41	46
82.942.1900	ER40	19	19h10	41	46
82.942.2000	ER40	20	20h10	41	46
82.942.2100	ER40	21	21h10	41	46
82.942.2200	ER40	22	22h10	41	46
82.942.2300	ER40	23	23h10	41	46
82.942.2400	ER40	24	24h10	41	46
82.942.2500	ER40	25	25h10	41	46

## > 82.960 Phantom

NL Moer voor Spantanghouder  
 FR Ecrou pour Mandrin porte-pinces  
 ES Tuerca para Portapinzas  
 DE Muttern für Spannzangenfutter

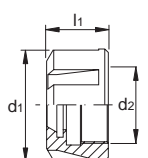


Ref.	Type	d1	M	l1
82.960.1600	ER16	32	M22x1,5	17.5
82.960.2500	ER25	42	M32x1,5	20

Ref.	Type	d1	M	l1
82.960.3200	ER32	50	M40x1,5	22.5
82.960.4000	ER40	63	M50x1,5	25.5

## > 82.962 Phantom

NL Moer voor Spantanghouder, voor afdichtring 82.963  
 FR Ecrou pour Mandrin porte-pinces, pour joint 82.963  
 ES Tuerca para Portapinzas, para junta 82.963  
 DE Muttern für Spannzangenfutter, Für Dichtungsringe 82.963



Ref.	Type	d1	M	l1
82.962.1600	ER16	32	M22 x 1,5	23.5
82.962.2500	ER25	42	M32 x 1,5	26

Ref.	Type	d1	M	l1
82.962.3200	ER32	50	M40 x 1,5	28.5
82.962.4000	ER40	63	M50 x 1,5	31.5

> **82.963 Phantom**

NL Afdichting voor spantangen, ER DIN 6499  
 FR Joint pour pinces, ER DIN 6499  
 ES Junta para pinzas, ER DIN 6499  
 DE Dichtungsringe für Spannzangen, ER DIN 6499

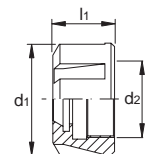


Ref.	Type	Ø
82.963.1603	ER16	3-2,5
82.963.1604	ER16	4-3,5
82.963.1605	ER16	5-4,5
82.963.1606	ER16	6-5,5
82.963.1607	ER16	7-6,5
82.963.1608	ER16	8-7,5
82.963.1609	ER16	9-8,5
82.963.1610	ER16	10-9,5
82.963.2503	ER25	3-2,5
82.963.2504	ER25	4-3,5
82.963.2505	ER25	5-4,5
82.963.2506	ER25	6-5,5
82.963.2507	ER25	7-6,5
82.963.2508	ER25	8-7,5
82.963.2509	ER25	9-8,5
82.963.2510	ER25	10-9,5
82.963.2511	ER25	11-10,5
82.963.2512	ER25	12-11,5
82.963.2513	ER25	13-12,5
82.963.2514	ER25	14-13,5
82.963.2515	ER25	15-14,5
82.963.2516	ER25	16-15,5
82.963.3203	ER32	3-2,5
82.963.3204	ER32	4-3,5
82.963.3205	ER32	5-4,5
82.963.3206	ER32	6-5,5
82.963.3207	ER32	7-6,5
82.963.3208	ER32	8-7,5
82.963.3209	ER32	9-8,5
82.963.3210	ER32	10-9,5
82.963.3211	ER32	11-10,5
82.963.3212	ER32	12-11,5

Ref.	Type	Ø
82.963.3213	ER32	13-12,5
82.963.3214	ER32	14-13,5
82.963.3215	ER32	15-14,5
82.963.3216	ER32	16-15,5
82.963.3217	ER32	17-16,5
82.963.3218	ER32	18-17,5
82.963.3219	ER32	19-18,5
82.963.3220	ER32	20-19,5
82.963.4003	ER40	3-2,5
82.963.4004	ER40	4-3,5
82.963.4005	ER40	5-4,5
82.963.4006	ER40	6-5,5
82.963.4007	ER40	7-6,5
82.963.4008	ER40	8-7,5
82.963.4009	ER40	9-8,5
82.963.4010	ER40	10-9,5
82.963.4011	ER40	11-10,5
82.963.4012	ER40	12-11,5
82.963.4013	ER40	13-12,5
82.963.4014	ER40	14-13,5
82.963.4015	ER40	15-14,5
82.963.4016	ER40	16-15,5
82.963.4017	ER40	17-16,5
82.963.4018	ER40	18-17,5
82.963.4019	ER40	19-18,5
82.963.4020	ER40	20-19,5
82.963.4021	ER40	21-20,5
82.963.4022	ER40	22-21,5
82.963.4023	ER40	23-22,5
82.963.4024	ER40	24-23,5
82.963.4025	ER40	25-24,5
82.963.4026	ER40	26-25,5

> **82.965 Phantom**

NL Mini-moer, ER DIN 6499  
 FR Mini-écrou, ER DIN 6499  
 ES Mini-tuerca, ER DIN 6499  
 DE Mini-spannmutter, ER DIN 6499



**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type	d1	M
82.965.1100	ER11	16	M13 x 0,75
82.965.1600	ER16	22	M22 x 1,5

Ref.	Type	d1	M
82.965.2000	ER20	28	M24 x 1
82.965.2500	ER25	35	M32 x 1,5

> **82.990 Phantom**

NL Sleutel voor Spantangmoer, ER DIN 6499  
 FR Clé pour écrou de mandrins à pinces, ER DIN 6499  
 ES Llave para Tuerca para portapinzas, ER DIN 6499  
 DE Schlüssel für Spannzangenmuttern, ER DIN 6499



Ref.	Type
82.990.1600	ER16
82.990.2500	ER25

Ref.	Type
82.990.3200	ER32
82.990.4000	ER40







## > 82.993 Phantom

NL Sleutel voor Spantangmoer mini, ER DIN 6499  
 FR Clé pour Ecrou de mandrins à pinces mini, ER DIN 6499  
 ES Llave para Tuerca para portapinzas mini, ER DIN 6499  
 DE Schlüssel für Spannzangenmuttern mini, ER DIN 6499



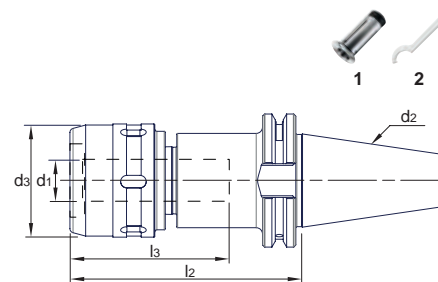
**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	Type
82.993.1100	ER11
82.993.1600	ER16

Ref.	Type
82.993.2000	ER20
82.993.2500	ER25

## > 83.624 Phantom

NL Krachtspan opname, SK volgens DIN 69871  
 FR Mandrin à grande force de serrage, SA selon DIN 69871  
 ES Portaherramientas de gran apriete, SK según DIN 69871  
 DE Kraftspannfutter, SK nach DIN 69871

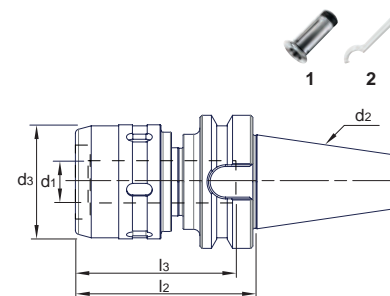


AD	SK	AT3	0,005	G6.3 15.000 RPM
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Ref.	d2	d1	Ø mm	l2	l3	d3	M	1 excl.	2
83.624.4202	SK40	20	3-16	105	70	54	M16	83.691.2xx1	83.629.0200
83.624.4322	SK40	32	6-25	105	100	72	M16	83.691.3xx1	83.629.0320
83.624.5202	SK50	20	3-16	105	70	54	M24	83.691.2xx1	83.629.0200
83.624.5322	SK50	32	6-25	105	100	72	M24	83.691.3xx1	83.629.0320

## > 83.626 Phantom

NL Krachtspan opname, BT volgens MAS 403 BT  
 FR Mandrin à grande force de serrage, BT selon MAS 403 BT  
 ES Portaherramientas de gran apriete, BT según MAS 403 BT  
 DE Kraftspannfutter, BT nach MAS 403 BT

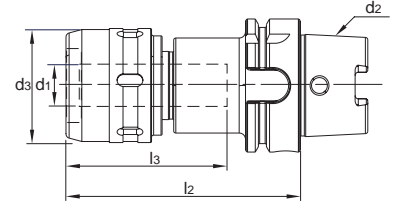
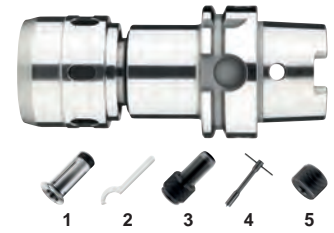


AD	MAS-BT	AT3	0,005	G6.3 15.000 RPM
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Ref.	d2	d1	Ø mm	l2	l3	d3	M	1 excl.	2
83.626.4201	BT40	20	3-16	80	70	54	M16	83.691.2xx1	83.629.0200
83.626.4322	BT40	32	6-25	90	100	72	M16	83.691.3xx1	83.629.0320
83.626.5202	BT50	20	3-16	105	70	54	M24	83.691.2xx1	83.629.0200
83.626.5322	BT50	32	6-25	105	100	72	M24	83.691.3xx1	83.629.0320

> **83.627 Phantom**

NL Krachtspan opname, HSK-A volgens DIN 69893  
 FR Mandrin à grande force de serrage, HSK-A selon DIN 69893  
 ES Portaherramientas de gran apriete, HSK-A según DIN 69893  
 DE Kraftspannfutter, HSK-A nach DIN 69893



Ref.	d2	d1	Ø mm	l2	l3	d3	M	1 excl.	2	3	4	5
83.627.6202	HSK63A	20	3-16	105	70	54	M18X1	83.691.2xx1	83.629.0200	84.790.1800	84.791.1800	84.789.1800
83.627.6324	HSK63A	32	6-25	130	100	72	M18X1	83.691.3xx1	83.629.0320	84.790.1800	84.791.1800	84.789.1800

> **83.629 Phantom**

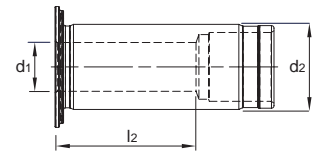
NL Krachtspan opname, sleutel  
 FR Mandrin à grande force de serrage, clé  
 ES Portaherramientas de gran apriete, llave  
 DE Kraftspannfutter, Schlüssel



Ref.	Type
83.629.0200	20
83.629.0320	32

> **83.691 Phantom**

NL Reduceerhuls, voor, Krachtspan opname  
 FR Douille de réduction, pour, Mandrin à grande force de serrage  
 ES Casquillo de reducción, para, Portaherramientas de gran apriete  
 DE Reduzierhülsen, für, Kraftspannfutter



Ref.	d2	d1	l2
83.691.2061	20	6	25
83.691.2081	20	8	30
83.691.2101	20	10	33
83.691.2121	20	12	34
83.691.2141	20	14	34
83.691.2161	20	16	40
83.691.3061	32	6	25
83.691.3081	32	8	25

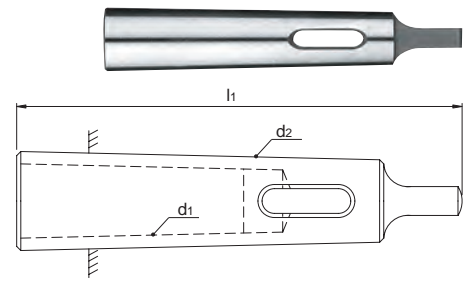
Ref.	d2	d1	l2
83.691.3101	32	10	33
83.691.3121	32	12	34
83.691.3141	32	14	34
83.691.3161	32	16	40
83.691.3181	32	18	40
83.691.3201	32	20	40
83.691.3251	32	25	42





### > 84.100 INTERNATIONAL TOOLS

NL ECO PRO Boorhuls (Reduceerhuls), MK x MK  
 FR Douille (de réduction) ECO PRO, CM x CM  
 ES Casquillo (Casquillo de reducción) ECO PRO, CM x CM  
 DE ECO PRO Bohrhülse (Reduzierhülse), MK x MK

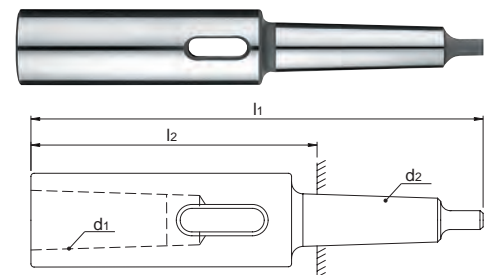


DIN 2185 **ECO PRO**

Ref.	d2	d1	l1	Ref.	d2	d1	l1
84.100.0100	MK 1		85	84.100.0502	MK 5	MK 2	156
84.100.0201	MK 2	MK 1	92	84.100.0503	MK 5	MK 3	156
84.100.0301	MK 3	MK 1	99	84.100.0504	MK 5	MK 4	171
84.100.0302	MK 3	MK 2	112	84.100.0602	MK 6	MK 2	218
84.100.0401	MK 4	MK 1	124	84.100.0603	MK 6	MK 3	218
84.100.0402	MK 4	MK 2	124	84.100.0604	MK 6	MK 4	218
84.100.0403	MK 4	MK 3	140	84.100.0605	MK 6	MK 5	218
84.100.0501	MK 5	MK 1	156				

### > 84.110 INTERNATIONAL TOOLS

NL ECO PRO Verlengde Boorhuls MK x MK  
 FR Douille allongée ECO PRO CM x CM  
 ES Casquillo de prolongación ECO PRO CM x CM  
 DE ECO PRO Verlängerte Bohrhülse MK x MK

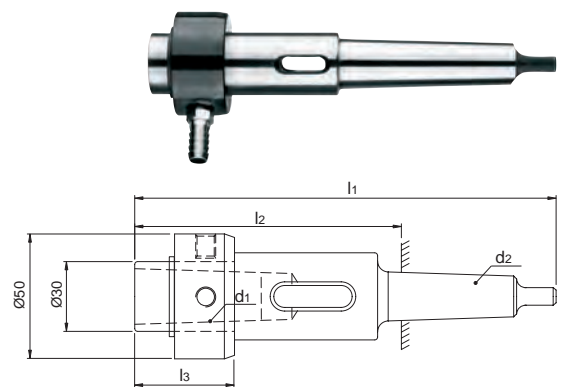


DIN 2187 **ECO PRO**

Ref.	d2	d1	l1	l2	Ref.	d2	d1	l1	l2
84.110.0101	MK 1	MK 1	145	83	84.110.0305	MK 3	MK 5	275	181
84.110.0102	MK 1	MK 2	160	91	84.110.0401	MK 4	MK 1	200	76
84.110.0103	MK 1	MK 3	183	121	84.110.0402	MK 4	MK 2	215	97.5
84.110.0201	MK 2	MK 1	160	85	84.110.0403	MK 4	MK 3	240	122.5
84.110.0202	MK 2	MK 2	175	100	84.110.0404	MK 4	MK 4	265	147.5
84.110.0203	MK 2	MK 3	196	112	84.110.0405	MK 4	MK 5	300	172
84.110.0204	MK 2	MK 4	221	146	84.110.0502	MK 5	MK 2	247	145
84.110.0301	MK 3	MK 1	175	81	84.110.0503	MK 5	MK 3	268	118.5
84.110.0302	MK 3	MK 2	194	100	84.110.0504	MK 5	MK 4	300	150.5
84.110.0303	MK 3	MK 3	215	121	84.110.0505	MK 5	MK 5	335	185.5
84.110.0304	MK 3	MK 4	240	137					

### > 84.120 INTERNATIONAL TOOLS

NL ECO PRO Boorhouder, voor boren met inwendige koeling, MK x MK  
 FR Mandrin porte-forets ECO PRO, pour forets à lubrification interne, CM x CM  
 ES Portabroca ECO PRO, para brocas con refrigeración interna, CM x CM  
 DE ECO PRO Bohrfutter, für Bohrer mit Innenkühlung, MK x MK

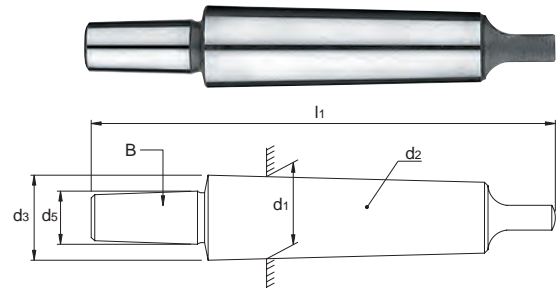


**ECO PRO**

Ref.	d2	d1	l1	l2	l3	Ref.	d2	d1	l1	l2	l3
84.120.0202	MK 2	MK 2	175	100	38.5	84.120.0303	MK 3	MK 3	216	122	47.5
84.120.0203	MK 2	MK 3	196	121	47.5	84.120.0402	MK 4	MK 2	240	122.5	38.5
84.120.0302	MK 3	MK 2	194	100	38.5	84.120.0403	MK 4	MK 3	240	122.5	47.5

➤ **84.170** **INTERNATIONAL TOOLS**

NL ECO PRO Boorhouderstift, MK en B-opname DIN 238  
 FR Arbre de mandrin de perçage ECO PRO, CM et cône B selon DIN 238  
 ES Espiga para portabrocas ECO PRO, CM y con sujeción B DIN 238  
 DE ECO PRO Bohrfutterkegel, MK und B-Aufnahme DIN 238



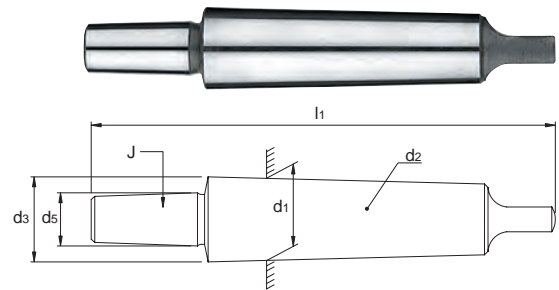
**DIN 238** **ECO PRO**

Ref.	d2	B	l1	d1	d5	d3
84.170.0110	MK 1	B10	86	12.065	10.095	12.22
84.170.0112	MK 1	B12	90	12.065	12.065	12.22
84.170.0116	MK 1	B16	96	12.065	15.733	12.22
84.170.0118	MK 1	B18	104	12.065	17.78	12.22
84.170.0210	MK 2	B10	105	17.78	10.095	18
84.170.0212	MK 2	B12	105	17.78	12.065	18
84.170.0216	MK 2	B16	112	17.78	15.733	18
84.170.0218	MK 2	B18	119	17.78	17.78	18
84.170.0222	MK 2	B22	128	17.78	21.793	18
84.170.0312	MK 3	B12	124	23.825	12.065	24.1

Ref.	d2	B	l1	d1	d5	d3
84.170.0316	MK 3	B16	130	23.825	15.733	24.1
84.170.0318	MK 3	B18	138	23.825	17.78	24.1
84.170.0322	MK 3	B22	147	23.825	21.793	24.1
84.170.0416	MK 4	B16	156	31.267	15.733	31.6
84.170.0418	MK 4	B18	164	31.267	17.78	31.6
84.170.0422	MK 4	B22	176	31.267	21.793	31.6
84.170.0516	MK 5	B16	188	44.399	15.733	44.7
84.170.0518	MK 5	B18	198	44.399	17.78	44.7
84.170.0522	MK 5	B22	207	44.399	21.793	44.7

➤ **84.171** **INTERNATIONAL TOOLS**

NL ECO PRO Boorhouderstift, MK- en J-opname  
 FR Arbre de mandrin de perçage ECO PRO, CM et cône J  
 ES Espiga para portabrocas ECO PRO, CM y cono J  
 DE ECO PRO Bohrfutterkegel, MK- und J-Aufnahme



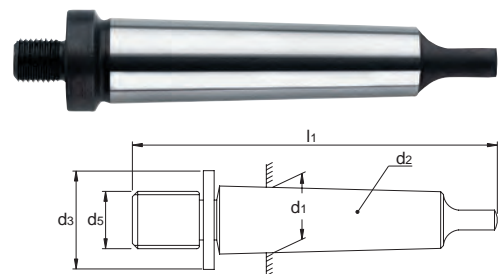
**ECO PRO**

Ref.	d2	J	l1	d1	d5	d3
84.171.0101	MK 1	J1	83.8	12.065	8.469	12.22
84.171.0102	MK 1	J2	90.5	12.065	12.386	12.22
84.171.0103	MK 1	J3	100.5	12.065	18.951	12.22
84.171.0201	MK 2	J1	102.5	17.78	8.469	18
84.171.0202	MK 2	J2	106	17.78	12.386	18
84.171.0203	MK 2	J3	112.5	17.78	18.951	18
84.171.0206	MK 2	J6	107	17.78	15.852	18

Ref.	d2	J	l1	d1	d5	d3
84.171.0233	MK 2	J33	107	17.78	14.237	18
84.171.0302	MK 3	J2	127	23.825	12.386	24.1
84.171.0303	MK 3	J3	131.5	23.825	18.951	24.1
84.171.0306	MK 3	J6	129	23.825	15.852	24.1
84.171.0333	MK 3	J33	126	23.825	14.237	24.1
84.171.0403	MK 4	J3	160.5	31.267	18.951	31.6
84.171.0406	MK 4	J6	155	31.267	15.852	31.6

➤ **84.172** **INTERNATIONAL TOOLS**

NL ECO PRO Boorhouderstift, MK en UNF-UN-M-draadopname  
 FR Arbre de mandrin de perçage ECO PRO, CM et filetage UNF-UN-M  
 ES Espiga para portabrocas ECO PRO, CM y sujeción con rosca UNF-UN-M  
 DE ECO PRO Bohrfutterkegel, MK und UNF-UN-M-Gewindeaufnahme



**ECO PRO**

Ref.	d2	d5	l1	d1	d3
84.172.0212	MK 2	1/2"-20 UNF	104	17.78	18
84.172.0305	MK 3	5/8"-16 UN	122	23.825	24.1

Ref.	d2	d5	l1	d1	d3
84.172.0320	MK 3	M20	125	23.825	24.1
84.172.0420	MK 4	M20	150	31.267	31.6





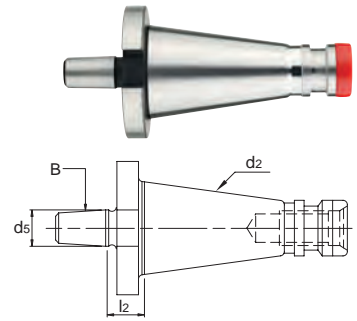
### > 84.173 Phantom

- NL Boorhouderstift, SK volgens DIN 2080, B-opname DIN 238  
 FR Arbre de mandrin de perçage, SA selon DIN 2080, cône B selon DIN 238  
 ES Espiga para portabrocas, SK según DIN 2080, con sujeción B DIN 238  
 DE Bohrfutterkegel, SK nach DIN 2080, B-Aufnahme DIN 238

HRC 58<sup>±2</sup> DIN 238 SK AT3  $\pm 0,005$

Ref.	d2	B	d5	l2
84.173.3012	SK30	B12	12.065	15
84.173.3016	SK30	B16	15.733	17
84.173.4012	SK40	B12	12.065	15
84.173.4016	SK40	B16	15.733	17

Ref.	d2	B	d5	l2
84.173.4018	SK40	B18	17.78	17
84.173.5016	SK50	B16	15.733	20
84.173.5018	SK50	B18	17.78	20



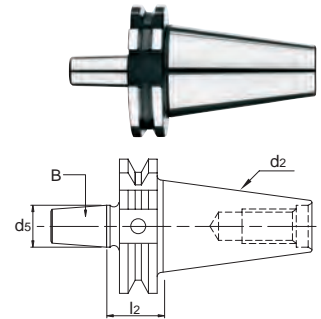
### > 84.174 Phantom

- NL Boorhouderstift, SK volgens DIN 69871, B-opname DIN 238  
 FR Arbre de mandrin de perçage, SA selon DIN 69871, cône B selon DIN 238  
 ES Espiga para portabrocas, SK según DIN 69871, con sujeción B DIN 238  
 DE Bohrfutterkegel, SK nach DIN 69871, B-Aufnahme DIN 238

HRC 58<sup>±2</sup> DIN 238 SK AT3  $\pm 0,005$  G6,3 12.000 RPM

Ref.	d2	B	d5	l2
84.174.4012	SK40	B12	12.065	25
84.174.4016	SK40	B16	15.733	25
84.174.4018	SK40	B18	17.78	25

Ref.	d2	B	d5	l2
84.174.5016	SK50	B16	15.733	25
84.174.5018	SK50	B18	17.78	25



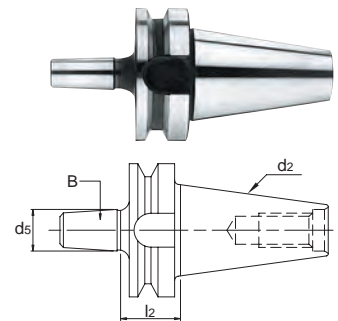
### > 84.176 Phantom

- NL Boorhouderstift, BT volgens MAS 403 BT, B-opname DIN 238  
 FR Arbre de mandrin de perçage, BT selon MAS 403 BT, cône B selon DIN 238  
 ES Espiga para portabrocas, BT según MAS 403 BT, con sujeción B DIN 238  
 DE Bohrfutterkegel, BT nach MAS 403 BT, B-Aufnahme DIN 238

HRC 58<sup>±2</sup> DIN 238 MAS-BT AT3  $\pm 0,005$  G6,3 12.000 RPM

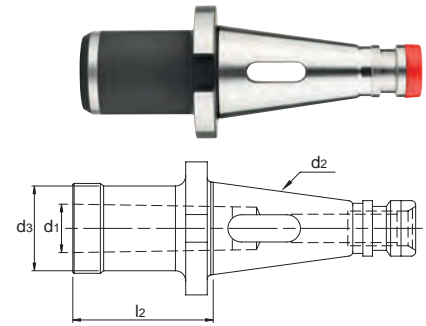
Ref.	d2	B	d5	l2
84.176.4012	BT40	B12	12.065	32
84.176.4016	BT40	B16	15.733	32
84.176.4018	BT40	B18	17.78	32

Ref.	d2	B	d5	l2
84.176.5016	BT50	B16	15.733	32
84.176.5018	BT50	B18	17.78	32



> **84.203 Phantom**

NL Verloophuls voor MK opname, SK volgens DIN 2080  
 FR Adaptateur pour queues cône morse, SA selon DIN 2080  
 ES Reductor a Morse, SK según DIN 2080  
 DE Reduzierhülsen für MK Aufnahme, SK nach DIN 2080



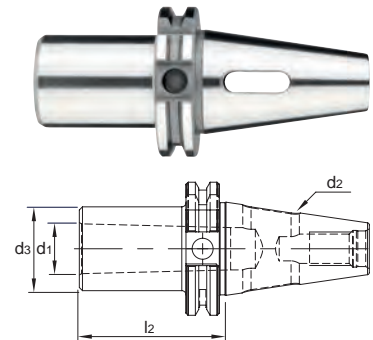
**HRC 58<sup>+2</sup>** **DIN 6383** **SK** **AT3** **0,005**

Ref.	d2	d1	l2	d3
84.203.3001	SK30	1	50	25
84.203.3002	SK30	2	50	32
84.203.3003	SK30	3	75	40
84.203.4001	SK40	1	50	25
84.203.4002	SK40	2	50	32
84.203.4003	SK40	3	65	40

Ref.	d2	d1	l2	d3
84.203.4004	SK40	4	95	48
84.203.5001	SK50	1	45	25
84.203.5002	SK50	2	60	32
84.203.5003	SK50	3	65	40
84.203.5004	SK50	4	70	48
84.203.5005	SK50	5	105	63

> **84.204 Phantom**

NL Verloophuls voor MK opname, SK volgens DIN 69871  
 FR Adaptateur pour queues cône morse, SA selon DIN 69871  
 ES Reductor a Morse, SK según DIN 69871  
 DE Reduzierhülsen für MK Aufnahme, SK nach DIN 69871



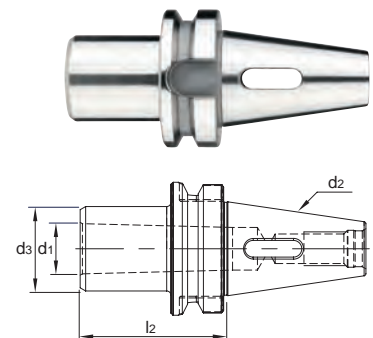
**HRC 58<sup>+2</sup>** **SK** **AT3** **0,005** **G6,3 15.000 RPM**

Ref.	d2	d1	l2	d3
84.204.4001	SK40	1	50	25
84.204.4002	SK40	2	50	32
84.204.4003	SK40	3	70	40
84.204.4004	SK40	4	95	48
84.204.5001	SK50	1	45	25

Ref.	d2	d1	l2	d3
84.204.5002	SK50	2	60	32
84.204.5003	SK50	3	65	40
84.204.5004	SK50	4	95	48
84.204.5005	SK50	5	105	63

> **84.206 Phantom**

NL Verloophuls voor MK opname, BT volgens MAS 403 BT  
 FR Adaptateur pour queues cône morse, BT selon MAS 403 BT  
 ES Reductor a Morse, BT según MAS 403 BT  
 DE Reduzierhülsen für MK Aufnahme, BT nach MAS 403 BT



**HRC 58<sup>+2</sup>** **MAS-BT** **AT3** **0,005** **G6,3 15.000 RPM**

Ref.	d2	d1	l2	d3
84.206.4001	BT40	1	50	25
84.206.4002	BT40	2	50	32
84.206.4003	BT40	3	70	40
84.206.4004	BT40	4	95	48
84.206.5001	BT50	1	45	25

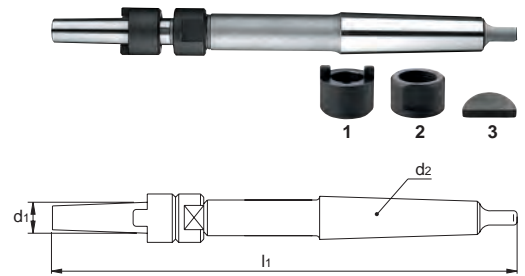
Ref.	d2	d1	l2	d3
84.206.5002	BT50	2	60	32
84.206.5003	BT50	3	65	40
84.206.5004	BT50	4	95	48
84.206.5005	BT50	5	105	63





## > 84.410 Phantom

- NL Opsteekhouder, voor opsteekruimers DIN 219 en opsteekopboor DIN 222, MK  
 FR Arbre de montage, pour alésoirs creux DIN 219 et forets creux DIN 222, CM  
 ES Porta-escariadores, para escariadores huecos DIN 219 y brocas escariadores huecos DIN 222, CM  
 DE Aufsteckhalter, für Aufsteckreibahnen DIN 219 und Aufsteckaufbohrer DIN 222, MK



DIN  
217

Ref.	Nr.	d1	l1	d2	Ø 51.650	Ø 13.350	1	2	3
84.410.0200	2	13	250	MK 3	25-30	25-35	84.411.0200	84.412.0200	84.413.0200
84.410.0300	3	16	261	MK 3	31-35	36-45	84.411.0300	84.412.0300	84.413.0300
84.410.0400	4	19	298	MK 4	36-42	46-52	84.411.0400	84.412.0400	84.413.0400
84.410.0500	5	22	312	MK 4	43-50	53-62	84.411.0500	84.412.0500	84.413.0500
84.410.0600	6	27	359	MK 5	51-60	63-75	84.411.0600	84.412.0600	84.413.0600
84.410.0700	7	32	376	MK 5	61-71	76-90	84.411.0700	84.412.0700	84.413.0700
84.410.0800	8	40	396	MK 5	72-85	91-100	84.411.0800	84.412.0800	84.413.0800
84.410.0900	9	50	416	MK 5	86-100	-	84.411.0900	84.412.0900	84.413.0900

## > 84.411 Phantom

- NL Meeneemring voor Opsteekhouder  
 FR Bague de déblocage pour arbre de montage  
 ES Arandela de arrastre para porta-escariadores  
 DE Mitnehmerringe für Aufsteckhalter

Ref.	Nr.
84.411.0200	2
84.411.0300	3
84.411.0400	4
84.411.0500	5

Ref.	Nr.
84.411.0600	6
84.411.0700	7
84.411.0800	8
84.411.0900	9

## > 84.412 Phantom

- NL Afdrukmoer voor Opsteekhouder  
 FR Écrou de déblocage pour arbre de montage  
 ES Tuerca de extracción para porta-escariadores  
 DE Abdrückmutter für Aufsteckhalter

Ref.	Nr.
84.412.0200	2
84.412.0300	3
84.412.0400	4
84.412.0500	5

Ref.	Nr.
84.412.0600	6
84.412.0700	7
84.412.0800	8
84.412.0900	9

## > 84.413 Phantom

- NL Spie voor Opsteekhouder  
 FR Clavette demi-ronde pour arbre de montage  
 ES Chaveta para porta-escariadores  
 DE Keil für Aufsteckhalter

Ref.	Nr.
84.413.0200	2
84.413.0300	3
84.413.0400	4
84.413.0500	5

Ref.	Nr.
84.413.0600	6
84.413.0700	7
84.413.0800	8
84.413.0900	9

## > 84.600 INTERNATIONAL TOOLS

- NL ECO PRO Konusreiniger  
 FR Nettoie-cônes ECO PRO  
 ES Limpiaconos ECO PRO  
 DE ECO PRO Kegeliniger



ECO  
PRO

Ref.	d2
84.600.0100	MK 1
84.600.0200	MK 2
84.600.0300	MK 3
84.600.0400	MK 4

Ref.	d2
84.600.0500	MK 5
84.600.3000	SK30
84.600.4000	SK40
84.600.5000	SK50



> **84.610** **INTERNATIONAL TOOLS**



NL ECO PRO Konusuitdrijver  
 FR Chasse-cônes ECO PRO  
 ES Cuña expulsora ECO PRO  
 DE ECO PRO Kegelaustreiber

DIN 317 **ECO PRO**

Ref.	Nr.	Ø mm	l1
84.610.0100	1	MK 1+MK 2	140
84.610.0300	3	MK 3	190

Ref.	Nr.	Ø mm	l1
84.610.0400	4	MK 4	225
84.610.0500	5	MK 5+MK 6	265

> **84.620** **INTERNATIONAL TOOLS**



NL ECO PRO Konusuitdrijver  
 FR Chasse-cônes ECO PRO  
 ES Cuña expulsora ECO PRO  
 DE ECO PRO Kegelaustreiber

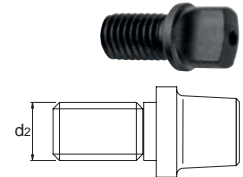
**ECO PRO**

Ref.	Nr.	Ø mm	l1
84.620.0100	1	MK 1-MK 3	317

Ref.	Nr.	Ø mm	l1
84.620.0200	2	MK 4-MK 6	380

> **84.745** **INTERNATIONAL TOOLS**

NL ECO PRO MK Uitdrijflijp  
 FR Tenons à visser CM ECO PRO  
 ES Tornillo de expulsión ECO PRO  
 DE ECO PRO Einschraubbare MK Austreiblappen



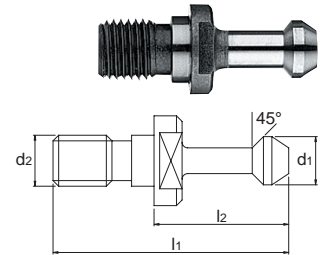
**ECO PRO**

Ref.	Type	d2
84.745.1000	2	M10
84.745.1200	3	M12

Ref.	Type	d2
84.745.1600	4	M16

> **84.750** **Phantom**

NL Aantrekbout, BT volgens MAS 403 BT, 45°, (.XX01 = doorboorde uitvoering)  
 FR Tirette, BT selon MAS 403 BT, 45°, (.XX01 = version avec trou pour lubrification)  
 ES Tirante, BT según MAS 403 BT, 45°, (.XX01 = versión con agujero para refrigeración)  
 DE Anzugsbolzen, BT nach MAS 403 BT, 45°, (.XX01 = durchbohrte Ausführung)



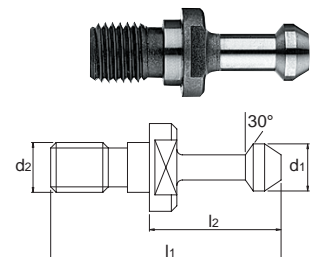
MAS-BT

Ref.	Type	d2	d1	l1	l2
84.750.1600	BT-40 45°	M16	15	60	35
84.750.1601	BT-40 45°	M16	15	60	35

Ref.	Type	d2	d1	l1	l2
84.750.2400	BT-50 45°	M24	23	85	45
84.750.2401	BT-50 45°	M24	23	85	45

> **84.751** **Phantom**

NL Aantrekbout, BT volgens MAS 403 BT, 60°  
 FR Tirette, BT selon MAS 403 BT, 60°  
 ES Tirante, BT según MAS 403 BT, 60°  
 DE Anzugsbolzen, BT nach MAS 403 BT, 60°



MAS-BT

Ref.	Type	d2	d1	l1	l2
84.751.1600	BT-40 60°	M16	15	60	35

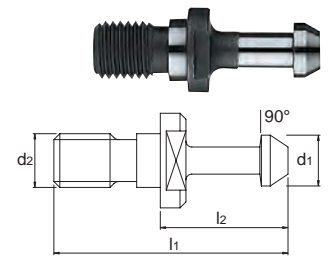
Ref.	Type	d2	d1	l1	l2
84.751.2400	BT-50 60°	M24	23	85	45





## > 84.752 Phantom

NL Aantrekbout, BT volgens MAS 403 BT, 90°  
 FR Tirette, BT selon MAS 403 BT, 90°  
 ES Tirante, BT según MAS 403 BT, 90°  
 DE Anzugsbolzen, BT nach MAS 403 BT, 90°



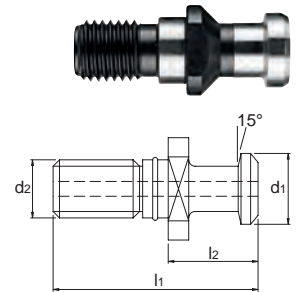
MAS-BT

Ref.	Type	d2	d1	l1	l2
84.752.1600	BT-40 90°	M16	15	60	35

Ref.	Type	d2	d1	l1	l2
84.752.2400	BT-50 90°	M24	23	85	45

## > 84.760 Phantom

NL Aantrekbout, DIN 69872-A, doorboorde uitvoering  
 FR Tirette, DIN 69872-A, version avec trou pour lubrification  
 ES Tirante, DIN 69872-A, versión con agujero para refrigeración  
 DE Anzugsbolzen, DIN 69872-A, Durchbohrte Ausführung



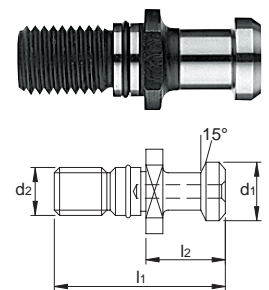
DIN  
69872-A

Ref.	Type	d2	d1	l1	l2
84.760.1600	DIN 40 A2	M16	19	54	26

Ref.	Type	d2	d1	l1	l2
84.760.2400	DIN 50 A2	M24	28	74	34

## > 84.770 Phantom

NL Aantrekbout, DIN 69872-B, niet-doorboorde uitvoering, met O-ring  
 FR Tirette, DIN 69872-B, version sans trou pour lubrification, à joint torique  
 ES Tirante, DIN 69872-B, versión sin agujero para refrigeración, con junta O  
 DE Anzugsbolzen, DIN 69872-B, Nicht-Durchbohrte Ausführung, mit O-Ring



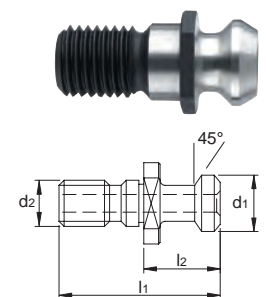
DIN  
69872-B

Ref.	Type	d2	d1	l1	l2
84.770.1600	DIN 40 B2	M16	19	54	26

Ref.	Type	d2	d1	l1	l2
84.770.2400	DIN 50 B2	M24	28	74	34

## > 84.775 Phantom

NL Aantrekbout, ISO 7388B, doorboorde uitvoering  
 FR Tirette, ISO 7388B, version avec trou pour lubrification  
 ES Tirante, ISO 7388B, versión con agujero para refrigeración  
 DE Anzugsbolzen, ISO 7388B, Durchbohrte Ausführung



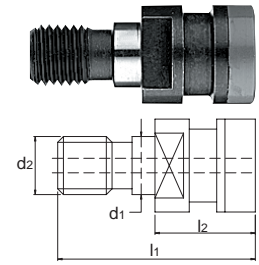
ISO  
7388/2-B

Ref.	Type	d2	d1	l1	l2
84.775.1600	DIN 40 B1	M16	18.9	44.5	16.4

Ref.	Type	d2	d1	l1	l2
84.775.2400	DIN 50 B1	M24	29	65.5	25.5

> **84.780** **Phantom**

NL Aantrekbout, SK volgens DIN 2080, systeem OTT  
 FR Tirette, SA selon DIN 2080, système OTT  
 ES Tirante, SK según DIN 2080, sistema OTT  
 DE Anzugsbolzen, SK nach DIN 2080, System OTT



OTT-90°

Ref.	Type	d2	d1	l1	l2
84.780.1600	OTT 40	M16	17	55	25

Ref.	Type	d2	d1	l1	l2
84.780.2400	OTT 50	M24	25	63	25

> **84.789** **Phantom**

NL Koelvløestofplug, HSK  
 FR Bouchon pour tube de liquide de refroidissement, HSK  
 ES Enchufe del tubo de refrigerante, HSK  
 DE Kühlmittelrohrstopfen, HSK



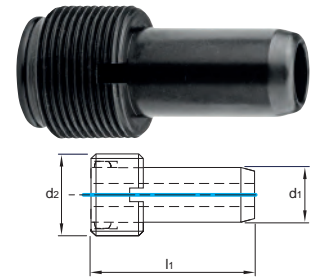
HSK-A

Ref.	Type	M
84.789.1800	HSK63	18x1

Ref.	Type	M

> **84.790** **Phantom**

NL Koelpijp, HSK  
 FR Tube à réfrigérant, HSK  
 ES Tubo de refrigerante, HSK  
 DE Kühlschmierstoffrohr, HSK



HSK-A

Ref.	Type	d2	d1	l1
84.790.1800	HSK63	M18X1	12	34.5

Ref.	Type	d2	d1	l1

> **84.791** **Phantom**

NL Koelpijp sleutel, HSK  
 FR Clé pour tube à réfrigérant, HSK  
 ES Llave para tubo de refrigerante, HSK  
 DE Schlüssel für Kühlschmierstoffrohr, HSK



HSK-A

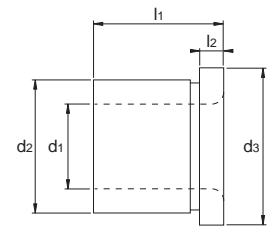
Ref.	Type
84.791.1800	HSK63

Ref.	Type



## > 84.872 Phantom

NL Boorbus, korte uitvoering, met kraag  
 FR Canon de perçage, version courte, à collerette  
 ES Casquillo guía broca, versión corto, con valona  
 DE Bohrbuchsen, kurze Ausführung, mit Kragen

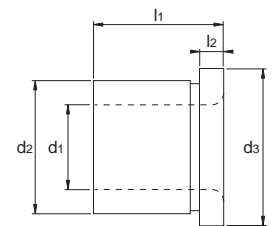


DIN 172-A n6 F7

Ref.	d1	d2	d3	l1	l2	Ref.	d1	d2	d3	l1	l2
84.872.0120 - 84.872.0180	1.2 - 1.8	4	7	6	2	84.872.1210 - 84.872.1500	12,1 - 15	22	26	16	4
84.872.0190 - 84.872.0260	1.9 - 2.6	5	8	6	2	84.872.1525 - 84.872.1800	15,25 - 18	26	30	16	4
84.872.0270 - 84.872.0330	2.7 - 3.3	6	9	8	2.5	84.872.1825 - 84.872.2200	18,25 - 22	30	34	20	5
84.872.0340 - 84.872.0400	3.4 - 4.0	7	10	8	2.5	84.872.2225 - 84.872.2600	22,25 - 26	35	39	20	5
84.872.0410 - 84.872.0500	4.1 - 5.0	8	11	8	2.5	84.872.2625 - 84.872.3000	26,25 - 30	42	46	25	5
84.872.0510 - 84.872.0600	5.1 - 6.0	10	13	10	3	84.872.3025 - 84.872.3500	30,25 - 35	48	52	25	5
84.872.0610 - 84.872.0800	6.1 - 8.0	12	15	10	3	84.872.3550 - 84.872.3750	35,5 - 37,5	55	59	25	5
84.872.0810 - 84.872.1000	8.1 - 10.0	15	18	12	3	84.872.3800 - 84.872.4000	38 - 40	55	59	30	5
84.872.1010 - 84.872.1200	10.1 - 12.0	18	22	12	4						

## > 84.873 Phantom

NL Boorbus, middellange uitvoering, met kraag  
 FR Canon de perçage, version longue, à collerette  
 ES Casquillo guía broca, versión larga, con valona  
 DE Bohrbuchsen, mittellange Ausführung, mit Kragen

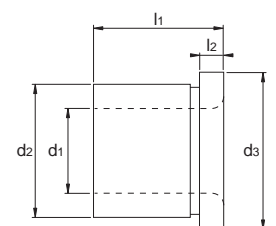


DIN 172-A n6 F7

Ref.	d1	d2	d3	l1	l2	Ref.	d1	d2	d3	l1	l2
84.873.0120 - 84.873.0180	1.2 - 1.8	4	7	9	2	84.873.0610 - 84.873.0800	6.1 - 8	12	15	16	3
84.873.0190 - 84.873.0260	1.9 - 2.6	5	8	9	2	84.873.0810 - 84.873.1000	8.1 - 10	15	18	20	3
84.873.0270 - 84.873.0330	2.7 - 3.3	6	9	12	2.5	84.873.1020 - 84.873.1200	10.2 - 12	18	22	20	4
84.873.0340 - 84.873.0400	3.4 - 4	7	10	12	2.5	84.873.1225 - 84.873.1500	12.25 - 15	22	26	28	4
84.873.0410 - 84.873.0500	4.1 - 5	8	11	12	2.5	84.873.1525 - 84.873.1800	15.25 - 18	26	30	28	4
84.873.0510 - 84.873.0600	5.1 - 6	10	13	16	3	84.873.1825 - 84.873.2000	18.25 - 20	30	34	36	5

## > 84.874 Phantom

NL Boorbus, extra lange uitvoering, met kraag  
 FR Canon de perçage, version extra longue, à collerette  
 ES Casquillo guía broca, versión extra larga, con valona  
 DE Bohrbuchsen, extra lange Ausführung, mit Kragen

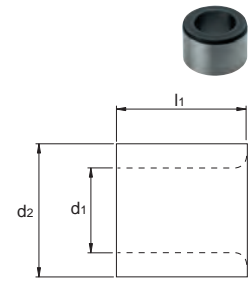


DIN 172-A n6 F7

Ref.	d1	d2	d3	l1	l2	Ref.	d1	d2	d3	l1	l2	Ref.	d1	d2	d3	l1	l2
84.874.0300	3	6	9	16	2.5	84.874.0750	7.5	12	15	20	3	84.874.1200	12	18	22	25	4
84.874.0350	3.5	7	10	16	2.5	84.874.0800	8	12	15	20	3	84.874.1250	12.5	22	26	36	4
84.874.0400	4	7	10	16	2.5	84.874.0850	8.5	15	18	25	3	84.874.1300	13	22	26	36	4
84.874.0450	4.5	8	11	16	2.5	84.874.0900	9	15	18	25	3	84.874.1350	13.5	22	26	36	4
84.874.0500	5	8	11	16	2.5	84.874.0950	9.5	15	18	25	3	84.874.1400	14	22	26	36	4
84.874.0550	5.5	10	13	20	3	84.874.1000	10	15	18	25	3	84.874.1450	14.5	22	26	36	4
84.874.0600	6	10	13	20	3	84.874.1050	10.5	18	22	25	4	84.874.1500	15	22	26	36	4
84.874.0650	6.5	12	15	20	3	84.874.1100	11	18	22	25	4	84.874.1550	15.5	26	30	36	4
84.874.0700	7	12	15	20	3	84.874.1150	11.5	18	22	25	4	84.874.1600	16	26	30	36	4

> **84.879 Phantom**

NL Boorbus, korte uitvoering  
 FR Canon de perçage, version courte  
 ES Casquillo guía broca, versión corto  
 DE Bohrbuchsen, kurze Ausführung



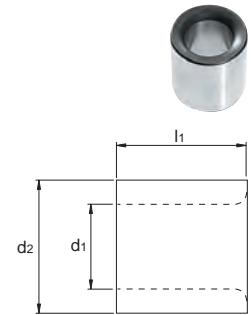
DIN 179-A n6 F7

Ref.	d1	d2	l1
84.879.0120 - 84.879.0180	1.2 - 1.8	4	6
84.879.0190 - 84.879.0260	1.9 - 2.6	5	6
84.879.0270 - 84.879.0330	2.7 - 3.3	6	8
84.879.0340 - 84.879.0400	3.4 - 4	7	8
84.879.0410 - 84.879.0500	4.1 - 5	8	8
84.879.0510 - 84.879.0600	5.1 - 6	10	10
84.897.0610 - 84.879.0800	6.1 - 8	12	10
84.879.0810 - 84.879.1000	8.1 - 10	15	12
84.879.1010 - 84.879.1200	10.1 - 12	18	12
84.879.1210 - 84.879.1500	12.1 - 15	22	16

Ref.	d1	d2	l1
84.879.1525 - 84.879.1800	15.25 - 18	26	16
84.879.1825 - 84.879.2200	18.25 - 22	30	20
84.879.2225 - 84.879.2600	22.25 - 26	35	20
84.879.2625 - 84.879.3000	26.25 - 30	42	25
84.879.3025 - 84.879.3500	30.25 - 35	48	25
84.879.3550 - 84.879.4200	35.5 - 42	55	30
84.879.4300 - 84.879.4800	43 - 48	62	30
84.879.4900 - 84.879.5500	49 - 55	70	30
84.879.6000 - 84.879.6200	60 - 62	78	35
84.879.6500	65	85	35

> **84.880 Phantom**

NL Boorbus, middellange uitvoering  
 FR Canon de perçage, version longue  
 ES Casquillo guía broca, versión larga  
 DE Bohrbuchsen, mittellange Ausführung



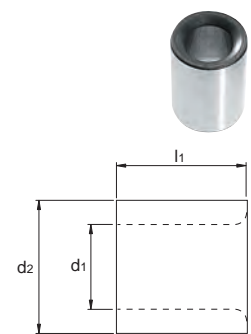
DIN 179-A n6 F7

Ref.	d1	d2	l1
84.880.0120 - 84.880.0180	1.2 - 1.8	4	9
84.880.0190 - 84.880.0260	1.9 - 2.6	5	9
84.880.0270 - 84.880.0330	2.7 - 3.3	6	12
84.880.0340 - 84.880.0400	3.4 - 4	7	12
84.880.0410 - 84.880.0500	4.1 - 5	8	12
84.880.0510 - 84.880.0600	5.1 - 6	10	16
84.880.0610 - 84.880.0800	6.1 - 8	12	16

Ref.	d1	d2	l1
84.880.0810 - 84.880.1000	8.1 - 10	15	20
84.880.1020 - 84.880.1200	10.2 - 12	18	20
84.880.1225 - 84.880.1500	12.25 - 15	22	28
84.880.1525 - 84.880.1800	15.25 - 18	26	28
84.880.1825 - 84.880.2500	18.25 - 25	30	36
84.880.2500	25	35	36

> **84.881 Phantom**

NL Boorbus, extra lange uitvoering  
 FR Canon de perçage, version extra longue  
 ES Casquillo guía broca, versión extra larga  
 DE Bohrbuchsen, extra lange Ausführung



DIN 179-A n6 F7

Ref.	d1	d2	l1
84.881.0300	3	6	16
84.881.0350	3.5	7	16
84.881.0400	4	7	16
84.881.0450	4.5	8	16
84.881.0500	5	8	16
84.881.0550	5.5	10	20
84.881.0600	6	10	20
84.881.0650	6.5	12	20
84.881.0700	7	12	20
84.881.0750	7.5	12	20

Ref.	d1	d2	l1
84.881.0780	7.8	12	20
84.881.0800	8	12	20
84.881.0850	8.5	15	25
84.881.0900	9	15	25
84.881.0950	9.5	15	25
84.881.1000	10	15	25
84.881.1050	10.5	18	25
84.881.1100	11	18	25
84.881.1150	11.5	18	25
84.881.1200	12	18	25

Ref.	d1	d2	l1
84.881.1250	12.5	22	36
84.881.1300	13	22	36
84.881.1350	13.5	22	36
84.881.1400	14	22	36
84.881.1450	14.5	22	36
84.881.1500	15	22	36
84.881.1550	15.5	26	36
84.881.1600	16	26	36
84.881.1650	16.5	26	36
84.881.3200	32	48	56





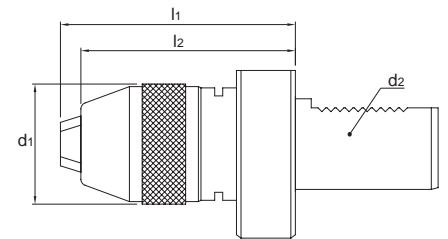
## > 84.908 Phantom

NL Zelfspannende Precisieboorhouder, type XP, VDI volgens DIN 69880

FR Mandrin de perçage de précision auto-serrant, type XP, VDI selon DIN 69880

ES Portabroca de precisión, cierre automático, tipo XP, VDI según DIN 69880

DE Selbstspannende Präzisionsbohrfutter, Typ XP, VDI nach DIN 69880



Ref.	Ø mm	d2	d1	l1	l2	Type	1	2	3
84.908.3013	1-13	VDI30	48	105	94	13XP	81.412.1300	81.413.1300	81.414.1300
84.908.4013	1-13	VDI40	48	92	85	13XP	81.412.1300	81.413.1300	81.414.1300
84.908.4016	3-16	VDI40	55	96	85	16XP	81.412.1600	81.413.1600	81.414.1640

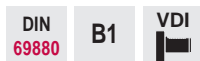
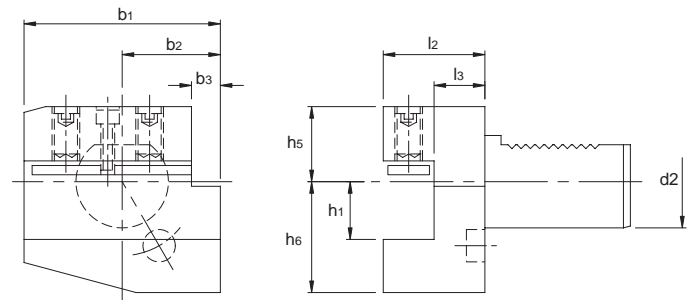
## > 84.910 Phantom

NL VDI-houder DIN 69880, uitvoering B1, radiaal, rechts

FR Porte outils VDI DIN 69880, version B1, radial, à droite

ES Portaherramientas VDI DIN 69880, versión B1, radial, a derecha

DE VDI-Halter DIN 69880, Ausführung B1, radial, rechts

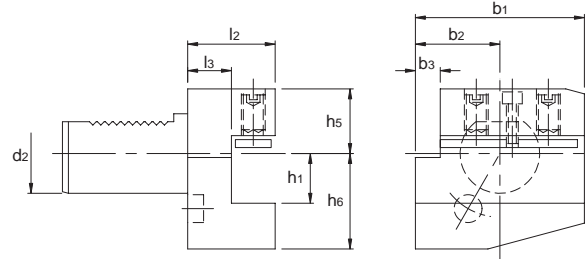


Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.910.3024	VDI30	40	22	20	28	38	70	35	10
84.910.4024	VDI40	44	22	25	32.5	48	85	42.5	12.5

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.910.5035	VDI50	55	30	32	35	60	100	50	16

> **84.911 Phantom**

NL VDI-houder DIN 69880, uitvoering B2, radiaal, links  
 FR Porte outils VDI DIN 69880, version B2, radial, à gauche  
 ES Portaherramientas VDI DIN 69880, versión B2, radial, a la izquierda  
 DE VDI-Halter DIN 69880, Ausführung B2, radial, links



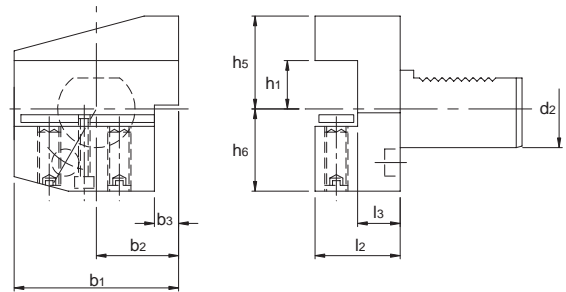
DIN 69880 B2 VDI

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.911.3024	VDI30	40	22	20	28	38	70	35	10
84.911.4024	VDI40	44	22	25	32.5	48	85	42.5	12.5

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.911.5035	VDI50	55	30	32	35	60	100	50	16

> **84.912 Phantom**

NL VDI-houder DIN 69880, uitvoering B3, radiaal, rechts  
 FR Porte outils VDI DIN 69880, version B3, radial, à droite  
 ES Portaherramientas VDI DIN 69880, versión B3, radial, a derecha  
 DE VDI-Halter DIN 69880, Ausführung B3, radial, rechts



DIN 69880 B3 VDI

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.912.3024	VDI30	40	22	20	38	35	70	35	10
84.912.4024	VDI40	44	22	25	48	42.5	85	42.5	12.5

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.912.5035	VDI50	55	30	32	60	50	100	50	16

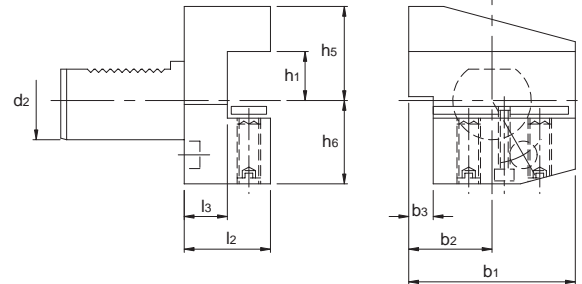
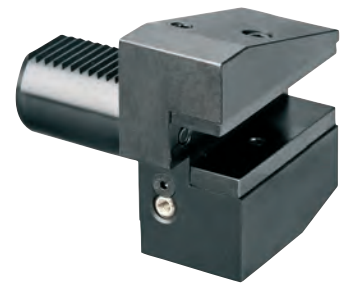






## > 84.913 Phantom

NL VDI-houder DIN 69880, uitvoering B4, radiaal, links  
 FR Porte outils VDI DIN 69880, version B4, radial, à gauche  
 ES Portaherramientas VDI DIN 69880, versión B4, radial, a la izquierda  
 DE VDI-Halter DIN 69880, Ausführung B4, radial, links



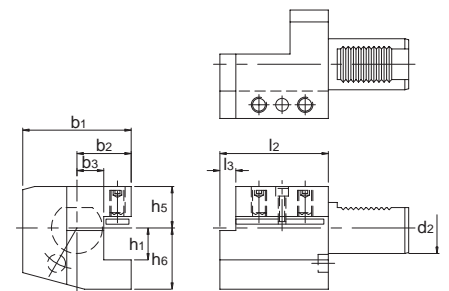
DIN 69880 B4 VDI

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.913.3024	VDI30	40	22	20	38	35	70	35	10
84.913.4024	VDI40	44	22	25	48	42.5	85	42.5	12.5

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.913.5035	VDI50	55	30	32	60	50	100	50	16

## > 84.920 Phantom

NL VDI-houder DIN 69880, uitvoering C1, axiaal, rechts  
 FR Porte outils VDI DIN 69880, version C1, axial, à droite  
 ES Portaherramientas VDI DIN 69880, versión C1, axial, a derecha  
 DE VDI-Halter DIN 69880, Ausführung C1, axial, rechts



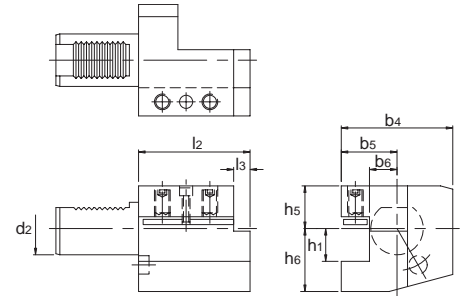
DIN 69880 C1 VDI

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.920.3027	VDI30	70	10	20	28	38	70	35	17
84.920.4028	VDI40	85	12.5	25	32.5	48	85	42.5	21

Ref.	d2	l2	l3	h1	h5	h6	b1	b2	b3
84.920.5031	VDI50	100	16	32	35	60	100	50	26

> **84.921** **Phantom**

NL VDI-houder DIN 69880, uitvoering C2, axiaal, links  
 FR Porte outils VDI DIN 69880, version C2, axial, à gauche  
 ES Portaherramientas VDI DIN 69880, versión C2, axial, a la izquierda  
 DE VDI-Halter DIN 69880, Ausführung C2, axial, links



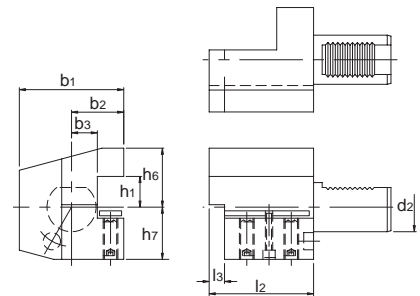
DIN 69880 C2 VDI

Ref.	d2	l2	l3	h1	h5	h6	b4	b5	b6
84.921.3027	VDI30	70	10	20	28	38	70	41	23
84.921.4029	VDI40	85	12.5	25	32.5	48	85	47.5	25.5

Ref.	d2	l2	l3	h1	h5	h6	b4	b5	b6
84.921.5031	VDI50	100	16	32	35	60	100	55	30.5

> **84.922** **Phantom**

NL VDI-houder DIN 69880, uitvoering C3, axiaal, rechts  
 FR Porte outils VDI DIN 69880, version C3, axial, à droite  
 ES Portaherramientas VDI DIN 69880, versión C3, axial, a derecha  
 DE VDI-Halter DIN 69880, Ausführung C3, axial, rechts



DIN 69880 C3 VDI

Ref.	d2	l2	l3	h1	h6	h7	b1	b2	b3
84.922.3027	VDI30	70	10	20	38	35	70	35	17
84.922.4028	VDI40	85	12.5	25	48	42.5	85	42.5	21

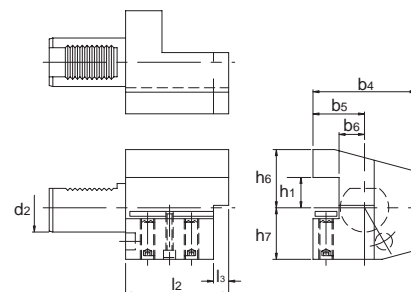
Ref.	d2	l2	l3	h1	h6	h7	b1	b2	b3
84.922.5031	VDI50	100	16	32	60	50	100	50	26





## > 84.923 Phantom

NL VDI-houder DIN 69880, uitvoering C4, axiaal, links  
 FR Porte outils VDI DIN 69880, version C4, axial, à gauche  
 ES Portaherramientas VDI DIN 69880, versión C4, axial, a la izquierda  
 DE VDI-Halter DIN 69880, Ausführung C4, axial, links



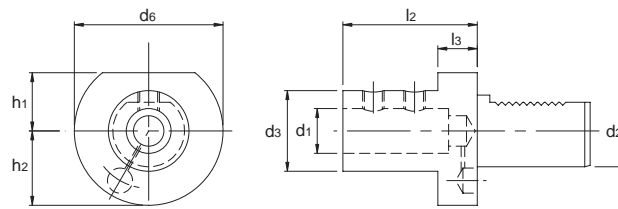
DIN 69880 C4 VDI

Ref.	d2	l2	l3	b4	b5	b6	h1	h6	h7
84.923.3027	VDI30	70	10	70	35	17	20	35	38
84.923.4029	VDI40	85	12.5	85	42.5	21	25	42.5	48

Ref.	d2	l2	l3	b4	b5	b6	h1	h6	h7
84.923.5031	VDI50	100	16	100	50	26	32	50	60

## > 84.950 Phantom

NL VDI-houder DIN 69880, uitvoering E1, voor volboren  
 FR Porte outils VDI DIN 69880, version E1, pour forets à plaquettes  
 ES Portaherramientas VDI DIN 69880, versión E1, para Brocas con plaquitas  
 DE VDI-Halter DIN 69880, Ausführung E1, für Vollbohren



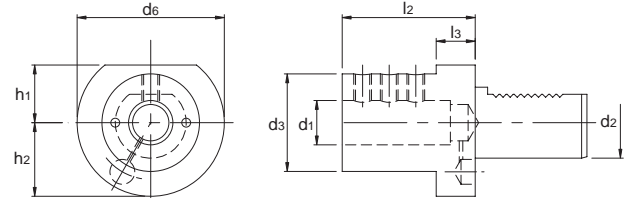
DIN 69880 E1 VDI

Ref.	d2	d1	d3	d6	h1	h2	l2	l3
84.950.3016	VDI30	16	36	68	28	30	64	22
84.950.3020	VDI30	20	40	68	28	30	67	22
84.950.3025	VDI30	25	45	68	28	30	71	22
84.950.3032	VDI30	32	52	68	28	30	75	22
84.950.4016	VDI40	16	36	83	32.5		64	22
84.950.4020	VDI40	20	40	83	32.5		67	22
84.950.4025	VDI40	25	45	83	32.5		75	22
84.950.4032	VDI40	32	52	83	32.5		75	22

Ref.	d2	d1	d3	d6	h1	h2	l2	l3
84.950.4040	VDI40	40	60	83	32.5		90	22
84.950.5016	VDI50	16	40	98	35		66	30
84.950.5020	VDI50	20	40	98	35		66	30
84.950.5025	VDI50	25	45	98	35		80	30
84.950.5032	VDI50	32	52	98	35		80	30
84.950.5040	VDI50	40	65	98	35		90	30
84.950.5050	VDI50	50	75	98	35		100	30

> **84.951 Phantom**

- NL VDI-houder DIN 69880, uitvoering E2, voor cilindrische opname
- FR Porte outils VDI DIN 69880, version E2, pour queues cylindriques
- ES Portaherramientas VDI DIN 69880, versión E2, para mangos cilíndricos
- DE VDI-Halter DIN 69880, Ausführung E2, für zylindrische Aufnahme



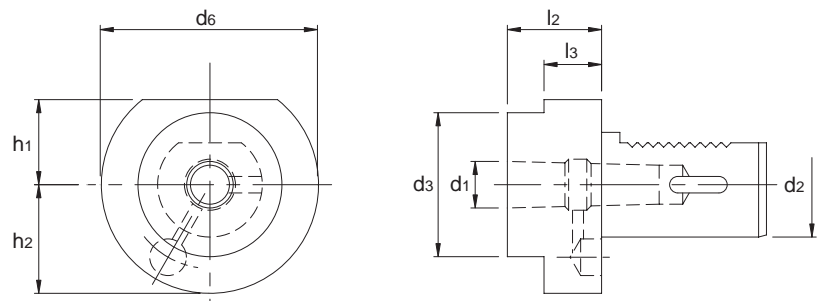
DIN 69880	E2	VDI
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Ref.	d2	d1	d3	d6	h1	h2	l2	l3
84.951.3008	VDI30	8	55	68	28	30	60	22
84.951.3010	VDI30	10	55	68	28	30	60	22
84.951.3012	VDI30	12	55	68	28	30	60	22
84.951.3016	VDI30	16	55	68	28	30	60	22
84.951.3020	VDI30	20	55	68	28	30	60	22
84.951.3025	VDI30	25	55	68	28	30	60	22
84.951.3032	VDI30	32	55	68	28	30	75	22
84.951.4008	VDI40	8	55	83	32.5		75	22
84.951.4010	VDI40	10	55	83	32.5		75	22
84.951.4012	VDI40	12	55	83	32.5		75	22
84.951.4016	VDI40	16	55	83	32.5		75	22

Ref.	d2	d1	d3	d6	h1	h2	l2	l3
84.951.4020	VDI40	20	55	83	32.5		75	22
84.951.4025	VDI40	25	55	83	32.5		75	22
84.951.4032	VDI40	32	83	83	32.5		75	22
84.951.4040	VDI40	40	83	83	32.5		90	22
84.951.5012	VDI50	12	68	98	35		90	30
84.951.5016	VDI50	16	68	98	35		90	30
84.951.5020	VDI50	20	68	98	35		90	30
84.951.5025	VDI50	25	68	98	35		90	30
84.951.5032	VDI50	32	68	98	35		90	30
84.951.5040	VDI50	40	98	98	35		90	30
84.951.5050	VDI50	50	98	98	35		100	30

> **84.955 Phantom**

- NL VDI-houder DIN 69880, uitvoering F1, voor MK volgens DIN 228-B
- FR Porte outils VDI DIN 69880, version F1, pour CM selon DIN 228-B
- ES Portaherramientas VDI DIN 69880, versión F1, para CM según DIN 228-B
- DE VDI-Halter DIN 69880, Ausführung F1, für MK nach DIN 228-B



DIN 69880	F1	VDI
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Ref.	d2	d1	d3	l2	l3	d6	h1	h2
84.955.3001	VDI30	1		27		68	28	30
84.955.3002	VDI30	2		27		68	28	30
84.955.3003	VDI30	3	58	40	22	68	28	30
84.955.4002	VDI40	2	55	36	22	83	32.5	
84.955.4003	VDI40	3	55	36	22	83	32.5	

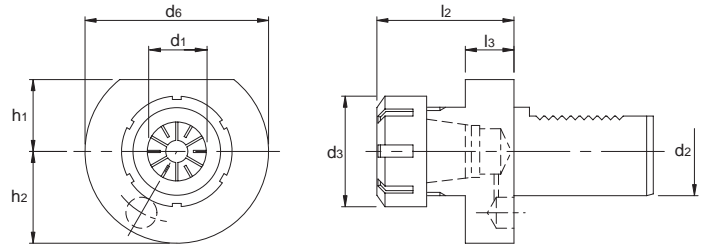
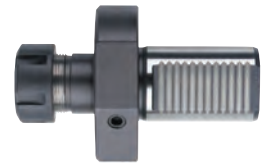
Ref.	d2	d1	d3	l2	l3	d6	h1	h2
84.955.4004	VDI40	4	68	80	22	83	32.5	
84.955.5002	VDI50	2	55	36	30	98	35	
84.955.5003	VDI50	3	58	36	30	98	35	
84.955.5004	VDI50	4	68	50	30	98	35	
84.955.5005	VDI50	5	75	72	30	98	35	





## > 84.958 Phantom

NL VDI-houder DIN 69880, uitvoering E4, spantanghouder  
 FR Porte outils VDI DIN 69880, version E4, mandrin porte-pinces  
 ES Portaherramientas VDI DIN 69880, versión E4, portapinzas  
 DE VDI-Halter DIN 69880, Ausführung E4, Spannzangenfutter



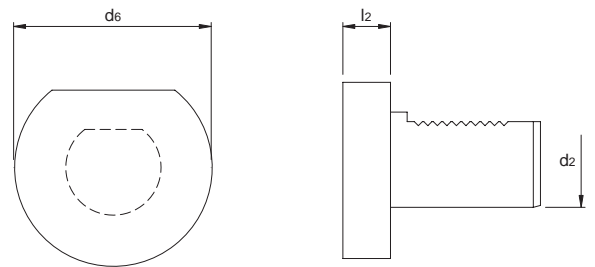
DIN 69880	E4	VDI
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Ref.	d2	d1	d6	d3	h1	l2	l3	h2	Ø mm
84.958.3025	VDI30	ER25	68	42	28	57	22	34	2-16
84.958.3032	VDI30	ER32	68	50	28	75	22	34	2-20
84.958.3040	VDI30	ER40	68	63	28	75	22	34	3-26
84.958.4025	VDI40	ER25	83	42	32.5	75	22	41.5	2-16

Ref.	d2	d1	d6	d3	h1	l2	l3	h2	Ø mm
84.958.4032	VDI40	ER32	83	50	32.5	75	22	41.5	2-20
84.958.4040	VDI40	ER40	83	63	32.5	75	22	41.5	3-26
84.958.5040	VDI50	ER40	98	63	35	75	30	49	3-26

## > 84.961 Phantom

NL Afstopplug, VDI-houder DIN 69880  
 FR Bouchon de protection, Porte outils VDI DIN 69880  
 ES Tapón de protección, Portaherramientas VDI DIN 69880  
 DE Verschlussstopfen, VDI-Halter DIN 69880

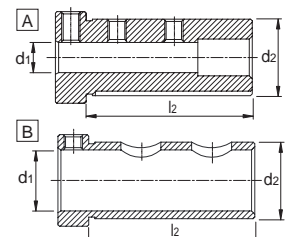
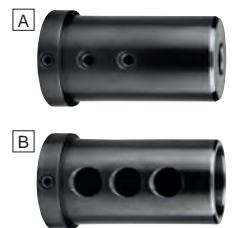


Ref.	d2	l2	d6
84.961.3068	VDI30	20	68
84.961.4083	VDI40	20	83

Ref.	d2	l2	d6
84.961.5098	VDI50	20	98

## > 84.970 Phantom

NL Reduceerhuls, voor VDI-houder DIN 69880 E2  
 FR Douille de réduction, pour porte-outils VDI DIN 69880 E2  
 ES Casquillo de reducción, para Portaherramientas VDI DIN 69880 E2  
 DE Reduzierhülsen, für VDI-Halter DIN 69880 E2

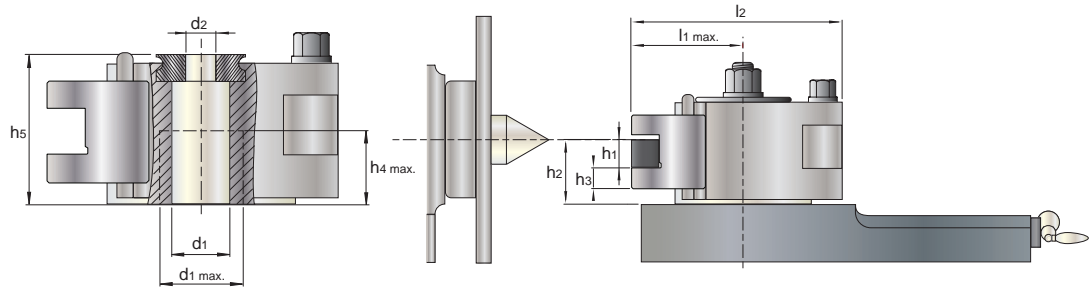
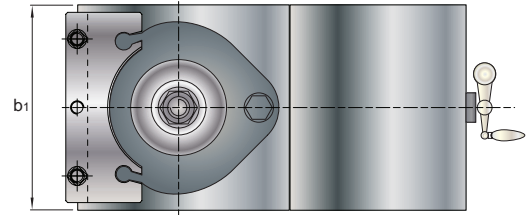


Ref.	d1	d2	l2	A, B
84.970.2506	6	25	46	A
84.970.2508	8	25	50	A
84.970.2510	10	25	50	A
84.970.2512	12	25	50	A
84.970.2516	16	25	50	B
84.970.3208	8	32	59	A
84.970.3210	10	32	59	A
84.970.3212	12	32	59	A

Ref.	d1	d2	l2	A, B
84.970.3216	16	32	59	A
84.970.3220	20	32	59	B
84.970.3225	25	32	59	B
84.970.4012	12	40	69	A
84.970.4016	16	40	69	A
84.970.4020	20	40	69	A
84.970.4025	25	40	69	B
84.970.4032	32	40	69	B

> **85.050 Phantom**

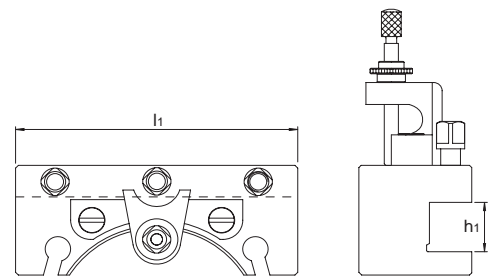
NL Snelwissel-Basishouder  
 FR Mandrin de base à serrage rapide  
 ES Torreta de precisión para herramientas de torno con cambio rápido  
 DE Schnellwechsel- Grundhalter



Ref.	Type	Holder	d1	d1 max.	d2	h1	h2 min	h2 max	h3	h4 max	h5	l1 max	l2	b1
85.050.0000	Aa	Aad 12	13		10	12	18	26	5		37	30	70	80
85.050.1000	A	AD 16	20	35	10	16	24.5	39.5	8.5	35	56	48	100	100
85.050.3000	B	BD 25	32	40	16	25	37	58.5	12	45	79	71	150	150
85.050.4000	C	CD 32	40	55	16	32	47	93	15	75	110	90	200	180
85.050.5000	D1	D1D 40	40	65	22	40	60	103	20	75	122	112	230	200

> **85.051 Phantom**

NL Snelwissel-Draaibehouder, type D  
 FR Porte-outils de tournage à serrage rapide, type D  
 ES Soporte de cambio Rápido, para exteriores, herramientas de torno, tipo D  
 DE Schnellwechsel-Drehstahlhalter, Typ D



Ref.	Type	Nr.	l1	h1
85.051.0120	Aa	AaD 1250	50	12
85.051.1167	A	AD 1675	75	16
85.051.1169	A	AD 1690	90	16
85.051.1207	A	AD 2075	75	20
85.051.1209	A	AD 2090	90	20
85.051.3252	B	BD 25120	120	25
85.051.3254	B	BD 25140	140	25
85.051.3322	B	BD 32120	120	32
85.051.3324	B	BD 32140	140	32

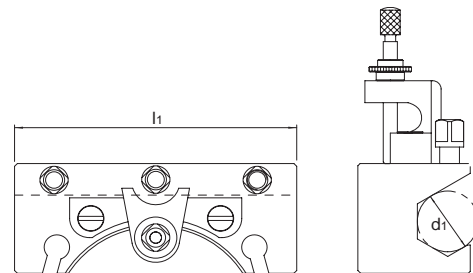
Ref.	Type	Nr.	l1	h1
85.051.4325	C	CD 32150	150	32
85.051.4327	C	CD 32170	170	32
85.051.4405	C	CD 40150	150	40
85.051.4407	C	CD 40170	170	40
85.051.4457	C	CD 45170	170	45
85.051.5400	D1	D1D 40180	180	40
85.051.5500	D1	D1D 50180	180	50
85.051.5630	D1	D1D 63180	180	63





### > 85.052 Phantom

NL Snelwissel-Boorbeitelhouder, type H  
 FR Porte-outils d'alésage à serrage rapide, type H  
 ES Soporte de cambio Rápido, para interiores exagonal, tipo, tipo H  
 DE Schnellwechsel-Bohrstangenhalter, Typ H

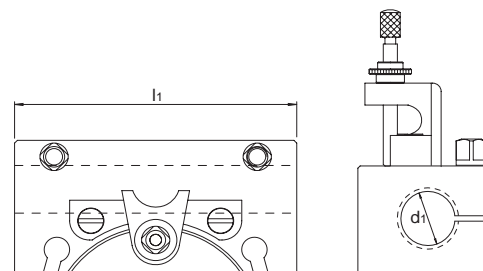


Ref.	Type	Nr.	l1	d1
85.052.0120	Aa	AaH 1250	50	12
85.052.1200	A	AH 2085	85	20
85.052.3320	B	BH 32130	130	32

Ref.	Type	Nr.	l1	d1
85.052.4400	C	CH 40160	160	40
85.052.5630	D1	D1BH 63180	180	63

### > 85.053 Phantom

NL Snelwissel-Boorbaarhouder, type J  
 FR Porte-barre d'alésage à serrage rapide, type J  
 ES Soporte de cambio Rápido, para interiores cilíndrico, tipo J  
 DE Schnellwechsel-Halter mit zylindrischer Bohrung, Typ J

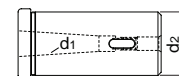


Ref.	Type	Nr.	l1	d1
85.053.0150	Aa	AaJ 1550	50	15
85.053.1300	A	AJ 3080	85	30
85.053.3400	B	BJ 40120	130	40

Ref.	Type	Nr.	l1	d1
85.053.4400	C	CJ 40160	160	40
85.053.4500	C	CJ 50160	160	50
85.053.5630	D1	D1J 63180	180	63

### > 85.058 Phantom

NL Morsekonushuls, type L  
 FR Douille avec cône morse, type L  
 ES casquillo para cono Morse, tipo L  
 DE Konusbuchse, Typ L



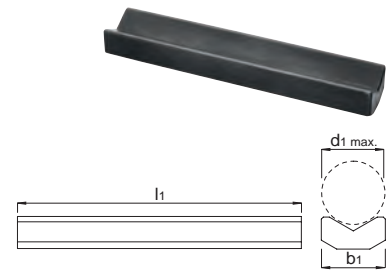
Ref.	Type	d1	d2
85.058.1010	A	1	30
85.058.1020	A	2	30
85.058.3020	B	2	40
85.058.3030	B	3	40

Ref.	Type	d1	d2
85.058.3040	B	4	40
85.058.4030	C	3	50
85.058.4040	C	4	50
85.058.5050	C	5	63



> **85.059 Phantom**

NL Inlegprisma, type P  
 FR Mors, type P  
 ES Garra de ajuste, tipo P  
 DE V-Block, Typ P

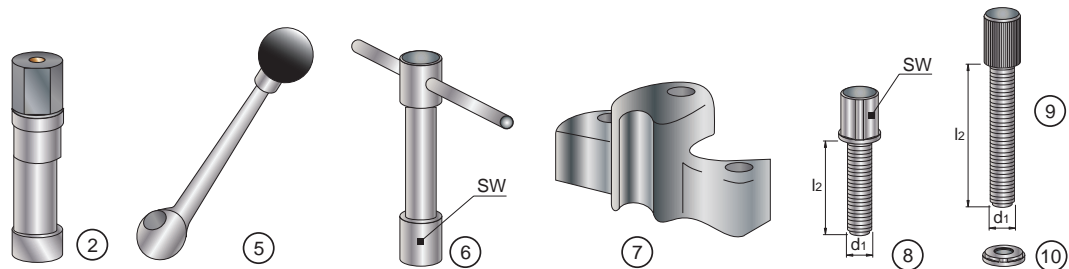


Ref.	Type	d1 max	l1	b1
85.059.1140	A	14	85	16
85.059.3200	B	20	130	22

Ref.	Type	d1 max	l1	b1
85.059.4250	C	25	160	30
85.059.4320	C	32	160	38

> **85.062 Phantom**

NL Onderdelen en Toebehoren  
 FR Pièces détachées et Accessoires  
 ES Componentes fundamentales y Accesorios  
 DE Einzelteile und Zubehör



Ref.	Type	Nr.	d1	P	l2	sw
85.062.0002	Aa	7				
85.062.0006	Aa	8	5	0.8	20	5
85.062.0008	Aa	9+10	4	0.7	25	
85.062.0012	Aa	5				
85.062.0014	Aa	6				5
85.062.0024	Aa	2				
85.062.1002	A	7				
85.062.1006	A	8	7	1	25	8
85.062.1008	A	9+10	5	0.8	35	
85.062.1012	A	5				
85.062.1014	A	6				8
85.062.1024	A	2				
85.062.3002	B	7				
85.062.3006	B	8	11	1.5	30	10
85.062.3008	B	9+10	7	1	57	

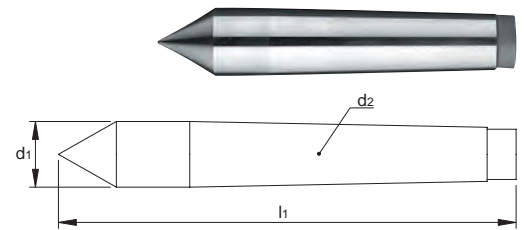
Ref.	Type	Nr.	d1	P	l2	sw
85.062.3012	B	5				
85.062.3014	B	6				10
85.062.3024	B	2				
85.062.4002	C	7				
85.062.4006	C + D1	8	14	1.5	40	14
85.062.4008	C	9+10	9	1.25	65	
85.062.4012	C	5				
85.062.4014	C	6				14
85.062.4024	C	2				
85.062.5002	D1	8				
85.062.5008	D1	9+10	12	1.75	80	
85.062.5012	D1	5				
85.062.5014	D1	6				14
85.062.5024	D1	2				





### > 85.100 INTERNATIONAL TOOLS

NL ECO PRO Vast Center, 60°, MK  
 FR Contre-pointe fixe ECO PRO, 60°, CM  
 ES Contrapunto fijo ECO PRO, 60°, CM  
 DE ECO PRO Feste Zentrierspitzen, 60°, MK

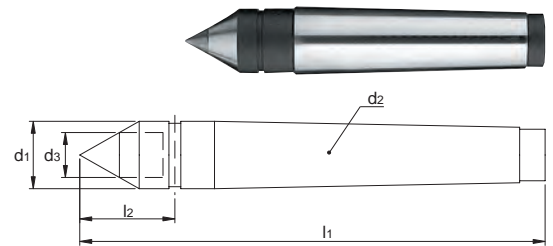


**ECO PRO**

Ref.	d2	d1	l1
85.100.0100	MK 1	12.2	80
85.100.0200	MK 2	18	100
85.100.0300	MK 3	24.1	125
85.100.0400	MK 4	31.6	160
85.100.0500	MK 5	44.7	200
85.100.0600	MK 6	63.8	270

### > 85.110 INTERNATIONAL TOOLS

NL ECO PRO Vast Center, met HM-punt, 60°, MK  
 FR Contre-pointe fixe ECO PRO, à pointe carbure, 60°, CM  
 ES Contrapunto fijo ECO PRO, con punta de MD, 60°, CM  
 DE ECO PRO Feste Zentrierspitzen, mit HM-Spitze, 60°, MK

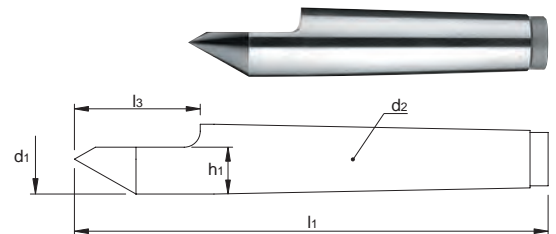


**ECO PRO**

Ref.	d2	d1	d3	l2	l1
85.110.0100	MK 1	12.2	7	16	80
85.110.0200	MK 2	18	7	21	100
85.110.0300	MK 3	24.1	11	27	125
85.110.0400	MK 4	31.6	14	31.2	160
85.110.0500	MK 5	44.7	18	45	200
85.110.0600	MK 6	63.8	18	62	270

### > 85.120 INTERNATIONAL TOOLS

NL ECO PRO Vast Center, 60°, met uitgediepte punt, MK  
 FR Contre-pointe fixe ECO PRO, 60°, avec pointe approfondie, CM  
 ES Contrapunto fijo ECO PRO, 60°, con media punta rebajada, CM  
 DE ECO PRO Feste Zentrierspitzen, 60°, mit verdünnter Spitze, MK

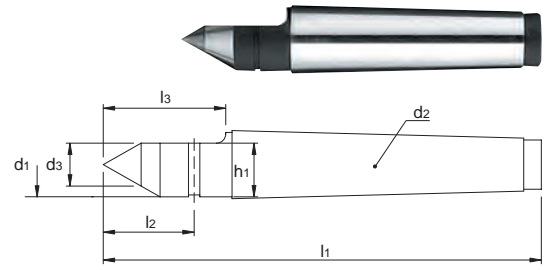


**ECO PRO**

Ref.	d2	d1	h1	l3	l1
85.120.0100	MK 1	12.2	7.6	22	80
85.120.0200	MK 2	18	11	30	100
85.120.0300	MK 3	24.1	15.05	38	125
85.120.0400	MK 4	31.6	20.8	50	160
85.120.0500	MK 5	44.7	29.35	63	200
85.120.0600	MK 6	63.8	41.9	79	270

**> 85.130 INTERNATIONAL TOOLS**

- NL ECO PRO Vast Center, 60°, met uitgediepte HM-punt, MK
- FR Contre-pointe fixe ECO PRO, 60°, avec pointe carbure approfondie, CM
- ES Contrapunto fijo ECO PRO, 60°, con media punta rebajada de MD, CM
- DE ECO PRO Feste Zentrierspitzen, 60°, mit verdünnter HM-Spitze, MK

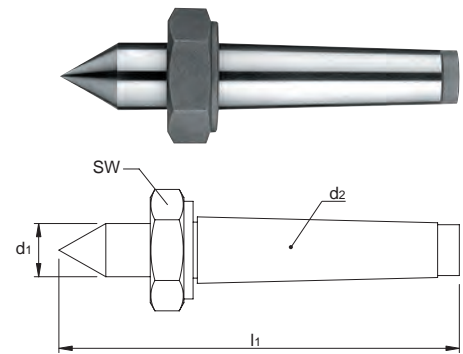


**ECO PRO**

Ref.	d2	d1	d3	h1	l2	l3	l1
85.130.0100	MK 1	12.2	7.6	7.6	16	22	80
85.130.0200	MK 2	18	7	12.8	21	30	100
85.130.0300	MK 3	24.1	11	18.05	27	38	125
85.130.0400	MK 4	31.6	14	23.3	31.2	50	160
85.130.0500	MK 5	44.7	18	31.85	45	63	200
85.130.0600	MK 6	63.8	41.9	41.9	62	79	270

**> 85.140 INTERNATIONAL TOOLS**

- NL ECO PRO Vast Center, 60°, met afdrukmoer, MK
- FR Contre-pointe fixe ECO PRO, 60°, avec écrou de déblocage, CM
- ES Contrapunto fijo ECO PRO, 60°, con tuerca de extracción, CM
- DE ECO PRO Feste Zentrierspitzen, 60°, mit Abdrückmutter, MK

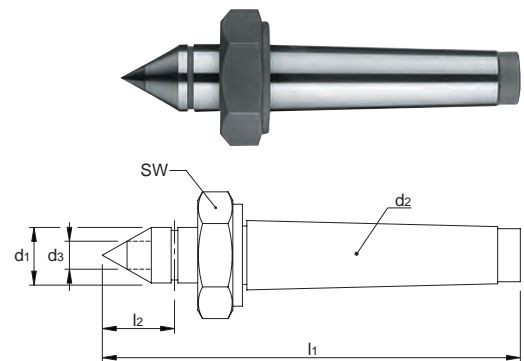


**ECO PRO**

Ref.	d2	d1	sw	l1
85.140.0100	MK 1	12.1	24	80
85.140.0200	MK 2	17.8	32	100
85.140.0300	MK 3	23.8	41	125
85.140.0400	MK 4	31.3	55	160
85.140.0500	MK 5	44.4	75	200

**> 85.150 INTERNATIONAL TOOLS**

- NL ECO PRO Vast Center, met HM-punt, 60°, met afdrukmoer, MK
- FR Contre-pointe fixe ECO PRO, à pointe carbure, 60°, avec écrou de déblocage, CM
- ES Contrapunto fijo ECO PRO, con punta de MD, 60°, con tuerca de extracción, CM
- DE ECO PRO Feste Zentrierspitzen, mit HM-Spitze, 60°, mit Abdrückmutter, MK



**ECO PRO**

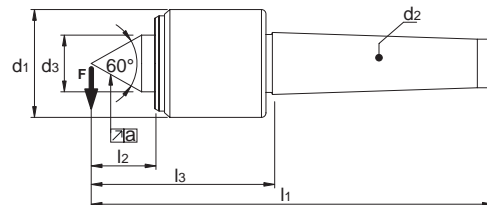
Ref.	d2	d1	d3	sw	l2	l1
85.150.0200	MK 2	18	8	32	21	100
85.150.0300	MK 3	24.1	12	41	27	125
85.150.0400	MK 4	31.3	15	55	31.2	160
85.150.0500	MK 5	44.4	18	75	45	200





### > 85.210 Phantom

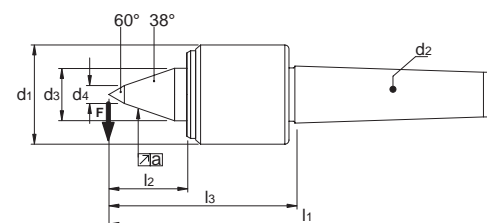
NL Medium Duty Meedraaiend Center, MK  
 FR Medium Duty Contre-pointe à grande capacité, CM  
 ES Contrapunto giratorio de gran capacidad, a media carga, CM  
 DE Mitlaufende Medium Duty Drehbankspitze, MK



Ref.	d2	d1	d3	l1	l2	l3	F (Kg)	RPM	Tol.
85.210.0200	MK 2	34	15	131.5	19	67.5	200	7000	0,005
85.210.0300	MK 3	34	15	148.5	19	67.5	400	7000	0,005
85.210.0400	MK 4	42	20	183.5	25	81	800	6300	0,005
85.210.0500	MK 5	68	32	248.5	41	119	1600	4300	0,01

### > 85.215 Phantom

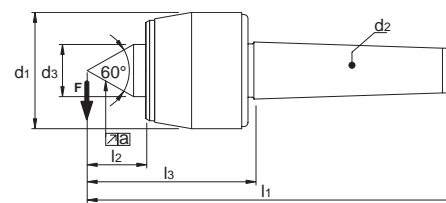
NL Medium Duty Meedraaiend Center, met verlengde punt, MK  
 FR Medium Duty Contre-pointe à grande capacité, avec pointe allongée, CM  
 ES Contrapunto giratorio de gran capacidad, a media carga, punta extendida, CM  
 DE Mitlaufende Medium Duty Drehbankspitze, mit Spitzenverlängerung, MK



Ref.	d2	d1	d3	d4	l1	l2	l3	F (Kg)	RPM	Tol.
85.215.0200	MK 2	34	15	10	141.5	29	77.5	170	7000	0,008
85.215.0300	MK 3	34	15	11	159.5	30	78.5	340	7000	0,008
85.215.0400	MK 4	42	20	13	196.5	38	94	700	6300	0,008
85.215.0500	MK 5	68	32	14	260.5	53	131	1400	4300	0,01

### > 85.220 Phantom

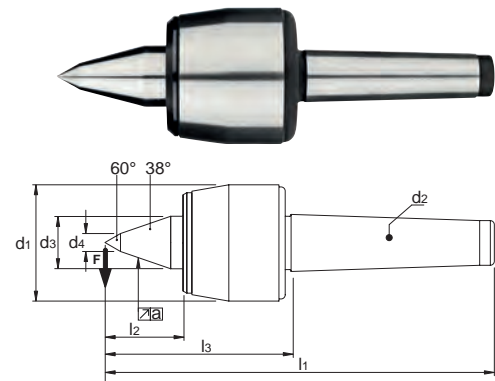
NL Heavy Duty Meedraaiend Center, MK  
 FR Heavy Duty Contre-pointe à grande capacité, CM  
 ES Contrapunto giratorio de grand capacidad, CM  
 DE Mitlaufende Heavy Duty Drehbankspitze, MK



Ref.	d2	d1	d3	l1	l2	l3	F (Kg)	RPM	Tol.
85.220.0200	MK 2	46	20	139.5	25	75.5	200	7000	0,005
85.220.0300	MK 3	62	28	179.5	34	98.5	500	5000	0,005
85.220.0400	MK 4	68	32	208.5	41	106	800	3800	0,005
85.220.0500	MK 5	87	38	263.5	51	134	2000	3000	0,005
85.220.0600	MK 6	102	50	341	57.5	159	3500	2600	0,01

> **85.225 Phantom**

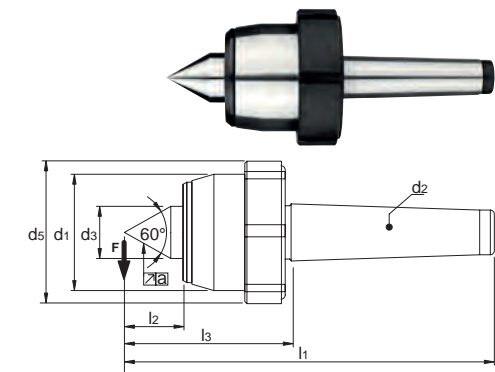
- NL Heavy Duty Meedraaiend Center, met verlengde punt, MK
- FR Heavy Duty Contre-pointe à grande capacité, avec pointe allongée, CM
- ES Contrapunto giratorio de grand capacidad, punta extendida, CM
- DE Mitlaufende Heavy Duty Drehbankspitze, mit Spitzenverlängerung, MK



Ref.	d2	d1	d3	d4	l1	l2	l3	F (Kg)	RPM	Tol.
85.225.0200	MK 2	46	20	10	149.5	35	85.5	140	7000	0,005
85.225.0300	MK 3	62	28	12	196.5	51	115.5	400	5000	0,005
85.225.0400	MK 4	68	32	14	222	54.5	119.5	500	3800	0,005
85.225.0500	MK 5	87	38	16	277.5	65	148	1200	3000	0,005
85.225.0600	MK 6	102	40	18	364.5	81	182.5	2500	2600	0,01

> **85.230 Phantom**

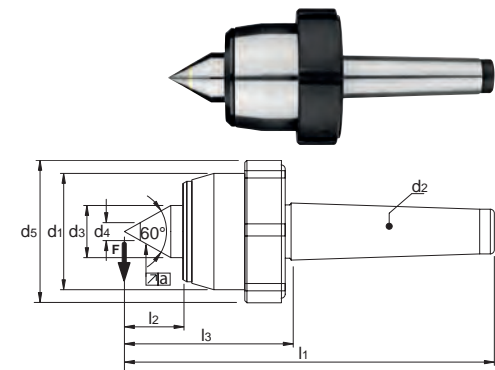
- NL Heavy Duty Meedraaiend Center, met afdrukmoer, MK
- FR Heavy Duty Contre-pointe à grande capacité, avec écrou de déblocage, CM
- ES Contrapunto giratorio de grand capacidad, con tuerca de extracción, CM
- DE Mitlaufende Heavy Duty Drehbankspitze, mit Abdruckmutter, MK



Ref.	d2	d1	d3	d5	l1	l2	l3	F (Kg)	RPM	Tol.
85.230.0200	MK 2	44	20	61	139.5	25	75.5	200	7000	0,005
85.230.0300	MK 3	60	28	75	179.5	34	98.5	500	5000	0,005
85.230.0400	MK 4	66	32	83	208.5	41	106	800	3800	0,005
85.230.0500	MK 5	65	38	104	263.5	51	134	2000	3000	0,005
85.230.0600	MK 6	100	50	122	341	57.5	159	3500	2600	0,01

> **85.232 Phantom**

- NL Heavy Duty Meedraaiend Center met HM-punt, met afdrukmoer, MK
- FR Heavy Duty Contre-pointe à grande capacité avec pointe carbure, avec écrou de déblocage, CM
- ES Contrapunto giratorio de gran capacidad, para alta carga, con punta de MD, con tuerca de extracción, CM
- DE Mitlaufende Heavy Duty Drehbankspitze mit HM-Spitze, mit Abdruckmutter, MK



Ref.	d2	d1	d3	d4	d5	l1	l2	l3	F (Kg)	RPM	Tol.
85.232.0200	MK 2	44	20	11	61	139.5	25	75.5	120	7000	0,005
85.232.0300	MK 3	60	28	14	75	179.5	34	98.5	360	5000	0,005
85.232.0400	MK 4	66	32	14	83	108.5	41	106	500	3800	0,005
85.232.0500	MK 5	85	38	18	104	263.5	51	134	1000	3000	0,005
85.232.0600	MK 6	100	50	18	122	341	57.5	159	1800	2600	0,01





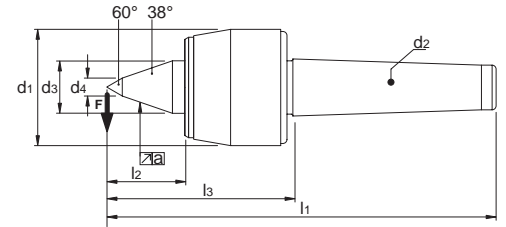
## > 85.280 Phantom

NL Heavy Duty Meedraaiend Kopieercenter, MK

FR Contre-pointe pour machines à copier, de grande capacité avec charge différentielle, CM

ES Contrapunto giratorio copiadador de gran capacidad, CM

DE Mitlaufende Heavy Duty Drehbankspitze mit verlängerter Spitze, MK



Ref.	d2	d1	d3	d4	l1	l2	l3	F (Kg)	RPM	Tol.
85.280.0300	MK 3	49	22	10	174	38	85	360	5000	0,005
85.280.0400	MK 4	63	30	11	207	46	98	500	4000	0,005
85.280.0500	MK 5	85	35	18	266	64	128	1000	3500	0,005



1 SC



1 HSS-E



2



3 SC



3 HSS-E



4



5



6



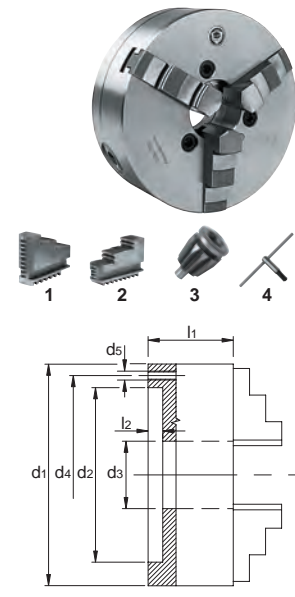
7



8

> **85.410** **BISON**

- NL Zelfcenterende Drie-Klawwplaat, gietijzer, type 3204, DIN 6350
- FR Mandrin à 3 mors concentriques, fonte, type 3204, DIN 6350
- ES Plato de sujeción autocentrador de 3 garras, fundición, tipo 3204, DIN 6350
- DE Selbstzentrierende Dreibackenfutter, Gusseisen, Typ 3204, DIN 6350

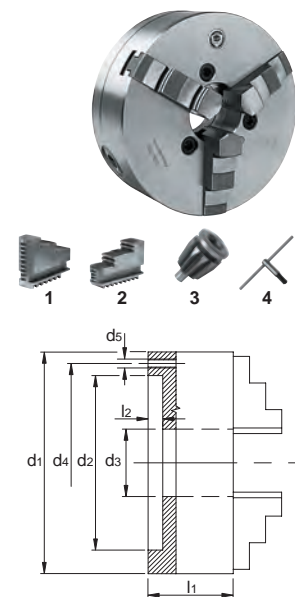


**DIN 6350**

Ref.	d1	l1	l2	d2	d3	d4	d5	1	2	3	4
85.410.0080	80	44	3	56	16	67	3x M6	85.850.0080	85.855.0080	85.866.0080	85.890.0100
85.410.0100	100	50	3	70	20	83	3x M8	85.850.0100	85.855.0100	85.868.0100	85.890.0200
85.410.0125	125	56	4	95	32	108	3x M8	85.850.0125	85.855.0125	85.868.0125	85.890.0200
85.410.0160	160	64.5	4	125	42	140	6x M10	85.850.0160	85.855.0160	85.868.0160	85.890.0300
85.410.0200	200	75	4	160	55	176	6x M10	85.850.0200	85.855.0200	85.868.0200	85.890.0300
85.410.0250	250	85	5	200	76	224	6x M12	85.850.0250	85.855.0250	85.868.0250	85.890.0400
85.410.0315	315	94	5	260	103	286	6x M16	85.850.0315	85.855.0315	85.868.0315	85.890.0400
85.410.0400	400	105	5	330	136	362	6x M16	85.850.0400	85.855.0400	85.868.0400	85.890.0500
85.410.0500	500	120	5	420	190	458	6x M16	85.850.0500	85.855.0500	85.868.0500	85.890.0600
85.410.0630	630	135	7	545	252	586	6x M16	85.850.0630	85.855.0630	85.868.0630	85.890.0600

> **85.420** **BISON**

- NL Zelfcenterende Drie-Klawwplaat, staal, type 3504, DIN 6350
- FR Mandrin à 3 mors concentriques, acier, type 3504, DIN 6350
- ES Plato de sujeción autocentrador de 3 garras, acero, tipo 3504, DIN 6350
- DE Selbstzentrierende Dreibackenfutter, Stahl, Typ 3504, DIN 6350



**DIN 6350**

Ref.	d1	l1	l2	d2	d3	d4	d5	1	2	3	4
85.420.0080	80	44	3	56	16	67	3x M6	85.850.0080	85.855.0080	85.868.0080	85.890.0100
85.420.0100	100	50	3	70	20	83	3x M8	85.850.0100	85.855.0100	85.868.0100	85.890.0200
85.420.0125	125	59.5	4	95	35	108	3x M8	85.850.0125	85.855.0125	85.868.0125	85.890.0200
85.420.0160	160	68	4	125	42	140	6x M10	85.850.0160	85.855.0160	85.868.0160	85.890.0300
85.420.0200	200	78	4	160	55	176	6x M10	85.850.0200	85.855.0200	85.868.0200	85.890.0300
85.420.0250	250	89	5	200	76	224	6x M12	85.850.0250	85.855.0250	85.868.0250	85.890.0400
85.420.0315	315	96.2	5	260	103	286	6x M16	85.850.0315	85.855.0315	85.868.0315	85.890.0400
85.420.0400	400	108	5	330	136	362	6x M16	85.850.0400	85.855.0400	85.868.0400	85.890.0500







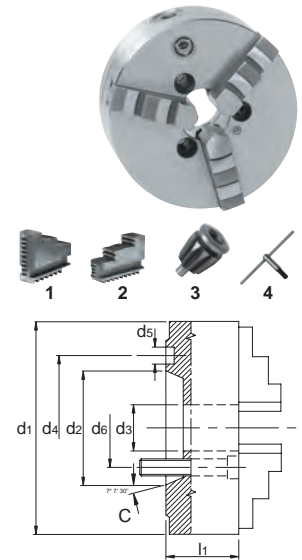
## > 85.421 BISON

NL Zelfcentrerende Drie-Klawwplaat, staal, type 3514, DIN 55026

FR Mandrin à 3 mors concentriques, acier, type 3514, DIN 55026

ES Plato de sujeción autocentrador de 3 garras, acero, tipo 3514, DIN 55026

DE Selbstzentrierende Dreibackenfutter, Stahl, Typ 3514, DIN 55026



DIN  
55026-B

Ref.	d1	C	l1	d2	d3	d4	d5	d6	1	2	3	4
85.421.1605	160	5	68	82.56	42	104.8	19.6	61.9	85.850.0160	85.855.0160	85.868.0160	85.890.0300
85.421.2005	200	5	78	82.56	42	104.8	19.6	61.9	85.850.0200	85.855.0200	85.868.0200	85.890.0300
85.421.2006	200	6	78	106.37	55	133.4	19.6	82.6	85.850.0200	85.855.0200	85.868.0200	85.890.0300
85.421.2505	250	5	89	82.56	76	104.8	19.6	61.9	85.850.0250	85.855.0250	85.868.0250	85.890.0400
85.421.2506	250	6	89	106.37	55	133.4	19.6	82.6	85.850.0250	85.855.0250	85.868.0250	85.890.0400
85.421.2508	250	8	89	139.71	76	171.4	19.6	111.1	85.850.0250	85.855.0250	85.868.0250	85.890.0400
85.421.3106	315	6	96.2	106.37	103	133.4	19.6	82.6	85.850.0315	85.855.0315	85.868.0315	85.890.0400
85.421.3108	315	8	96.2	139.71	80	171.4	19.6	111.1	85.850.0315	85.855.0315	85.868.0315	85.890.0400
85.421.4008	400	8	108	139.71	136	171.4	19.6	111.1	85.850.0400	85.855.0400	85.868.0400	85.890.0500
85.421.4011	400	11	108	196.86	130	235	19.6	165.1	85.850.0400	85.855.0400	85.868.0400	85.890.0500

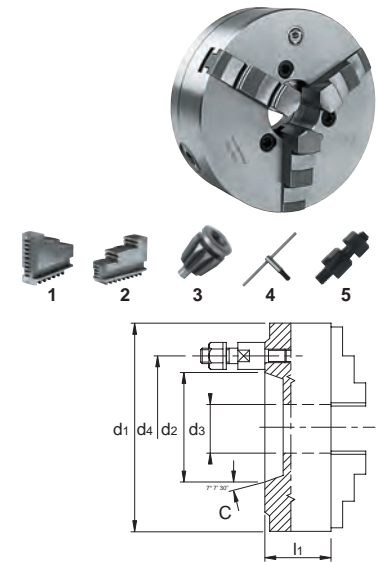
## > 85.422 BISON

NL Zelfcentrerende Drie-Klawwplaat, staal, type 3534, DIN 55027

FR Mandrin à 3 mors concentriques, acier, type 3534, DIN 55027

ES Plato de sujeción autocentrador de 3 garras, acero, tipo 3534, DIN 55027

DE Selbstzentrierende Dreibackenfutter, Stahl, Typ 3534, DIN 55027



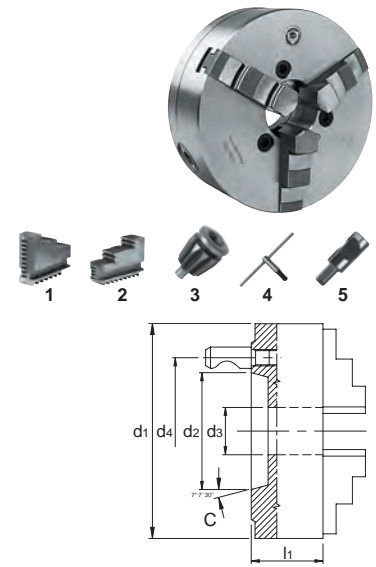
DIN  
55027

BAJO-  
NET

Ref.	d1	C	l1	d2	d3	d4	1	2	3	4	5
85.422.1203	125	3	59.5	53.97	32	75	85.850.0125	85.855.0125	85.868.0125	89.890.0200	85.992.0300 (3x)
85.422.1204	125	4	59.5	63.51	32	85	85.850.0125	85.855.0125	85.868.0125	85.890.0200	85.992.0400 (3x)
85.422.1604	160	4	68	63.51	42	85	85.850.0160	85.855.0160	85.868.0160	85.890.0300	85.992.0400 (3x)
85.422.1605	160	5	68	82.56	42	104.8	85.850.0160	85.855.0160	85.868.0160	85.890.0300	85.992.0500 (4x)
85.422.2005	200	5	78	82.56	55	104.8	85.850.0200	85.855.0200	85.868.0200	85.890.0300	85.992.0500 (4x)
85.422.2006	200	6	78	106.37	55	133.4	85.850.0200	85.855.0200	85.868.0200	85.890.0300	85.992.0600 (4x)
85.422.2506	250	6	89	106.37	76	133.4	85.850.0250	85.855.0250	85.868.0250	85.890.0400	85.992.0600 (4x)
85.422.2508	250	8	89	139.71	76	171.4	85.850.0250	85.855.0250	85.868.0250	85.890.0400	85.992.0800 (4x)
85.422.3106	315	6	96.2	106.37	103	133.4	85.850.0315	85.855.0315	85.868.0315	85.890.0400	85.992.0600 (4x)
85.422.3108	315	8	96.2	139.71	103	171.4	85.850.0315	85.855.0315	85.868.0315	85.890.0400	85.992.0800 (4x)
85.422.3111	315	11	111.7	196.86	103	235	85.850.0315	85.855.0315	85.868.0315	85.890.0400	85.992.1100 (6x)
85.422.4008	400	8	108	139.71	136	171.4	85.850.0400	85.855.0400	85.868.0400	85.890.0500	85.992.0800 (4x)
85.422.4011	400	11	108	196.86	136	235	85.850.0400	85.855.0400	85.868.0400	85.890.0500	85.992.1100 (6x)

> **85.423 BISON**

- NL Zelfcenterende Drie-Klawwplaat, staal, type 3544, DIN 55029
- FR Mandrin à 3 mors concentriques, acier, type 3544, DIN 55029
- ES Plato de sujeción autocentrador de 3 garras, acero, tipo 3544, DIN 55029
- DE Selbstzentrierende Dreibackenfutter, Stahl, Typ 3544, DIN 55029

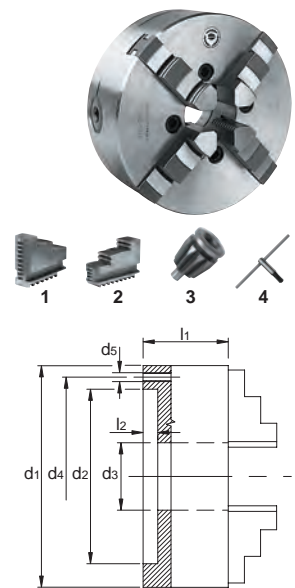


**DIN 55029** **CAM-LOCK**

Ref.	d1	C	l1	d2	d3	d4	1	2	3	4	5
85.423.1203	125	3	59.5	53.97	32	70.6	85.850.0125	85.855.0125	85.868.0125	85.890.0200	85.993.0300 (3x)
85.423.1204	125	4	59.5	63.51	32	82.6	85.850.0125	85.855.0125	85.868.0125	85.890.0200	85.993.0400 (3x)
85.423.1604	160	4	68	63.51	42	82.6	85.850.0160	85.855.0160	85.868.0160	85.890.0300	85.993.0400 (3x)
85.423.1605	160	5	68	82.56	42	104.8	85.850.0160	85.855.0160	85.868.0160	85.890.0300	85.993.0500 (6x)
85.423.2004	200	4	78	63.51	55	82.6	85.850.0200	85.855.0200	85.868.0200	85.890.0300	85.993.0400 (3x)
85.423.2005	200	5	78	82.56	55	104.8	85.850.0200	85.855.0200	85.868.0200	85.890.0300	85.993.0500 (6x)
85.423.2006	200	6	78	106.37	55	133.4	85.850.0200	85.855.0200	85.868.0200	85.890.0300	85.993.0600 (6x)
85.423.2506	250	6	89	106.37	76	133.4	85.850.0250	85.855.0250	85.868.0250	85.890.0400	85.993.0600 (6x)
85.423.2508	250	8	89	139.71	76	171.4	85.850.0250	85.855.0250	85.868.0250	85.890.0400	85.993.0800 (6x)
85.423.3106	315	6	96.2	106.37	103	133.4	85.850.0315	85.855.0315	85.868.0315	85.890.0400	85.993.0600 (6x)
85.423.3108	315	8	96.2	139.71	103	171.4	85.850.0315	85.855.0315	85.868.0315	85.890.0400	85.993.0800 (6x)
85.423.4008	400	8	108	139.71	136	171.4	85.850.0400	85.855.0400	85.868.0400	85.890.0500	85.993.0800 (6x)
85.423.4011	400	11	108	196.86	136	235	85.850.0400	85.855.0400	85.868.0400	85.890.0500	85.993.1100 (6x)

> **85.500 BISON**

- NL Zelfcenterende Vier-Klawwplaat, gietijzer, type 3604, DIN 6350
- FR Mandrin à 4 mors concentriques, fonte, type 3604, DIN 6350
- ES Plato de sujeción autocentrador de 4 garras, fundición, tipo 3604, DIN 6350
- DE Selbstzentrierende Vierbackenfutter, Gusseisen, Typ 3604, DIN 6350



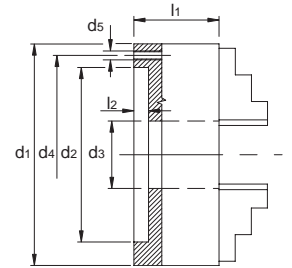
**DIN 6350**

Ref.	d1	l1	l2	d2	d3	d4	d5	1	2	3	4
85.500.0125	125	56	4	95	32	108	3x M8	85.851.0125	85.856.0125	85.866.0100	85.890.0200
85.500.0160	160	64.5	4	125	42	140	6x M10	85.851.0160	85.856.0160	85.866.0100	85.890.0300
85.500.0200	200	75	4	160	55	176	6x M10	85.851.0200	85.856.0200	85.866.0100	85.890.0300
85.500.0250	250	85	5	200	76	224	6x M12	85.851.0250	85.856.0250	85.866.0100	85.890.0400
85.500.0315	315	94	5	260	103	286	6x M16	85.851.0315	85.856.0315	85.866.0100	85.890.0400
85.500.0400	400	105	5	330	136	362	6x M16	85.851.0400	85.856.0400	85.866.0100	85.890.0500
85.500.0500	500	120	5	420	190	458	6x M16	85.851.0500	85.856.0500	85.866.0100	85.890.0600



## > 85.510 BISON

- NL Zelfcenterende Vier-Klauwplaat, staal, type 3704, DIN 6350  
 FR Mandrin à 4 mors concentriques, acier, type 3704, DIN 6350  
 ES Plato de sujeción autocentrador de 4 garras, acero, tipo 3704, DIN 6350  
 DE Selbstzentrierende Vierbackenfutter, Stahl, Typ 3704, DIN 6350

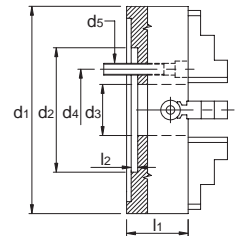


DIN  
6350

Ref.	d1	l1	l2	d2	d3	d4	d5	1	2	3	4
85.510.0100	100	50	3	70	20	83	3x M8	85.851.0100	85.856.0100	85.866.0100	85.890.0200
85.510.0125	125	59.5	4	95	35	108	3x M8	85.851.0125	85.856.0125	85.866.0100	85.890.0200
85.510.0160	160	68	4	125	42	140	6x M10	85.851.0160	85.856.0160	85.866.0100	85.890.0300
85.510.0200	200	78	4	160	55	176	6x M10	85.851.0200	85.856.0200	85.866.0100	85.890.0300
85.510.0250	250	89	5	200	76	224	6x M12	85.851.0250	85.856.0250	85.866.0100	85.890.0400
85.510.0315	315	96.2	5	260	103	286	6x M16	85.851.0315	85.856.0315	85.866.0100	85.890.0400
85.510.0400	400	108	5	330	136	362	6x M16	85.851.0400	85.856.0400	85.866.0100	85.890.0500

## > 85.600 BISON

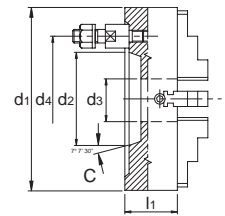
- NL Onafhankelijke Vier-Klauwplaat, diam. 85-160 mm staal (Bison type 4306), vanaf diam. 200 mm gietijzer (Bison type 4304)  
 FR Mandrin à 4 mors indépendants, diam. 85-160 mm acier (type Bison 4306), à partir du diam. 200 mm fonte (type Bison 4304)  
 ES Plato de 4 garras independientes, diám. 85-160 mm acero (tipo Bison 4306), desde diám. 200 mm fundición (tipo Bison 4304)  
 DE 4-Backenfutter einzeln spannend, durchm. 85-160 mm Stahl (Bison Typ 4306), ab durchm. 200 mm Gusseisen (Bison type 4304)



Ref.	d1	l1	l2	d2	d3	d4	d5	Bison
85.600.0100	100	40	2.5	79.38	25	54	4x M8	4306
85.600.0200	200	80	5	110	50	82.6	4x M10	4304
85.600.0250	250	85	7	150	65	104.8	4x M12	4304
85.600.0315	315	95	7	175	80	133.4	4x M16	4304
85.600.0500	500	120	12	270	125	235	4x M20	4304
85.600.0630	630	140	12	270	160	235	4x M20	4304

> **85.602 BISON**

NL Onafhankelijke Vier-Klauwplaat, gietijzer, type 4334, DIN 55027  
 FR Mandrin à 4 mors indépendants, fonte, type 4334, DIN 55027  
 ES Plato de 4 garras independientes, fundición, tipo 4334, DIN 55027  
 DE 4-Backenfutter einzeln spannend, Gusseisen, Typ 4334, DIN 55027

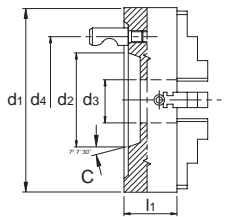


DIN 55027 BAJO-NET

Ref.	d1	C	l1	d2	d3	d4	1
85.602.2006	200	6	80	106.39	50	133.4	85.992.0600 (4x)
85.602.2506	250	6	85	106.39	65	133.4	85.992.0600 (4x)
85.602.2508	250	8	85	139.734	65	171.4	85.992.0800 (4x)
85.602.3106	315	6	95	106.39	80	133.4	85.992.0600 (4x)
85.602.3108	315	8	95	139.734	80	171.4	85.992.0800 (4x)
85.602.3111	315	11	95	196.887	80	235	85.992.1100 (6x)
85.602.4006	400	6	105	106.39	100	133.4	85.992.0600 (4x)
85.602.4008	400	8	105	139.734	100	171.4	85.992.0800 (4x)
85.602.4011	400	11	105	196.887	100	235	85.992.1100 (6x)
85.602.5008	500	8	120	139.734	125	171.4	85.992.0800 (4x)
85.602.5011	500	11	120	196.887	125	235	85.992.1100 (6x)

> **85.603 BISON**

NL Onafhankelijke Vier-Klauwplaat, gietijzer, type 4344, DIN 55029  
 FR Mandrin à 4 mors indépendants, fonte, type 4344, DIN 55029  
 ES Plato de 4 garras independientes, fundición, tipo 4344, DIN 55029  
 DE 4-Backenfutter einzeln spannend, Gusseisen, Typ 4344, DIN 55029



DIN 55029 CAM-LOCK

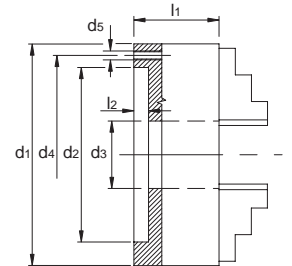
Ref.	d1	C	l1	d2	d3	d4	1
85.603.2004	200	4	80	63.526	50	82.6	85.993.0400
85.603.2006	200	6	80	106.39	50	133.4	85.993.0600
85.603.2506	250	6	85	106.39	65	133.4	85.993.0600
85.603.2508	250	8	85	139.734	65	171.4	85.993.0800
85.603.3106	315	6	95	106.39	80	133.4	85.993.0600
85.603.3108	315	8	95	139.734	80	171.4	85.993.0800
85.603.4008	400	8	105	139.734	100	171.4	85.993.0800
85.603.4011	400	11	105	196.887	100	235	85.993.1100
85.603.5008	500	8	120	139.734	125	171.4	85.993.0800
85.603.5011	500	11	120	196.887	125	235	85.993.1100





## > 85.670 BISON

- NL Gecombineerde Vier-Klauwplaat, gietijzer, type 4605, DIN 6351  
 FR Mandrin à 4 mors combinés, Fonte, type 4605, DIN 6351  
 ES Plato de 4 garras combinado, fundición, tipo 4605, DIN 6351  
 DE Kombinierte Vierbackenfutter, Gusseisen, Typ 4605, DIN 6351

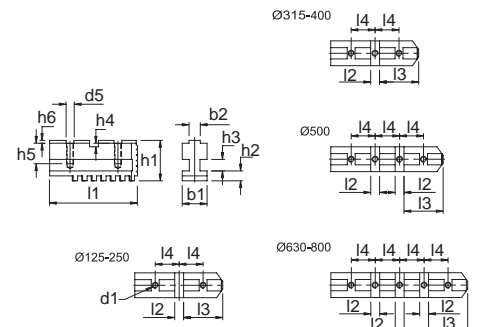


DIN  
6351

Ref.	d1	l1	l2	d2	d3	d4	d5
85.670.0200	200	96	5.5	160	55	176	6x M10
85.670.0250	250	102	6	200	76	224	6x M12
85.670.0315	315	117	6	260	103	286	6x M16

## > 85.801 BISON

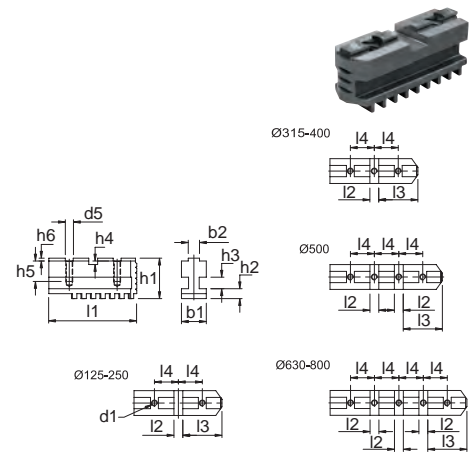
- NL Harde Grondbekken, set à 3 stuks, voor 3-klauwplaat  
 type 32\*\*, 35\*\*  
 FR Jeu de semelles, Jeu de 3 pièces, pour mandrin à 3 mors  
 type 32\*\*, 35\*\*  
 ES Garras duras, juego de 3 piezas, Para plato de 3 garras  
 tipo 32\*\*, 35\*\*  
 DE Harte Grundbacken, Satz von 3 Stück, für 3-Backenfutter  
 Typ 32\*\*, 35\*\*



Ref.	d1	l1	b1	h1	h2	h3	b2	l2	l3	h4	l4	h5	d5	h6
85.801.0125	125	54	20	28	8	8	7.94	12.69	22.6	4	16	13.5	M8	3.2
85.801.0160	160	65	20	29	8	8	7.94	12.69	28.6	4	19.05	14	M10	3.2
85.801.0200	200	79	25	33	9	10	7.94	12.69	34.9	4	22.25	14	M10	3.2
85.801.0250	250	92	28	36	11	12	12.7	19.04	39.7	4	27	16	M12	3.2
85.801.0315	315	110	32	40	12.7	12	12.7	19.04	47.6	4	31.75	16	M12	3.2
85.801.0400	400	130	36	49	15	14	12.7	19.04	57.1	7.2	38.1	22	M16	3.2
85.801.0500	500	166	40	54	16	14	12.7	19.04	57.1	7.2	38.1	32.5	M20	3.2
85.801.0630	630	210	50	54.5	16	14	12.7	19.04	57.1	7.2	38.1	32.5	M20	3.2

> **85.802** **BISON**

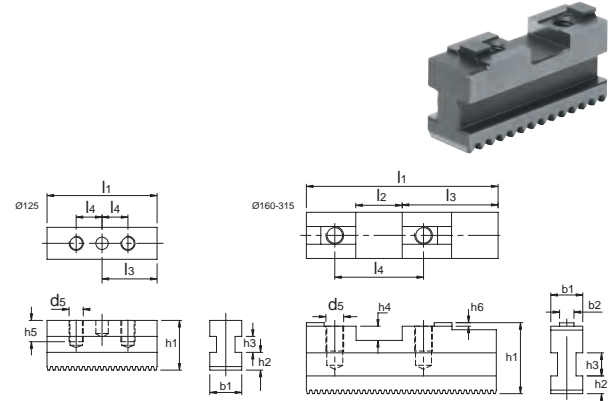
- NL Harde Grondbekken, set à 4 stuks, voor 4-klawplaat type 36\*\*, 37\*\*
- FR Jeu de semelles, Jeu de 4 pièces, pour mandrin à 4 mors type 36\*\*, 37\*\*
- ES Garras duras, juego de 4 piezas, para plato de 4 garras tipo 36\*\*, 37\*\*
- DE Harte Grundbacken, Satz von 4 Stück, für 4-Backenfutter Typ 36\*\*, 37\*\*



Ref.	d1	l1	b1	h1	h2	h3	b2	l2	l3	h4	l4	h5	d5	h6
85.802.0125	125	54	20	28	8	8	7.94	12.69	22.6	4	16	13.5	M8	3.2
85.802.0160	160	65	20	29	8	8	7.94	12.69	28.6	4	19.05	14	M10	3.2
85.802.0200	200	79	25	33	9	10	7.94	12.69	34.9	4	22.25	14	M10	3.2
85.802.0250	250	92	28	36	11	12	12.7	19.04	39.7	4	27	16	M12	3.2
85.802.0315	315	110	32	40	12.7	12	12.7	19.04	47.6	4	31.75	16	M12	3.2
85.802.0400	400	130	36	49	15	14	12.7	19.04	57.1	7.2	38.1	22	M16	3.2
85.802.0500	500	166	40	54	16	14	12.7	19.04	57.1	7.2	38.1	32.5	M20	3.2

> **85.805** **BISON**

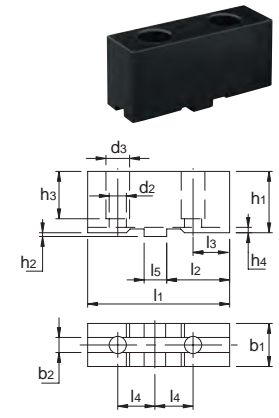
- NL Harde Grondbekken, set à 3 stuks, voor 3-klawplaat type 3404
- FR Jeu de semelles, Jeu de 3 pièces, pour mandrin à 3 mors type 3404
- ES Garras duras, juego de 3 piezas, para plato de 3 garras tipo 3404
- DE Harte Grundbacken, Satz von 3 Stück, für 3-Backenfutter Typ 3404



Ref.	d1	l1	b1	h1	h2	h3	b2	l2	l3	h4	l4	h5	d5	h6
85.805.0125	125	51.5	14	21.5	6.5	7		5	25.75	3	10	10	M6	
85.805.0160	160	65	20	26.5	7.5	9	8	18	28	5	32	12	M8	2.5
85.805.0200	200	85	22	28.5	8	9	10	20	42	5.5	40	12	M8	2.5
85.805.0250	250	87.5	26	36	10	11	12	20	41.5	5.5	40	17	M12	3
85.805.0315	315	125	32	42	12	14	12	26	69	7	54	17	M12	3

> **85.811** **BISON**

- NL Zachte Opschroefbekken, set à 3 stuks, voor 3-klawplaat type 32\*\*, 35\*\*
- FR Jeu de mors doux, Jeu de 3 pièces, pour mandrin à 3 mors type 32\*\*, 35\*\*
- ES Garras de acoplado blandas, juego de 3 piezas, para plato de 3 garras tipo 32\*\*, 35\*\*
- DE Weiche Aufschraubbacken, Satz von 3 Stück, für 3-Backenfutter Typ 32\*\*, 35\*\*

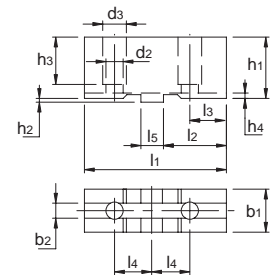


Ref.	d1	l1	b1	h1	b2	h2	h4	l5	l2	d2	d3	h3	l4	l3
85.811.0125	125	64	22	38.5	7.95	4	3.2	12.69	25	9	15	26	16	15
85.811.0160	160	78	25	41.5	7.95	4	3.2	12.69	34	11	18	29	19.05	21
85.811.0200	200	90	27	43.5	7.95	4	3.2	12.69	40	11	18	31	22.25	24
85.811.0250	250	106	32.5	51.5	12.71	4	3.2	19.04	45	14	20	36	27	27.5
85.811.0315	315	120	37	55	12.71	4	3.2	19.04	53	14	20	40	31.75	30.7
85.811.0400	400	140	42	64.5	12.71	4	6.3	19.04	63	18	26	45.5	38.1	34.4
85.811.0500	500	140	42	74.5	12.71	4	6.3	19.04	63	22	33	56	38.1	34.4
85.811.0630	630	160	52	82	12.71	4	6.3	19.04	63	22	33	64	38.1	34.4



## > 85.812 BISON

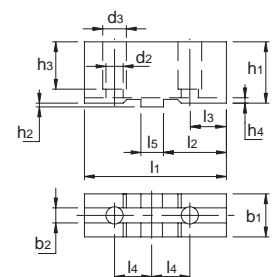
- NL Zachte Opschroefbekken, set à 4 stuks, voor 4-klawwplaat type 36\*\*, 37\*\*  
 FR Jeu de mors doux, Jeu de 4 pièces, pour mandrin à 4 mors type 36\*\*, 37\*\*  
 ES Garras de acoplado blandas, juego de 4 piezas, para plato de 4 garras tipo 36\*\*, 37\*\*  
 DE Weiche Aufschraubbacken, Satz von 4 Stück, für 4-Backenfutter Typ 36\*\*, 37\*\*



Ref.	d1	l1	b1	h1	b2	h2	h4	l2	l5	l2	d2	d3	h3	l4	l3
85.812.0125	125	64	22	38.5	7.95	4	3.2	12.69	25	9	15	26	16	15	
85.812.0160	160	78	25	41.5	7.95	4	3.2	12.69	34	11	18	29	19.05	21	
85.812.0200	200	90	27	43.5	7.95	4	3.2	12.69	40	11	18	31	22.25	24	
85.812.0250	250	106	32.5	51.5	12.71	4	3.2	19.04	45	14	20	38	27	27.5	
85.812.0315	315	120	37	55	12.71	4	3.2	19.04	53	14	20	40	31.75	30.7	
85.812.0400	400	140	42	64.5	12.71	4	6.3	19.04	63	18	26	45.5	38.1	34.4	
85.812.0500	500	140	42	74.5	12.71	4	6.3	19.04	63	22	33	56	38.1	34.4	

## > 85.813 BISON

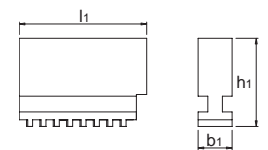
- NL Zachte Opschroefbekken, set à 3 stuks, voor 3-klawwplaat type 3404  
 FR Jeu de mors doux, Jeu de 3 pièces, pour mandrin à 3 mors type 3404  
 ES Garras de acoplado blandas, juego de 3 piezas, para plato de 3 garras tipo 3404  
 DE Weiche Aufschraubbacken, Satz von 3 Stück, für 3-Backenfutter Typ 3404



Ref.	d1	l1	b1	h1	b2	h2	h4	l2	l5	d2	d3	h3
85.813.0125	125	55	20	30	14	1.5	5	25	5	6.4	10.4	24
85.813.0160	160	85	20	40	8	4.5	3	35	18	8.4	13.5	26.5
85.813.0200	200	105	22	50	10	5	3	40	20	8.4	13.5	35
85.813.0250	250	125	30	55	12	5	3.5	60	20	13	19	41
85.813.0315	315	145	35	60	12	6	3.5	60	26	13	19	38

## > 85.820 BISON

- NL Zachte Blokbekken, set à 3 stuks, voor 3-klawwplaat type 32\*\*, 35\*\*  
 FR Jeu de mors doux, Jeu de 3 pièces, pour mandrin à 3 mors type 32\*\*, 35\*\*  
 ES Garras blandas, juego de 3 piezas, para plato de 3 garras tipo 32\*\*, 35\*\*  
 DE Weiche Blockbacken, Satz von 3 Stück, für 3-Backenfutter Typ 32\*\*, 35\*\*



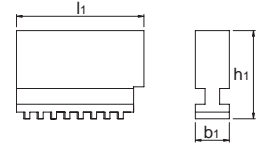
Ref.	d1	l1	b1	h1
85.820.0080	80	32	11	28
85.820.0100	100	42	15	32
85.820.0125	125	51	20	40
85.820.0160	160	70	20	53
85.820.0200	200	85	25	54

Ref.	d1	l1	b1	h1
85.820.0250	250	105	28	63
85.820.0315	315	125	32	73
85.820.0400	400	145	36	92
85.820.0500	500	180	40	100
85.820.0630	630	225	50	110



> **85.821 BISON**

- NL Zachte Blokbekken, set à 4 stuks, voor 4-klawplaat type 36\*\*, 37\*\*
- FR Jeu de mors doux, Jeu de 4 pièces, pour mandrin à 4 mors type 36\*\*, 37\*\*
- ES Garras blandas, juego de 4 piezas, para plato de 4 garras tipo 36\*\*, 37\*\*
- DE Weiche Blockbacken, Satz von 4 Stück, für 4-Backenfutter Typ 36\*\*, 37\*\*

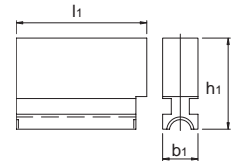
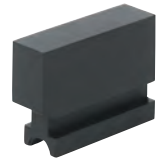


Ref.	d1	l1	b1	h1
85.821.0125	125	51	20	40
85.821.0160	160	70	20	53
85.821.0200	200	85	25	54
85.821.0250	250	105	28	63

Ref.	d1	l1	b1	h1
85.821.0315	315	125	32	73
85.821.0400	400	145	36	92
85.821.0500	500	180	40	100

> **85.823 BISON**

- NL Zachte Blokbekken, set à 4 stuks, voor 4-klawplaat type 4605
- FR Jeu de mors doux, Jeu de 4 pièces, pour mandrin à 4 mors type 4605
- ES Garras blandas, juego de 4 piezas, para plato de 4 garras tipo 4605
- DE Weiche Blockbacken, Satz von 4 Stück, für 4-Backenfutter Typ 4605

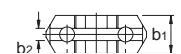
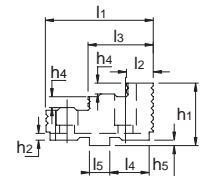


Ref.	d1	l1	b1	h1
85.823.0200	200	85	25	58
85.823.0250	250	91	28	61

Ref.	d1	l1	b1	h1
85.823.0315	315	125	32	73

> **85.840 BISON**

- NL Harde Omkeerbare Opzetbekken, set à 3 stuks, voor 3-klawplaat type 32\*\*, 35\*\*
- FR Mors rapportés durs réversibles, Jeu de 3 pièces, pour mandrin à 3 mors type 32\*\*, 35\*\*
- ES Garras superiores reversibles duras, juego de 3 piezas, para plato de 3 garras tipo 32\*\*, 35\*\*
- DE Harte, umkehrbare Aufsatzbacken, Satz von 3 Stück, für 3-Backenfutter Typ 32\*\*, 35\*\*



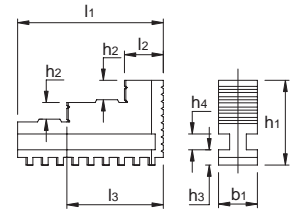
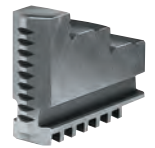
Ref.	d1	l1	b1	h1	b2	h2	h5	l5	l4	l2	l3	l6	h4
85.840.0125	125	56	22	38.5	7.95	4	3.2	12.69	22.6	14.5	35	16	8
85.840.0160	160	67	25	41.5	7.95	4	3.2	12.69	28.6	18	41.5	19.05	8.5
85.840.0200	200	80	27	43.5	7.95	4	3.2	12.69	34.9	21.5	51	22.25	9.5
85.840.0250	250	95	32.5	51.5	12.71	4	3.2	19.04	39.7	24.5	59	27	12
85.840.0315	315	110	37	55	12.71	4	3.2	19.04	47.6	26.5	68	31.75	13
85.840.0400	400	127	42	64.5	12.71	4	6.3	19.04	57.1	27	76.5	38.1	13.5
85.840.0500	500	127	42	74.5	12.71	4	6.3	19.04	57.1	50	88	38.1	17
85.840.0630	630	127	52	82	12.71	4	6.3	19.04	57.1	51	89	38.1	21





## > 85.850 BISON

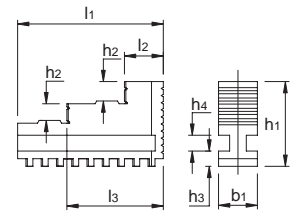
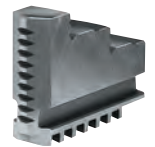
- NL** Harde naar buiten getrapte Bekken (Boorbekken), set à 3 stuks, voor 3-klawplaat type 32\*\*, 35\*\*
- FR** Mors durs à l'endroit, Jeu de 3 pièces, pour mandrin à 3 mors type 32\*\*, 35\*\*
- ES** Garras duras exteriores, juego de 3 piezas, para plato de 3 garras tipo 32\*\*, 35\*\*
- DE** Harte, nach außen gestufte Backen (Bohrbacken), Satz von 3 Stück, für 3-Backenfutter Typ 32\*\*, 35\*\*



Ref.	d1	l1	b1	h1	h3	h4	h2	l2	l3
85.850.0080	80	32	11	28	6	6	6	9.5	21
85.850.0100	100	42	15	32	6	6	7	12	27.5
85.850.0125	125	51	20	40	8	8	8	13	33.5
85.850.0160	160	70	20	53	8	8	10	22	47.5
85.850.0200	200	85	25	54	10	10	12	23	57
85.850.0250	250	105	28	63	11	12	14	28	69.5
85.850.0315	315	125	32	73	12.7	12	18	34.5	83
85.850.0400	400	145	36	92	15	14	22	36	99
85.850.0500	500	180	40	100	16	14	26	50	119.5
85.850.0630	630	225	50	110	16	14	28	66	149

## > 85.851 BISON

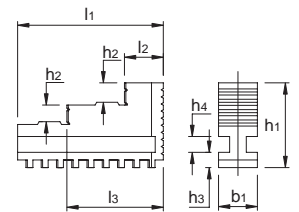
- NL** Harde naar buiten getrapte Bekken (Boorbekken), set à 4 stuks, voor 4-klawplaat type 36\*\*, 37\*\*
- FR** Mors durs à l'endroit, Jeu de 4 pièces, pour mandrin à 4 mors type 36\*\*, 37\*\*
- ES** Garras duras exteriores, juego de 4 piezas, para plato de 4 garras tipo 36\*\*, 37\*\*
- DE** Harte, nach außen gestufte Backen (Bohrbacken), Satz von 4 Stück, für 4-Backenfutter Typ 36\*\*, 37\*\*



Ref.	d1	l1	b1	h1	h3	h4	h2	l2	l3
85.851.0125	125	51	20	40	8	8	8	13	33.5
85.851.0160	160	70	20	53	8	8	10	22	47.5
85.851.0200	200	85	25	54	10	10	12	23	57
85.851.0250	250	105	28	63	11	12	14	28	69.5
85.851.0315	315	125	32	73	12.7	12	18	34.5	83
85.851.0400	400	145	36	92	15	14	22	36	99
85.851.0500	500	180	40	100	16	14	26	50	119.5

## > 85.855 BISON

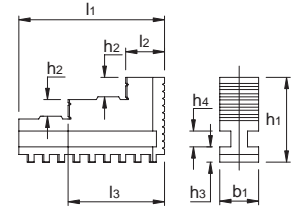
- NL** Harde naar binnen getrapte Bekken (Draaibekken), set à 3 stuks, voor 3-klawplaat type 32\*\*, 35\*\*
- FR** Mors durs à l'envers, Jeu de 3 pièces, pour mandrin à 3 mors type 32\*\*, 35\*\*
- ES** Garras duras interiores, juego de 3 piezas, para plato de 3 garras tipo 32\*\*, 35\*\*
- DE** Harte, nach innen gestufte Backen (Drehbacken), Satz von 3 Stück, für 3-Backenfutter Typ 32\*\*, 35\*\*



Ref.	d1	l1	b1	h1	h3	h4	h2	l2	l3
85.855.0080	80	32	11	28	6	6	6	9.5	21
85.855.0100	100	42	15	32	6	6	7	11	27
85.855.0125	125	51	20	40	8	8	8	13	33.5
85.855.0160	160	70	20	53	8	8	10	19	45
85.855.0200	200	85	25	54	10	10	12	23	57
85.855.0250	250	105	28	63	11	12	14	28	69.5
85.855.0315	315	125	32	73	12.7	12	18	34.5	83
85.855.0400	400	145	36	92	15	14	22	36	99
85.855.0500	500	180	40	100	16	14	26	50	119.5
85.855.0630	630	225	50	110	16	14	28	66	149

> **85.856 BISON**

- NL Harde naar binnen getrapte Bekken (Draaibekken), set à 4 stuks, voor 4-klauwplaat type 36\*\*, 37\*\*  
 FR Mors durs à l'envers, Jeu de 4 pièces, pour mandrin à 4 mors type 36\*\*, 37\*\*  
 ES Garras duras interiores, juego de 4 piezas, para plato de 4 garras tipo 36\*\*, 37\*\*  
 DE Harte, nach innen gestufte Backen (Drehbacken), Satz von 4 Stück, für 4-Backenfutter Typ 36\*\*, 37\*\*



Ref.	d1	l1	b1	h1	h3	h4	h2	l2	l3
85.856.0100	100	42	15	32	6	6	7	11	27
85.856.0125	125	51	20	40	8	8	8	13	33.5
85.856.0160	160	70	20	53	8	8	10	19	45
85.856.0200	200	85	25	54	10	10	12	23	57
85.856.0250	250	105	28	63	11	12	14	28	69.5
85.856.0315	315	125	32	73	12.7	12	18	34.5	83
85.856.0400	400	145	36	92	15	14	22	36	99
85.856.0500	500	180	40	100	16	14	26	50	119.5

> **85.866 BISON**

- NL Rondsel, voor gietijzeren klauwplaat type 32\*\*, 36\*\*  
 FR Pignon, pour mandrin fonte type 32\*\*, 36\*\*  
 ES Piñón, Para plato de sujeción fundición tipo 32\*\*, 36\*\*  
 DE Ritzel, für gusseisen Backenfutter Typ 32\*\*, 36\*\*



Ref.	d1	sw
85.866.0080	80	6
85.866.0100	100	9
85.866.0125	125	9
85.866.0160	160	11
85.866.0200	200	11

Ref.	d1	sw
85.866.0250	250	14
85.866.0315	315	14
85.866.0400	400	17
85.866.0500	500	19
85.866.0630	630	19

> **85.868 BISON**

- NL Rondsel, voor stalen klauwplaat type 35\*\*, 37\*\*  
 FR Pignon, pour mandrin acier type 35\*\*, 37\*\*  
 ES Piñón, Para plato de sujeción acero tipo 35\*\*, 37\*\*  
 DE Ritzel, für Stahlen Backenfutter Typ 35\*\*, 37\*\*



Ref.	d1	sw
85.868.0125	125	9
85.868.0160	160	11
85.868.0200	200	11

Ref.	d1	sw
85.868.0250	250	14
85.868.0315	315	14
85.868.0400	400	17

> **85.890 BISON**

- NL Klauwplaatsleutel  
 FR clé à mandrin  
 ES Llave para platos  
 DE Spannschlüssel



Ref.	Nr.	sw	l1	h1	Ø mm
85.890.0100	1	6	100	60	80
85.890.0200	2	9	140	60	100/125
85.890.0300	3	11	215	80	160/200
85.890.0400	4	14	310	100	250/315

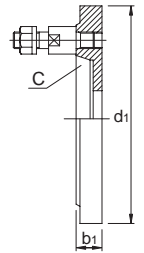
Ref.	Nr.	sw	l1	h1	Ø mm
85.890.0500	5	17	400	120	400
85.890.0600	6	19	450	140	500/630
85.890.0700	7	19	650	140	800





## > 85.961 BISON

- NL Klauwplaatflens, gietijzer, Halfbewerkte gereedschapshouder, type 8232, DIN 55027  
 FR Faux-plateau, fonte, Mandrin porte-outils non fini, type 8232, DIN 55027  
 ES Contraplato, fundición, Pieza en bruto, tipo 8232, DIN 55027  
 DE Spannfutterflansche, Gusseisen, Werkzeughalter-Rohling, Typ 8232, DIN 55027



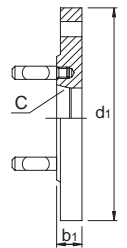
DIN 55027 BAJONET

Ref.	d1	C	b1
85.961.1203	127	3	19.5
85.961.1204	127	4	19.5
85.961.1604	162	4	24
85.961.1605	162	5	24
85.961.2005	203	5	38
85.961.2006	203	6	33

Ref.	d1	C	b1
85.961.2506	253	6	50
85.961.2508	253	8	46
85.961.3106	318	6	33
85.961.3108	318	8	55
85.961.3111	318	11	47
85.961.4011	405	11	47

## > 85.962 BISON

- NL Klauwplaatflens, gietijzer, Halfbewerkte gereedschapshouder, type 8242, DIN 55029  
 FR Faux-plateau, fonte, Mandrin porte-outils non fini, type 8242, DIN 55029  
 ES Contraplato, fundición, Pieza en bruto, tipo 8242, DIN 55029  
 DE Spannfutterflansche, Gusseisen, Werkzeughalter-Rohling, Typ 8242, DIN 55029



DIN 55029 CAM-LOCK

Ref.	d1	C	b1
85.962.1203	127	3	26
85.962.1204	127	4	26
85.962.1604	162	4	29
85.962.1605	162	5	29
85.962.2005	203	5	50
85.962.2006	203	6	35

Ref.	d1	C	b1
85.962.2506	253	6	49
85.962.2508	253	8	49
85.962.3108	318	8	55
85.962.3111	318	11	55
85.962.4011	405	11	75

## > 85.992 BISON

- NL Klauwplaatpen, voor DIN 55027 (Bajonet)  
 FR Tenon de fixation, pour DIN 55027 (Baïonnette)  
 ES Tornillo de fijación, para DIN 55027 (bayoneta)  
 DE Camloc Bolzen, für DIN 55027 (Bajonet)



Ref.	C	d1	NR
85.992.0300	3	M10x34	3
85.992.0400	4	M10x39	3
85.992.0500	5	M10x43	4

Ref.	C	d1	NR
85.992.0600	6	M12x50	4
85.992.0800	8	M16x60	4
85.992.1100	11	M20x75	6

> **85.993** **BISON**

NL Klauwplaatpen, voor DIN 55029 (Camlock)  
 FR Tenon de fixation, pour DIN 55029 (Camlock)  
 ES Tornillo de fijación, para DIN 55029 (Camlock)  
 DE Camloc Bolzen, für DIN 55029 (Camlock)



Ref.	C	d1	NR
85.993.0300	3	M10x1x35	3
85.993.0400	4	M10x1x37	3
85.993.0500	5	M12x1x43	6

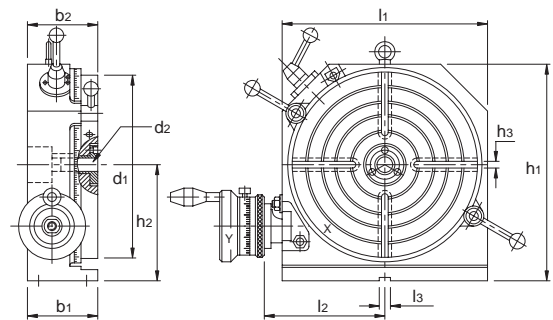
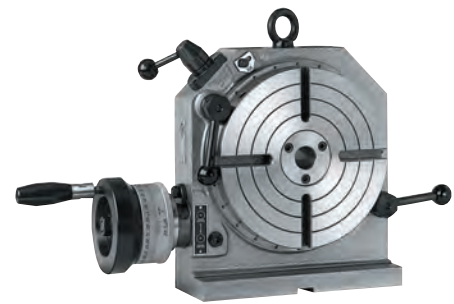
Ref.	C	d1	NR
85.993.0600	6	M16x1,5x49	6
85.993.0800	8	M20x1,5x55,5	6
85.993.1100	11	M22x1,5x67	6





## > 87.110 BISON

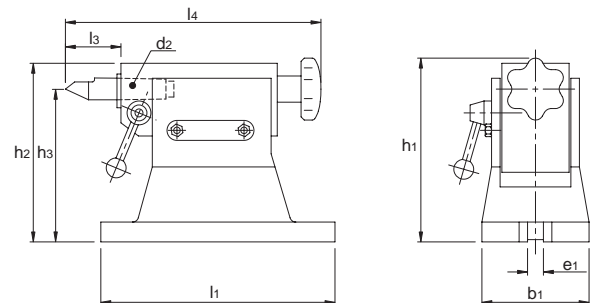
NL Rondverdeeltafel, type 5859  
 FR Plateau diviseur, type 5859  
 ES Plato divisor, tipo 5859  
 DE Rundtische, Typ 5859



Ref.	d1	x:y	h1	l1	b1	l3	h2	h3	b2	l2	d2
87.110.0160	160	1:60	225	200	90	14	125	10	96	127	MK 3
87.110.0200	200	1:60	270	240	95	14	150	10	98	147	MK 3
87.110.0250	250	1:90	318	285	115	18	175	12	115	175	MK 3
87.110.0320	320	1:90	374	348	115	18	200	12	120	207	MK 3
87.110.0400	400	1:90	465	430	125	18	250	14	135	248	MK 4

## > 87.250 BISON

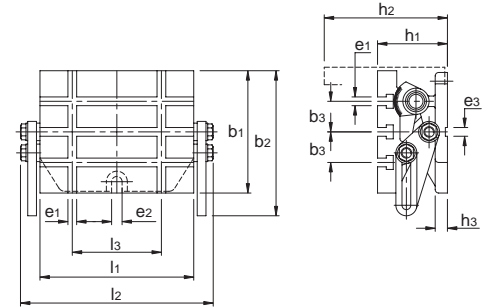
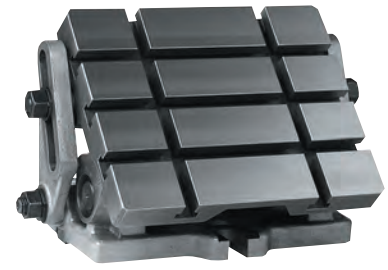
NL Tegencenter, type 5819  
 FR Contre-pointe, type 5819  
 ES Contrapunto, tipo 5819  
 DE Reitstock, Typ 5819



Ref.	h3	l1	b1	h1 max	e1 (H7)	l3	h2	l4	d2
87.250.0100	95-130	195	100	183	14	40-70	155	335	MK 2
87.250.0125	130-170	250	120	223	18	50-90	200	409	MK 3
87.250.0160	170-200	280	142	253	18	50-90	230	433	MK 3
87.250.0200	220-250	300	164	303	18	60-100	285	465	MK 4

> **87.400** **BISON**

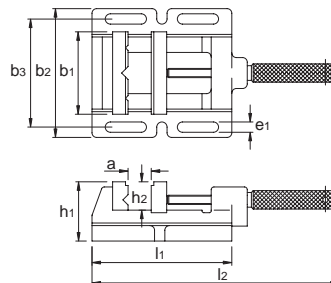
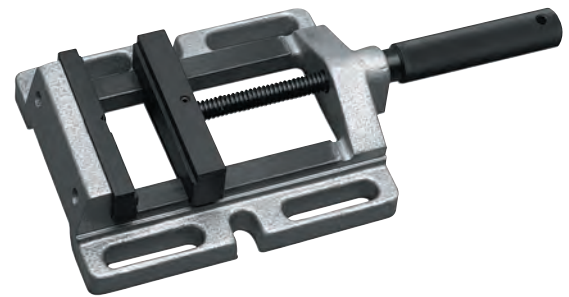
NL Zwenkbare Opspantafel, type 5150  
 FR Table de bridage articulée, type 5150  
 ES Mesa de fijación basculante, tipo 5150  
 DE Schwenkbare Spanntische, Typ 5150



Ref.	b1	l1	l2	b2	b3	e1 N6	l3	e2	h1	h2	h3	e3
87.400.0200	200	250	324	236	50	12	126	18	111	201	22	16
87.400.0250	250	315	405	306	63	14	160	18	127	252	25	18

> **88.150** **BISON**

NL Boorklem, type 6543  
 FR Étau machine, type 6543  
 ES Mordaza para taladros, tipo 6543  
 DE Bohrschraubstock, Typ 6543



Ref.	b1	b2	l1	h1	l2	a max	h2	e1 N6	Max daN
88.150.0120	120	176	212	64	360	120	30	13.5	650
88.150.0150	150	208	262	66	442	150	38	13.5	800

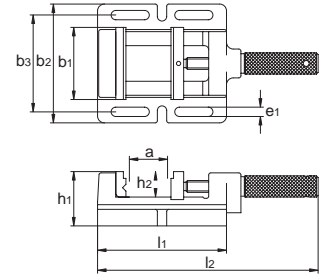






### > 88.152 INTERNATIONAL TOOLS

NL ECO PRO Boorklem  
 FR Étau machine ECO PRO  
 ES Mordaza para taladros ECO PRO  
 DE ECO PRO Bohrschraubstock



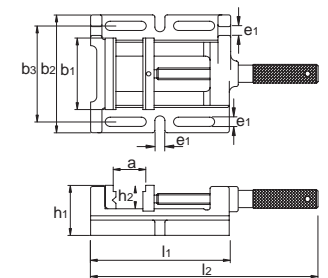
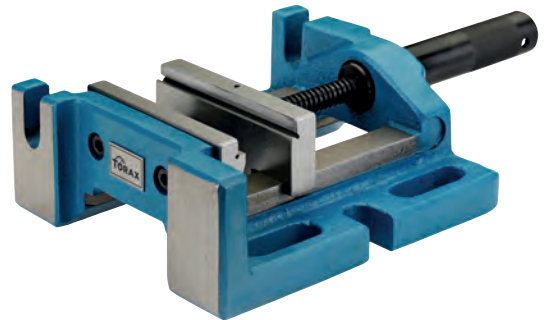
**ECO PRO**

Ref.	b1	b2	a max	l1	l2	h1	h2	e1
88.152.0085	85	143	70	157	238	54	30	45x12,5
88.152.0100	100	152	95	176	280	60	30	49x14

Ref.	b1	b2	a max	l1	l2	h1	h2	e1
88.152.0120	120	178	105	220	340	60	35	64x14
88.152.0150	150	195	140	229	380	77	39	75x15

### > 88.154 INTERNATIONAL TOOLS

NL ECO PRO Boorklem, met 3 opspanmogelijkheden  
 FR Étau machine ECO PRO, 3 positions  
 ES Mordaza para taladros ECO PRO, 3 posiciones  
 DE ECO PRO Bohrschraubstock, mit 3 Aufspannmöglichkeiten



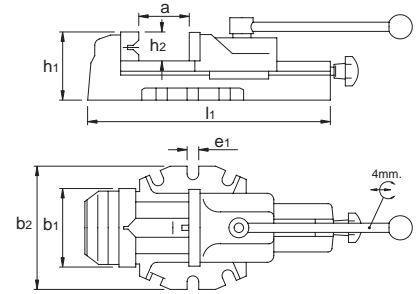
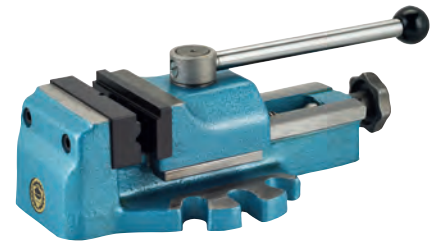
**ECO PRO**

Ref.	b1	b2	a max	l1	l2	h1	h2
88.154.0100	100	158	95	189	275	64	30

Ref.	b1	b2	a max	l1	l2	h1	h2

> **88.170** **BISON**

NL Snelspanmachineklem, type 6542  
 FR Étau à came à serrage rapide, type 6542  
 ES Mordaza mecánica de fijación rápida, tipo 6542  
 DE Schnellspan-Bohrerschraubstöcke, Typ 6542

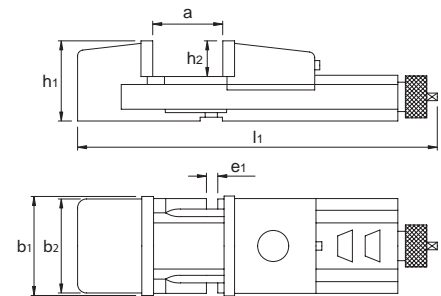


Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.170.0080	80	140	70	220	80	30	14	800

Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.170.0100	100	165	80	270	100	35	14	1200

> **88.200** **BISON**

NL Snelspanmachineklem, type 6517  
 FR Étau à came à serrage rapide, type 6517  
 ES Mordaza mecánica de fijación rápida, tipo 6517  
 DE Schnellspan-Bohrerschraubstöcke, Typ 6517



Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.200.0125	125	122	103	405	160	40	14	2500
88.200.0160	160	156	125	505	200	50	18	4200

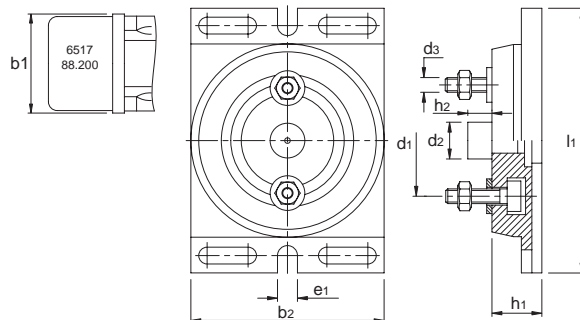
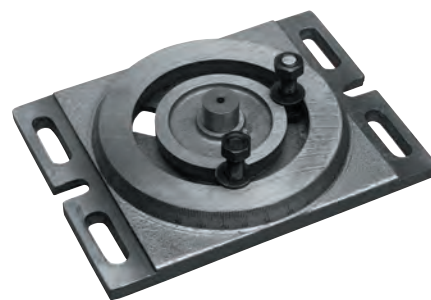
Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.200.0200	200	194	150	666	250	63	18	6200





## > 88.205 BISON

- NL Draaiplaat, type 6587, met gradenverdeling, voor snelspanmachinneklem 88.200  
 FR Base tournante, type 6587, avec graduation des degrés, pour étaux machine 88.200  
 ES Base giratoria, tipo 6587, con graduación, para mordazas mecánicas de fijación rápida 88.200  
 DE Dreibackenfutter, Typ 6587, mit Gradeinteilung, Für Maschinenschraubstöcke 88.200

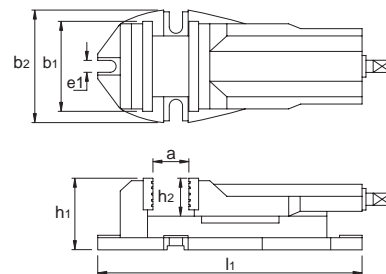


Ref.	b1	b2	d1	h1	l1	d3	d2	h2	e1 N6
88.205.0125	125	175	103	28	236	M12	25	18	14

Ref.	b1	b2	d1	h1	l1	d3	d2	h2	e1 N6
88.205.0160	160	224	130	34	294	M16	30	20	18

## > 88.230 BISON

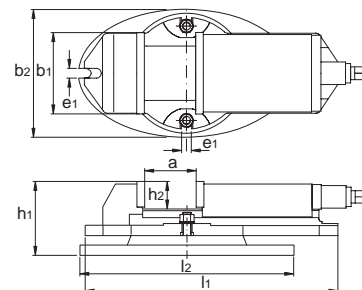
- NL Machinespanklem, type 6512  
 FR Étau de fraisage, type 6512  
 ES Mordaza mecánica, tipo 6512  
 DE Maschinenschraubstöcke, Typ 6512



Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.230.0100	100	156	84	294	80	32	14	2500
88.230.0125	125	156	100	347	95	40	14	3500
88.230.0160	160	193	121	423	125	50	18	4000
88.230.0200	200	256	147	515	160	63	18	5500
88.230.0250	250	316	174	615	200	80	22	6200

> **88.237** **INTERNATIONAL TOOLS**

- NL ECO PRO Machinespanklem met draaiplaat
- FR Étau de fraisage avec base tournante ECO PRO
- ES Mordaza mecánica con base giratoria ECO PRO
- DE ECO PRO Maschinenschraubstöcke mit Drehplatte

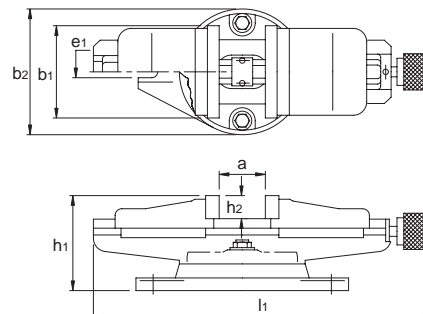


**ECO PRO**

Ref.	b1	b2	a max	l1	l2	h1	h2	e1
88.237.0050	50	102	50	175	148	80	25	11
88.237.0075	75	140	75	257	198	101	33	14
88.237.0100	100	175	100	310	244	122	40	14
88.237.0125	125	210	125	354	275	141	47	16
88.237.0150	150	240	150	385	300	148	50	16

> **88.250** **BISON**

- NL Centrisch spannende Machinespanklem, type 6531
- FR Étau de fraisage à serrage concentrique, type 6531
- ES Mordaza mecánica concéntrica, tipo 6531
- DE Zentrisch spannende Maschinenschraubstöcke, Typ 6531



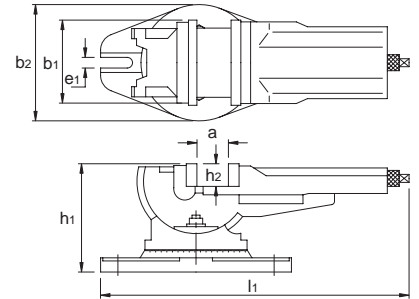
Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.250.0125	125	168	136	458	100	40	14	3500
88.250.0160	160	212	169	534	125	50	14	4000
88.250.0200	200	286	185	591	160	63	18	5500





## > 88.260 BISON

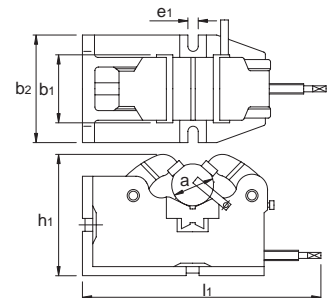
NL Draai- en Zwenkbare Machineklem, type 6530  
 FR Etai orientable 2 axes, type 6530  
 ES Mordaza mecánica basculante y giratoria, tipo 6530  
 DE Dreh- und schwenkbare Maschinenschraubstöcke, Typ 6530



Ref.	b1	b2	h1	l1	a max	h2	e1 N6	Max daN
88.260.0100	100	144	145	372	80	32	14	2500
88.260.0125	125	168	169	437	100	40	17	3500
88.260.0160	160	212	195	492	125	50	18	4000

## > 88.270 BISON

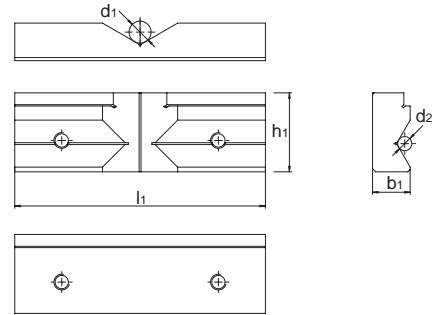
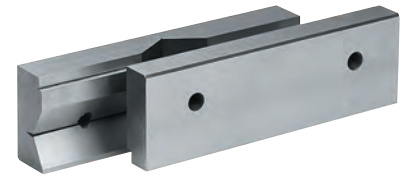
NL Assenspanklem, type 6546  
 FR Etai auto centreur, type 6546  
 ES Mordaza mecánica para ejes, tipo 6546  
 DE Klemme für Wellen, Typ 6546



Ref.	b1	b2	h1	l1	a max	e1 N6	Max daN
88.270.0100	100	180	170	305	10-63	18	1000
88.270.0125	125	200	235	405	15-100	18	1500

> **88.318** **BISON**

NL Prismabekken voor machinespanklem artikelnr. 88.200  
 FR Jeu de mors pour étau de fraisage n° article 88.200  
 ES Garras con ranurado para mordaza mecánica n° artículo 88.200  
 DE Prismabacken für Maschinenschraubstöcke Artikel-Nr. 88.200

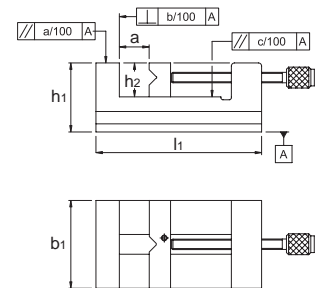
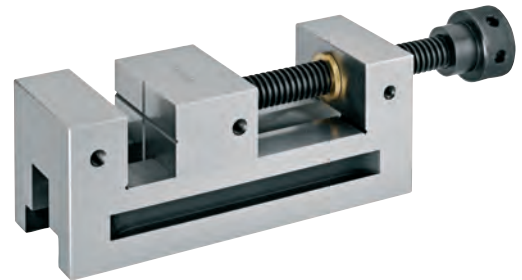


Ref.	l1	h1	b1	d1	d2	Bison
88.318.0160	160	50.4	24	10-35	18-80	6517, 6518

Ref.	l1	h1	b1	d1	d2	Bison
88.318.0200	200	63.4	30	14-44	22-100	6517, 6518

> **88.340** **Phantom**

NL Precisie Slijpklem  
 FR Etou de précision  
 ES Mordaza de precisión  
 DE Präzisions-Schleifschraubstöcke



Ref.	b1	l1	h1	l2	a max	h2	Tol. a	Tol. b	Tol. c
88.340.0050	50	155	50	207.5	65	25	0.005	0.005	0.005
88.340.0063	63	190	65	242.5	85	32	0.005	0.005	0.005

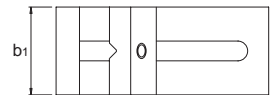
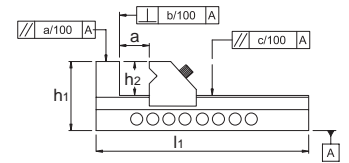
Ref.	b1	l1	h1	l2	a max	h2	Tol. a	Tol. b	Tol. c
88.340.0080	80	220	84	280.5	100	40	0.005	0.005	0.005
88.340.0100	100	260	95	328.5	125	45	0.007	0.005	0.005





## > 88.350 Phantom

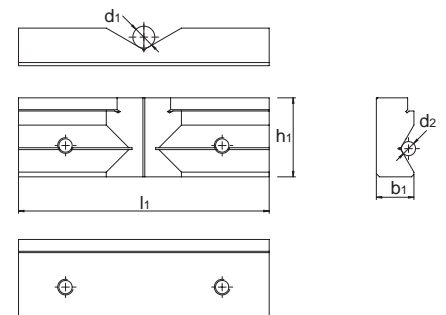
NL Precisie Slijpklem, met spanbout aan bovenzijde en snelverstelling  
 FR Etau de précision, Mors avec système de positionnement rapide  
 ES Mordaza de precisión, con perno a parte encima y cambio rápido  
 DE Präzisions-Schleifschraubstöcke, mit Spannbolzen oben und Schnellverstellung



Ref.	b1	l1	h1	h2	a max	Tol. a	Tol. b	Tol. c
88.350.0026	26	65.4	29	9.15	22	0.007	0.005	0.005
88.350.0036	36	100	45	20	40	0.005	0.005	0.005
88.350.0050	50	140	50	25	65	0.005	0.005	0.005
88.350.0073	73	190	67	35	100	0.005	0.005	0.005
88.350.0100	100	245	90	45	125	0.005	0.005	0.005
88.350.0125	125	285	100	50	160	0.007	0.005	0.005

## > 88.407 BISON

NL Prismabekken voor machinespanklem type 6512, 6530, 6537  
 FR Jeu de mors pour étau de fraisage type 6512, 6530, 6537  
 ES Garras con ranurado para mordaza mecánica tipo 6512, 6530, 6537  
 DE Prismabacken für Maschinenschraubstöcke Typ 6512, 6530, 6537

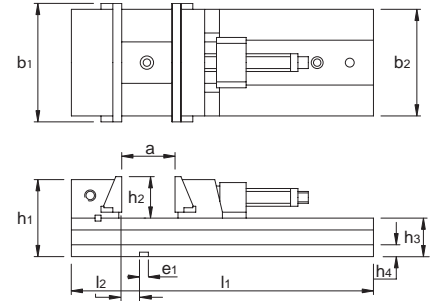
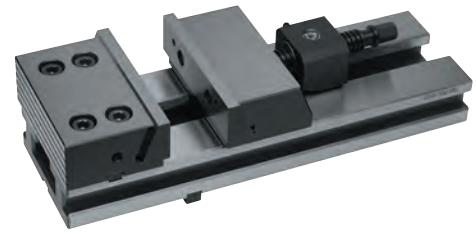


Ref.	l1	h1	b1	d1	d2	Bison
88.407.0100	100	32	18	6-24	12-48	6512, 6530, 6537
88.407.0125	125	40.4	22	8-30	15-60	6512, 6530, 6537
88.407.0160	160	50.4	24	10-35	18-80	6512, 6530, 6531, 6537, 6522, 6515, 6516
88.407.0200	200	63.4	30	14-44	22-100	6512, 6530, 6531, 6537, 6522, 6515, 6516



> **88.430** **BISON**

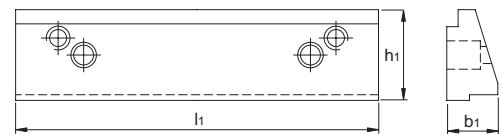
- NL Modulaire Precisie Machinespanklem, type 6620
- FR Étau modulaire de haute précision, type 6620
- ES Mordaza mecánica modular de alta precisión, tipo 6620
- DE Modulare Präzisions-Maschinenschraubstöcke, Typ 6620



Ref.	b1	b2	l1	l2	h1	h2	h3	h4	a max	e1 N6	Max. daN
88.430.1033	100	85	320	12	65	30	35	13	165	12	2000
88.430.1234	125	105	335	18	82	40	42	15	165	12	3000
88.430.1543	150	140	425	21.2	102	50	52	18	210	18	4100
88.430.1548	150	140	475	21.2	102	50	52	18	260	18	4100
88.430.1552	150	140	520	21.2	102	50	52	18	305	18	4100
88.430.2054	200	165	535	38.07	121	60	61	20	260	18	4500
88.430.2059	200	165	585	38.07	121	60	61	20	310	18	4500
88.430.2064	200	165	635	38.07	121	60	61	20	360	18	4500

> **88.431** **BISON**

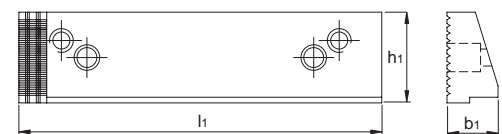
- NL Getrapte Bekken, voor Modulaire Precisie Machinespanklem type 6620
- FR Mors avec méplat, pour étau modulaire de haute précision type 6620
- ES Garras escalonada, para Mordaza mecánica modular de alta precisión tipo 6620
- DE Stufenbacke, für Modulare Präzisions-Maschinenschraubstöcke Typ 6620



Ref.	l1	h1	b1	Bison
88.431.0125	125	32	18	6620
88.431.0150	150	42	24	6620
88.431.0200	200	50	30	6620

> **88.432** **BISON**

- NL Gegroefde bekken, voor Modulaire Precisie Machinespanklem type 6620
- FR Mors rainurés, pour étau modulaire de haute précision type 6620
- ES Garras ranuradas, para Mordaza mecánica modular de alta precisión tipo 6620
- DE Gerillten Backen, für Modulare Präzisions-Maschinenschraubstöcke Typ 6620



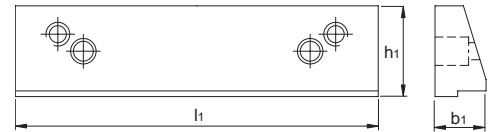
Ref.	l1	h1	b1	Bison
88.432.0100	100	23	15	6620
88.432.0125	125	32	18	6620
88.432.0150	150	42	24	6620
88.432.0200	200	50	30	6620





## > 88.433 BISON

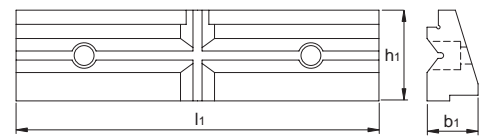
- NL Gladde bekken, voor Modulaire Precisie Machinespanklem type 6620  
 FR Mors lisses, pour étau modulaire de haute précision type 6620  
 ES Garras lisas, para Mordaza mecánica modular de alta precisión tipo 6620  
 DE Glatte Backen, für Modulare Präzisions-Maschinenschraubstöcke Typ 6620



Ref.	l1	h1	b1	Bison
88.433.0100	100	23	15	6620
88.433.0125	125	32	18	6620
88.433.0150	150	42	24	6620
88.433.0200	200	50	30	6620

## > 88.434 BISON

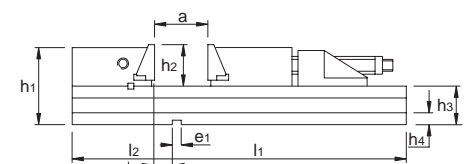
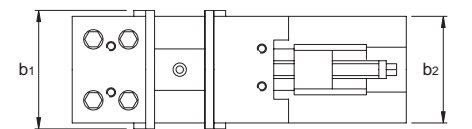
- NL Prismabekken, voor Modulaire Precisie Machinespanklem type 6620  
 FR Jeu de mors, pour étau modulaire de haute précision type 6620  
 ES Garras con ranurado, para Mordaza mecánica modular de alta precisión tipo 6620  
 DE Prismabacken, für Modulare Präzisions-Maschinenschraubstöcke Typ 6620



Ref.	l1	h1	b1	Bison
88.434.0125	125	32	18	6620
88.434.0150	150	42	24	6620
88.434.0200	200	50	30	6620

## > 88.440 TORAX

- NL Precisie Machinespanklem  
 FR Étau de fraisage de précision  
 ES Mordaza mecánica de precisión  
 DE Präzisionsschraubstöcke

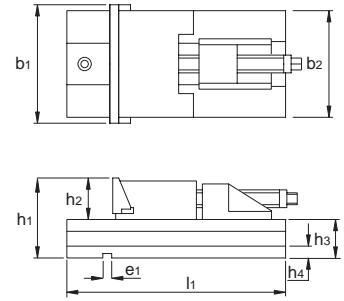
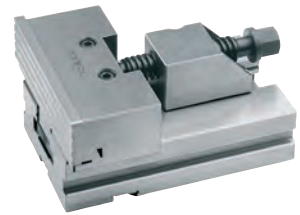


Ref.	b1	b2	l1	l2	h1	h2	h3	h4	a max	e1 N6	Max. daN
88.440.1027	100	75	270	25.61	65	30	35	15	100	16	3000
88.440.1234	125	95	345	25.61	80	40	40	15	150	16	3000
88.440.1542	150	125	420	25.61	100	50	50	20	200	16	5000
88.440.1552	150	125	520	25.61	100	50	50	20	300	16	5000
88.440.1745	175	145	455	25.61	118	60	58	20	200	16	6000
88.440.1755	175	145	555	25.61	118	60	58	20	300	16	6000
88.440.1765	175	145	655	25.61	118	60	58	20	400	16	6000
88.440.1775	175	145	755	25.61	118	60	58	20	500	16	6000

Ref.	b1	b2	l1	l2	h1	h2	h3	h4	a max	e1 N6	Max. daN
88.440.2059	200	170	595	25.61	135	65	70	26	300	16	10000
88.440.2069	200	170	695	25.61	135	65	70	26	400	16	10000
88.440.2079	200	170	795	25.61	135	65	70	26	500	16	10000
88.440.3063	300	195	635	25.61	158	80	78	26	300	16	12000
88.440.3073	300	195	735	25.61	158	80	78	26	400	16	12000
88.440.3083	300	195	835	25.61	158	80	78	26	500	16	12000
88.440.3093	300	195	935	25.61	158	80	78	26	600	16	12000

> **88.470** **TORAX**

NL **Beweegbare Precisie Machinespanklem**  
 FR **Étau machine mobile de précision**  
 ES **Mordaza mecánica de alta precisión rotativa**  
 DE **bewegbare Präzisions Maschinenklemme**

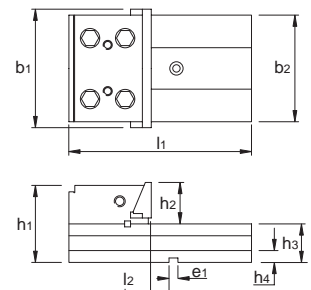


Ref.	b1	b2	h1	h2	h3	h4	l1	e1 N6
88.470.1250	125	95	80	40	40	15	160	16
88.470.1500	150	125	100	50	50	20	230	16

Ref.	b1	b2	h1	h2	h3	h4	l1	e1 N6
88.470.1750	175	145	118	60	58	20	240	16
88.470.2000	200	170	135	65	70	26	300	16

> **88.472** **TORAX**

NL **Vaste Precisie Machinespanklem**  
 FR **Étau machine fixe de précision**  
 ES **Mordaza Mecánica de precisión fija**  
 DE **Präzisions Maschinenschraubstöcke**

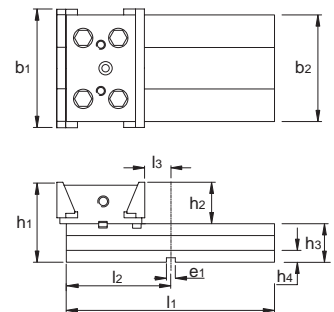


Ref.	b1	b2	h1	h2	h3	h4	l1	l2	e1 N6
88.472.1250	125	95	80	40	40	15	160	25.61	16
88.472.1500	150	125	100	50	50	20	230	25.61	16

Ref.	b1	b2	h1	h2	h3	h4	l1	l2	e1 N6
88.472.1750	175	145	118	60	58	20	240	25.61	16
88.472.2000	200	170	135	65	70	26	300	25.61	16

> **88.474** **TORAX**

NL **Vaste Dubbele Precisie Machinespanklem**  
 FR **Étau machine fixe double de précision**  
 ES **Mordaza Mecánica de doble precisión fija**  
 DE **Präzisions Maschinenschraubstock mit Doppelspannung**



Ref.	b1	b2	h1	h2	h3	h4	l1	l2	l3	e1 N6
88.474.1250	125	95	80	40	40	15	160	71	33.6	16
88.474.1500	150	125	100	50	50	20	230	122.5	33.6	16

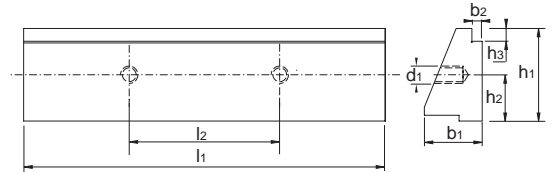
Ref.	b1	b2	h1	h2	h3	h4	l1	l2	l3	e1 N6
88.474.1750	175	145	118	60	58	20	240	79	33.6	16
88.474.2000	200	170	135	65	70	26	300	155	33.6	16





## > 88.475 TORAX

- NL Getrapte Bekken voor precisie machinespanklem 88.440, 88.470 en 88.472  
 FR Mors avec méplat pour étau de haute précision 88.440, 88.470 et 88.472  
 ES Garras escalonada para mordaza mecánica de alta precisión 88.440, 88.470 y 88.472  
 DE Stufenbacke für Präzisionsschraubstöcke 88.440, 88.470 und 88.472

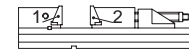
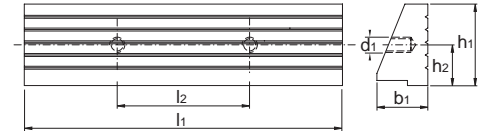


Ref.	l1	h1	b1	l2	h2	d1	b2	h3	Type
88.475.1002	100	24.5	14	20	10	M6	3	5	1
88.475.1004	100	24.5	14	62	10	M6	3	5	2
88.475.1202	125	32	19	32	15	M8	3	5	1
88.475.1204	125	32	19	80	15	M8	3	5	2
88.475.1502	150	40	24	50	19	M8	5	5	1

Ref.	l1	h1	b1	l2	h2	d1	b2	h3	Type
88.475.1504	150	40	24	90	19	M8	5	5	2
88.475.1702	175	43	24	50	20.5	M8	5	5	1
88.475.1704	175	43	24	116	20.5	M8	4	5	2
88.475.2002	200	53	30	76	25.5	M10	5	10	1
88.475.2004	200	53	30	138	25.5	M10	5	10	2

## > 88.476 TORAX

- NL Standaard Gegroefde Bekken voor precisie machinespanklem 88.440, 88.470 en 88.472  
 FR Mors rainurés standards pour étau de haute précision 88.440, 88.470 et 88.472  
 ES Garras escalonada para mordaza mecánica de alta precisión 88.440, 88.470 y 88.472  
 DE Stufenbacke für Präzisionsschraubstöcke 88.440, 88.470 und 88.472

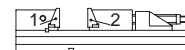
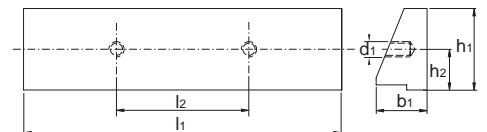


Ref.	l1	h1	b1	l2	h2	d1	Type
88.476.1002	100	24.5	14	20	10	M6	1
88.476.1004	100	24.5	14	62	10	M6	2
88.476.1202	125	32	19	32	15	M8	1
88.476.1204	125	32	19	80	15	M8	2
88.476.1502	150	40	24	50	19	M8	1
88.476.1504	150	40	24	90	19	M8	2

Ref.	l1	h1	b1	l2	h2	d1	Type
88.476.1702	175	43	24	50	20.5	M8	1
88.476.1704	175	43	24	116	20.5	M8	2
88.476.2002	200	53	30	76	25.5	M10	1
88.476.2004	200	53	30	138	25.5	M10	2
88.476.3002	300	63	35	90	30.5	M10	1
88.476.3004	300	63	35	181	30.5	M10	2

## > 88.477 TORAX

- NL Gladde Bekken voor precisie machinespanklem, 88.440, 88.470 en 88.472  
 FR Mors lisses pour étau de haute précision 88.440, 88.470 et 88.472  
 ES garras lisas para mordaza mecánica de alta precisión 88.440, 88.470 y 88.472  
 DE glatte Backen für Präzisionsschraubstöcke 88.440, 88.470 und 88.472

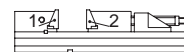
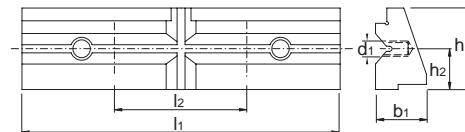
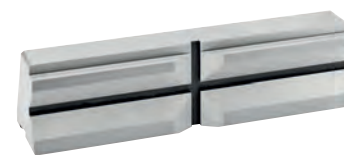


Ref.	l1	h1	b1	l2	h2	d1	Type
88.477.1002	100	24.5	14	20	10	M6	1
88.477.1004	100	24.5	14	62	10	M6	2
88.477.1202	125	32	19	32	15	M8	1
88.477.1204	125	32	19	80	15	M8	2
88.477.1502	150	40	24	50	19	M8	1
88.477.1504	150	40	24	90	19	M8	2

Ref.	l1	h1	b1	l2	h2	d1	Type
88.477.1702	175	43	24	50	20.5	M8	1
88.477.1704	175	43	24	116	20.5	M8	2
88.477.2002	200	53	30	76	25.5	M10	1
88.477.2004	200	53	30	138	25.5	M10	2
88.477.3002	300	63	35	90	30.5	M10	1
88.477.3004	300	63	35	181	30.5	M10	2

> **88.478 TORAX**

- NL Prismabekken voor precisie machinespanklem, 88.440, 88.470 en 88.472
- FR Mors prismatiques pour étau de haute précision 88.440, 88.470 et 88.472
- ES Garras prismáticas para mordaza mecánica de alta precisión 88.440, 88.470 y 88.472
- DE Prismabacken für Präzisionsschraubstöcke 88.440, 88.470 und 88.472



Ref.	l1	h1	b1	l2	h2	d1	Type
88.478.1004	100	24.5	14	62	10	M6	2
88.478.1204	125	32	19	80	15	M8	2
88.478.1504	150	40	24	90	19	M8	2

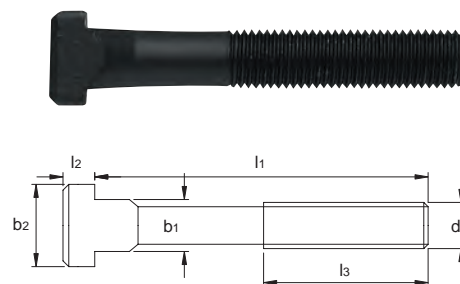
Ref.	l1	h1	b1	l2	h2	d1	Type
88.478.1704	175	43	24	116	20.5	M8	2
88.478.2004	200	53	30	138	25.5	M10	2





## > 88.600

NL T-Gleufbout, DIN 787, kwaliteit 8.8  
 FR Boulon en T, DIN 787, qualité de résistance 8.8  
 ES Tensor para ranuras T, DIN 787, calidad 8.8  
 DE T-Nutenschrauben, DIN 787, Qualität 8.8



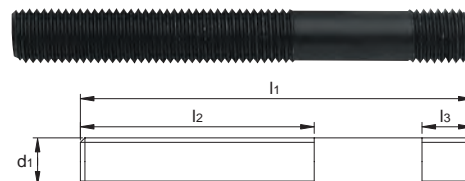
### DIN 787

Ref.	a	d1	l1	l3	b1	l2	b2
88.600.1004	10	M10	40	30	9.7	6	15
88.600.1006	10	M10	63	45	9.7	6	15
88.600.1010	10	M10	100	60	9.7	6	15
88.600.1205	12	M12	50	35	11.5	7	18
88.600.1206	12	M12	63	40	11.5	7	18
88.600.1208	12	M12	80	55	11.5	7	18
88.600.1210	12	M12	100	63	11.5	7	18
88.600.1212	12	M12	125	75	11.5	7	18
88.600.1216	12	M12	160	100	11.5	7	18
88.600.1220	12	M12	200	120	11.5	7	18
88.600.1405	14	M12	50	35	13.5	8	22
88.600.1406	14	M12	63	40	13.5	8	22
88.600.1408	14	M12	80	55	13.5	8	22
88.600.1410	14	M12	100	63	13.5	8	22
88.600.1412	14	M12	125	75	13.5	8	22
88.600.1416	14	M12	160	100	13.5	8	22
88.600.1420	14	M12	200	120	13.5	8	22
88.600.1606	16	M14	63	45	15.5	9	25
88.600.1610	16	M14	100	63	15.5	9	25
88.600.1616	16	M14	160	100	15.5	9	25
88.600.1620	16	M14	200	120	15.5	9	25
88.600.1625	16	M14	250	160	15.5	9	25
88.600.1706	16	M16	63	45	15.5	9	25
88.600.1708	16	M16	80	55	15.5	9	25
88.600.1710	16	M16	100	63	15.5	9	25
88.600.1716	16	M16	160	100	15.5	9	25
88.600.1720	16	M16	200	125	15.5	9	25
88.600.1725	16	M16	250	160	15.5	9	25
88.600.1806	18	M16	63	45	17.5	10	28
88.600.1808	18	M16	80	55	17.5	10	28
88.600.1810	18	M16	100	63	17.5	10	28

Ref.	a	d1	l1	l3	b1	l2	b2
88.600.1816	18	M16	160	100	17.5	10	28
88.600.1820	18	M16	200	125	17.5	10	28
88.600.1825	18	M16	250	160	17.5	10	28
88.600.2008	20	M20	80	55	19.5	12	32
88.600.2010	20	M20	100	63	19.5	12	32
88.600.2012	20	M20	125	85	19.5	12	32
88.600.2016	20	M20	160	110	19.5	12	32
88.600.2020	20	M20	200	125	19.5	12	32
88.600.2025	20	M20	250	160	19.5	12	32
88.600.2031	20	M20	315	180	19.5	12	32
88.600.2208	22	M20	80	55	21.5	14	35
88.600.2210	22	M20	100	63	21.5	14	35
88.600.2212	22	M20	125	85	21.5	14	35
88.600.2216	22	M20	160	100	21.5	14	35
88.600.2220	22	M20	200	125	21.5	14	35
88.600.2225	22	M20	250	160	21.5	14	35
88.600.2231	22	M20	315	180	21.5	14	35
88.600.2410	24	M24	100	70	23.5	16	40
88.600.2412	24	M24	125	85	23.5	16	40
88.600.2416	24	M24	160	110	23.5	16	40
88.600.2420	24	M24	200	125	23.5	16	40
88.600.2425	24	M24	250	160	23.5	16	40
88.600.2431	24	M24	315	180	23.5	16	40
88.600.2440	24	M24	400	250	23.5	16	40
88.600.2810	28	M24	100	70	27.5	18	44
88.600.2812	28	M24	125	85	27.5	18	44
88.600.2816	28	M24	160	110	27.5	18	44
88.600.2820	28	M24	200	125	27.5	18	44
88.600.2825	28	M24	250	160	27.5	18	44
88.600.2831	28	M24	315	180	27.5	18	44
88.600.2840	28	M24	400	250	27.5	18	44

## > 88.605

NL Draadeind, DIN 6379, kwaliteit 8.8  
 FR Goujon, DIN 6379, qualité de résistance 8.8  
 ES Tensor sin cabeza, DIN 6379, calidad 8.8  
 DE Stiftschrauben, DIN 6379, Qualität 8.8



### DIN 6379

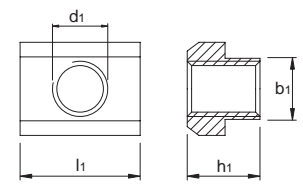
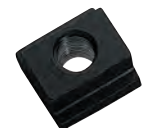
Ref.	d1	l1	l2	l3	Ref.	d1	l1	l2	l3
88.605.0604	M6	40	20	9	88.605.1420	M14	200	125	17
88.605.0606	M6	60	37	9	88.605.1425	M14	250	160	17
88.605.0607	M6	70	50	9	88.605.1606	M16	63	32	19
88.605.0608	M6	80	60	9	88.605.1608	M16	80	50	19
88.605.0804	M8	40	20	11	88.605.1610	M16	100	63	19
88.605.0806	M8	63	40	11	88.605.1612	M16	125	75	19
88.605.0808	M8	85	55	11	88.605.1616	M16	160	100	19
88.605.0810	M8	100	63	11	88.605.1620	M16	200	125	19
88.605.0812	M8	125	75	11	88.605.1625	M16	250	160	19
88.605.1005	M10	50	25	13	88.605.1631	M16	315	180	19
88.605.1008	M10	80	50	13	88.605.1808	M18	80	50	23
88.605.1010	M10	100	63	13	88.605.1810	M18	100	63	23
88.605.1012	M10	125	75	13	88.605.1812	M18	125	75	23
88.605.1014	M10	140	80	13	88.605.1816	M18	160	100	23
88.605.1016	M10	160	100	13	88.605.1820	M18	200	125	23
88.605.1205	M12	50	25	15	88.605.1825	M18	250	160	23
88.605.1206	M12	63	32	15	88.605.1831	M18	315	180	23
88.605.1208	M12	80	50	15	88.605.2008	M20	80	32	27
88.605.1210	M12	100	63	15	88.605.2010	M20	100	63	27
88.605.1212	M12	125	75	15	88.605.2012	M20	125	75	27
88.605.1216	M12	160	100	15	88.605.2016	M20	160	100	27
88.605.1220	M12	200	125	15	88.605.2020	M20	200	125	27
88.605.1406	M14	63	32	17	88.605.2025	M20	250	160	27
88.605.1410	M14	100	50	17	88.605.2031	M20	315	180	27
88.605.1412	M14	125	75	17	88.605.2040	M20	400	250	27
88.605.1416	M14	160	100	17	88.605.2210	M22	100	45	31

> **88.605**

Ref.	d1	l1	l2	l3	Ref.	d1	l1	l2	l3
88.605.2212	M22	125	75	31	88.605.2725	M27	250	160	39
88.605.2216	M22	160	100	31	88.605.2731	M27	315	180	39
88.605.2220	M22	200	125	31	88.605.2740	M27	400	250	39
88.605.2225	M22	250	160	31	88.605.2750	M27	500	315	39
88.605.2231	M22	315	180	31	88.605.3012	M30	125	55	43
88.605.2240	M22	400	250	31	88.605.3016	M30	160	100	43
88.605.2410	M24	100	45	35	88.605.3020	M30	200	125	43
88.605.2412	M24	125	75	35	88.605.3025	M30	250	160	43
88.605.2416	M24	160	100	35	88.605.3031	M30	315	180	43
88.605.2420	M24	200	125	35	88.605.3040	M30	400	250	43
88.605.2425	M24	250	160	35	88.605.3050	M30	500	315	43
88.605.2431	M24	315	180	35	88.605.3616	M36	160	80	51
88.605.2440	M24	400	250	35	88.605.3620	M36	200	125	51
88.605.2450	M24	500	315	35	88.605.3625	M36	250	160	51
88.605.2712	M27	125	75	39	88.605.3631	M36	315	200	51
88.605.2716	M27	160	100	39	88.605.3640	M36	400	250	51
88.605.2720	M27	200	125	39	88.605.3650	M36	500	315	51

> **88.610**

NL T-Gleufmoer, DIN 508, kwaliteit 10  
 FR Ecrou en T, DIN 508, qualité de résistance 10  
 ES Cabeza-T, DIN 508, calidad 10  
 DE Muttern für T-Nuten, DIN 508, Qualität 10

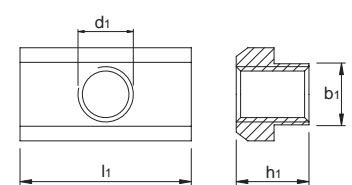
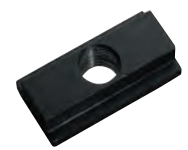


DIN 508

Ref.	a	d1	l1	h1	b1	Ref.	a	d1	l1	h1	b1
88.610.0806	8	M6	13	10	7.7	88.610.2018	20	M18	32	24	19.7
88.610.1008	10	M8	15	12	9.7	88.610.2216	22	M16	35	28	21.7
88.610.1208	12	M8	18	14	11.7	88.610.2220	22	M20	35	28	21.7
88.610.1210	12	M10	18	14	11.7	88.610.2420	24	M20	40	32	23.7
88.610.1410	14	M10	22	16	13.7	88.610.2422	24	M22	40	32	23.7
88.610.1412	14	M12	22	16	13.7	88.610.2820	28	M20	44	36	27.7
88.610.1612	16	M12	25	18	15.7	88.610.2824	28	M24	44	36	27.7
88.610.1614	16	M14	25	18	15.7	88.610.3224	32	M24	50	40	31.5
88.610.1812	18	M12	28	20	17.7	88.610.3227	32	M27	50	40	31.5
88.610.1814	18	M14	28	20	17.7	88.610.3624	36	M24	54	44	35.5
88.610.1816	18	M16	28	20	17.7	88.610.3630	36	M30	54	44	35.5
88.610.2016	20	M16	32	24	19.7	88.610.4236	42	M36	65	52	41.6

> **88.612**

NL T-Gleufmoer, lange uitvoering, DIN 508-L, kwaliteit 10  
 FR Ecrou en T allongé, DIN 508-L, qualité de résistance 10  
 ES Cabeza-T, versión larga, DIN 508-L, calidad 10  
 DE Muttern für T-Nuten, langes Modell, DIN 508-L, Qualität 10



DIN 508-L

Ref.	a	d1	l1	h1	b1	Ref.	a	d1	l1	h1	b1
88.612.1008	10	M8	30	12	9.7	88.612.2220	22	M20	70	28	21.7
88.612.1210	12	M10	36	14	11.7	88.612.2422	24	M22	80	32	23.7
88.612.1412	14	M12	44	16	13.7	88.612.2824	28	M24	88	36	27.7
88.612.1614	16	M14	50	18	15.7	88.612.3227	32	M27	100	40	31.5
88.612.1816	18	M16	56	20	17.7	88.612.3630	36	M30	108	44	35.5
88.612.2018	20	M18	64	24	19.7						

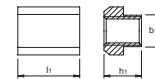
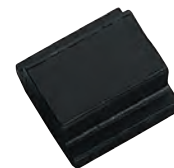






### > 88.613

NL T-Gleufmoer, onbewerkt, DIN 508-R  
 FR Ecrou en T borgne, DIN 508-R  
 ES Cabeza-T en bruto, DIN 508-R  
 DE T-Nutenstein, Rohling, DIN 508-R



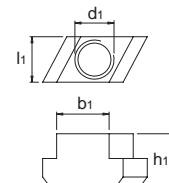
DIN  
508-R

Ref.	a	l1	h1	b1
88.613.1000	10	15	12	9.7
88.613.1200	12	18	14	11.7
88.613.1400	14	22	16	13.7
88.613.1600	16	25	18	15.7
88.613.1800	18	28	20	17.7
88.613.2000	20	32	24	19.7

Ref.	a	l1	h1	b1
88.613.2200	22	35	28	21.7
88.613.2400	24	40	32	23.7
88.613.2800	28	44	36	27.7
88.613.3200	32	50	40	31.5
88.613.3600	36	54	44	35.5

### > 88.614

NL T-Gleufmoer, systeem "Rhombus"  
 FR Ecrou en T, système "Rhombus"  
 ES Cabeza-T, sistema "Romboidal"  
 DE Muttern für T-Nuten, System "Rhombus"

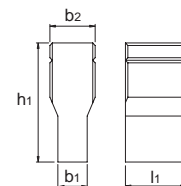
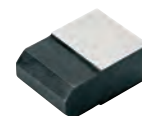


Ref.	a	d1	l1	h1	b1
88.614.1008	10	M8	15	12	9.7
88.614.1210	12	M10	18	14	11.7
88.614.1412	14	M12	22	16	13.7
88.614.1614	16	M14	25	18	15.7

Ref.	a	d1	l1	h1	b1
88.614.1816	18	M16	28	20	17.7
88.614.2220	22	M20	32	24	21.7
88.614.2824	28	M24	35	28	27.7

### > 88.615

NL T-Gleufsteen, DIN 6323, inzetgehard en geslepen  
 FR Lardon percé en T, DIN 6323, trempé et rectifié  
 ES Regletas en T, DIN 6323, templado y rectificado  
 DE T-Nutensteine, DIN 6323, Gehärtet und geschliffen



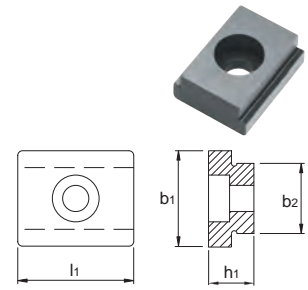
DIN  
6323

Ref.	b1	b2	h1	l1
88.615.1012	10	12	12	20
88.615.1212	12	12	28.6	20
88.615.1220	12	20	14	32
88.615.1420	14	20	14	32
88.615.1620	16	20	14	32
88.615.1820	18	20	14	32

Ref.	b1	b2	h1	l1
88.615.2020	20	20	45.5	32
88.615.2220	22	20	50.5	40
88.615.2420	24	20	55.5	40
88.615.2820	28	20	61.5	40
88.615.3620	36	20	76.5	50

> **88.616**

NL T-Gleufsteen, DIN 6322-A, inzetgehard en geslepen  
 FR Lardon percé en T, DIN 6322-A, trempé et rectifié  
 ES Regletas en T, DIN 6322-A, templado y rectificado  
 DE T-Nutensteine, DIN 6322-A, Gehärtet und geschliffen



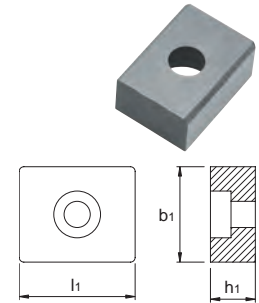
DIN  
6322-A

Ref.	b1	b2	h1	l1
88.616.1000	10	20	10	22
88.616.1200	12	20	10	22
88.616.1400	14	20	10	25
88.616.1600	16	20	10	25
88.616.1800	18	20	10	25

Ref.	b1	b2	h1	l1
88.616.2200	22	20	12	32
88.616.2400	24	20	12	32
88.616.2800	28	20	12	32
88.616.3600	36	20	12	32

> **88.617**

NL T-Gleufsteen, DIN 6322-B, inzetgehard en geslepen  
 FR Lardon percé en T, DIN 6322-B, trempé et rectifié  
 ES Regletas en T, DIN 6322-B, templado y rectificado  
 DE T-Nutensteine, DIN 6322-B, Gehärtet und geschliffen



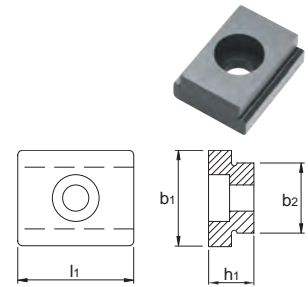
DIN  
6322-B

Ref.	b1	h1	l1
88.617.1000	10	8	20
88.617.1200	12	8	20
88.617.1400	14	10	22
88.617.1600	16	10	22

Ref.	b1	h1	l1
88.617.1800	18	10	22
88.617.2000	20	10	22
88.617.2200	22	12	32
88.617.2400	24	12	32

> **88.618**

NL T-Gleufsteen, voor machinespanklemmen 88.440, 88.470, 88.472  
 FR Lardon percé en T, pour étaux 88.440, 88.470, 88.472  
 ES Regletas en T, para mordaza mecánica 88.440, 88.470, 88.472  
 DE T-Nutensteine, für Präzisionsschraubstöcke 88.440, 88.470, 88.472



Ref.	b1	b2	h1	l1
88.618.1200	12	16	10	25
88.618.1400	14	16	10	25
88.618.1600	16	16	10	25
88.618.1800	18	16	10	25
88.618.2000	20	16	12	25

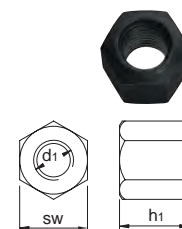
Ref.	b1	b2	h1	l1
88.618.2200	22	16	12	25
88.618.2400	24	16	12	25
88.618.2800	28	16	12	25
88.618.3600	36	16	12	25





### > 88.630

NL Hoge Moer (1,5x diam.), DIN 6330-B, kwaliteit 10  
 FR Ecrou Haut (1,5x diam.), DIN 6330-B, qualité de résistance 10  
 ES Tuerca alargada alta (1,5x diám.), DIN 6330-B, calidad 10  
 DE Sechskantmuttern, hoch (1,5 x durchm.), DIN 6330-B, Qualität 10



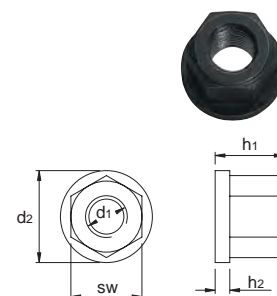
DIN  
6330-B

Ref.	d1	h1	sw
88.630.0600	M6	8	10
88.630.0800	M8	12	13
88.630.1000	M10	15	17
88.630.1200	M12	18	19
88.630.1400	M14	21	22
88.630.1600	M16	24	24
88.630.1800	M18	27	27

Ref.	d1	h1	sw
88.630.2000	M20	30	30
88.630.2200	M22	33	32
88.630.2400	M24	36	36
88.630.2700	M27	40	41
88.630.3000	M30	45	46
88.630.3600	M36	54	55

### > 88.631

NL Kraagmoer, DIN 6331, kwaliteit 10  
 FR Ecrou à collet, DIN 6331, qualité de résistance 10  
 ES Tuerca hexagonal con collar, DIN 6331, calidad 10  
 DE Sechskantmuttern mit Bund, DIN 6331, Qualität 10



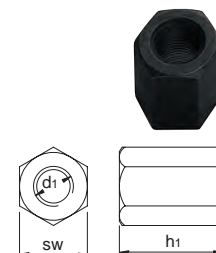
DIN  
6331

Ref.	d1	sw	h1	d2	h2
88.631.0600	M6	10	9	14	3
88.631.0800	M8	13	12	18	3,5
88.631.1000	M10	17	15	22	4
88.631.1200	M12	19	18	25	4
88.631.1400	M14	22	21	28	4,5
88.631.1600	M16	24	24	31	5

Ref.	d1	sw	h1	d2	h2
88.631.1800	M18	27	27	34	5
88.631.2000	M20	30	30	37	6
88.631.2200	M22	32	33	40	6
88.631.2400	M24	36	36	45	6
88.631.2700	M27	41	40	51	8
88.631.3000	M30	46	45	58	8

### > 88.632

NL Verlengmoer (3x diam.), DIN 6334, kwaliteit 10  
 FR Ecrou allongé haut (3x diam.), DIN 6334, qualité de résistance 10  
 ES Tuerca alargada alta (3x diám.), DIN 6334, calidad 10  
 DE Verlängerungsmuttern (3x durchm.), DIN 6334, Qualität 10



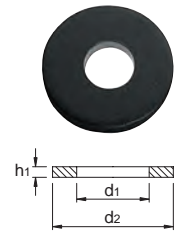
DIN  
6334

Ref.	d1	h1	sw
88.632.0600	M6	18	10
88.632.0800	M8	24	13
88.632.1000	M10	30	17
88.632.1200	M12	36	19
88.632.1400	M14	42	22
88.632.1600	M16	48	24

Ref.	d1	h1	sw
88.632.1800	M18	54	27
88.632.2000	M20	60	30
88.632.2200	M22	66	32
88.632.2400	M24	72	36
88.632.2700	M27	81	41
88.632.3000	M30	90	46

> **88.640**

NL Onderlegschiif, DIN 6340  
 FR Rondelle, DIN 6340  
 ES Arandela, DIN 6340  
 DE Unterlegscheiben, DIN 6340



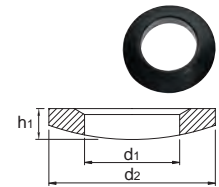
DIN  
6340

Ref.	M	d1	d2	h1
88.640.0600	M6	6.4	17	3
88.640.0800	M8	8.5	23	4
88.640.1000	M10	10.5	28	4
88.640.1200	M12	13	35	5
88.640.1400	M14	15	40	5
88.640.1600	M16	17	45	6
88.640.1800	M18	19	45	6

Ref.	M	d1	d2	h1
88.640.2000	M20	21	50	6
88.640.2200	M22	23	50	7
88.640.2400	M24	25	60	8
88.640.2700	M27	28	60	8
88.640.3000	M30	31	65	10
88.640.3600	M36	38	80	12

> **88.641**

NL Kogelschiif, DIN 6319-C  
 FR Rondelle sphérique, DIN 6319-C  
 ES Disco esférico, DIN 6319-C  
 DE Kugelscheiben, DIN 6319-C



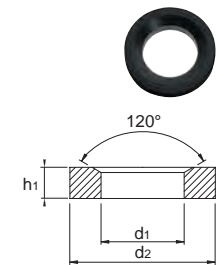
DIN  
6319-C

Ref.	M	d1	d2	h1
88.641.0800	M8	8.4	17	3.2
88.641.1000	M10	10.5	21	4
88.641.1200	M12	13	24	4.6
88.641.1400	M14	15	28	5

Ref.	M	d1	d2	h1
88.641.1600	M16	17	30	5.3
88.641.2000	M20	21	36	6.3
88.641.2400	M24	25	44	8.2
88.641.3000	M30	31	56	11.2

> **88.642**

NL Kegelschiif, hol, DIN 6319-D  
 FR Rondelle articulée, cimentée, DIN 6319-D  
 ES Cazoleta cónica, cementada, DIN 6319-D  
 DE Kegelpfannen, hohl, DIN 6319-D



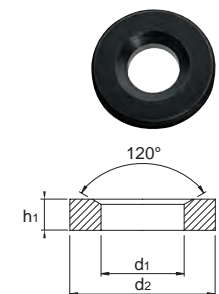
DIN  
6319-D

Ref.	M	d1	d2	h1
88.642.0800	M8	9.6	17	3.5
88.642.1000	M10	12	21	4.2
88.642.1200	M12	14.2	24	5
88.642.1400	M14	16.5	28	5.6

Ref.	M	d1	d2	h1
88.642.1600	M16	19	30	6.2
88.642.2000	M20	23.2	36	7.5
88.642.2400	M24	28	44	9.5
88.642.3000	M30	35	56	12

> **88.643**

NL Kegelschiif, DIN 6319-G  
 FR Rondelle articulée, DIN 6319-G  
 ES Cazoleta cónica, DIN 6319-G  
 DE Kegelpfannen, DIN 6319-G



DIN  
6319-G

Ref.	M	d1	d2	h1
88.643.0800	M8	9.6	23	5
88.643.1000	M10	12	28	5
88.643.1200	M12	14.2	35	6
88.643.1400	M14	16.5	40	6

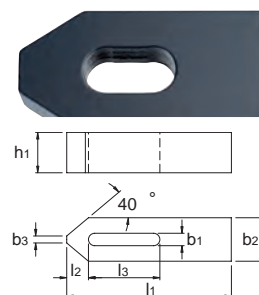
Ref.	M	d1	d2	h1
88.643.1600	M16	19	45	7
88.643.2000	M20	23.2	50	8
88.643.2400	M24	28	60	10
88.643.3000	M30	35	68	10





### > 88.650

NL Spanijzer, vlak, DIN 6314  
FR Bride droite, DIN 6314  
ES Brida plana, DIN 6314  
DE Flache Spanneisen, DIN 6314



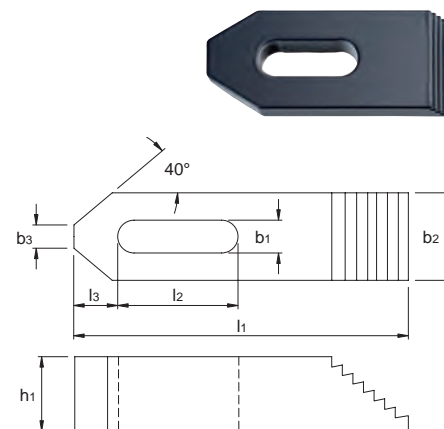
DIN  
6314

Ref.	b1	l1	h1	M	b2	b3	l2	l3
88.650.0705	7	50	10	M6	20	8	10	20
88.650.0906	9	60	12	M8	25	10	13	22
88.650.1108	11	80	15	M10	30	12	15	30
88.650.1408	14	80	20	M12, M14	40	14	21	30
88.650.1410	14	100	20	M12, M14	40	14	21	40
88.650.1412	14	125	20	M12, M14	40	14	21	50
88.650.1810	18	100	25	M16, M18	50	18	26	40
88.650.1812	18	125	25	M16, M18	50	18	26	45
88.650.1816	18	160	25	M16, M18	50	18	26	65

Ref.	b1	l1	h1	M	b2	b3	l2	l3
88.650.2216	22	160	30	M20, M22	60	22	30	80
88.650.2220	22	200	30	M20, M22	60	22	30	80
88.650.2225	22	250	30	M20, M22	60	22	30	100
88.650.2616	26	160	30	M24	70	26	35	60
88.650.2620	26	200	30	M24	70	26	35	80
88.650.2625	26	250	30	M24	70	26	35	105
88.650.3425	34	250	40	M30	80	34	45	100
88.650.3431	34	315	50	M30	80	34	45	130

### > 88.655

NL Spanijzer, vertand, DIN 6314-Z  
FR Bride droite pour cales crénelées, DIN 6314-Z  
ES Brida dentada, DIN 6314-Z  
DE Spanneisen mit Treppenzähnen, DIN 6314-Z



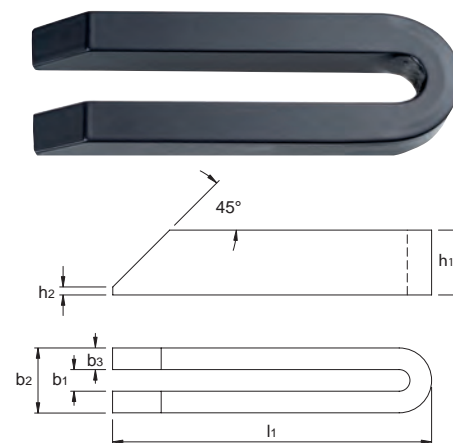
DIN  
6314-Z

Ref.	b1	l1	h1	M	b2	b3	l2	l3
88.655.0705	7	50	10	M6	20	8	10	20
88.655.0906	9	60	12	M8	25	10	13	22
88.655.1108	11	80	15	M10	30	12	15	30
88.655.1410	14	100	20	M12, M14	40	14	21	40

Ref.	b1	l1	h1	M	b2	b3	l2	l3
88.655.1812	18	125	25	M16, M18	50	18	26	45
88.655.2216	22	160	30	M20, M22	60	22	30	60
88.655.2620	26	200	30	M24	70	26	35	80

### > 88.660

NL Spanbeugel, afgeschuind  
FR Bride à fourche simple  
ES Brida horquilla  
DE Abgeschrägte Gabelspanneisen



DIN  
6315-B

Ref.	b1	l1	M	h1	b2	b3	h2
88.660.0706	7	60	M6	12	12	6	3
88.660.0908	9	80	M8	25	15	8	4
88.660.1110	11	100	M10	31	20	10	5
88.660.1412	14	125	M12, M14	38	25	12	6
88.660.1416	14	160	M12, M14	38	25	12	6
88.660.1420	14	200	M12, M14	38	25	12	6

Ref.	b1	l1	M	h1	b2	b3	h2
88.660.1816	18	160	M16, M18	48	30	15	8
88.660.1820	18	200	M16, M18	48	30	15	8
88.660.1825	18	250	M16, M18	48	40	15	8
88.660.2220	22	200	M20, M22	52	40	15	10
88.660.2225	22	250	M20, M22	52	40	15	10
88.660.2231	22	315	M20, M22	52	40	20	10

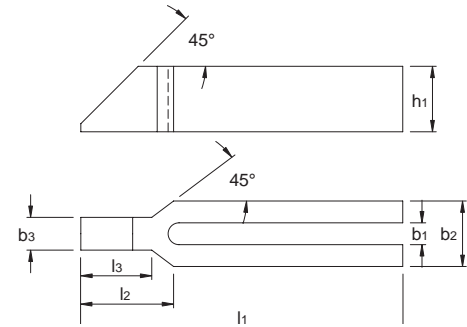
88.660

Ref.	b1	l1	M	h1	b2	b3	h2
88.660.2620	26	200	M24	66	40	20	10
88.660.2625	26	250	M24	66	40	20	10
88.660.2631	26	315	M24	66	40	20	10

Ref.	b1	l1	M	h1	b2	b3	h2
88.660.3425	34	250	M30	74	50	20	12
88.660.3431	34	315	M30	74	50	20	12
88.660.3440	34	400	M30	74	50	20	12

> 88.665

- NL Spanijzer met neus, DIN 6315-GN
- FR Bride avec nez, DIN 6315-GN
- ES Brida con nariz, DIN 6315-GN
- DE Spanneisen mit Nase, DIN 6315-GN



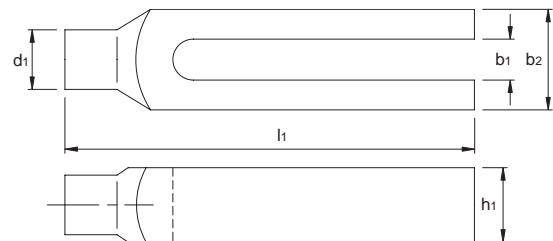
DIN 6315-GN

Ref.	b1	l1	h1	M	b2	b3	l2	l3
88.665.0910	9	100	15	M8	30	16	32	18
88.665.1112	11	125	20	M10	30	20	38	24
88.665.1416	14	160	25	M12, M14	40	24	47	30
88.665.1420	14	200	25	M12, M14	40	24	47	30
88.665.1816	18	160	30	M16, M18	50	28	57	36
88.665.1820	18	200	30	M16, M18	50	28	57	36
88.665.1825	18	250	30	M16, M18	50	28	57	36

Ref.	b1	l1	h1	M	b2	b3	l2	l3
88.665.2220	22	200	40	M20, M22	60	35	68	45
88.665.2225	22	250	40	M20, M22	60	35	68	45
88.665.2231	22	315	40	M20, M22	60	35	68	45
88.665.2625	26	250	40	M24	70	43	83	56
88.665.2631	26	315	40	M24	70	43	83	56
88.665.3431	34	315	50	M30	80	50	88	56
88.665.3440	34	400	50	M30	80	50	88	56

> 88.670

- NL Spanijzer met ronde neus, DIN 6315-C
- FR Bride avec nez rond, DIN 6315-C
- ES Brida con espiga redonda, DIN 6315-C
- DE Spanneisen mit Kugel-Nase, DIN 6315-C



DIN 6315-C

Ref.	b1	l1	d1	M	b2	h1
88.670.0708	7	80	12	M6	19	15
88.670.0910	9	100	12	M8	25	15
88.670.1112	11	125	16	M10	31	20
88.670.1416	14	160	20	M12, M14	38	25

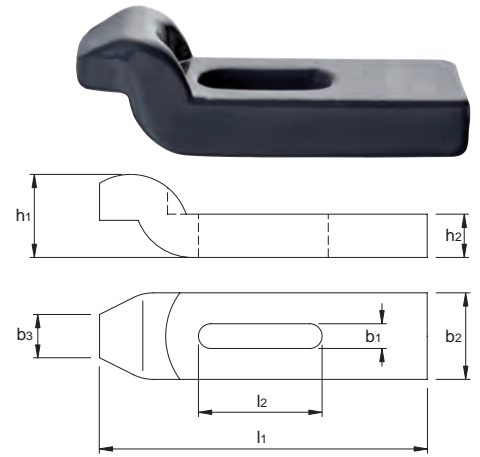
Ref.	b1	l1	d1	M	b2	h1
88.670.1820	18	200	24	M16, M18	48	30
88.670.2225	22	250	30	M20, M22	62	40
88.670.2631	26	315	38	M24	66	40
88.670.3440	34	400	45	M27, M30	74	50





### > 88.675

NL Spanijzer, gebogen, DIN 6316  
 FR Bride contre-coudée, DIN 6316  
 ES Brida acodada, DIN 6316  
 DE Spanneisen, gekröpft, DIN 6316



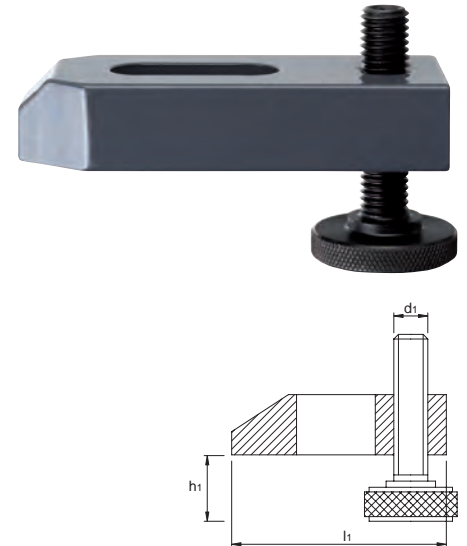
DIN  
6316

Ref.	b1	l1	M	h1	b2	b3	h2
88.675.0908	9	80	M8	25	25	12	12
88.675.1110	11	100	M10	30	32	15	15
88.675.1412	14	125	M12, M14	40	40	20	20
88.675.1812	18	125	M16, M18	50	50	25	25
88.675.1816	18	160	M16, M18	50	50	25	25

Ref.	b1	l1	M	h1	b2	b3	h2
88.675.2216	22	160	M20	60	70	30	30
88.675.2220	22	200	M20	60	70	30	30
88.675.2620	26	200	M24	70	80	35	35
88.675.2625	26	240	M24	70	80	35	35

### > 88.700

NL Spanijzer, verstelbaar, Type 6314-T  
 FR Bride expansible, Type 6314-T  
 ES Brida regulable, Tipo 6314-T  
 DE Verstellbares Spanneisen, Typ 6314-T



DIN  
6314-T

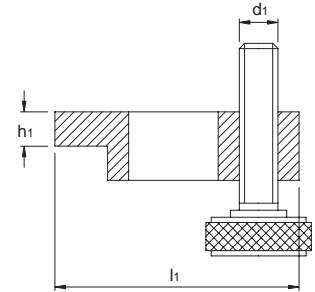
Ref.	e1 N6	l1	d1	h1	M
88.700.1108	11	80	M10	8-27	M10
88.700.1410	14	100	M12	10-34	M12, M14
88.700.1812	18	125	M16	13-41	M16, M18

Ref.	e1 N6	l1	d1	h1	M
88.700.2216	22	160	M20	16-55	M20, M22
88.700.2620	26	200	M24	20-60	M24



> **88.705**

NL Spanijzer, verstelbaar, Type 6314-AT  
 FR Bride expansible, Type 6314-AT  
 ES Brida regulable, Tipo 6314-AT  
 DE Verstellbares Spanneisen, Typ 6314-AT



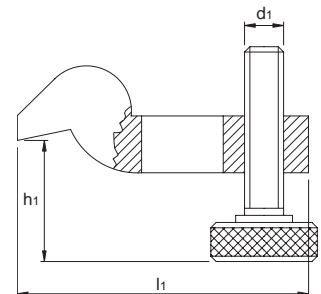
DIN  
 6314-AT

Ref.	e1 N6	l1	d1	h1	h2	M
88.705.1108	10	80	M10	11-30	14	M10
88.705.1410	14	100	M12	16-40	14	M12, M14

Ref.	e1 N6	l1	d1	h1	h2	M
88.705.1812	18	125	M16	22-50	16	M16, M18
88.705.2216	22	160	M20	26-65	20	M20, M22

> **88.710**

NL Spanijzer, verstelbaar, Type 6316-T  
 FR Bride expansible, Type 6316-T  
 ES Brida regulable, Tipo 6316-T  
 DE Verstellbares Spanneisen, Typ 6316-T



DIN  
 6316-T

Ref.	e1 N6	l1	d1	h1	M
88.710.1110	11	100	M10	23-42	M10
88.710.1412	14	125	M12	30-53	M12, M14

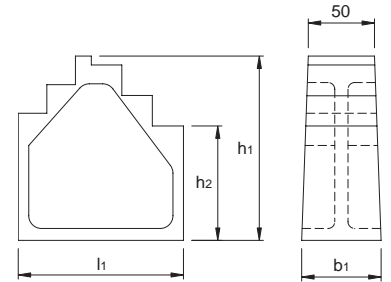
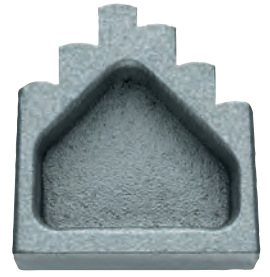
Ref.	e1 N6	l1	d1	h1	M
88.710.1816	18	160	M16	38-65	M16, M18
88.710.2220	22	200	M20	46-83	M20, M22





### > 88.750

NL Ophoogblok, DIN 6318  
FR Cale étagée, DIN 6318  
ES Calzos de escalera, DIN 6318  
DE Treppenblöcke, DIN 6318



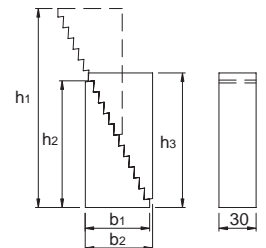
DIN  
6318

Ref.	l1	b1	h2	h1
88.750.0095	55	50	57.5	95

Ref.	l1	b1	h2	h1
88.750.0140	60	100	102.5	140

### > 88.780

NL Opstopblok, type 6500  
FR Cale crénelée, type 6500  
ES Calzo universal, tipo 6500  
DE Spannunterlagen, Typ 6500

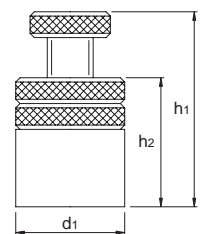


Ref.	b2	h1	h2	b1	h3
88.780.0050	25	50	36	22	40
88.780.0100	35	100	70	33	74

Ref.	b2	h1	h2	b1	h3
88.780.0190	60	190	120	60	124

### > 88.800

NL Vijzel, type 6400  
FR Vérin de calage et d'alignement, type 6400  
ES Gato de apuntalamiento y alineado, tipo 6400  
DE Höhen-Richtschraubbock, Typ 6400

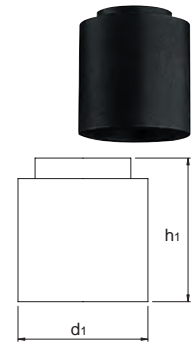


Ref.	Type	d1	h2	h1
88.800.0100	1	28	30	45
88.800.0200	2	38	45	65
88.800.0300	3	45	65	95
88.800.0400	4	60	90	140

Ref.	Type	d1	h2	h1
88.800.0500	5	80	125	190
88.800.0600	6	100	190	280
88.800.0700	7	100	275	500

> **88.805**

- NL Onderzetstuk voor Vijzel
- FR Rallonge pour Vérin de calage et d'alignement
- ES Alargo para Gato de apuntalamiento y alineado
- DE Distanzstücke für Höhen-Richtschaubock

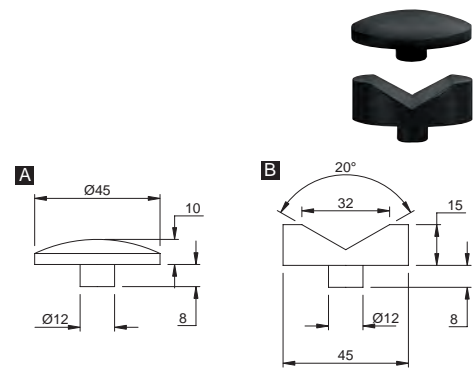


Ref.	Type	d1	h1
88.805.0101	1	28	15
88.805.0102	1	28	30
88.805.0103	1	28	60
88.805.0201	2	38	20
88.805.0202	2	38	40
88.805.0203	2	38	80
88.805.0301	3	45	30

Ref.	Type	d1	h1
88.805.0302	3	45	60
88.805.0303	3	45	100
88.805.0401	4	60	50
88.805.0402	4	60	100
88.805.0501	5	80	65
88.805.0502	5	100	130

> **88.810**

- NL Opzetelement voor Vijzel
- FR Tête pour Vérin de calage et d'alignement
- ES Cabeza para Gato de apuntalamiento y alineado
- DE Strukturelement für Höhen-Richtschaubock



Ref.	Type
88.810.0100	A

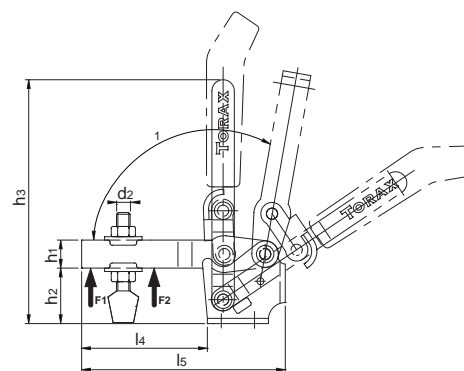
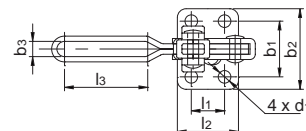
Ref.	Type
88.810.0200	B





## > 88.900 TORAX

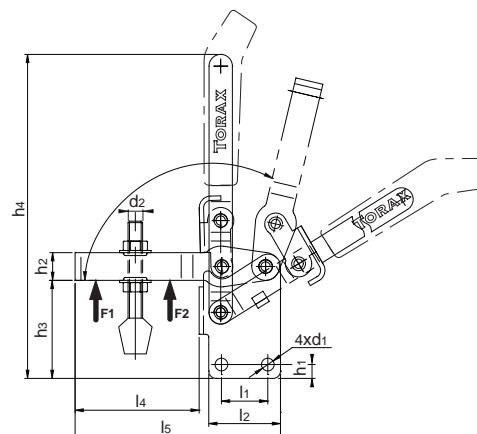
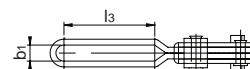
- NL Verticale Spanklem, met horizontale voet  
 FR Sauterelle verticale, à pied horizontal  
 ES Grapas Rápidas vertical, con base horizontal  
 DE Vertikale Spannklemme, mit waagrechtem Fuß



Ref.	Type	b1	l1	d1	b2	l2	b3	h1	h2	h3	l3	l4	l5	$\alpha 1$	F1	F2	d2
88.900.0000	0	23.8	15.9	4.4	33.3	25.4	5	8	18.8	76.1	17.5	26	54.2	100°	0.5	0.7	M4 x 25
88.900.0100	1	27	12.7	5.2	39.7	25.4	6.4	9.8	22.7	97.3	16	33	64	100°	0.8	1.1	M6 x 44
88.900.0300	3	31.8	19	7.2	46	34.9	8.7	16	31.8	140	47.6	71.4	116	100°	1.4	2.5	M8 x 63
88.900.0400	4	45.3	31.8	8.7	64.3	49.2	11	19	44	202	49.2	85.1	140.9	105°	2	3	M10 x 85
88.900.0500	5	45.2	31.8	8.7	64.2	50.8	13.4	23	51	225	79.4	125.4	176.2	100° - 135°	3	5	M12 x 100
88.900.0600	6	69.8	50.8	12.3	95.2	76.2	16.7	32	82.6	305	79.4	153	229.2	100° - 140°	3.5	5.5	M16 x 150

## > 88.902 TORAX

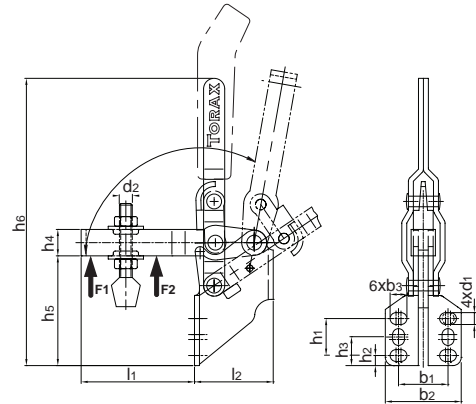
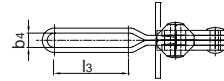
- NL Verticale Spanklem, met verticale voet  
 FR Sauterelle verticale, à pied vertical  
 ES Grapas Rápidas vertical, con base vertical  
 DE Vertikale Spannklemme, mit vertikalem Fuß



Ref.	Type	h1	l1	d1	l2	b1	h2	h3	h4	l3	l4	l5	$\alpha 1$	F1	F2	d2
88.902.0000	0	4.75	15.9	4.4	25.4	5	8	30.1	87.4	17.5	26	54.2	100°	0.8	1.1	M4 x 25
88.902.0100	1	6.4	12.7	5.2	25.4	6.4	9.8	34.6	109		32.9	64	100°	0.8	1.1	M6 x 44
88.902.0300	3	7.1	19	7.2	34.9	8.7	16	46.9	154	47.6	71.4	64	100°	1.4	2.5	M8 x 63
88.902.0400	4	9.5	31.8	8.7	49.2	11	19	67.3	222	62.5	85.1	116	105°	2	3	M10 x 85
88.902.0500	5	9.5	31.8	8.7	50.8	13.4	22.5	67	241	79.4	125.4	140.9	100° - 135°	3	5	M12 x 100
88.902.0600	6	12.7	50.8	12.3	76.2	16.7	31.8	115	338	90	153	176.2	100° - 140°	3.5	5.5	M16 x 150

> **88.904** **TORAX**

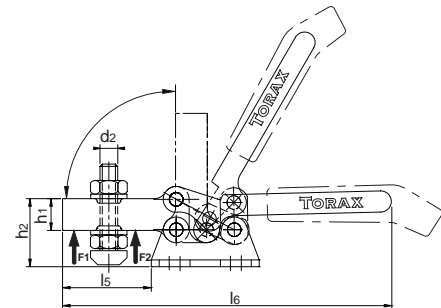
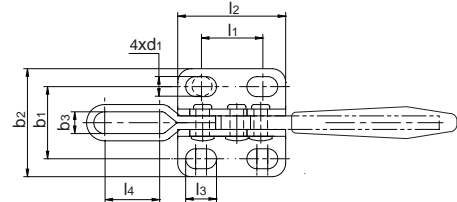
- NL Verticale Spanklem, met haakse hoek
- FR Sauterelle verticale, à angle perpendiculaire
- ES Grapas Rápidas vertical, con ángulo perpendicular
- DE Vertikale Spannklemme, mit rechtwinkliger Erstellung



Ref.	Type	b1	h1	d1	b2	b3	b4	h2	h3	h4	h5	h6	l1	l2	l3	$\alpha 1$	F1	F2	d2
88.904.0100	1	20	14	4.8	30		8.4	7.5		10	44.8	119	36	34.2	22.9	90°	0.8	1.1	M4 x 25
88.904.0300	3	30	22.4	7.2	46	10.2	8.7	6.1	17.3	16	66.6	174	68.2	47.7	47.6	100°	1.4	25	M8 x 63

> **88.910** **TORAX**

- NL Horizontale Spanklem, met horizontale voet
- FR Sauterelle horizontale, à pied horizontal
- ES Grapas Rápidas horizontal, con base horizontal
- DE Horizontaler Spannklemme, mit waagrechtem Fuß



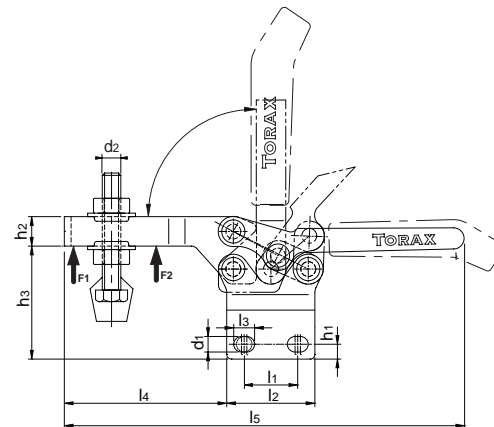
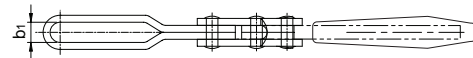
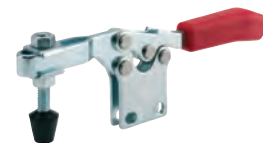
Ref.	Type	b1	l1	b2	l2	l3	b3	h1	h2	l4	l5	l6	$\alpha 1$	F1	F2	d2
88.910.0000	0	15.9	13.5	23.8	23.8	6.8	4.8	7	15	11	19.6	77	90°	0.25	0.4	M4 x 25
88.910.0200	2	22	27	36	37	6	7.4	12.7	38.1	35	56.2	142	85°	1	1.2	M6 x 44
88.910.0300	3	22.2	23.1	35	38	9	8.7	12.7	47.6	44	70	168	90°	1.8	2.5	M8 x 63
88.910.0500	5	41.3	41.3	57.2	57.1		11	19	63.5	78	107	292	85°	3	5	M10 x 85





## > 88.912 TORAX

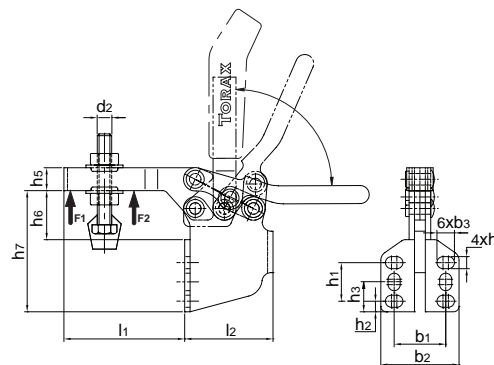
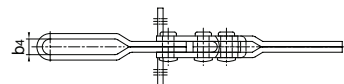
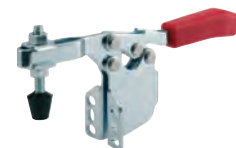
- NL Horizontale Spanklem, met verticale voet  
 FR Sauterelle horizontale, à pied vertical  
 ES Grapas Rápidas horizontal, con base vertical  
 DE Horizontaler Spannklemme, mit vertikalem Fuß



Ref.	Type	h1	l1	d1	l3	l2	b1	h2	h3	l4	l5	$\alpha 1$	F1	F2	d2
88.912.0000	0	3.95	13.5	4.4	6.8	23.8	4.8	7	16.1	19.6	77	90°	0.25	0.4	M4 x 25
88.912.0200	2	7	27	5.2	6	37	7.4	12.7	37.9	56.2	56.2	85°	1	1.2	M6 x 44
88.912.0300	3	6.4	23.1	6.7	9	38	8.7	12.7	48.7	70	168	90°	1.8	2.5	M8 x 63
88.912.0500	5	7.9	41.3	8.3		57.1	11	19	63	107	292	85°	3	5	M10 x 85

## > 88.914 TORAX

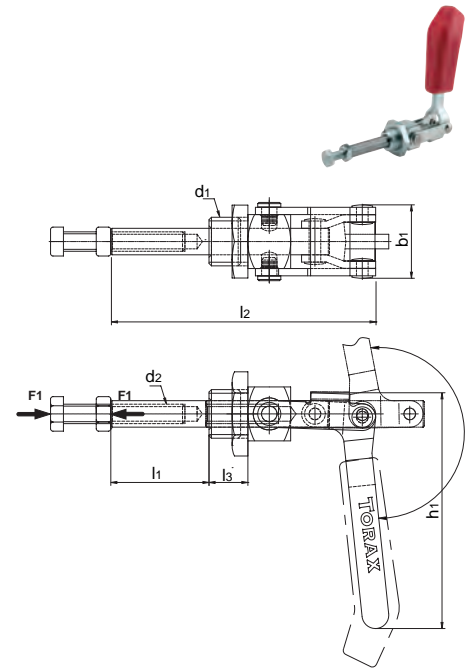
- NL Horizontale Spanklem, met haakse hoek  
 FR Sauterelle horizontale, à angle perpendiculaire  
 ES Grapas Rápidas horizontal, con ángulo perpendicular  
 DE Horizontaler Spannklemme, mit rechtwinkliger Erstellung



Ref.	Type	b1	h1	b3	h4	b2	b4	h2	h3	h5	h6	h7	l1	l2	$\alpha 1$	F1	F2	d2
88.914.0200	2	22	20.4	8.2	5.2	36	7.4	6.1	16.3	12.7	17.2	62.2	53.25	44	85°	1	1.2	M6 x 44
88.914.0300	3	28.6	21.4	9.7	6.7	43.4	8.7	5.85	16.55	12.7	27.2	67.2	67	49	90°	1.8	2.5	M8 x 63

> **88.920** **TORAX**

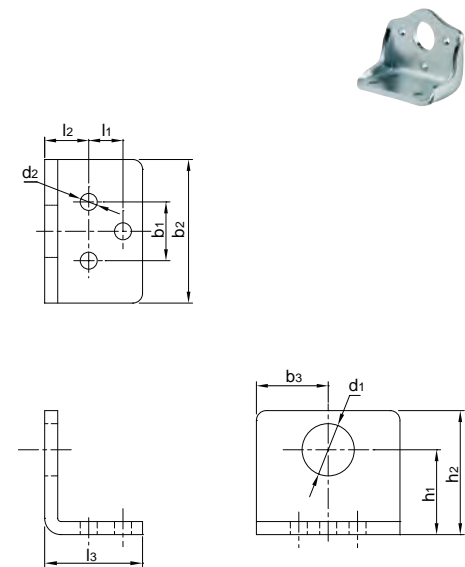
- NL Schuifstang Spanklem, zonder voet
- FR Sauterelle à tige coulissante, sans pied
- ES Grapas Rápidas Barra corredera, sin base
- DE Spannklemme mit Schiebbestange, ohne Fuß



Ref.	Type	l1	l2	b1	d1	h1	l3	$\alpha 1$	F1	d2
88.920.0200	2	21	64.2	24	M16 x 1,5	75	12.7	180°	2	M6 x 1 x 25
88.920.0300	3	39.7	115	31	M20x 1,5	98	15.9	180°	2.5	M8 x 1,25 x 35
88.920.0500	5	70.3	171	39	M27 x 2	137	22.3	180°	4.5	M10 x 1,5 x 40

> **88.921** **TORAX**

- NL Haakse voet voor Schuifstang
- FR Pied perpendiculaire pour tige coulissante
- ES Base perpendicular para Barra corredera
- DE Winkelfuß für Schubstange



Ref.	Type	l1	b1	h1	l2	b2	b3	d1	d2	h2	l3
88.921.0200	2	10.5	18	26	13.5	44	22	16	5.2	38	30
88.921.0300	3	19	41.3	33.3	14.4	69.9	34.95	20	5.6	52.4	41.3
88.921.0500	5	31.8	45.2	37	21	76	38	27	8.5	62	62

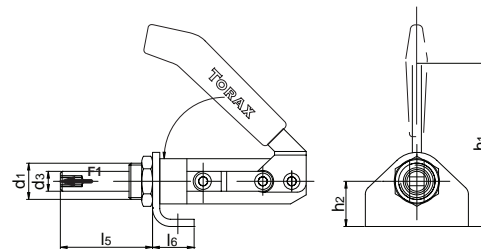
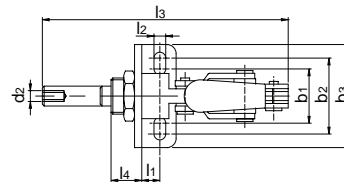






## > 88.924 TORAX

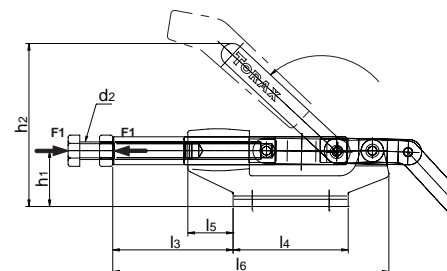
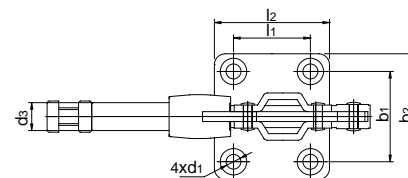
NL Schuifstang Spanklem, met voet  
 FR Sauterelle à tige coulissante, à pied  
 ES Grapas Rápidas Barra corredera, con base  
 DE Spannklemme mit Schiebbestange, mit Fuß



Ref.	Type	l1	b1	b2	l2	b3	h1	h2	l3	l4	l5	l6	d1	d3	$\alpha 1$	F1	d2
88.924.0300	3	30	10	42	6.5	57	85	25	136	17	51	23	M20 x 1,5	11	190°	2.5	M6 x 1
88.924.0500	5	30	13	45	8.5	64	120	30	16.55	22	59.5	30	M24 x 1,5	16	185°	4.5	M10 x 1,5

## > 88.928 TORAX

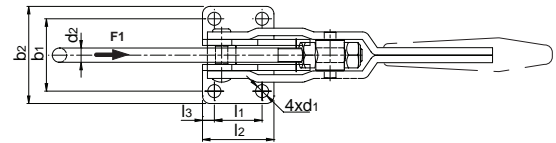
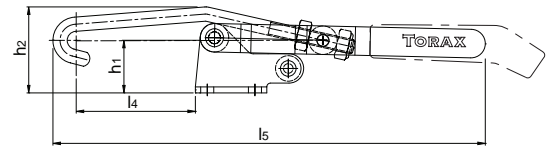
NL Schuifstang Spanklem, met voet, zware uitvoering  
 FR Sauterelle à tige coulissante, à pied, version extra lourde  
 ES Grapas Rápidas Barra corredera, con base, versión macizo  
 DE Spannklemme mit Schiebbestange, mit Fuß, schwere Ausführung



Ref.	Type	b1	l1	b2	l2	h1	h2	d1	d3	l3	l4	l5	l6	$\alpha 1$	F1	d2
88.928.0300	3	41.1	35	57.2	52.4	25.4	74.2	6.7	12.7	54.8	52.4	20.6	125	190°	4	M8 x 1,25
88.928.0500	5	41.1	41.1	57.2	58.8	31.8	93.5	8.3	16	81	58.8	31.8	163	185°	10	M10 x 1,5
88.928.0700	7	50.8	50.8	71.4	73.2	44.4	131.6	8.3	19.2	119.8	73.2	50.8	235	185°	25	M12 x 1,75

> **88.935 TORAX**

NL Sluitklem, zonder tegenhouder  
 FR Collier de serrage, sans bras support  
 ES Pasador de cierre, sin contrasoporte  
 DE Beckenendlage, ohne Gegenhalter



Ref.	Type	b1	l1	d1	b2	l2	h1	h2	d2	l4	l5	l3	F1
88.935.0100	1	35	19	5.6	49.2	38.1		36.5	8	58.4	210.2	12.7	2
88.935.0300	3	49.2	31.8	8.7	65.7	47.6	35.1	57.3	9.5	79.4	288	7.9	3
88.935.0500	5	60.3	28.6	10.3	85.7	54	46	66.7	12.7	76.2	335.2	12.7	5

> **88.936 TORAX**

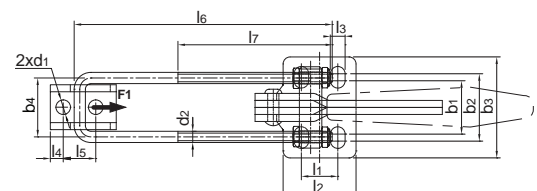
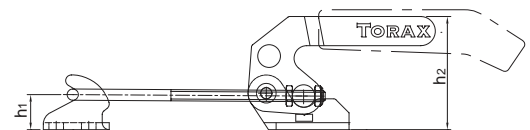
NL Tegenhouder, voor 88.935  
 FR Bras support, pour 88.935  
 ES Contrasoporte, para 88.935  
 DE Gegenhalter, für 88.935



Ref.	Type
88.936.1100	1
88.936.1300	3
88.936.1500	5

> **88.940 TORAX**

NL Sluitklem, met voet en tegenhouder  
 FR Collier de serrage, à pied et bras support  
 ES Pasador de cierre, con base y contrasoporte  
 DE Beckenendlage, mit Fuß und Gegenhalter



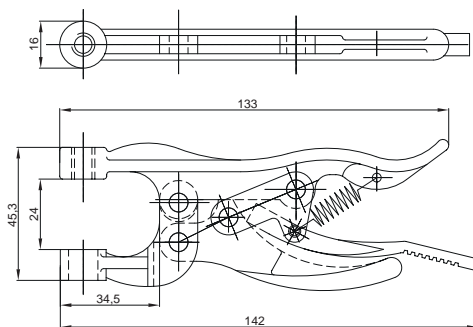
Ref.	Type	b1	l1	b2	l2	b3	l3	b4	l4	l5	d1	h1	h2	l6	l7	F1	d2
88.940.0200	2	19	13	24	26	36	5.2	21	4.6	11.6	5.2	12.5	40.3	92	55	1.6	M4
88.940.0300	3	25	19	32	35	48	6.5	28.5	17.7	14	6.4	21	59	114	60	3.2	M6
88.940.0500	5	36	32	45	51	60	8.5	44.5	8	19	8.5	24.2	82.3	152	60	7	M8





### > 88.965 TORAX

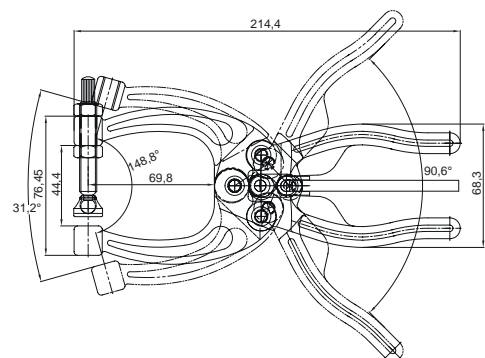
NL Klemtang  
FR Pince de bridage  
ES Pinza de sujeción  
DE Schweißer zange



Ref.	Nr.
88.965.0200	1

### > 88.966 TORAX

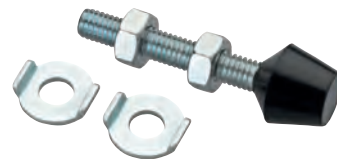
NL Klemtang groot  
FR Pince de bridage grand modèle  
ES Pinza de sujeción grande  
DE Schweißer zange groß



Ref.	Nr.
88.966.0320	1

### > 88.991 TORAX

NL Bout met kunststof voet  
FR Boulon à pied plastique  
ES Perno con base sintética  
DE Bolzen mit Kunststoffplatte



Ref.	d1
88.991.1025	M4x25
88.991.1042	M4x42
88.991.3044	M6x44
88.991.3051	M6x51
88.991.4063	M8x63
88.991.4085	M10x85
88.991.6100	M12x100

> **88.994** **TORAX**

NL Klemplaat  
 FR Plaque de serrage  
 ES Placa de fijación  
 DE Klemmplatte



Ref.	d1
88.994.0010	8-M4
88.994.0020	1/4-M6
88.994.0040	5/16-M8
88.994.0050	3/8-M10
88.994.0060	1/2-M12
88.994.0080	5/8-M16





### > 88.860 INTERNATIONAL TOOLS

NL ECO PRO Set Parallelvlakstukken  
FR Jeu de Cales parallèles ECO PRO  
ES Juego Bases paralelas ECO PRO  
DE ECO PRO Satz Parallelunterlagen



**ECO PRO**

Ref.	#	l1	hxb
88.860.0100	16	100	5-10-15-20 (2 mm) / 6-11-16-21 (3 mm) / 7-12-17-22 (4 mm) / 9-13-19-24 (6 mm)
88.860.0125	24	125	11-16-21-26-31-36 (8 mm) / 13-18-23-28-33-38 (10 mm) / 14-20-25-30-35-40 (12 mm) / 17-22-27-32-37-42 (14 mm)
88.860.0150	24	150	11-16-21-26-31-36 (8 mm) / 13-18-23-28-33-38 (10 mm) / 14-20-25-30-35-40 (12 mm) / 17-22-27-32-37-42 (14 mm)

### > 88.870 INTERNATIONAL TOOLS

NL ECO PRO Set Parallelvlakstukken  
FR Jeu de Cales parallèles ECO PRO  
ES Juego Bases paralelas ECO PRO  
DE ECO PRO Satz Parallelunterlagen



**ECO PRO**

Ref.	#	l1	hxb
88.870.0104	8	100	10-14-18-22-26-30-34-38 (4 mm)
88.870.0128	8	120	12-17-22-25-28-32-36-38 (8 mm)
88.870.0164	9	160	10-14-18-22-26-30-34-38-42 (4 mm)
88.870.0168	8	160	12-17-22-25-28-32-36-38 (8 mm)
88.870.0208	8	200	17-22-26-28-32-36-38-42 (8 mm)

### > 89.250 Phantom

NL Set Spantangen, standaard kwaliteit, 15 µm  
FR Jeu de Pinces, qualité standard, 15 µm  
ES Juego de Pinzas, calidad estándar, 15 µm  
DE Satz Spannzangen, Standard-Qualität, 15 µm



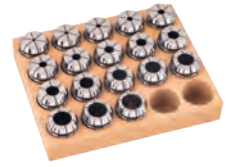
DIN 6499-B  

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	#	Type	Ø mm
89.250.1600	10	ER16	1-10
89.250.2500	15	ER25	2-16
89.250.3200	18	ER32	3-20
89.250.4000	23	ER40	4-26

> **89.252 Phantom**

NL Set Spantangen, Ultra precies, 5 µm  
 FR Jeu de Pinces, Ultra précis, 5 µm  
 ES Juego de Pinzas, Ultrapreciso, 5 µm  
 DE Satz Spannzangen, Ultrapräzise, 5 µm



DIN 6499-B ER 0,005

**NIEUW NOUVEAU NUEVO NEU**

Ref.	#	Type	Ø mm
89.252.1600	10	ER16	1-10
89.252.2500	15	ER25	2-16
89.252.3200	18	ER32	3-20
89.252.4000	23	ER40	4-26

> **89.260 Phantom**

NL Set Spantangen, rubber afgedicht, 8 µm  
 FR Jeu de Pinces, joint d'étanchéité en caoutchouc, 8 µm  
 ES Juego de Pinzas, sellado de goma, 8 µm  
 DE Satz Spannzangen, Gummi abgedichtet, 8 µm



DIN 6499 ER 0,008 40 BAR

**NIEUW NOUVEAU NUEVO NEU**

Ref.	#	Type	Ø mm
89.260.1600	5	ER16	3,4,6,8,10
89.260.2500	8	ER25	3,4,6,8,10,12,14,16
89.260.3200	10	ER32	3,4,6,8,10,12,14,16,18,20
89.260.4000	10	ER40	3,4,6,8,10,12,14,16,18,20

> **89.262 Phantom**

NL Set Spantangen, staal afgedicht, 8 µm  
 FR Jeu de Pinces, acier scellé, 8 µm  
 ES Juego de Pinzas, acero sellado, 8 µm  
 DE Satz Spannzangen, Stahl versiegelt, 8 µm



DIN 6499 ER 0,008 120 BAR

**NIEUW NOUVEAU NUEVO NEU**

Ref.	#	Type	Ø mm
89.262.1600	5	ER16	3,4,6,8,10
89.262.2500	8	ER25	3,4,6,8,10,12,14,16
89.262.3200	10	ER32	3,4,6,8,10,12,14,16,18,20
89.262.4000	10	ER40	3,4,6,8,10,12,14,16,18,20





## > 89.264 Phantom

NL Set Spantangen, Coolant Jet, 8 µm  
 FR Jeu de Pinces, Coolant Jet, 8 µm  
 ES Juego de Pinzas, Coolant Jet, 8 µm  
 DE Satz Spannzangen, Coolant Jet, 8 µm



DIN 6499  
 ER  
 0,008  
 40 BAR

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	#	Type	Ø mm
89.264.1600	5	ER16	3,4,6,8,10
89.264.2500	8	ER25	3,4,6,8,10,12,14,16
89.264.3200	10	ER32	3,4,6,8,10,12,14,16,18,20
89.264.4000	9	ER40	4,6,8,10,12,14,16,18,20

## > 89.282 Phantom

NL Set Spantanghouder met Spantangen  
 FR Coffret avec Mandrin porte-pinces et pinces ER  
 ES Juego de Portapinzas, pinzas y llave  
 DE Spannzangensätze mit Spannzangenfutter



DIN 6499-B  
 ER

Ref.	1	2	3	4
89.282.0225	MK2 - ER25		82.825 Ø 6-10-12-16	82.990.2500
89.282.0332	MK3 - ER32		82.832 Ø6-10-12-16-20	82.990.3200
89.282.0432	MK4 - ER32		82.832 Ø6-10-12-16-20	82.990.3200
89.282.3032		SK30 - ER32	82.832 Ø6-10-12-16-20	82.990.3200
89.282.4032		SK40 - ER32	82.832 Ø6-10-12-16-20	82.990.3200

## > 89.878 Phantom

NL Set Opstopblokken  
 FR Jeu de Cales crénelées  
 ES Juego Calzos universales  
 DE Satz Füllblock



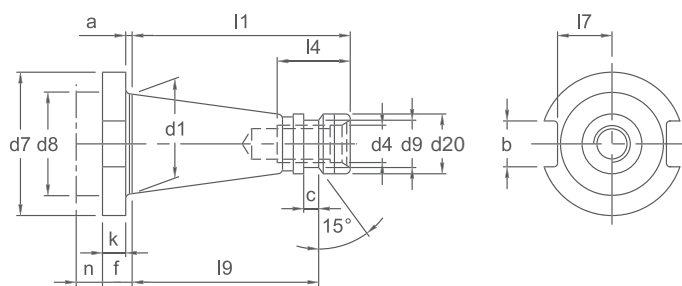
Ref.	Type
89.878.1000	8 x 25-50 mm, 8 x 35-100 mm, 4 x 60-190 mm





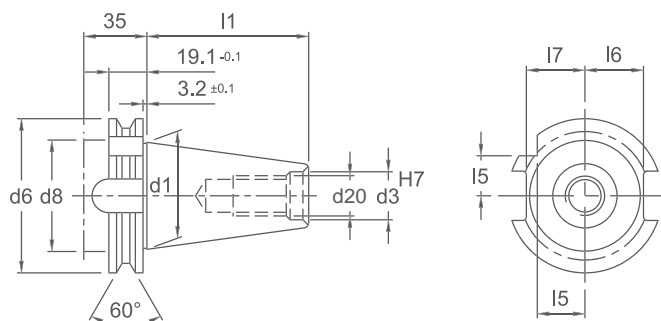


NL SK-opname volgens DIN 2080  
FR Attachements SA selon DIN 2080  
ES Sujeción SA según DIN 2080  
DU SK-Aufnahmen nach DIN 2080



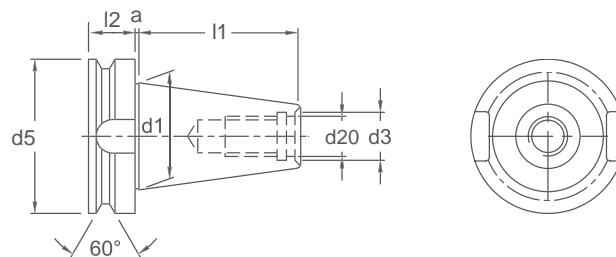
d2	d1	a	b	d20	d4	d7	d8	l1	l4	l7	l9	d9	c	k	f	n
SK 30	31,75	1,6	16,1	17,4	M12	50	36	68,4	24	16,2				8	9,5	9
SK 40	44,45	1,6	16,1	25,3	M16	63	50	93,4	32	22,5	82	21,1	7	10	11,1	11
SK 50	69,85	3,2	25,7	39,6	M24	97,5	78	126,8	47	35,3	115	32	13	12	15,1	16
SK 60	107,95	3,2	25,7	60,2	M30	156	136	206,8	59	60				16	19,1	16

NL SK-opname volgens DIN 69871-A  
FR Attachements SK selon DIN 69871-A  
ES Sujeción SK según DIN 69871-A  
DU SK-Aufnahmen nach DIN 69871-A



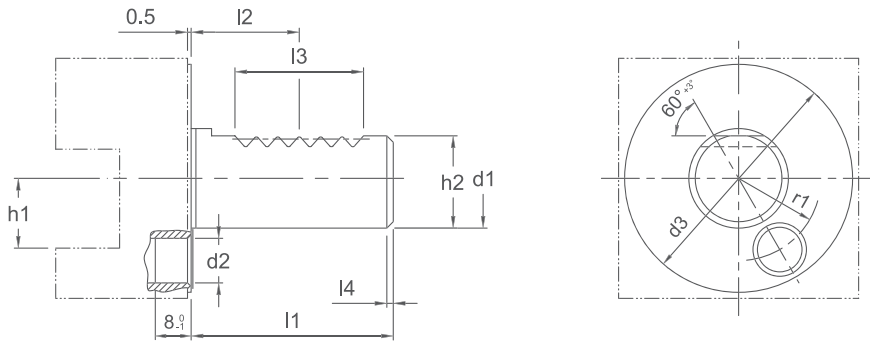
d2	d1	d20	d3	d6	d8	l1	l5	l6	l7
SK 30	31,75	M12	13	50,00	45	47,8	15,00	16,40	19,00
SK 40	44,45	M16	17	63,55	50	68,40	18,50	22,80	25,00
SK 45	57,15	M20	21	82,55	63	82,70	24,00	29,10	31,30
SK 50	69,85	M24	25	97,50	80	101,75	30,00	35,50	37,70

NL BT-opname volgens MAS 403-BT  
FR Attachements BT selon MAS 403-BT  
ES Sujeción BT según MAS 403-BT  
DU BT-Aufnahmen nach MAS 403-BT



d2	d1	l1	a	l2	d20	d3	d5
BT 30	31,75	48,4	2	22	M12	12,5	46
BT 35	38,1	56,5	2	22	M12	13	53
BT 40	44,45	65,4	2	27	M16	17	63
BT 45	57,15	82,8	3	33	M20	21	85
BT 50	69,85	101,8	3	38	M24	25	100

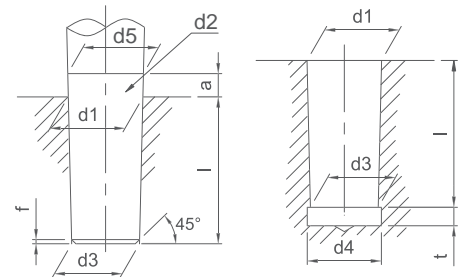
NL VDI-opnames volgens DIN 69880  
 FR Porte-outils VDI selon DIN 69880  
 ES Portaherramientas VDI según DIN 69880  
 DE VDI-Aufnahmen nach DIN 69880



d1	l1	d2	Tol.	d3	h1	h2	l2	l3	l4	r1
h6	+0,3				max	+0,1	+0,05	min	1	+0,02
16	32	8	H6	40	12	15	12,7	16	2	14,5
20	40	10	H6	50	16	18	21,7	24	2	18
25	48	10	H6	58	16	23,5	21,7	24	2	21
30	55	14	H8	68	20	27	29,7	40	2	25
40	63	14	H8	83	25	36	29,7	40	3	32
50	78	16	H8	98	32	45	35,7	48	3	37
60	94	16	H8	123	32	55	43,7	56	4	48

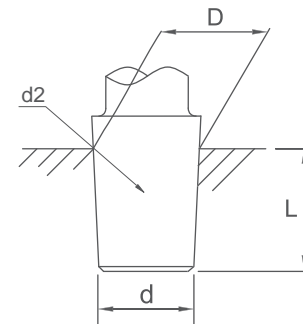
NL Boorstift-opnames volgens DIN 238  
 FR Attachements pour mandrin porte-forets selon DIN 238  
 ES Sujeción espiga para portabrocas según DIN 238  
 DE Bohrfutterkegel-Aufnahmen nach DIN 238

d2	a	d1	d5	d3	d4	f	l	t
B6	3	6,35	6,5	5,85	6,5	0,5	10	3
B10	3,5	10,094	10,3	9,4	9,8	1	14,5	3,5
B12	3,5	12,065	12,2	11,1	11,5	1	18,5	3,5
B16	5	15,733	16,0	14,5	15,0	1,5	24,0	4,0
B18	5	17,780	18,0	16,2	16,8	1,5	25,0	4,0
B18 short	5	17,431	18,0	16,2	16,8	1,5	25,0	4,0
B22	5	21,793	22,0	19,8	20,5	2,0	40,5	4,5
B25	5	23,825	24,1	21,3	22,0	2,0	50,5	4,5



NL Boorstift-opnames volgens Jacobs  
 FR Attachements pour mandrin porte-forets selon Jacobs  
 ES Sujeción espiga para portabrocas según Jacobs  
 DE Bohrfutterkegel-Aufnahmen nach DIN Jacobs

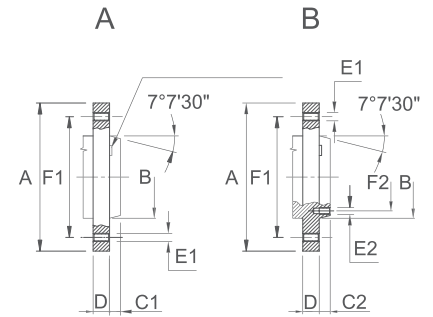
d2	D	d	L	Con. (%)
J1	9,754	8,469	16,669	7,709
J2 short	13,940	12,386	19,050	8,155
J2	14,199	12,386	22,225	8,155
J33	15,850	14,327	25,400	6,350
J6	17,170	15,852	25,400	5,191
J3	20,599	18,951	30,956	5,325





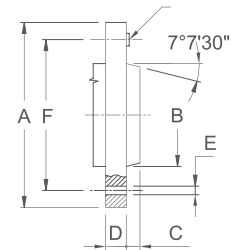
NL Machinespilneuzen volgens DIN 55026 (bevestiging van voren)  
 FR Broches de machine selon DIN 55026 (fixation par l'avant)  
 ES Cabezales de torno según DIN 55026 (montaje delantero)  
 DE Maschinenspindeln nach DIN 55026 (Befestigung von vorne)

Nr.	A	B max.	C1	C2	D	E1	F1	E2	F2
3	9212	53,983	11	-	16	3xM10	70,6	-	-
4	108	63,251	11	-	20	11xM10	82,6	-	-
5	133	82,753	13	14,288	22	11xM10	104,8	8xM10	61,9
6	165	106,385	14	15,875	25	11xM12	133,4	8xM12	82,6
8	210	139,731	16	17,462	28	11xM16	171,4	8xM16	111,1
11	280	196,883	18	19,05	35	11xM20 (11xM18)	235	8xM20 (8xM18)	165,1
15	380	285,791	19	20,638	42	12xM24 (12xM22)	330,2	11xM24 (11xM22)	247,6
20	520	412,795	21	22,225	48	12xM24	463,6	11xM24	398,3



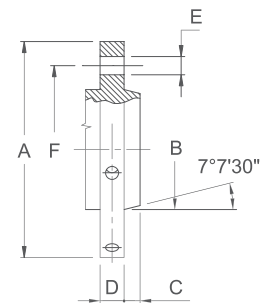
NL Machinespilneuzen met Bajonetbevestiging volgens DIN 55027  
 FR Broches de machine avec fixation Baïonnette selon DIN 55027  
 ES Cabezales de torno con fijación Bayoneta según DIN 55027  
 DE Maschinenspindeln mit Bajonet-Befestigung nach DIN 55027

Bajonet						
Nr.	A	B max.	C	D	E	F
3	102	53,983	11	16	3 x 21	75
4	112	63,251	11	20	3 x 21	85
5	135	82,573	13	22	4 x 21	104,8
6	170	106,385	14	25	4 x 23	133,4
8	220	139,731	16	28	4 x 29	171,4
11	290	196,883	18	35	6 x 36	235
15	400	285,791	19	42	6 x 43	330,2
20	540	412,795	21	48	6 x 43	463,6



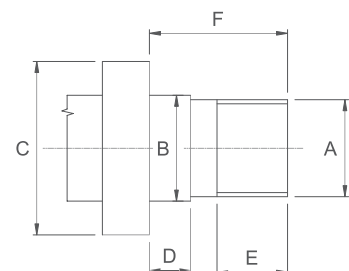
NL Machinespilneuzen met Camlockbevestiging volgens DIN 55029  
 FR Broches de machine avec fixation Camlock selon DIN 55029  
 ES Cabezales de torno con fijación Camlock según DIN 55029  
 DE Maschinenspindeln mit Camlock-Befestigung nach DIN 55029

Camlock						
Nr.	A	B max.	C	D	E	F
3	92	53,983	11	32	3 x 15,1	70,6
4	117	63,251	11	34	3 x 16,7	82,6
5	146	82,573	13	38	6 x 19,8	104,8
6	181	106,385	14	45	6 x 23	133,4
8	225	139,731	16	50	6 x 31	171,4
11	298	196,883	18	60	6 x 36	235
15	403	285,791	19	70	6 x 35,7	330,2



NL Machinespilneuzen met draad volgens DIN 800  
 FR Broches de machine avec filetage selon DIN 800  
 ES Cabezales de torno con roscado según DIN 800  
 DE Maschinenspindeln mit Gewinde nach DIN 800

M					
A	Bg5	C min.	D	E	F
M20	21	30	6,3	10	20
M24	25	36	8	12	24
M33	34	50	9	14	30
M39	40	56	10	16	35
M45	46	67	11	18	40
M52	55	80	12	20	45
M60	62	90	14	22	50
M76x6	78	112	16	30	63
M105x6	106	150	20	40	80



**NL** Machinespindelneuzen volgens ANSI B 5.9  
**FR** Broches de machine selon ANSI B 5.9  
**ES** Cabezales de torno según ANSI B 5.9  
**DE** Maschinenspindeln nach ANSI B 5.9

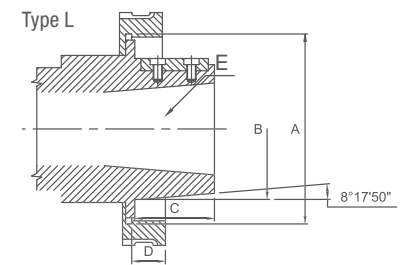
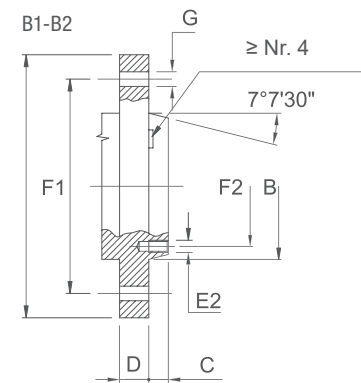
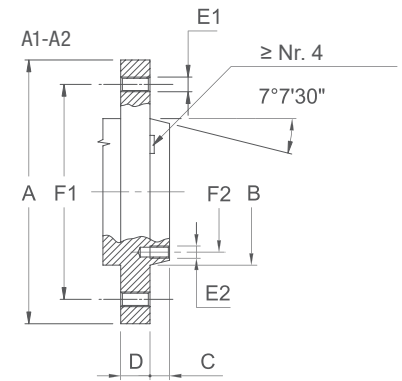
A1								
Nr.	A	B max.	C -0,025	D	E1	F1	E2	F2
5	133,4	82,275	14,288	22,2	11 x 7/16-14 UNC	104,8	8 x 7/16-14 UNC	61,9
6	165,1	106,390	15,875	25,4	11 x 1/2-13 UNC	133,4	8 x 1/2-13 UNC	82,6
8	209,5	139,735	17,462	28,6	11 x 5/8-11 UNC	171,4	8 x 5/8-11 UNC	111,1
11	279,4	196,885	19,05	34,9	11 x 3/4-10 UNC	235	8 x 3/4-10 UNC	165,1
15	381	285,8	20,638	41,3	12 x 7/8-9 UNC	330,2	11 x 7/8-9 UNC	247,6

A2						
Nr.	A	B max.	C -0,025	D	E1	F1
3	92,1	53,985	11,1	15,9	3 x 7/15-14 UNC	70,66
4	108	63,525	11,1	19	11 x 7/16-14 UNC	82,55
5	133,4	82,575	12,7	22,2	11 x 7/16-14 UNC	104,8
6	165,1	106,39	14,3	25,4	11 x 1/2-13 UNC	133,4
8	209,5	139,735	15,9	28,6	11 x 5/8-11 UNC	171,4
11	279,4	196,885	17,5	34,9	11 x 3/4-10 UNC	235
15	381	285,8	19	41,3	12 x 7/8-9 UNC	330,2

B1								
Nr.	A	B max.	C -0,025	D	G	F1	E2	F2
5	133,4	82,275	14,288	22,2	11 x 7/16-14 UNC	104,8	8 x 7/16-14 UNC	61,9
6	165,1	106,390	15,875	25,4	11 x 1/2-13 UNC	133,4	8 x 1/2-13 UNC	82,6
8	209,5	139,735	17,462	28,6	11 x 5/8-11 UNC	171,4	8 x 5/8-11 UNC	111,1
11	279,4	196,885	19,05	34,9	11 x 3/4-10 UNC	235	8 x 3/4-10 UNC	165,1
15	381	285,8	20,638	41,3	12 x 7/8-9 UNC	330,2	11 x 7/8-9 UNC	247,6

B2						
Nr.	A	B max.	C	D	G	F1
3	92,1	53,985	11,1	15,9	3 x 11,9	70,66
4	108	63,525	11,1	19	11 x 11,9	82,55
5	133,4	82,575	12,7	22,2	11 x 11,9	104,8
6	165,1	106,39	14,3	25,4	11 x 13,5	133,4
8	209,5	139,735	15,9	28,6	11 x 16,7	171,4
11	279,4	196,885	17,5	34,9	11 x 20,2	235
15	381	285,8	19	41,3	12 x 23,4	330,2

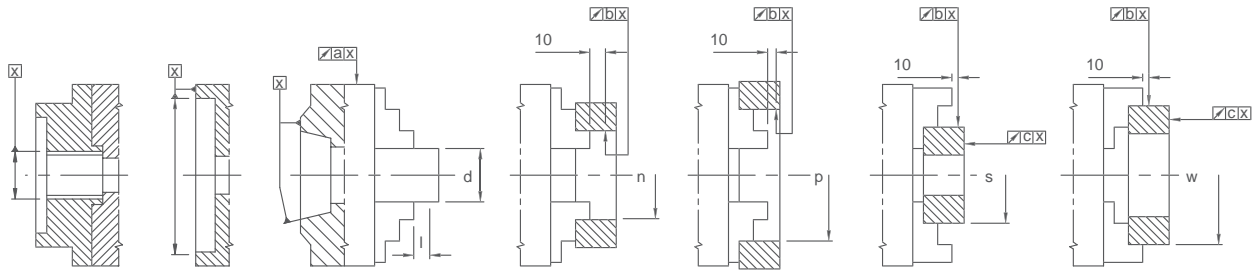
Type L, con. 7 : 24					
Nr.	A	B + 0,051	C	D	E
L00	3 3/4-6 UNS	69,850	50,800	14,288	9,525 x 9,525 x 38,1
L0	4 1/2-6 UNS	82,550	60,325	15,875	9,525 x 9,525 x 44,45
L1	6 - 6 UNS	104,775	73,025	19,050	15,875 x 15,875 x 60,32
L2	7 3/4-5 UNS	133,350	85,725	25,400	19,05 x 19,05 x 73,02
L3	10 3/8-4 UNS	165,100	94,425	28,575	25,4 x 25,4 x 82,55





REF. 85.410, 85.420, 85.421, 85.422, 85.423, 85.450, 85.500, 85.510

NL Centreernauwkeurigheid voor klauwplaten  
 FR Tolérance de centrage pour les mandrins  
 ES Tolerancia de centrado para los platos de garras  
 DE Zentriergenauigkeit von Backenfutter



$\emptyset$	80 - 85	100 - 110	125 - 140	160	200	250	315	400	500	630	800
d	10	10	18	18	30	30	52	53	75	75	160
	-	14	25	30	40	53	75	100	100	125	200
l	14	18	30	40	53	75	100	125	125	160	250
n	40	40	60	60	80	80	120	120	160	160	160
p	40	40	50	50	80	80	125	125	200	200	325
s	60	75	100	135	162	200	252	282	282	325	500
w	35	50	62	88	96	150	210	250	300	400	400
w + 85.855	63	80	100	100	160	160	250	250	400	400	500
w + 85.840	-	-	120	150	185	225	300	350	400	400	500

NL Centreernauwkeurigheid voor stalen en gietijzeren klauwplaten 80 - 400 mm  
 FR Tolérance de centrage pour les mandrins en acier et en fonte 80 - 400 mm  
 ES Tolerancia de centrado para los platos de garras de acero y de fundición 80 - 400 mm  
 DE Zentriergenauigkeit von Stahl- und Gusseisenbackenfutter 80 - 400 mm

	Tol. (mm)				
	85 - 100	125 - 160	200 - 250	315	400
a	0,020	0,030	0,040	0,050	0,060
b	0,025	0,035	0,045	0,055	0,065
c	0,015	0,020	0,025	0,030	0,030

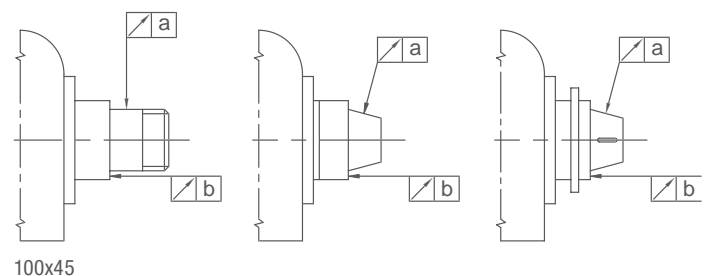
NL Centreernauwkeurigheid voor gietijzeren klauwplaten 500 - 800 mm  
 FR Tolérance de centrage pour les mandrins en fonte 500 - 800 mm  
 ES Tolerancia de centrado para los platos de garras de fundición 500 - 800 mm  
 DE Zentriergenauigkeit von Gusseisenbackenfutter 500 - 800 mm

	Tol. (mm)		
	500	630	800
a	0,10	0,10	0,15
b	0,075	0,10	0,15
c	0,05	0,05	0,06

REF. 85.410, 85.420, 85.422, 85.423, 85.500, 85.510

NL Centreernauwkeurigheid machinespilneuzen  
 FR Tolérance de centrage broches de machine  
 ES Tolerancia de centrado cabezales de torno  
 DE Zentriergenauigkeit Maschinenspindeln

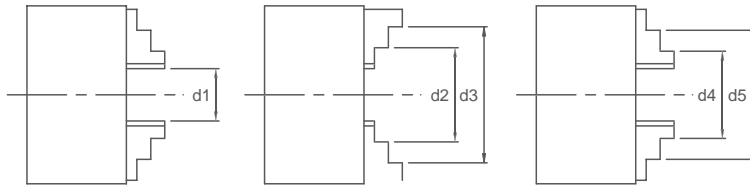
	Tol. (mm)	
	80 - 160	200 - 800
a	0,003 mm	0,005 mm
b	0,003 mm	0,005 mm



100x45

REF. 85.410, 85.420, 85.422, 85.423, 85.500, 85.510

**NL** Spanbereik voor klauwplaten met vaste bekken  
**FR** Capacité de serrage des mandrins avec mors fixes  
**ES** Capacidad de fijación de platos de garras con garra fija  
**DE** Spannbereich von Backenfutter mit fester Backen



	Ø (mm)													
	80	85	100	110	125	140	160	200	250	315	400	500	630	800
d1	2 - 27	2 - 40	3 - 33	3 - 33	3 - 50	3 - 50	3 - 64	4 - 90	5 - 118	5 - 131	10 - 180	20 - 235	30 - 335	150 - 482
d2	25 - 50	32 - 70	36 - 62	32 - 62	39 - 83	39 - 83	50 - 107	60 - 145	77 - 188	90 - 215	103 - 272	140 - 357	180 - 487	302 - 634
d3	45 - 71	64 - 102	62 - 93	62 - 93	80 - 125	80 - 125	98 - 160	130 - 200	160 - 250	190 - 315	230 - 400	276 - 500	345 - 630	468 - 800
d4	22 - 46	22 - 60	25 - 56	25 - 56	34 - 74	34 - 74	42 - 100	52 - 135	62 - 174	78 - 200	85 - 252	120 - 335	160 - 465	282 - 614
d5	45 - 69	54 - 92	56 - 87	56 - 87	72 - 115	72 - 115	94 - 154	120 - 202	145 - 256	172 - 299	210 - 380	245 - 476	325 - 630	448 - 780

**NL** Spanbereik voor klauwplaten met gedeelde bekken  
**FR** Capacité de serrage des mandrins avec mors réglables  
**ES** Capacidad de fijación de platos de garras con garra móvil  
**DE** Spannbereich von Backenfutter mit geteilte Backen

	Ø (mm)										
	125	140	160	200	250	315	400	500	630	800	
d1	3 - 50	3 - 50	3 - 64	4 - 90	5 - 118	5 - 131	10 - 180	20 - 235	30 - 335	150 - 482	
d2	52 - 96	52 - 96	62 - 121	72 - 156	86 - 197	103 - 226	127 - 294	110 - 400	120 - 570	240 - 724	
d3	95 - 125	95 - 125	115 - 160	133 - 200	160 - 250	190 - 315	230 - 400	190 - 500	200 - 630	316 - 800	
d4	34 - 76	34 - 76	42 - 97	50 - 130	58 - 165	65 - 182	72 - 228	120 - 410	140 - 590	252 - 736	
d5	75 - 118	75 - 118	88 - 146	105 - 190	125 - 135	145 - 265	165 - 329	200 - 485	210 - 665	328 - 812	

**NL** Maximaal toegestane toerental (omw/min)  
**FR** Vitesse de rotation maximale (tour/min)  
**ES** Número de revoluciones máximo (rev/min)  
**DE** Zulässige Höchstzahl (U/min)

	n = rpm										
Ref.	80 - 85	100 - 110	125	140 - 160	200	250	315	400	500	630	800
85.410 (3200)	4000	3500	3200	3000	2500	2000	1500	1000	700	500	300
85.500 (3600)	4000	3500	3200	3000	2500	2000	1500	1000	700	500	300
85.420 85.422, 85.423	6000	5200	4800	4500	4000	3500	2800	2000			
85.510 (3700)	6000	5200	4800	4500	4000	3500	2800	2000			

**NL** Draaimoment aan sleutel (Nm)  
**FR** Couple de rotation de clé (Nm)  
**ES** Par de apriete (Nm)  
**DE** Drehmoment am Schlüssel (Nm)

	Ø (mm)										
Nm	80 - 85	100 - 110	125	140 - 160	200	250	315	400	500	630	800
	35	50	75	120	160	180	200	280	360	460	500

**NL** Totale spankracht (daN) voor klauwplaten  
**FR** Force de serrage totale (daN) pour serrage des mandrins  
**ES** Fuerza de sujeción total (daN) para platos de garras  
**DE** Gesamtspannkraft (daN) für Backenfutter

	Ø (mm)										
daN	80 - 85	100 - 110	125	140 - 160	200	250	315	400	500	630	800
	1000	1700	2400	3100	3700	4600	5500	6500	7200	8000	9000

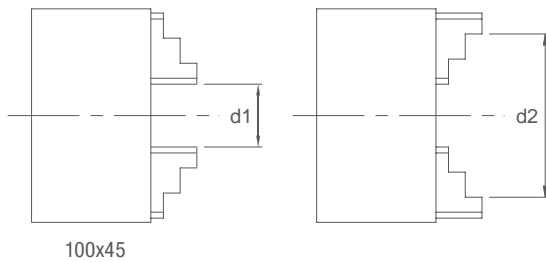






REF. 85.600, 85.602

NL Spanbereik voor klauwplaten met omkeerbekken  
 FR Capacité de serrage des mandrins avec mors réversibles  
 ES Capacidad de fijación de platos con garras reversibles  
 DE Spannbereich von Backenfutter mit Umkehrbacken



	Ø (mm)							
d1	85	100	125	150	160	200	250	315
d2	3	3	8	8	8	10	10	15
d1	85	100	125	150	160	200	250	315
d1	350	400	500	630	800	915	1000	1250
d2	15	20	45	50	50	120	170	170
d2	350	400	500	630	800	915	1000	1250

NL Maximaal toegestane toerental voor stalen klauwplaten (omw/min) - voor symmetrisch ingespannen werkstukken  
 FR Vitesse de rotation maximale pour les mandrins en acier (tour/min) - pour le serrage concentrique des pièces  
 ES Número de revoluciones máximo para los platos de garras de acero (rev/min) - para la sujeción concéntrica de las piezas  
 DE Zulässige Höchstzahl von Stahlbackenfutter (U/min) - für symmetrisch gespannte Werkstücke

n = rpm							
85	100	125	150	160	200	250	315
4000	3800	3500	3200	3200	2500	2000	1500
350	400	500	630	800	915	1000	1250
1500	1100	700	550	450	200	200	150

NL Maximaal toegestane toerental voor gietijzeren klauwplaten (omw/min) - voor symmetrisch ingespannen werkstukken  
 FR Vitesse de rotation maximale pour les mandrins en fonte (tour/min) - pour le serrage concentrique des pièces  
 ES Número de revoluciones máximo para los platos de garras de fundición (rev/min) - para la sujeción concéntrica de las piezas  
 DE Zulässige Höchstzahl von Gusseisenbackenfutter (U/min) - für symmetrisch gespannte Werkstücke

n = rpm							
85	100	125	150	160	200	250	315
					1800	1500	1200
350	400	500	630	800	915	1000	1250
1200	800	500	400	300	150	150	100

NL Instelmomenten van tapinzetstukken met ratel (Nm)  
 FR Tableau des réglages pour les têtes à tarauder à limiteur de couple (Nm)  
 ES Tabla de los momentos torsor para casquillos para roscado con embrague de seguridad (Nm)  
 DE Einstellmomente von Gewindebohrereinsatzstück mit Sicherheitskupplung (Nm)

M	Type 19/1	Type 31/2	Type 48/3
M2	0,6		
M3	1		
M3,5	1,5 - 2		
M4	2-3		
M5	5-6		
M6-M7	7-9	7-9	
M8-M9	16-19	16-19	
M10-M11	27-30	27-30	
M12	37-40	37-40	37-40
M14	37-40	50-53	50-53
M16	37-40	55-58	55-58
M18		85-90	85-90
M20		100-106	100-106
M22		100-106	110-115
M24		100-106	140-150
M27		100-106	150-160
M30			240-250
M33			260-270
M36			260-270
M39			260-270

NL Tabel aantrekmoment voor ER spantangen  
 FR Tableau de couple de serrage pour pinces ER  
 ES Tabla de embrague para pinzas ER  
 DE Tabelle der Anzugsmoment für ER-Spannzangen

Type of Collet Chuck	Collet Nut	Shank-Ø	Max. tightening torque [Nm]	Max. transmittable torque [Nm] (For smallest shaft dimension h6)	Max. rpm
ER11	M14 x 0.75	0.5 - 2.5	7	< 1.0	40000
		3.0 - 7.0	10	2.5 - 10.0	
ER16	M22 x 1.50	0.5 - 1.0	10	< 1.0	40000
		1.5 - 3.5	25 - 30	1.0 - 3.0	
		4.0 - 10.0	50 - 55	10.0 - 55.0	
ER20	M25 x 1.50	1.5 - 2.0	15	1.0 - 2.0	40000
		2.5 - 6.5	30 - 35	2.5 - 15.0	
		7.0 - 13.0	50 - 55	26.0 - 60.0	
ER25	M32 x 1.50	1.0 - 3.0	25 - 30	1.0 - 3.0	35000
		3.5 - 6.5	35 - 40	4.0 - 15.0	
		7.0 - 16.0	55 - 60	38.0 - 130.0	
ER25	M40 x 1.50	1.5 - 3.0	30 - 35	1.0 - 4.0	35000
		3.5 - 6.5	55 - 60	6.0 - 25.0	
		7.0 - 20.0	110 - 120	55.0 - 250.0	
ER40	M50 x 1.50	2.0 - 7.0	60 - 70	3.0 - 25.0	25000
		8.0 - 11.0	100 - 110	35.0 - 50.0	
		12.0 - 26.0	140 - 150	85.0 - 250.0	





1 SC



1 HSS(+E)



2



3 SC



3 HSS-E



4



5



6



7



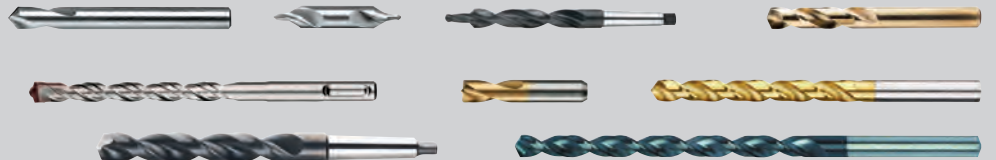
8

NL VHM Boren  
 FR Forets Carbure Monobloc  
 ES Brocas Metal Duro  
 DE VHM Bohrer



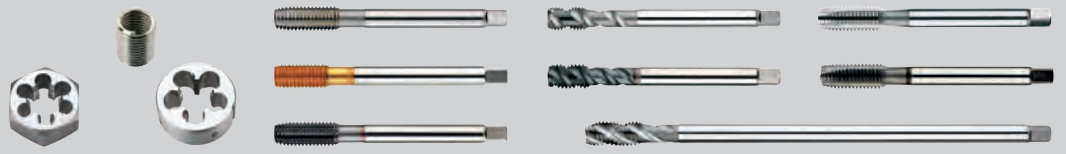
SP 1

NL HSS Boren en HSS-E Boren  
 FR Forets HSS et HSS-E  
 ES Brocas HSS y HSS-E  
 DE HSS-Bohrer und HSS-E Bohrer



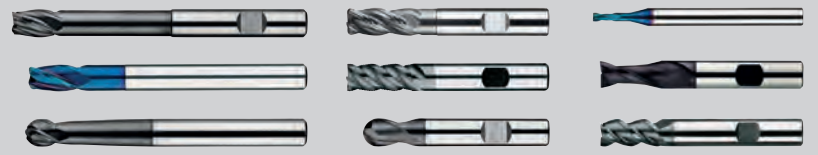
HSS-(E) 1

NL Draadsnijden  
 FR Filetage  
 ES Roscar  
 DE Gewinde Schneiden



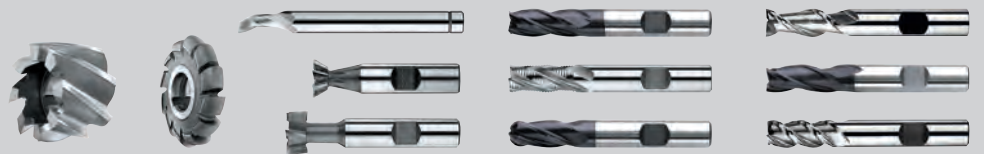
2

NL VHM Frezen  
 FR Fraises Carbure Monobloc  
 ES Fresas Metal Duro  
 DE VHM Fräser



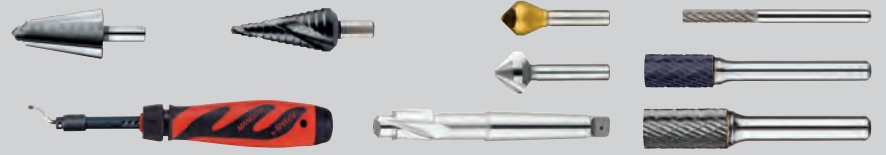
SP 3

NL HSS-E Frezen  
 FR Fraises HSS-E  
 ES Fresas HSS-E  
 DE HSS-E Fräser



HSS-E 3

NL Verzinken en Ontbramen  
 FR Chanfreinage et Ebavurage  
 ES Avellanar y Desbarbar  
 DE Senker und Entgrater



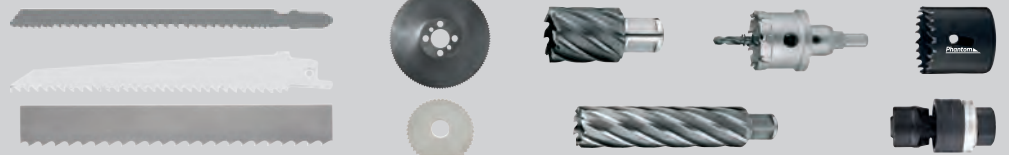
4

NL Ruimen  
 FR Alésage  
 ES Escariar  
 DE Reibahlen



5

NL Zagen en Ponsen  
 FR Sciage et Poinçonnage  
 ES Serrar y Punzonar  
 DE Sägen und Blechlocher



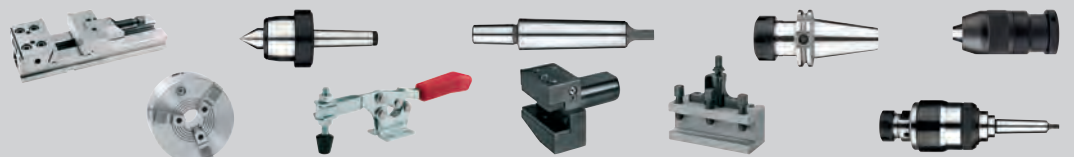
6

NL Draaien  
 FR Tournage  
 ES Tornear  
 DE Dreh- und Fräswerkzeuge



7

NL Spannen  
 FR Serrage et Bridage  
 ES Fijar y Sujetar  
 DE Spannwerkzeuge



8

NL Overig  
 FR Autres  
 ES Otros  
 DE Übrig



ETC. 9



1 SC



1 HSS(+E)



2



3 SC



3 HSS-E



4



5



6



7



8


















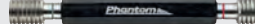


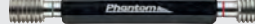


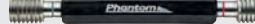




ETC.

NL Overig  
FR Autres  
ES Otros  
DE Übrig

**P** **K** Bij uitstek geschikt  
Très approprié  
**H** **N** Muy adecuado  
**M** **S** Ideal geeignet

**P** **K** Beperkt geschikt  
Approprié  
**H** **N** Adecuado  
**M** **S** Eingeschränkt geeignet

P= pagina  
P= page  
P= página  
P= Seite

> 90.110	<b>Phantom</b>				P. 2
> 90.120	<b>Phantom</b>				P. 2
> 90.130	<b>Phantom</b>				P. 2
> 90.140	<b>Phantom</b>				P. 2
> 90.145	<b>Phantom</b>				P. 3
> 90.150	<b>Phantom</b>			 P. 3	P. 3
> 90.170	<b>Phantom</b>				P. 3
> 90.180	<b>Phantom</b>				P. 3
> 90.210	<b>Phantom</b>				P. 3
> 90.510	<b>Phantom</b>	1/4"			P. 4
> 90.520	<b>Phantom</b>	1/2"			P. 5
> 91.200	<b>Phantom</b>	M			P. 7
> 91.205	<b>Phantom</b>	M			P. 7
> 91.206	<b>Phantom</b>	M			P. 7
> 91.210	<b>Phantom</b>	MF			P. 7
> 91.215	<b>Phantom</b>	MF			P. 8
> 91.216	<b>Phantom</b>	MF			P. 8
> 91.220	<b>Phantom</b>	UNC			P. 8
> 91.225	<b>Phantom</b>	UNC			P. 9
> 91.226	<b>Phantom</b>	UNC			P. 9
> 91.230	<b>Phantom</b>	UNF			P. 9
> 91.235	<b>Phantom</b>	UNF			P. 9
> 91.236	<b>Phantom</b>	UNF			P. 10
> 91.250	<b>Phantom</b>	BSP G			P. 10
> 91.255	<b>Phantom</b>	BSP G			P. 10
> 91.256	<b>Phantom</b>	BSP G			P. 10
> 91.270	<b>Phantom</b>	NPT			P. 10
> 91.275	<b>Phantom</b>	NPT			P. 11



**> 90.110 Phantom**

- NL Universal Snijolie EP (Extreme Pressure), chloor- en siliconvrij, op mineraaloliebasis  
 FR Huile de coupe Universal EP (Haute Pression), sans chlore, à base d'huile minérale  
 ES Aceite de corte Universal EP (Alta Presión), sin cloro, base de aceite mineral  
 DE Universal Schneidöl EP (Hochdruck), Chlorfreie, auf Mineralölbasis



Ref.	Contents
90.110.0250	250 ml
90.110.0251	10x 250 ml
90.110.5005	5 l

Ref.	Contents
90.110.5010	10 l
90.110.5025	25 l
90.110.5060	60 l

Ref.	Contents
90.110.5200	200 l

**> 90.120 Phantom**

- NL Non-Ferro Snijolie EP (Extreme Pressure), chloor- en siliconvrij, op mineraaloliebasis  
 FR Huile de coupe Non-Ferro EP (Haute Pression), sans chlore, à base d'huile minérale  
 ES Aceite de corte Non-Ferro EP (Alta Presión), sin cloro, base de aceite mineral  
 DE Nicht-Eisen Schneidöl EP (Hochdruck), Chlorfreie, auf Mineralölbasis



Ref.	Contents
90.120.0250	250 ml
90.120.0251	10x 250 ml
90.120.5005	5 l

Ref.	Contents
90.120.5010	10 l
90.120.5025	25 l
90.120.5060	60 l

Ref.	Contents
90.120.5200	200 l

**> 90.130 Phantom**

- NL Heavy Duty Snijolie EP (Extreme Pressure), chloor- en siliconvrij, op mineraaloliebasis  
 FR Huile de coupe Heavy Duty EP (Haute Pression), sans chlore, à base d'huile minérale  
 ES Aceite de corte Heavy Duty EP (Alta Presión), sin cloro, base de aceite mineral  
 DE Heavy Duty Schneidöl EP (Hochdruck), Chlorfreie, auf Mineralölbasis



Ref.	Contents
90.130.0250	250 ml
90.130.0251	10x 250 ml
90.130.5005	5 l

Ref.	Contents
90.130.5010	10 l
90.130.5025	25 l
90.130.5060	60 l

Ref.	Contents
90.130.5200	200 l

**> 90.140 Phantom**

- NL Allround Snijolie spray EP (Extreme Pressure), chloor- en siliconvrij, op plantaardige basis  
 FR Allround Huile de coupe spray EP (Haute Pression), sans chlore, à base d'huile végétale  
 ES Allround Aceite de corte pulverizador EP (Alta Presión), sin cloro, base vegetal  
 DE Allround Schneidöl Spray EP (Extreme Pressure), Chlorfreie, auf pflanzlicher Basis



Ref.	Contents
90.140.0400	400 ml

Ref.	Contents
90.140.0401	12 x 400 ml

Ref.	Contents
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## > 90.510 Phantom

NL Koelmiddelslang 1/4"







FR Tuyau pour réfrigérant 1/4"

ES Sistema de mangueras 1/4"

DE Kühlmittelschlauch 1/4"

1/4" max.  
6 bar 15  
l/min















Ref.	NL	FR	ES	DE	#	
90.510.1028	Segmenten, lengte 280 mm	Segments, 280 mm	Segmentos largo=280 mm	Segmenten länge 280 mm	20	
90.510.2015	Ronde spuitmond 1,5 mm	Buse ronde 1,5 mm	Tobera redonda 1,5 mm	Runde Düse 1,5 mm	4	
90.510.2030	Ronde spuitmond 3 mm	Buse ronde 3 mm	Tobera redonda 3 mm	Runde Düse 3 mm	4	
90.510.2060	Ronde spuitmond 6 mm	Buse ronde 6 mm	Tobera redonda 6 mm	Runde Düse 6 mm	4	
90.510.2115	Spuitmond 90° 1,5 mm	Buse 90 ° 1,5 mm	Tobera 90° 1,5 mm	Düse 90° 1,5 mm	4	
90.510.2130	Spuitmond 90° 3 mm	Buse 90 ° 3 mm	Tobera 90° 3 mm	Düse 90° 3 mm	4	
90.510.2160	Spuitmond 90° 6 mm	Buse 90 ° 6 mm	Tobera 90° 6 mm	Düse 90° 6 mm	4	
90.510.2190	Douchespuitmond 90°	Buse de douche 90°	Tobera de ducha 90°	Duschkopf 90°	2	
90.510.2307	Spuitmond 7 x Ø 1 mm	Buse 7x Ø 1 mm	Tobera 7 x Ø 1 mm	Düse 7 x Ø 1 mm	4	
90.510.2325	Platte spuitmond 25 x 1 mm	Buse plate 25x1 mm	Tobera plana 25 x 1 mm	Flachdüse 25 x 1 mm	2	
90.510.2412	Platte spuitmond 12 x 1,5 mm	Buse plate 25x1 mm	Tobera plana 12 x 1,5 mm	Flachdüse 12 x 1,5 mm	4	
90.510.2600	Ringsysteem bestaat uit 15 elementen en afsluitkap	Système de bague (15x) et bouchon	Sistema de anillo (15x) y tapa de cierre	Ringsysteem bestehende aus 15 Elementen und Schlusskappe	1	
90.510.3000	Koppingsstuk	Raccord	Conexión	Kupplung	4	
90.510.3050	Afsluitkap	Bouchon	Tapa de cierre	Schlusskappe	4	
90.510.3100	Verlengstuk lengte 93 mm	Rallonge 93 mm	Expendedor largo 93 mm	Verlängerung 93 mm	4	
90.510.3150	Klemring met schroef	Bague de serrage m/vis	Abrazadera de aro con tornillo	Klemmring mit Schraube	4	
90.510.3170	Haaks verbindingstuk	Bague de serrage m/vis	Conexión angular	Winkelverbindungsstücke	2	
90.510.3200	Y-verbindingstuk	Raccord Y	Y-distribuidor	Y-Verbindungsstücke	2	
90.510.3220	T-verbindingstuk	Pièce en T	Unión en T	T-Verbindungsstücke	2	
90.510.4080	Adapter NPT 1/8" buitendraad	Adaptateur NPT filetage externe 1/8"	Tobera de conexión NPT 1/8" rosca externa	Adapter NPT 1/8" Aussengewinde	4	
90.510.4140	Adapter NPT 1/4" buitendraad	Adaptateur NPT filetage externe 1/4"	Tobera de conexión NPT 1/4" rosca externa	Adapter NPT 1/4" Aussengewinde	4	
90.510.4270	Adapter NPT 1/8" binnendraad	1/8 Raccord de réduction NPT	Tobera de conexión 1/8" NPT rosca interna	Adapter NPT 1/8" Innengewinde	4	

Ref.	NL	FR	ES	DE	#	
90.510.4680	Adapter SAE 3/8" binnendraad	Adaptateur SAE filetage interne 3/8	Tobera de conexión SAE 3/8" rosca interna	Adapter SAE 3/8" Innengewinde	4	
90.510.5000	Kraan buitendraad NPT 1/4"	Robinet filetage externe NPT 1/4	Llave de cierre rosca externa NPT 1/4"	Hahn Aussengewinde NPT 1/4"	2	
90.510.5040	Kraan segmentaansluiting	Robinet Raccord de segment	Tubo flexible articulado con llave de cierre	Hahn Segmentanschluss	2	
90.510.8000	Montagetang	Pince de montage	Tenazas de montaje	Montagezange	1	
90.510.9000	Basisset: 10 segmenten, adapter NPT 1/8" buitendraad, adapter NPT 1/4" buitendraad, spuitmond 90° 1,5 - 3 - 6 mm	Kit de base: 10 Segments, Adaptateur NPT filetage externe 1/8", Adaptateur NPT filetage externe 1/4", Buse 90° 1,5 - 3 - 6 mm	Juego de base consiste de: 10 segmentos, Tobera de conexión NPT 1/8" rosca externa, Tobera de conexión NPT 1/8" rosca externa, Tobera 90° Ø 1,5 - 3 - 6	Basissatz bestehend aus: 10 Segmenten, Adapter NPT 1/8" Aussengewinde, Adapter NPT 1/4" Aussengewinde, Düse 90° 1,5 - 3 - 6 mm	1	
90.510.9210	Spuitmondset 90°	Kit pour buse 90°	Juego de Toberas 90°	Düsensatz 90°	4	
















> **90.520** **Phantom**

NL Koelmiddelslang 1/2"  
 FR Tuyau pour réfrigérant 1/2"  
 ES Sistema de mangueras 1/2"  
 DE Kühlmittelschlauch 1/2"

1/2" max. 28  
 6 bar l/min

Ref.	NL	FR	ES	DE	#	
90.520.1028	Segmenten, lengte 280 mm	Segments, 280 mm	Segmentos largo=280 mm	Segmenten länge 280 mm	14	
90.520.2060	Ronde spuitmond 6 mm	Buse ronde 6 mm	Tobera redonda 6 mm	Runddüse 6 mm	4	
90.520.2090	Ronde spuitmond 9 mm	Buse ronde 9 mm	Tobera redonda 9 mm	Runddüse 9 mm	4	
90.520.2095	Ronde spuitmond 12 mm	Buse ronde 12 mm	Tobera redonda 12 mm	Runddüse 12 mm	4	
90.520.2160	Spuitmond 90° 6 mm	Buse 90° 6 mm	Tobera 90° 6 mm	Düse 90° 6 mm	4	
90.520.2190	Spuitmond 90° 9 mm	Buse 90° 9 mm	Tobera 90° 9 mm	Düse 90° 9 mm	4	
90.520.2220	Spuitmond 90° 12 mm	Buse 90° 12 mm	Tobera 90° 12 mm	Düse 90° 12 mm	4	
90.520.2290	Douchespuitmond 90°	Buse de douche 90°	Tobera de ducha 90°	Duschkopf 90°	2	
90.520.2307	Platte spuitmond 5 x Ø 3 mm	Buse plate 5 x Ø 3 mm	Tobera plana 5 x Ø 3 mm	Flachdüse 5 x Ø 3 mm	4	
90.520.2310	Platte spuitmond 5 x Ø 2 mm	Buse plate 5 x Ø 2 mm	Tobera plana 5 x Ø 2 mm	Flachdüse 5 x Ø 2 mm	4	
90.520.2318	Platte spuitmond 18 x 2 mm	Buse plate 18 x 2 mm	Tobera plana 18 x 2 mm	Flachdüse 18 x 2 mm	4	
90.520.2320	Platte spuitmond 18 x 3 mm	Buse plate 18 x 3 mm	Tobera plana 18 x 3 mm	Flachdüse 18 x 3 mm	4	
90.520.2332	Platte spuitmond 32 mm	Buse plate 32 mm	Tobera plana 32 mm	Flachdüse 32 mm	2	
90.520.2363	Platte spuitmond 63 mm	Buse plate 63 mm	Tobera plana 63 mm	Flachdüse 63 mm	2	



Ref.	NL	FR	ES	DE	#	
90.520.2600	Ringsysteem bestaat uit 14 elementen en afsluitkap	Système de bague (14x) et bouchon	Sistema de anillo (14x) y tapa de cierre	Ringsysteem bestehende aus 14 Elementen und Schlusskappe	1	
90.520.3000	Koppelingsstuk	Raccord	Pieza de conexión	Kupplung	4	
90.520.3050	Afsluitkap	Bouchon	Tapa de cierre	Schlusskappe	4	
90.520.3100	Verlengstuk lengte 96 mm	Rallonge 96 mm	Expendedor largo 96 mm	Verlängerung 96 mm	4	
90.520.3170	Haaks verbindingstuk	Raccord à angle droit	Conexión angular	Winkelverbindungsstücke	2	
90.520.3200	Y-verbindingstuk	Raccord Y	Y-distribuidor	Y-Verbindungsstücke	2	
90.520.3220	T-verbindingstuk	Pièce en T	Unión en T	T-Verbindungsstücke	2	
90.520.4080	Adapter NPT 3/8" buitendraad	Adaptateur NPT filetage externe 3/8"	Tobera de conexión NPT 3/8" rosca externa	Adapter NPT 3/8" Aussengewinde	4	
90.520.4140	Adapter NPT 1/2" buitendraad	Adaptateur NPT filetage externe 1/2"	Tobera de conexión NPT 1/2" rosca externa	Adapter NPT 1/2" Aussengewinde	4	
90.520.4270	Adapter NPT 1/4" binnendraad	Adaptateur NPT filetage externe 1/4"	Tobera de conexión NPT 1/4" rosca interna	Adapter NPT 1/4" Innengewinde	4	
90.520.4280	Y-verloopstuk 1/4"	1/4" Raccord de réduction Y	Y-reducción 1/4"	Y-Verbindungsstücke 1/4"	2	
90.520.5000	Kraan buitendraad NPT 1/2"	Robinet filetage externe NPT 1/2"	Llave de cierre rosca externa NPT 1/2"	Hahn Aussengewinde NPT 1/2"	2	
90.520.5040	Kraan segmentaansluiting	Robinet Raccord de segment	Tubo flexible articulado con llave de cierre	Hahn Segmentanschluss	2	
90.520.8000	Montagetang	Pince de montage	Tenazas de montaje	Montagezange	1	
90.520.9000	Basisset bestaat uit: 7 segmenten, adapter NPT 3/8" buitendraad, adapter NPT 1/2" buitendraad, spuitmond 6 - 9 - 12 mm	Kit de base: 7 Segments, Adaptateur NPT filetage externe 3/8", Adaptateur NPT filetage externe 1/2", Buse 6 - 9 - 12 mm	Juego de base consiste de: 7 segmentos, Tobera de conexión NPT 3/8" rosca externa, Tobera de conexión NPT 1/2" rosca externa, Tobera Ø 6 - 9 - 12 mm	Basissatz bestehend aus: 7 Segmenten, Adapter NPT 3/8" Aussengewinde, Adapter NPT 1/2" Aussengewinde, Düse 6 - 9 - 12 mm	1	

> **91.200** **Phantom**



NL Draadpenkaliber, goed- en afkeur, Metrisch, 6H  
 FR Tampon de filetage, entre et n'entre pas, Métrique, 6H  
 ES Tapon de rosca, pasa y no pasa, Métrica, 6H  
 DE Gewinde-Grenzlehndorn, Gut- und Ausschuss, Metrisch, 6H

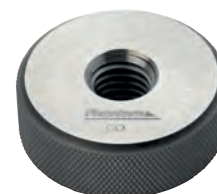
Ref.	d1
91.200.0300	M3
91.200.0400	M4
91.200.0500	M5
91.200.0600	M6
91.200.0800	M8
91.200.1000	M10

Ref.	d1
91.200.1200	M12
91.200.1400	M14
91.200.1600	M16
91.200.1800	M18
91.200.2000	M20
91.200.2200	M22

Ref.	d1
91.200.2400	M24
91.200.2700	M27
91.200.3000	M30
91.200.3300	M33
91.200.3600	M36

> **91.205** **Phantom**

NL Draadringkaliber, goedkeur, Metrisch, 6g  
 FR Bague filetée, entre, Métrique, 6g  
 ES Anillo, pasa, Métrica, 6g  
 DE Gut-GewindeLehrring, Metrisch, 6g



Ref.	d1
91.205.0300	M3
91.205.0400	M4
91.205.0500	M5
91.205.0600	M6
91.205.0800	M8
91.205.1000	M10

Ref.	d1
91.205.1200	M12
91.205.1400	M14
91.205.1600	M16
91.205.1800	M18
91.205.2000	M20
91.205.2200	M22

Ref.	d1
91.205.2400	M24
91.205.2700	M27
91.205.3000	M30
91.205.3300	M33
91.205.3600	M36

> **91.206** **Phantom**

NL Draadringkaliber, afkeur, Metrisch, 6g  
 FR Bague filetée, n'entre pas, Métrique, 6g  
 ES Anillo, no pasa, Métrica, 6g  
 DE Ausschuß-GewindeLehrring, Metrisch, 6g



Ref.	d1
91.206.0300	M3
91.206.0400	M4
91.206.0500	M5
91.206.0600	M6
91.206.0800	M8
91.206.1000	M10

Ref.	d1
91.206.1200	M12
91.206.1400	M14
91.206.1600	M16
91.206.1800	M18
91.206.2000	M20
91.206.2200	M22

Ref.	d1
91.206.2400	M24
91.206.2700	M27
91.206.3000	M30
91.206.3300	M33
91.206.3600	M36

> **91.210** **Phantom**

NL Draadpenkaliber, goed- en afkeur, Metrisch Fijn, 6H  
 FR Tampon de filetage, entre et n'entre pas, Métrique Fin, 6H  
 ES Tapon de rosca, pasa y no pasa, Métrica Fina, 6H  
 DE Gewinde-Grenzlehndorn, Gut- und Ausschuss, Metrisch Fein, 6H



Ref.	d1
91.210.0505	MF5
91.210.0605	MF6
91.210.0607	MF6
91.210.0807	MF8
91.210.0810	MF8
91.210.1007	MF10
91.210.1010	MF10
91.210.1012	MF10
91.210.1210	MF12
91.210.1212	MF12

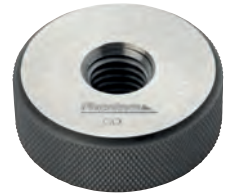
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91.210.1215	MF12
91.210.1410	MF14
91.210.1412	MF14
91.210.1415	MF14
91.210.1610	MF16
91.210.1615	MF16
91.210.1810	MF18
91.210.1815	MF18
91.210.2015	MF20
91.210.2215	MF22

Ref.	d1
91.210.2415	MF24
91.210.2420	MF24
91.210.2515	MF25
91.210.2715	MF27
91.210.2720	MF27
91.210.3015	MF30
91.210.3020	MF30
91.210.3215	MF32
91.210.3315	MF33
91.210.3320	MF33



### > 91.215 Phantom

NL Draadringkaliber, goedkeur, Metrisch Fijn, 6g  
 FR Bague filetée, entre, Métrique Fin, 6g  
 ES Anillo, pasa, Métrica Fina, 6g  
 DE Gut-GewindeLehrring, Metrisch Fein, 6g



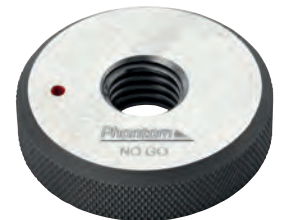
Ref.	d1
91.215.0505	MF5
91.215.0605	MF6
91.215.0607	MF6
91.215.0807	MF8
91.215.0810	MF8
91.215.1007	MF10
91.215.1010	MF10
91.215.1012	MF10
91.215.1210	MF12
91.215.1212	MF12

Ref.	d1
91.215.1215	MF12
91.215.1410	MF14
91.215.1412	MF14
91.215.1415	MF14
91.215.1610	MF16
91.215.1615	MF16
91.215.1810	MF18
91.215.1815	MF18
91.215.2015	MF20
91.215.2215	MF22

Ref.	d1
91.215.2415	MF24
91.215.2420	MF24
91.215.2515	MF25
91.215.2715	MF27
91.215.2720	MF27
91.215.3015	MF30
91.215.3020	MF30
91.215.3215	MF32
91.215.3315	MF33
91.215.3320	MF33

### > 91.216 Phantom

NL Draadringkaliber, afkeur, Metrisch Fijn, 6g  
 FR Bague filetée, n'entre pas, Métrique Fin, 6g  
 ES Anillo, no pasa, Métrica Fina, 6g  
 DE Ausschuß-GewindeLehrring, Metrisch Fein, 6g



Ref.	d1
91.216.0505	MF5
91.216.0605	MF6
91.216.0607	MF6
91.216.0807	MF8
91.216.0810	MF8
91.216.1007	MF10
91.216.1010	MF10
91.216.1012	MF10
91.216.1210	MF12
91.216.1212	MF12

Ref.	d1
91.216.1215	MF12
91.216.1410	MF14
91.216.1412	MF14
91.216.1415	MF14
91.216.1610	MF16
91.216.1615	MF16
91.216.1810	MF18
91.216.1815	MF18
91.216.2015	MF20
91.216.2215	MF22

Ref.	d1
91.216.2415	MF24
91.216.2420	MF24
91.216.2515	MF25
91.216.2715	MF27
91.216.2720	MF27
91.216.3015	MF30
91.216.3020	MF30
91.216.3215	MF32
91.216.3315	MF33
91.216.3320	MF33

### > 91.220 Phantom

NL Draadpenkaliber, goed- en afkeur, UNC, 2B  
 FR Tampon de filetage, entre et n'entre pas, UNC, 2B  
 ES Tampón de rosca, pasa y no pasa, UNC, 2B  
 DE Gewinde-Grenzlehndorn, Gut- und Ausschuss, UNC, 2B



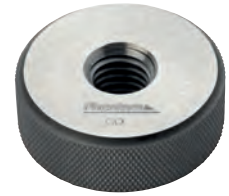
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91.220.0284	UNC Nr. 4
91.220.0350	UNC Nr. 6
91.220.0416	UNC Nr. 8
91.220.0482	UNC Nr. 10

Ref.	d1
91.220.0635	UNC 1/4
91.220.0794	UNC 5/16
91.220.0952	UNC 3/8
91.220.1270	UNC 1/2

Ref.	d1
91.220.1588	UNC 5/8
91.220.1905	UNC 3/4
91.220.2540	UNC 1

> **91.225 Phantom**

NL Draadringkaliber, goedkeur, UNC, 2A  
 FR Bague fileté, entre, UNC, 2A  
 ES Anillo, pasa, UNC, 2A  
 DE Gut-GewindeLehrring, UNC, 2A



Ref.	d1
91.225.0284	UNC Nr. 4
91.225.0350	UNC Nr. 6
91.225.0416	UNC Nr. 8
91.225.0482	UNC Nr. 10

Ref.	d1
91.225.0635	UNC 1/4
91.225.0794	UNC 5/16
91.225.0952	UNC 3/8
91.225.1270	UNC 1/2

Ref.	d1
91.225.1588	UNC 5/8
91.225.1905	UNC 3/4
91.225.2540	UNC 1

> **91.226 Phantom**

NL Draadringkaliber, afkeur, UNC, 2A  
 FR Bague fileté, n'entre pas, UNC, 2A  
 ES Anillo, no pasa, UNC, 2A  
 DE Ausschuß-GewindeLehrring, UNC, 2A



Ref.	d1
91.226.0284	UNC Nr. 4
91.226.0350	UNC Nr. 6
91.226.0416	UNC Nr. 8
91.226.0482	UNC Nr. 10

Ref.	d1
91.226.0635	UNC 1/4
91.226.0794	UNC 5/16
91.226.0952	UNC 3/8
91.226.1270	UNC 1/2

Ref.	d1
91.226.1588	UNC 5/8
91.226.1905	UNC 3/4
91.226.2540	UNC 1

> **91.230 Phantom**

NL Draadpenkaliber, goed- en afkeur, UNF, 2B  
 FR Tampon de filetage, entre et n'entre pas, UNF, 2B  
 ES Tampón de rosca, pasa y no pasa, UNF, 2B  
 DE Gewinde-Grenzlehndorn, Gut- und Ausschuss, UNF, 2B



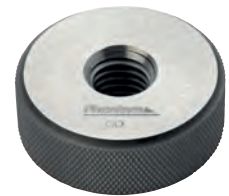
Ref.	d1
91.230.0285	UNF Nr. 4
91.230.0350	UNF Nr. 6
91.230.0416	UNF Nr. 8
91.230.0482	UNF Nr. 10
91.230.0635	UNF 1/4

Ref.	d1
91.230.0794	UNF 5/16
91.230.0952	UNF 3/8
91.230.1111	UNF 7/16
91.230.1270	UNF 1/2
91.230.1429	UNF 9/16

Ref.	d1
91.230.1588	UNF 5/8
91.230.1905	UNF 3/4
91.230.2540	UNF 1

> **91.235 Phantom**

NL Draadringkaliber, goedkeur, UNF, 2A  
 FR Bague fileté, entre, UNF, 2A  
 ES Anillo, pasa, UNF, 2A  
 DE Gut-GewindeLehrring, UNF, 2A



Ref.	d1
91.235.0482	UNF Nr. 10
91.235.0635	UNF 1/4
91.235.0794	UNF 5/16
91.235.0952	UNF 3/8

Ref.	d1
91.235.1111	UNF 7/16
91.235.1270	UNF 1/2
91.235.1429	UNF 9/16
91.235.1588	UNF 5/8

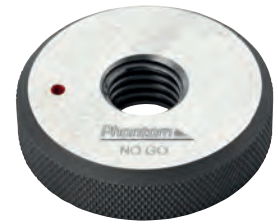
Ref.	d1
91.235.1905	UNF 3/4
91.235.2540	UNF 1





### > 91.236 Phantom

NL Draadringkaliber, afkeur, UNF, 2A  
 FR Bague filetée, n'entre pas, UNF, 2A  
 ES Anillo, no pasa, UNF, 2A  
 DE Ausschuß-GewindeLehrring, UNF, 2A



Ref.	d1
91.236.0482	UNF Nr. 10
91.236.0635	UNF 1/4
91.236.0794	UNF 5/16
91.236.0952	UNF 3/8

Ref.	d1
91.236.1111	UNF 7/16
91.236.1270	UNF 1/2
91.236.1429	UNF 9/16
91.236.1588	UNF 5/8

Ref.	d1
91.236.1905	UNF 3/4
91.236.2540	UNF 1

### > 91.250 Phantom

NL Draadpenkaliber, goed- en afkeur, BSP (Gasdraad)  
 FR Tampon de filetage, entre et n'entre pas, BSP (pas gaz)  
 ES Tapon de rosca, pasa y no pasa, BSP (gas)  
 DE Gewinde-Grenzlehndorn, Gut- und Ausschuss, BSP (Rohrgewinde)



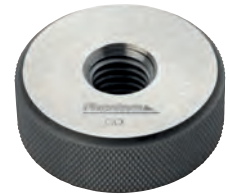
Ref.	d1
91.250.0973	BSP 1/8
91.250.1316	BSP 1/4
91.250.1666	BSP 3/8

Ref.	d1
91.250.2096	BSP 1/2
91.250.2291	BSP 5/8
91.250.2644	BSP 3/4

Ref.	d1
91.250.3325	BSP 1

### > 91.255 Phantom

NL Draadringkaliber, goedkeur, BSP (Gasdraad)  
 FR Bague filetée, entre, BSP (pas gaz)  
 ES Anillo, pasa, BSP (gas)  
 DE Gut-GewindeLehrring, BSP (Rohrgewinde)



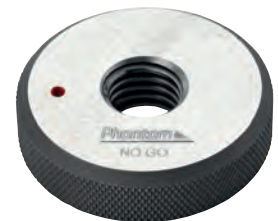
Ref.	d1
91.255.0973	BSP 1/8
91.255.1316	BSP 1/4
91.255.1666	BSP 3/8

Ref.	d1
91.255.2096	BSP 1/2
91.255.2291	BSP 5/8
91.255.2644	BSP 3/4

Ref.	d1
91.255.3325	BSP 1

### > 91.256 Phantom

NL Draadringkaliber, afkeur, BSP (Gasdraad)  
 FR Bague filetée, n'entre pas, BSP (pas gaz)  
 ES Anillo, no pasa, BSP (gas)  
 DE Ausschu -GewindeLehrring, BSP (Rohrgewinde)



Ref.	d1
91.256.0973	BSP 1/8
91.256.1316	BSP 1/4
91.256.1666	BSP 3/8

Ref.	d1
91.256.2096	BSP 1/2
91.256.2291	BSP 5/8
91.256.2644	BSP 3/4

Ref.	d1
91.256.3325	BSP 1

### > 91.270 Phantom

NL Draadpenkaliber, NPT  
 FR Tampon de filetage, NPT  
 ES Tapon de rosca, NPT  
 DE Gewinde-Lehndorn, NPT



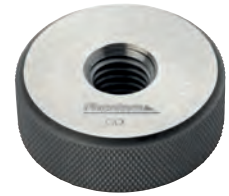
Ref.	d1
91.270.1029	NPT 1/8
91.270.1372	NPT 1/4

Ref.	d1
91.270.1715	NPT 3/8
91.270.2134	NPT 1/2

Ref.	d1
91.270.2667	NPT 3/4
91.270.3340	NPT 1

> **91.275** **Phantom**

NL Draadringkaliber, NPT  
 FR Bague filetée, NPT  
 ES Anillo, NPT  
 DE GewindeLehrring, NPT



Ref.	d1
91.275.1029	NPT 1/8
91.275.1372	NPT 1/4

Ref.	d1
91.275.1715	NPT 3/8
91.275.2134	NPT 1/2

Ref.	d1
91.275.2667	NPT 3/4
91.275.3340	NPT 1





1 SC



1 HSS(+E)



2



3 SC



3 HSS-E



4



5



6



7



8

ETC.



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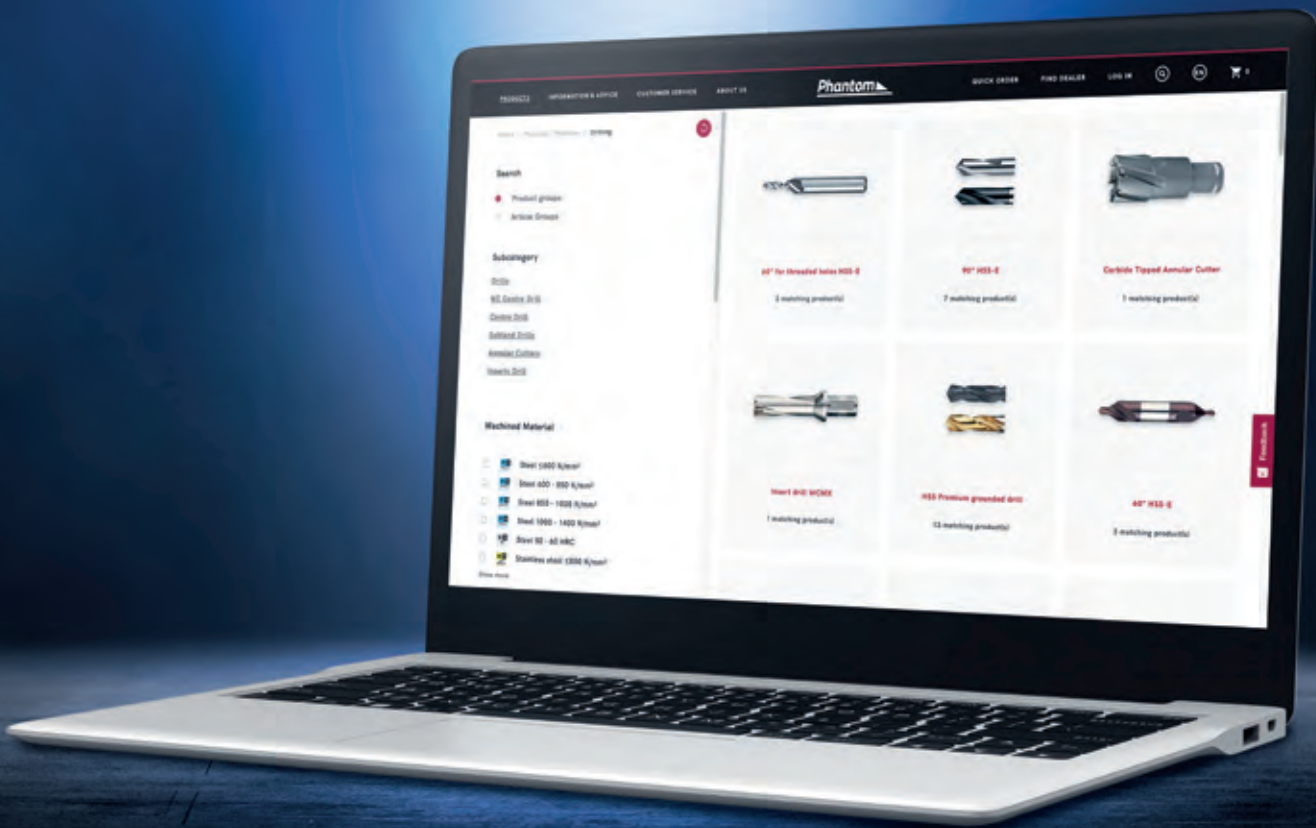
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ventes@vanommen.nl

**DE**  
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verkauf@vanommen.nl