

**Phantom** 

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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
 P 11 ≤600 N/mm²	 P 11 ≤600 N/mm²	<b>Ongelegerd en gelegeerd staal</b> ≤600 N/mm² 1.0037 (St37), 1.0038 (S235JR G2), 1.00402 (C22), 1.1178 (C30E)	<b>Aciers non-alliés ou faiblement alliés</b> ≤600 N/mm² 1.0037 (A37), 1.0038 (E 24-2 Ne), 1.00402 (1C20), 1.1178 (1C30)	<b>Acero no aleado</b> ≤600 N/mm² 1.0037 (S235JR), 1.0038 (S235JR G2), 1.0402 (F.112), 1.1178 (C30E)	<b>Unlegierter und legierter Stahl</b> ≤600 N/mm² 1.0037 (St37), 1.0038 (S235JR G2), 1.00402 (C22), 1.1178 (C30E)
 P 12 600 - 850 N/mm²	 P 12 600 - 850 N/mm²	<b>Ongelegerd en gelegeerd staal</b> 600 - 850 N/mm² 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</b> 600 - 850 N/mm² 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</b> 600 - 850 N/mm² 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</b> 600 - 850 N/mm² 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)
 P 13 850 - 1000 N/mm²	 P 13 850 - 1000 N/mm²	<b>Gelegeerd staal</b> 850 - 1000 N/mm² 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</b> 850 - 1000 N/mm² 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</b> 850 - 1000 N/mm² 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</b> 850 - 1000 N/mm² 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)
 P 14 1000 - 1400 N/mm²	 P 14 1000 - 1400 N/mm²	<b>Gelegeerd staal</b> 1000 - 1400 N/mm² 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</b> 1000 - 1400 N/mm² 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</b> 1000 - 1400 N/mm² 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</b> 1000 - 1400 N/mm² 1.5710 (36NiCr6), 1.7035 (41Cr40), 1.7225 (42CrMo4), 1.8519 (31CrMoV9), 1.8550 (34CrAlNi7), 1.5752 (15NiCr13), 1.7131 (16MnCr5), 1.7264 (20CrMo5)
 H 15 HRC	 H 15 HRC	<b>Gehard en inzetgehard staal</b> 50 - 60 HRC 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</b> 50 - 60 HRC 1.2344 (Z 40 CDV 5), 1.2767 (X45NiCrMo4), 1.2379 (D2), 1.2080 (Z200C12), 1.3343 (Z85WDCV)	<b>Acero templado</b> 50 - 60 HRC 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)	<b>Gehärteter und einsatzgehärteter Stahl</b> , 50-60 HRC 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)
 M 21 INOX ≤850 N/mm²	 M 21 INOX ≤850 N/mm²	<b>Roestvaststaal, INOX</b> ≤850 N/mm² 1.4005 (X12CrS13), 1.4104 (X14CrMos17), 1.4105 (X6CrMoS17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)	<b>Aciers inoxydables</b> ≤850 N/mm² 1.4005 (Z11CF13), 1.4104 (Z13CF17), 1.4105 (Z8CF17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)	<b>Acero inoxidable</b> ≤850 N/mm² 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</b> ≤850 N/mm² 1.4005 (X12CrS13), 1.4104 (X14CrMos17), 1.4105 (X6CrMoS17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)
 M 22 INOX >850 N/mm²	 M 22 INOX >850 N/mm²	<b>Roestvaststaal, INOX</b> >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)	<b>Aciers inoxydables</b> >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)	<b>Acero inoxidable</b> >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (F.3535-X6CrNiMoTi17-12-2)(316Ti)	<b>Rostfreier Stahl, INOX</b> >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)
 K 31 GG	 K 31 GG	<b>Grijs gietijzer</b> GG <260 HB30 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)	<b>Fontes</b> <260 HB30 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)	<b>Fundición gris con grafito laminado</b> GG <260 HB30 0.6015 (FG15), 0.6025 (FG25), 0.6040 (FG40)	<b>Grauguss</b> GG <260 HB30 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)
 K 32 GGG GTS-GTW	 K 32 GGG GTS-GTW	<b>Smeedbaar en Nodulair gietijzer</b> <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	<b>Fontes à graphites et malléables</b> <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	<b>Fundición gris con grafito esférico</b> <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	<b>Formbar und dehnbares Gusseisen</b> <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)
 N 41 Alu	 N 41 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 Aluminiumlegerungen</b> 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)
 N 42 Alu Si>10%	 N 42 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)
 N 43 Mg	 N 43 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>Magnesiumlegerungen</b> 3.5200 (MgMn2), 3.5812 (G-MgAl8Zn1), 3.5612 (G-MgAl6Zn1)
 N 51 Cu	 N 51 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 Kupferlegerungen</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)
 N 52 CuAlFe	 N 52 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 Aluminiumlegerungen</b> 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (Cu-Be2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18
 N 61 PVC	 N 61 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
 N 62 GFK/CFK	 N 62 GFK/CFK	<b>Versterkte kunststoffen</b> GFK, CFK	<b>Plastiques réinforcés</b> GFK, CFK	<b>Plásticos reforzados</b> GFK, CFK	<b>Verstärkte Kunststoffe</b> GFK, CFK
 S 71 NiCo	 S 71 NiCo	<b>Nikkel- en Cobaltlegeringen</b> Hastelloy, Inconel, Nimonic, Jetalloy	<b>Alliages de Nickel et de Cobalt</b> Hastelloy, Inconel, Nimonic, Jetalloy	<b>Aleaciones de Níquel y Cobalto</b> Hastelloy, Inconel, Nimonic, Jetalloy	<b>Nickel und Kobaltlegerungen</b> Hastelloy, Inconel, Nimonic, Jetalloy
 S 72 Ti	 S 72 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>Titanlegerungen</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 67 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 INDUSTRIAL  
INDUSTRIEQUALITÄT

- › **Basic quality**

Basis kwaliteit  
Qualité STANDARD  
Calidad básica  
Grundlegende Qualität

- › **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

- › **Professional use**

Professioneel gebruik  
Usage professionnel  
Uso profesional  
Professioneller Einsatz

- › **Favourably priced**

Gunstige prijs  
Le meilleur rapport qualité prix  
Precio favorable  
Günstiger Preis

- › **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 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 und Gewindebohrer in gängigen Maßen, die ab Lager lieferbar sind.



## 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	Werknorm
<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>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	Mehrflachs-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 facetado	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 **VHM Boren**  
FR **Forets Carbone Monobloc**  
ES **Brocas Metal Duro**  
DE **VHM Bohrer**

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

**P K** Beperkt geschikt  
**H N** Appropriate  
**M S** Adecuado  
**M S** Eingeschränkt geeignet

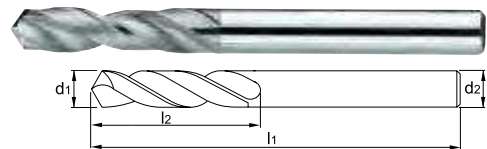
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P= Seite

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



> 11.200 Phantom

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



MG HM DIN 6539 3xD N h6 118°

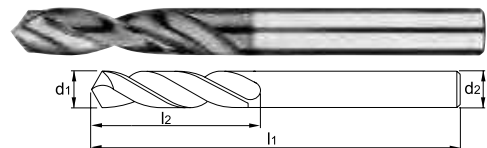
P 11 P 12 P 13 P 14 M 21 M 22 K 31 K 32 N 41 N 42 N 43 N 51 N 61 N 62 S 71 S 72

70-80 D 50-80 D 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 TiAlN  
FR Foret Carbure TiAlN  
ES Broca MD TiAlN  
DE VHM Spiralbohrer TiAlN



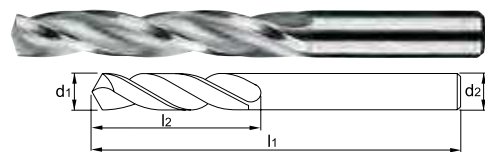
MG HM TiAlN DIN 6539 3xD N h6 118°

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 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 3 snijkanten**  
 FR **Foret Carbure 3 taillants**  
 ES **Broca MD 3 labios**  
 DE **VHM Spiralbohrer 3 Schneiden**

MG HM DIN 6539 3xD N h6 150°

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

≤1000 N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si10% Mg Cu

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

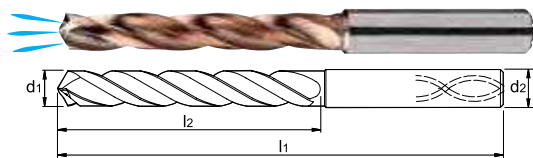
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11.240.0310	3.1	3.1	49	18	3
11.240.0320	3.2	3.2	49	18	3
11.240.0330	3.3	3.3	49	18	3
11.240.0340	3.4	3.4	52	20	3
11.240.0350	3.5	3.5	52	20	3
11.240.0360	3.6	3.6	52	20	3
11.240.0370	3.7	3.7	52	20	3
11.240.0380	3.8	3.8	55	22	3
11.240.0390	3.9	3.9	55	22	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 High-Feed Spiraalboor 5xD met koelkanaal, AlCrN-X, 3 snijkanten**  
 FR **Foret Carbure High-Feed 5xD à trou d'huile, AlCrN-X, 3 taillants**  
 ES **Broca MD High-Feed 5xD con canal de refrigeración, AlCrN-X, 3 labios**  
 DE **VHM High-Feed Spiralbohrer 5xD mit Innenkühlung, AlCrN-X, 3 Schneiden**



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

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

≤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 GG GGG GTS-GTW

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

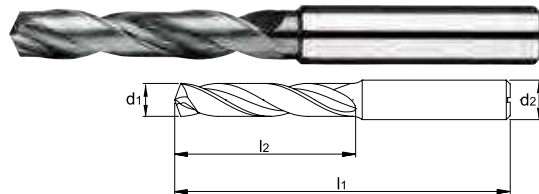
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11.245.0700	7	8	91	43	3
11.245.0740	7.4	8	91	43	3
11.245.0800	8	8	91	43	3
11.245.0850	8.5	10	103	49	3
11.245.0900	9	10	103	49	3
11.245.1000	10	10	103	49	3
11.245.1020	10.2	12	118	56	3

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, 30-45 HRc  
 FR Foret Carbure UNI 3xD TiAlN, 30-45 HRc  
 ES Broca MD UNI 3xD TiAlN, 30-45 HRc  
 DE UNI VHM Spiralbohrer 3xD TiAlN, 30-45 HRc



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

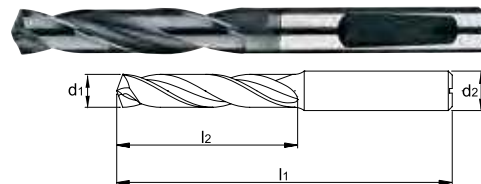
Ref.	d1	d2	l1	l2
11.250.0100	1	3	45	7
11.250.0110	1.1	3	45	7
11.250.0120	1.2	3	45	7
11.250.0130	1.3	3	45	7
11.250.0140	1.4	3	45	7
11.250.0150	1.5	3	55	14
11.250.0160	1.6	3	55	14
11.250.0170	1.7	3	55	14
11.250.0180	1.8	3	55	14
11.250.0190	1.9	3	55	14
11.250.0200	2	4	55	20
11.250.0210	2.1	4	55	20
11.250.0220	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, 30-45 HRc  
 FR Foret Carbure UNI 3xD TiAlN, 30-45 HRc  
 ES Broca MD UNI 3xD TiAlN, 30-45 HRc  
 DE UNI VHM Spiralbohrer 3xD TiAlN, 30-45 HRc



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

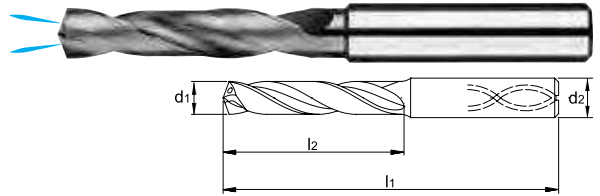
Ref.	d1	d2	l1	l2
11.251.0300	3	6	62	20
11.251.0330	3.3	6	62	20
11.251.0350	3.5	6	62	20
11.251.0380	3.8	6	66	24
11.251.0400	4	6	66	24
11.251.0420	4.2	6	66	24
11.251.0450	4.5	6	66	24
11.251.0480	4.8	6	66	28
11.251.0500	5	6	66	28
11.251.0550	5.5	6	66	28
11.251.0580	5.8	6	66	28

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, TiAlN, 30-45 HRC  
 FR Foret Carbure UNI 3xD à trou d'huile, TiAlN, 30-45 HRC  
 ES Broca MD UNI 3xD con canal de refrigeración, TiAlN, 30-45 HRC  
 DE UNI VHM Spiralbohrer 3xD mit Innenkühlung, TiAlN, 30-45 HRC

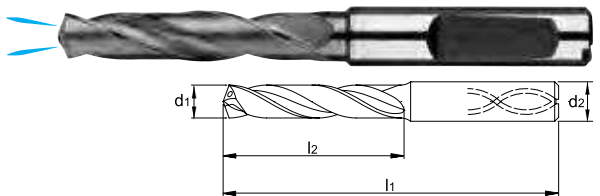


<b>MG HM</b>	<b>TiAlN</b>	<b>DIN 6537-K</b>	<b>3xD</b>	<b>h6</b>	<b>DIN 6535-HA</b>			<b>140°</b>		<b>UNI</b>
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>H 15</b> HRC	<b>M 21</b> INOX ≤850N/mm <sup>2</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>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	18.8	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, TiAlN, 30-45 HRC  
 FR Foret Carbure UNI 3xD à trou d'huile, TiAlN, 30-45 HRC  
 ES Broca MD UNI 3xD con canal de refrigeración, TiAlN, 30-45 HRC  
 DE UNI VHM Spiralbohrer 3xD mit Innenkühlung, TiAlN, 30-45 HRC



<b>MG HM</b>	<b>TiAlN</b>	<b>DIN 6537-K</b>	<b>3xD</b>	<b>h6</b>	<b>DIN 6535-HE</b>			<b>140°</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 ≤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>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

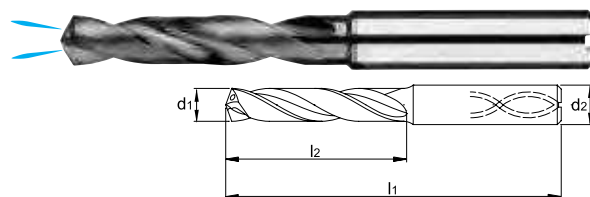
Ref.	d1	d2	l1	l2
11.254.0510	5.1	6	66	28
11.254.0520	5.2	6	66	28
11.254.0530	5.3	6	66	28
11.254.0540	5.4	6	66	28
11.254.0550	5.5	6	66	28
11.254.0560	5.6	6	66	28
11.254.0570	5.7	6	66	28
11.254.0580	5.8	6	66	28
11.254.0590	5.9	6	66	28
11.254.0600	6	6	66	28
11.254.0620	6.2	8	79	34
11.254.0630	6.3	8	79	34
11.254.0650	6.5	8	79	34
11.254.0670	6.7	8	79	34
11.254.0680	6.8	8	79	34
11.254.0690	6.9	8	79	34

Ref.	d1	d2	l1	l2
11.254.0700	7	8	79	34
11.254.0750	7.5	8	79	41
11.254.0780	7.8	8	79	41
11.254.0800	8	8	79	41
11.254.0850	8.5	10	89	47
11.254.0860	8.6	10	89	47
11.254.0880	8.8	10	89	47
11.254.0900	9	10	89	47
11.254.0920	9.2	10	89	47
11.254.0950	9.5	10	89	47
11.254.0980	9.8	10	89	47
11.254.1000	10	10	89	47
11.254.1010	10.1	12	102	55
11.254.1020	10.2	12	102	55
11.254.1030	10.3	12	102	55
11.254.1050	10.5	12	102	55

Ref.	d1	d2	l1	l2
11.254.1100	11	12	102	55
11.254.1150	11.5	12	102	55
11.254.1180	11.8	12	102	55
11.254.1200	12	12	102	55
11.254.1220	12.2	14	107	60
11.254.1250	12.5	14	107	60
11.254.1300	13	14	107	60
11.254.1400	14	14	107	60
11.254.1500	15	16	115	65
11.254.1550	15.5	16	115	65
11.254.1600	16	16	115	65
11.254.1700	17	18	123	73
11.254.1800	18	18	123	73
11.254.1900	19	20	131	79
11.254.2000	20	20	131	79

## > 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 h6 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

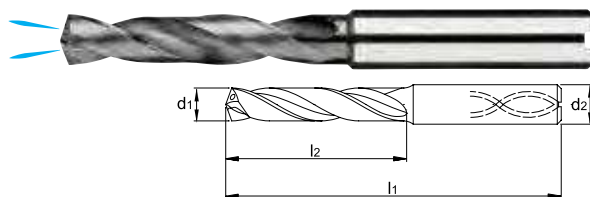
Ref.	d1	d2	l1	l2
11.259.0300	3	6	62	20
11.259.0320	3.2	6	62	20
11.259.0330	3.3	6	62	20
11.259.0350	3.5	6	62	20
11.259.0400	4	6	66	24
11.259.0410	4.1	6	66	24
11.259.0420	4.2	6	66	24
11.259.0450	4.5	6	66	24
11.259.0490	4.9	6	66	28
11.259.0500	5	6	66	28
11.259.0510	5.1	6	66	28
11.259.0520	5.2	6	66	28
11.259.0540	5.4	6	66	28
11.259.0550	5.5	6	66	28
11.259.0580	5.8	6	66	28
11.259.0600	6	6	66	28
11.259.0610	6.1	8	79	34

Ref.	d1	d2	l1	l2
11.259.0620	6.2	8	79	34
11.259.0650	6.5	8	79	34
11.259.0660	6.6	8	79	34
11.259.0680	6.8	8	79	34
11.259.0700	7	8	79	34
11.259.0750	7.5	8	79	41
11.259.0780	7.8	8	79	41
11.259.0800	8	8	79	41
11.259.0820	8.2	10	89	47
11.259.0850	8.5	10	89	47
11.259.0880	8.8	10	89	47
11.259.0900	9	10	89	47
11.259.0950	9.5	10	89	47
11.259.0980	9.8	10	89	47
11.259.1000	10	10	89	47
11.259.1020	10.2	12	102	55
11.259.1050	10.5	12	102	55

Ref.	d1	d2	l1	l2
11.259.1080	10.8	12	102	55
11.259.1100	11	12	102	55
11.259.1120	11.2	12	102	55
11.259.1150	11.5	12	102	55
11.259.1180	11.8	12	102	55
11.259.1200	12	12	102	55
11.259.1250	12.5	14	107	60
11.259.1300	13	14	107	60
11.259.1350	13.5	14	107	60
11.259.1380	13.8	14	107	60
11.259.1400	14	14	107	60
11.259.1450	14.5	16	115	65
11.259.1480	14.8	16	115	65
11.259.1500	15	16	115	65
11.259.1600	16	16	115	65
11.259.1800	18	18	123	73
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 140° m7 INOX

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 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
11.262.0300	3	6	62	20
11.262.0310	3.1	6	62	20
11.262.0320	3.2	6	62	20
11.262.0330	3.3	6	62	20
11.262.0340	3.4	6	62	20
11.262.0350	3.5	6	62	20
11.262.0360	3.6	6	62	20
11.262.0370	3.7	6	62	20
11.262.0380	3.8	6	66	24
11.262.0390	3.9	6	66	24

Ref.	d1	d2	l1	l2
11.262.0400	4	6	66	24
11.262.0410	4.1	6	66	24
11.262.0420	4.2	6	66	24
11.262.0430	4.3	6	66	24
11.262.0440	4.4	6	66	24
11.262.0450	4.5	6	66	24
11.262.0460	4.6	6	66	24
11.262.0470	4.7	6	66	24
11.262.0480	4.8	6	66	28
11.262.0490	4.9	6	66	28

Ref.	d1	d2	l1	l2
11.262.0500	5	6	66	28
11.262.0510	5.1	6	66	28
11.262.0520	5.2	6	66	28
11.262.0530	5.3	6	66	28
11.262.0540	5.4	6	66	28
11.262.0550	5.5	6	66	28
11.262.0560	5.6	6	66	28
11.262.0570	5.7	6	66	28
11.262.0580	5.8	6	66	28
11.262.0590	5.9	6	66	28





> **11.273 Phantom**

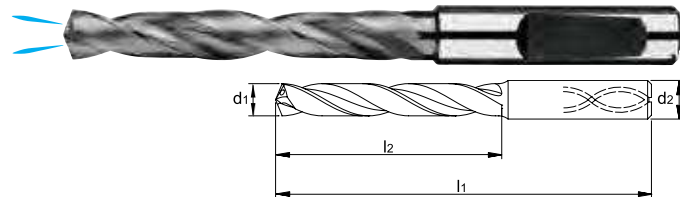
Ref.	d1	d2	l1	l2
11.273.1170	11.7	12	118	71
11.273.1180	11.8	12	118	71
11.273.1190	11.9	12	118	71
11.273.1200	12	12	118	71
11.273.1210	12.1	14	124	77
11.273.1220	12.2	14	124	77
11.273.1225	12.25	14	124	77
11.273.1230	12.3	14	124	77
11.273.1240	12.4	14	124	77
11.273.1250	12.5	14	124	77
11.273.1260	12.6	14	124	77
11.273.1270	12.7	14	124	77
11.273.1280	12.8	14	124	77

Ref.	d1	d2	l1	l2
11.273.1290	12.9	14	124	77
11.273.1300	13	14	124	77
11.273.1350	13.5	14	124	77
11.273.1380	13.8	14	124	77
11.273.1400	14	14	124	77
11.273.1450	14.5	16	133	83
11.273.1480	14.8	16	133	83
11.273.1500	15	16	133	83
11.273.1510	15.1	16	133	83
11.273.1550	15.5	16	133	83
11.273.1580	15.8	16	133	83
11.273.1600	16	16	133	83
11.273.1650	16.5	18	143	93

Ref.	d1	d2	l1	l2
11.273.1680	16.8	18	143	93
11.273.1700	17	18	143	93
11.273.1750	17.5	18	143	93
11.273.1780	17.8	18	143	93
11.273.1800	18	18	143	93
11.273.1850	18.5	20	153	101
11.273.1880	18.8	20	153	101
11.273.1900	19	20	153	101
11.273.1950	19.5	20	153	101
11.273.1980	19.8	20	153	101
11.273.2000	20	20	153	101

> **11.274 Phantom**

NL **UNI VHM Spiraalboor 5xD met koelkanaal, TiAlN, 30-45 HRC**  
 FR **Foret Carbure UNI 5xD à trou d'huile, TiAlN, 30-45 HRC**  
 ES **Broca MD UNI 5xD con canal de refrigeración, TiAlN, 30-45 HRC**  
 DE **UNI VHM Spiralbohrer 5xD mit Innenkühlung, TiAlN, 30-45 HRC**



**MG HM** **TiAlN** **DIN 6537-L** **5xD** **h6** **DIN 6535-HE** **140°** **m7** **UNI**  
**P 11** **P 12** **P 13** **P 14** **H 15** **M 21** **M 22** **K 31** **K 32** **N 51** **S 71**  
≤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 Cu 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

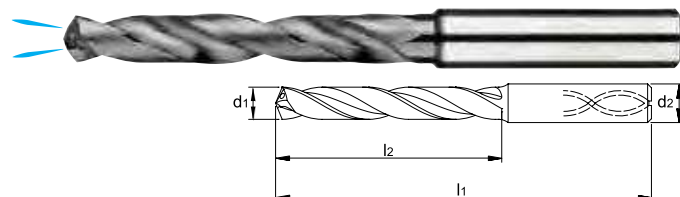
Ref.	d1	d2	l1	l2
11.274.0300	3	6	66	28
11.274.0310	3.1	6	66	28
11.274.0320	3.2	6	66	28
11.274.0330	3.3	6	66	28
11.274.0340	3.4	6	66	28
11.274.0350	3.5	6	66	28
11.274.0360	3.6	6	66	28
11.274.0370	3.7	6	66	28
11.274.0380	3.8	6	74	36
11.274.0390	3.9	6	74	36
11.274.0400	4	6	74	36
11.274.0410	4.1	6	74	36
11.274.0420	4.2	6	74	36
11.274.0430	4.3	6	74	36
11.274.0440	4.4	6	74	36
11.274.0450	4.5	6	74	36
11.274.0460	4.6	6	74	36
11.274.0470	4.7	6	74	36
11.274.0480	4.8	6	82	44

Ref.	d1	d2	l1	l2
11.274.0490	4.9	6	82	44
11.274.0500	5	6	82	44
11.274.0510	5.1	6	82	44
11.274.0520	5.2	6	82	44
11.274.0530	5.3	6	82	44
11.274.0540	5.4	5	82	44
11.274.0550	5.5	6	82	44
11.274.0560	5.6	6	82	44
11.274.0570	5.7	6	82	44
11.274.0580	5.8	6	82	44
11.274.0590	5.9	6	82	44
11.274.0600	6	6	82	44
11.274.0650	6.5	8	91	53
11.274.0680	6.8	8	91	53
11.274.0690	6.9	8	91	53
11.274.0700	7	8	91	53
11.274.0750	7.5	8	91	53
11.274.0800	8	8	91	53
11.274.0850	8.5	10	103	61

Ref.	d1	d2	l1	l2
11.274.0860	8.6	10	103	61
11.274.0900	9	10	103	61
11.274.0950	9.5	10	103	61
11.274.1000	10	10	103	61
11.274.1010	10.1	12	118	71
11.274.1020	10.2	12	118	71
11.274.1030	10.3	12	118	71
11.274.1050	10.5	12	118	71
11.274.1100	11	12	118	71
11.274.1150	11.5	12	118	71
11.274.1200	12	12	118	71
11.274.1250	12.5	14	124	77
11.274.1300	13	14	124	77
11.274.1350	13.5	14	124	77
11.274.1400	14	14	124	77
11.274.1500	15	16	133	83
11.274.1600	16	16	133	83
11.274.1800	18	18	143	93
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** **h6** **DIN 6535-HA** **118°** **m7** **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
11.279.0300	3	6	66	28
11.279.0310	3.1	6	66	28
11.279.0320	3.2	6	66	28
11.279.0330	3.3	6	66	28
11.279.0340	3.4	6	66	28
11.279.0350	3.5	6	66	28
11.279.0360	3.6	6	66	28
11.279.0370	3.7	6	66	28
11.279.0380	3.8	6	74	36
11.279.0390	3.9	6	74	36
11.279.0400	4	6	74	36

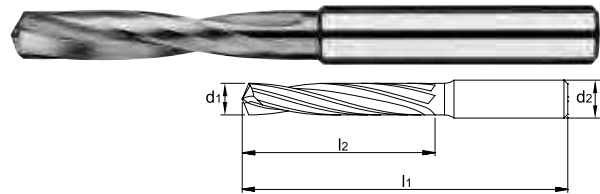
Ref.	d1	d2	l1	l2
11.279.0410	4.1	6	74	36
11.279.0420	4.2	6	74	36
11.279.0430	4.3	6	74	36
11.279.0440	4.4	6	74	36
11.279.0450	4.5	6	74	36
11.279.0460	4.6	6	74	36
11.279.0470	4.7	6	74	36
11.279.0480	4.8	6	82	44
11.279.0490	4.9	6	82	44
11.279.0500	5	6	82	44
11.279.0510	5.1	6	82	44

Ref.	d1	d2	l1	l2
11.279.0520	5.2	6	82	44
11.279.0530	5.3	6	82	44
11.279.0540	5.4	6	82	44
11.279.0550	5.5	6	82	44
11.279.0560	5.6	6	82	44
11.279.0570	5.7	6	82	44
11.279.0580	5.8	6	82	44
11.279.0590	5.9	6	82	44
11.279.0600	6	6	82	44
11.279.0610	6.1	8	91	53
11.279.0620	6.2	8	91	53





> **11.286 Phantom**



NL **VHM Spiraalboor 5xD TiAlN, gehard staal, 45-70 HRC**  
 FR **Foret Carbure 5xD TiAlN, métaux durs, 45-70 HRC**  
 ES **Broca MD 5xD TiAlN, aceros duros, 45-70 HRC**  
 DE **VHM Spiralbohrer 5xD TiAlN, harte Stähle, 45-70 HRC**

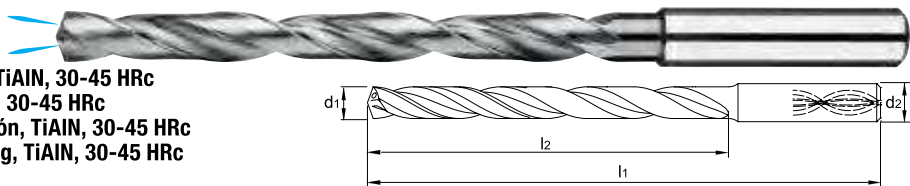
MG HM TiAlN NORM 5xD h6 DIN 6535-HA 140° h7

**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, TiAlN, 30-45 HRC**  
 FR **Foret Carbure UNI 8xD à trou d'huile, TiAlN, 30-45 HRC**  
 ES **Broca MD UNI 8xD con canal de refrigeración, TiAlN, 30-45 HRC**  
 DE **UNI VHM Spiralbohrer 8xD mit Innenkühlung, TiAlN, 30-45 HRC**

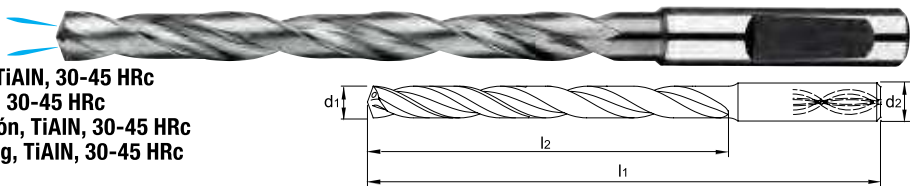
MG HM TiAlN NORM 8xD h6 DIN 6535-HA 140° m7 UNI

P 11 ≤600 N/mm² P 12 ≤850 N/mm² P 13 ≤1000 N/mm² P 14 ≤1400 N/mm² M 21 INOX ≤850 N/mm² M 22 INOX >850 N/mm² K 31 GG K 32 GGG GTS-GTW N 51 Cu S 71 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, TiAlN, 30-45 HRC**  
 FR **Foret Carbure UNI 8xD à trou d'huile, TiAlN, 30-45 HRC**  
 ES **Broca MD UNI 8xD con canal de refrigeración, TiAlN, 30-45 HRC**  
 DE **UNI VHM Spiralbohrer 8xD mit Innenkühlung, TiAlN, 30-45 HRC**

MG HM TiAlN NORM 8xD 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 M 21 INOX ≤850 N/mm² M 22 INOX >850 N/mm² K 31 GG K 32 GGG GTS-GTW N 51 Cu S 71 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

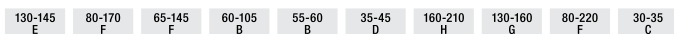
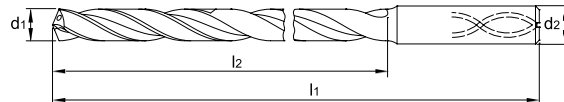
Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.296.0400	4	6	81	43	11.296.0800	8	8	114	76	11.296.1250	12.5	14	178	133
11.296.0420	4.2	6	81	43	11.296.0850	8.5	10	142	95	11.296.1300	13	14	178	133
11.296.0450	4.5	6	81	43	11.296.0900	9	10	142	95	11.296.1350	13.5	14	178	133
11.296.0500	5	6	95	57	11.296.0950	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, TiAlN, 30-45 HRc  
 FR Foret Carbure UNI 10xD à trou d'huile, TiAlN, 30-45 HRc  
 ES Broca MD UNI 10xD con canal de refrigeración, TiAlN, 30-45 HRc  
 DE UNI VHM Spiralbohrer 10xD mit Innenkühlung, TiAlN, 30-45 HRc



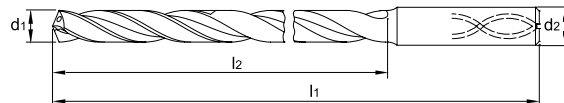
Ref.	d1	d2	l1	l2
11.305.0300	3	6	80	40
11.305.0330	3.3	6	87	47
11.305.0350	3.5	6	87	47
11.305.0400	4	6	93	53
11.305.0420	4.2	6	100	60
11.305.0450	4.5	6	100	60
11.305.0500	5	6	106	66
11.305.0550	5.5	6	113	73
11.305.0600	6	6	119	79

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, TiAlN, 30-45 HRc  
 FR Foret Carbure UNI 15xD à trou d'huile, TiAlN, 30-45 HRc  
 ES Broca MD UNI 15xD con canal de refrigeración, TiAlN, 30-45 HRc  
 DE UNI VHM Spiralbohrer 15xD mit Innenkühlung, TiAlN, 30-45 HRc



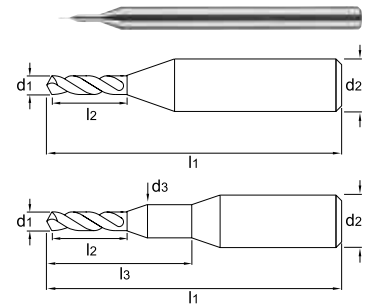
Ref.	d1	d2	l1	l2
11.310.0300	3	6	95	55
11.310.0350	3.5	6	104	64
11.310.0400	4	6	113	73
11.310.0450	4.5	6	122	82
11.310.0500	5	6	131	91
11.310.0550	5.5	6	140	100
11.310.0600	6	6	149	109
11.310.0650	6.5	8	158	118

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**



**NIEUW NOUVEAU NUEVO NEU**

MG HM NORM 5xD h5 130° UNI -0,000 +0,004

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  
≤600 N/mm² ≤850 N/mm² ≤1000 N/mm² INOX ≤850N/mm² INOX >850N/mm² GG GGG GTS-GTW Alu Alu Si>10% Cu PVC GFK/CFK Ni/Co Ti  
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

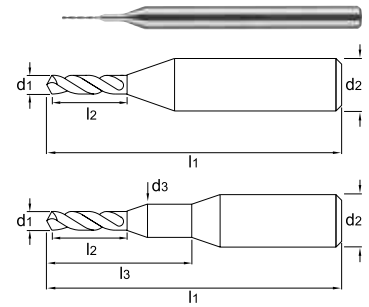
Ref.	d1	d2	d3	l1	l2	l3
11.330.0100	0.1	3	1	39	0.5	5
11.330.0150	0.15	3	1	39	0.8	5
11.330.0200	0.2	3	1	39	1	5
11.330.0250	0.25	3	1	39	1.25	5
11.330.0300	0.3	3	1	39	1.5	5
11.330.0350	0.35	3	1	39	1.75	5
11.330.0400	0.4	3	1	39	2	5
11.330.0450	0.45	3	1	39	2.25	5
11.330.0500	0.5	3	1.5	39	2.5	10
11.330.0550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



**NIEUW NOUVEAU NUEVO NEU**

MG HM NORM 8xD h5 130° UNI -0,000 +0,004

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  
≤600 N/mm² ≤850 N/mm² ≤1000 N/mm² INOX ≤850N/mm² INOX >850N/mm² GG GGG GTS-GTW Alu Alu Si>10% Cu PVC GFK/CFK Ni/Co Ti  
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

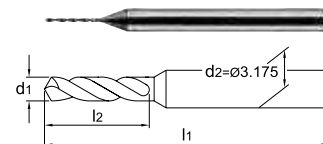
Ref.	d1	d2	d3	l1	l2	l3
11.335.0600	0.6	3	1.5	39	4.8	15
11.335.0650	0.65	3	1.5	39	5.6	15
11.335.0700	0.7	3	1.5	39	5.6	15
11.335.0750	0.75	3	1.5	39	6.4	15
11.335.0800	0.8	3	1.5	39	6.4	15
11.335.0850	0.85	3	1.5	39	7.2	15
11.335.0900	0.9	3	1.5	39	7.2	15
11.335.1000	1	3	2	39	8	15
11.335.1100	1.1	3	2	39	8.8	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> ≤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 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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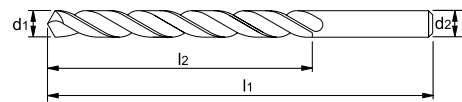
45-50 E	25-50 D	25-45 B	20-65 B	10-20 B	20-25 C	20-25 B	64-80 E	50-60 E	120-150 F	60-100 F	120-150 E	40-77 D	30-36 C	55-60 D	12-15 B	25-45 D
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Ref.	d1	d2	l1	l2
11.360.0030	0.3	3.175	38	5.5
11.360.0040	0.4	3.175	38	5.5
11.360.0050	0.5	3.175	38	5.5
11.360.0060	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

P 11 ≤600 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 43 Mg N 51 Cu N 61 PVC N 62 GFK/CFK S 71 Ni/Co S 72 Ti

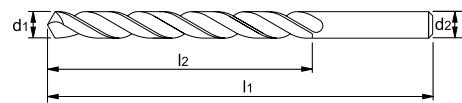
70-80 D 50-80 D 65-70 D 25-80 B 20-25 D 20-25 C 72-90 D 70-80 D 160-200 G 120-150 F 120-180 E 120-180 E 30-40 C 60-80 C 12-15 B 15-20 C

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

P 11 ≤600 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 43 Mg N 51 Cu N 61 PVC N 62 GFK/CFK S 71 Ni/Co S 72 Ti

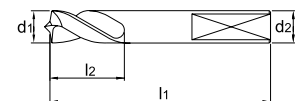
100-110 D 65-105 D 82-95 D 32-95 B 27-32 D 28-32 C 72-90 D 75-95 D 120-180 E 120-180 E 30-40 C 80-95 C 12-15 B 17-24 C

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 ≤600 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

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

Ref.	d1	d2	l1	l2
13.814.0645	6	6	45	15

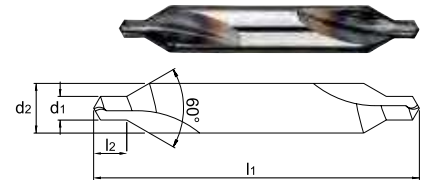
Ref.	d1	d2	l1	l2
13.814.0845	8	8	45	15

Ref.	d1	d2	l1	l2
13.814.1045	10	10	45	15



## > 15.144 Phantom

NL **VHM Centerboor TiAlN, 60°**  
 FR **Foret à centrer Carbone TiAlN, 60°**  
 ES **Broca de centrar MD TiAlN, 60°**  
 DE **VHM Zentrierbohrer TiAlN, 60°**



MG HM TiAlN 60° DIN 333-A NFE 66051-A

P 11 P 12 P 13 P 14 H 15 M 21  
 ≤800 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>

100-110 D 65-105 D 82-95 D 32-95 B 10-20 C 20-45 B

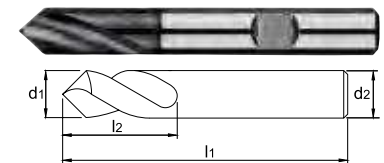
Ref.	d1	d2	l1	l2
15.144.1031	1	3.15	31.5	1,3-1,7
15.144.1231	1.25	3.15	31.5	1,6-2,0
15.144.1640	1.6	4	35.5	2,0-2,6

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

Ref.	d1	d2	l1	l2
15.144.4010	4	10	56	5,0-5,9
15.144.5013	5	12.5	63	6,3-7,2

## > 15.624 Phantom

NL **VHM NC-Centreerboor TiAlN, 90°**  
 FR **Foret à pointer NC Carbone TiAlN, 90°**  
 ES **Broca de puntear NC MD TiAlN, 90°**  
 DE **VHM NC Anbohrer TiAlN, 90°**



MG HM TiAlN 90° 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  
 ≤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% Mg Cu PVC Ni/Co Ti

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

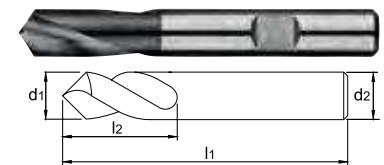
Ref.	d1	d2	l1	l2
15.624.0200	2	2	40	8
15.624.0300	3	3	45	10
15.624.0400	4	4	50	12
15.624.0500	5	5	50	13

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

Ref.	d1	d2	l1	l2
15.624.1600	16	16	75	29
15.624.2000	20	20	100	35

## > 15.724 Phantom

NL **VHM NC-Centreerboor TiAlN, 120°**  
 FR **Foret à pointer NC Carbone TiAlN, 120°**  
 ES **Broca de puntear NC MD TiAlN, 120°**  
 DE **VHM NC Anbohrer TiAlN, 120°**



MG HM TiAlN 120° 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  
 ≤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% Mg Cu PVC Ni/Co Ti

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

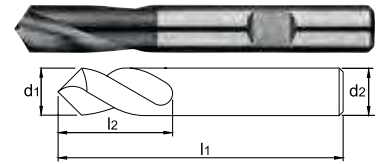
Ref.	d1	d2	l1	l2
15.724.0200	2	2	32	8
15.724.0300	3	3	32	8
15.724.0400	4	4	40	10
15.724.0500	5	5	50	13

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 TiAIN, 142°**  
 FR **Foret à pointer NC Carbure TiAIN, 142°**  
 ES **Broca de puntear NC MD TiAIN, 142°**  
 DE **VHM NC Anbohrer TiAIN, 142°**



**NIEUW / NOUVEAU / NUEVO / NEU**

MG HM TiAIN 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  

 ≤850 N/mm<sup>2</sup>   ≤1000 N/mm<sup>2</sup>   ≤1400 N/mm<sup>2</sup>   HRC   INOX ≤850 N/mm<sup>2</sup>   INOX >850 N/mm<sup>2</sup>   GG   GGG GTS-GTW   Alu Si>10%   Mg   Cu   PVC   Ni/Co   Ti

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 Vorschubtablelle

**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	J	K	L	P	Q	R	S	T	U
	f (mm/n)																	
0,1													0,0022	0,0025	0,003	0,004	0,006	0,007
0,3	0,002	0,003	0,003	0,004	0,010	0,010	0,010	0,010	0,010				0,0040	0,0045	0,005	0,007	0,010	0,013
0,5	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,019			0,0060	0,0070	0,008	0,010	0,016	0,020
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 Drehzahltablelle

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

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	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: Snijnsnelheid (m/min)  
FR: Vitesse de coupe (m/min)  
ES: Velocidad de corte (m/min)  
DE: Schnittgeschwindigkeit (m/min)

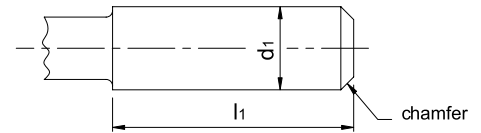
#### n=rpm

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



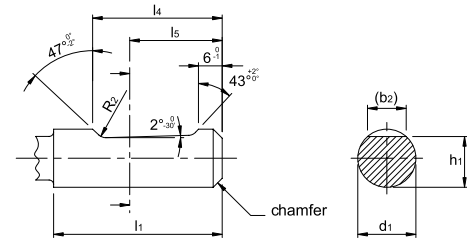
Dimensions in mm	
d <sub>1</sub>	l <sub>1</sub> +2 0
h6	0
3	28
4	28
5	28
6	36
8	36

Dimensions in mm	
d <sub>1</sub>	l <sub>1</sub> +2 0
h6	0
10	40
12	45
16	48
20	50
25	56

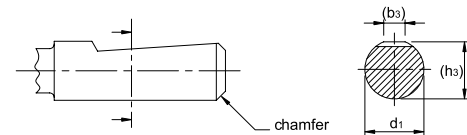
Dimensions in mm	
d <sub>1</sub>	l <sub>1</sub> +2 0
h6	0
32	60
40	70
50	80
63	90

**DIN 6535 HE**

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



d <sub>1</sub> = 6 to 20 mm								
d <sub>1</sub>	(b <sub>2</sub> )	(b <sub>3</sub> )	h <sub>2</sub>	(h <sub>3</sub> )	l <sub>1</sub> +2 0	l <sub>4</sub> 0 -1	l <sub>1</sub> nom. size	r <sub>2</sub>
h6	≈		h11					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 <sub>1</sub> = 25 to 32 mm								
d <sub>1</sub>	(b <sub>2</sub> )	(b <sub>3</sub> )	h <sub>2</sub>	(h <sub>3</sub> )	l <sub>1</sub> +2 0	l <sub>4</sub> 0 -1	l <sub>1</sub> nom. size	r <sub>2</sub>
h6	≈		h11					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



1



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1 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 **Escarar**  
 DE **Reibahlen**



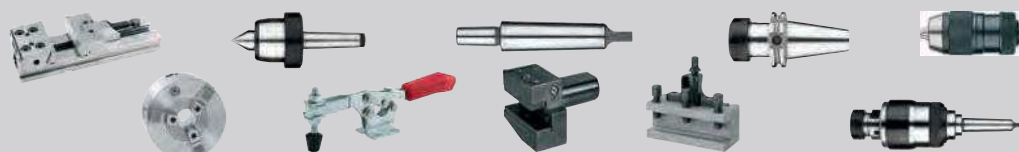
NL **Zagen en Ponsen**  
 FR **Sciage et Poinçonnage**  
 ES **Serrar y Punzonar**  
 DE **Sägen und Blechlocher**



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	Plaquetas de metal duro soldadas	mit HM-Schneiden
<b>HM</b>	Hardmetaal	Carbure monobloc	Metal duro integral	Hartmetall
<b>CV</b>	Hoog gelegerd 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)	Bitaufname (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	Ausgedünnte Spitze
	Aanslijping 3-lippenboor	Affûtage à 3 lèvres	Afilado con 3 labios	Aufbohrer-anchliff
	HM-Snijcanten	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 deamage	Versión ángulo avellanado	Ausführung Zentrierloch
	Centreerboor met kraag	Foret à centrer à bourrelet 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 chafian	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 Snijcanten	À 2 lèvres	Con 2 facetas	2 Schneiden
<b>Z=4</b>	4 Snijcanten	À 4 lèvres	Con 4 facetas	4 Schneiden
	Volgens PGM-keurmerk	Conformément à la directive PGM	Según la directiva PGM	Gemäß PGM-vorschriften

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  
**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

> 11.100	INTERNATIONAL TOOLS	HSS	DIN 1897	ECO	P	K				P. 6		
> 11.110	INTERNATIONAL TOOLS	HSS	DIN 1897	ECO	P	M	K	N		NEW P. 6		
> 11.130	Phantom	HSS	DIN 1897		P	M	K	N		P. 7		
> 11.145	Phantom	HSS	NORM		P	M	K	N		P. 7		
> 11.150	INTERNATIONAL TOOLS	HSS-E	DIN 1897	ECO PRO	P	M	K	N		NEW P. 8		
> 11.160	Phantom	HSS-E	DIN 1897		P	M	K	N		P. 8		
> 11.161	Phantom	HSS-E	DIN 1897		P	M	K	N		P. 9		
> 11.167	Phantom	HSS-E	DIN 1897	INOX	P	M	K	N	S		P. 9	
> 11.168	Phantom	HSS-E	DIN 1897	HP2 UNI	P	M	K	N		P. 10		
> 11.174	Phantom	HSS-E	DIN 1897		P	M	K			P. 10		
> 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	HSS-E	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		
> 11.426	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P	K	N			P. 15		
> 11.430	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P	K	N			P. 15		
> 11.431	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P	M	K	N		NEW P. 16		
> 11.450	Phantom	HSS	DIN 338	OX.	P	M	K	N		P. 17		
> 11.451	Phantom	HSS	DIN 338		P	M	K	N		P. 18		
> 11.461	Phantom	HSS	DIN 338		P	M	K	N		NEW P. 19		
> 11.490	INTERNATIONAL TOOLS	HSS-E	DIN 338	ECO PRO	P	M	K	N		P. 19		
> 11.500	Phantom	HSS-E	DIN 338		P	M	K	N		P. 20		
> 11.501	Phantom	HSS-E	DIN 338		P	M	K	N		P. 21		
> 11.510	Phantom	HSS-E 8%	DIN 338		P	M	K	N	S		NEW P. 21	
> 11.568	Phantom	HSS-E	DIN 338	HP2 UNI	P	M	K	N		P. 22		
> 11.600	Phantom	HM-TIP	DIN 338		P	M	K	N	S	H		P. 22
> 11.700	Phantom	HSS	DIN 338	H				N		P. 23		
> 11.710	Phantom	HSS	DIN 338	ALU				N		P. 24		
> 11.760	Phantom	HSS-E	DIN 338	INOX	P	M			S		P. 24	
> 11.764	Phantom	HSS-E	DIN 338	INOX	P	M			S		P. 25	







































> 11.770	<b>Phantom</b>	HSS-E	DIN 338	TS	P M K N		P. 26
> 11.774	<b>Phantom</b>	HSS-E	DIN 338	TS	P M K N		P. 26
> 11.810	<b>INTERNATIONAL TOOLS</b>	HSS	DIN 340	ECO	P K		P. 27
> 11.815	<b>Phantom</b>	HSS	DIN 340		P M K N		P. 27
> 11.820	<b>Phantom</b>	HSS-E	DIN 340	INOX	P M S		P. 28
> 11.840	<b>Phantom</b>	HM-TIP	DIN 340		P M K N S H		P. 28
> 11.850	<b>Phantom</b>	HSS	DIN 340	TS	P N		P. 28
> 11.860	<b>Phantom</b>	HSS	DIN 340	TS	P K N		P. 29
> 11.870	<b>Phantom</b>	HSS-E	DIN 340	TS	P M K N		P. 29
> 11.874	<b>Phantom</b>	HSS-E	DIN 340	TS	P M K N		P. 30
> 11.890	<b>Phantom</b>	HSS	NORM		P M K N		P. 30
> 11.900	<b>Phantom</b>	HSS	DIN 1869		P K N		P. 30
> 11.920	<b>Phantom</b>	HSS	DIN 1869	TS	P K N		P. 31
> 12.150	<b>Phantom</b>	HSS-E 8%	NORM	DIN 228-B	P		P. 32
> 12.400	<b>INTERNATIONAL TOOLS</b>	HSS	DIN 345	DIN 228-B	P K		P. 32
> 12.420	<b>INTERNATIONAL TOOLS</b>	HSS	NORM	DIN 228-B	P K		P. 33
> 12.440	<b>Phantom</b>	HSS	DIN 345	DIN 228-B	P M K N		P. 33
> 12.480	<b>Phantom</b>	HSS	DIN 346	DIN 228-B	P M K N		P. 34
> 12.500	<b>Phantom</b>	HSS-E	DIN 345	DIN 228-B	P M K N		P. 34
> 12.520	<b>Phantom</b>	HSS-E	DIN 345	DIN 228-B	P M K N		P. 35
> 12.600	<b>Phantom</b>	HM-TIP	DIN 345	DIN 228-B	P M K N S H		P. 35
> 12.800	<b>Phantom</b>	HSS	DIN 341	DIN 228-B	P M K N		P. 35
> 12.840	<b>Phantom</b>	HSS	II	DIN 228-B	P M K N		P. 36
> 12.860	<b>Phantom</b>	HSS	II	DIN 228-B	P M K N		P. 36
> 12.900	<b>Phantom</b>	HSS	DIN 1870	DIN 228-B	P M K N		P. 37
> 12.910	<b>Phantom</b>	HSS	DIN 1870	DIN 228-B	P M K N		<b>NEW</b> P. 37
> 12.920	<b>Phantom</b>	HSS-E	DIN 1870	DIN 228-B	P M N		P. 38
> 13.200	<b>Phantom</b>	HSS	DIN 1898 A	1:50	P		P. 38
> 13.300	<b>Phantom</b>	HSS	DIN 344		P M N		P. 38
> 13.320	<b>Phantom</b>	HSS	DIN 343		P M N		P. 39
> 13.350	<b>Phantom</b>	HSS	DIN 222		P M N		P. 39
> 84.410	<b>INTERNATIONAL TOOLS</b>		DIN 217				P. 40
> 13.603	<b>Phantom</b>	CV		B			P. 41
> 13.606	<b>Phantom</b>	CV		90°			P. 41
> 13.610	<b>Phantom</b>	CV		1/2"			P. 41

> 13.615	<b>Phantom</b>					P. 41
> 13.640	<b>Phantom</b>	CV				P. 42
> 13.650	<b>Phantom</b>	CV				P. 42
> 13.680	<b>Phantom</b>	HM				P. 42
> 13.700	<b>Phantom</b>	HM	DIN 8039			P. 43
> 13.710	<b>Phantom</b>	HM				P. 43
> 13.720	<b>Phantom</b>	HM				P. 43
> 13.730	<b>Phantom</b>	HM				P. 44
> 13.740	<b>Phantom</b>	HM	Z=2			P. 44
> 13.744	<b>Phantom</b>	HM	Z=4			P. 44
> 13.750	<b>Phantom</b>	HM				P. 45
> 13.765	<b>Phantom</b>	HM				P. 45
> 13.766	<b>Phantom</b>	HM				P. 45
> 13.770	<b>Phantom</b>					P. 46
> 13.775	<b>Phantom</b>					P. 47
> 13.790	<b>Phantom</b>	HM				P. 47
> 13.800	<b>Phantom</b>	HSS-E				P. 48
> 13.801	<b>Phantom</b>	HSS-E				P. 48
> 15.095	INTERNATIONAL TOOLS	HSS	DIN 333-A	<b>P</b> <b>K</b> <b>N</b>		<b>NEW</b> P. 49
> 15.096	INTERNATIONAL TOOLS	HSS	DIN 333-A	<b>P</b> <b>K</b> <b>N</b>		<b>NEW</b> P. 49
> 15.100	<b>Phantom</b>	HSS	DIN 333-A	<b>P</b> <b>K</b> <b>N</b>		P. 49
> 15.120	<b>Phantom</b>	HSS-E	DIN 333-A	<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 50
> 15.124	<b>Phantom</b>	HSS-E	DIN 333-A	<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 50
> 15.150	<b>Phantom</b>	HSS-E		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 50
> 15.200	<b>Phantom</b>	HSS	DIN 333-W	<b>P</b> <b>K</b> <b>N</b>		P. 51
> 15.250	<b>Phantom</b>	HSS	DIN 333-R	<b>P</b> <b>K</b> <b>N</b>		P. 51
> 15.380	<b>Phantom</b>	HSS	NFE 66064	<b>P</b> <b>K</b> <b>N</b>		P. 52
> 15.500	<b>Phantom</b>	HSS		<b>P</b> <b>K</b> <b>N</b>		P. 52
> 15.600	<b>Phantom</b>	HSS-E		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 52
> 15.604	<b>Phantom</b>	HSS-E		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 53
> 15.606	<b>Phantom</b>	HSS-E 8%		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		<b>NEW</b> P. 53
> 15.611	<b>Phantom</b>	HSS-E		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 53
> 15.640	<b>Phantom</b>	HSS-E		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 54
> 15.644	<b>Phantom</b>	HSS-E		<b>P</b> <b>M</b> <b>K</b> <b>N</b>		P. 54



> 15.650	<b>Phantom</b>	HSS-E	DIN 228-B	90°	P M K N		P. 54
> 15.700	<b>Phantom</b>	HSS-E		120°	P M K N		P. 54
> 15.704	<b>Phantom</b>	HSS-E		120°	P M K N		P. 55
> 15.740	<b>Phantom</b>	HSS-E		120°	P M K N		P. 55
> 15.744	<b>Phantom</b>	HSS-E		120°	P M K N		P. 55
> 15.751	<b>Phantom</b>	HSS-E		142°	P M K N		NEW P. 56
> 15.820	<b>Phantom</b>	HSS-E	DIN 332-2	60°	P M K N		P. 56
> 15.840	<b>Phantom</b>	HSS-E	DIN 332-2	60°	P M K N		P. 56
> 15.880	<b>Phantom</b>	HSS-E		90°	P M K N		P. 57
> 16.100	<b>Phantom</b>	HSS-E		90°	P M K N		P. 58
> 16.104	<b>Phantom</b>	HSS-E		90°	P M K N		NEW P. 58
> 16.120	<b>Phantom</b>	HSS-E		90°	P M K N		P. 58
> 16.124	<b>Phantom</b>	HSS-E		90°	P M K N		NEW P. 59
> 16.200	<b>Phantom</b>	HSS		90°	P M K N		P. 59
> 16.220	<b>Phantom</b>	HSS	DIN 8374	90°	P M K N		P. 59
> 16.250	<b>Phantom</b>	HSS	DIN 8378	90°	P M K N		P. 59
> 16.300	<b>Phantom</b>	HSS	DIN 8375	90°	P M K N		P. 60
> 16.350	<b>Phantom</b>	HSS	DIN 8379	90°	P M K N		P. 60
> 16.500	<b>Phantom</b>	HSS-E		180°	P M K N		P. 60
> 16.504	<b>Phantom</b>	HSS-E		180°	P M K N		NEW P. 60
> 16.600	<b>Phantom</b>	HSS	DIN 8376	180°	P M K N		P. 61
> 16.700	<b>Phantom</b>	HSS	DIN 8377	180°	P M K N		P. 61
> 16.730	<b>Phantom</b>	HSS		180°	P M K N		P. 61
> 19.100	<b>Phantom</b>						P. 62
> 19.105	<b>Phantom</b>						P. 62
> 19.113	<b>Phantom</b>	HSS	DIN 1897		P M K N		P. 62
> 19.116	<b>Phantom</b>	HSS-E	DIN 1897		P M K N		P. 63
> 19.120	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P K N		P. 63
> 19.124	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P K N		P. 64
> 19.130	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P K N		P. 64



> 19.134	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P	K	N		 P. 65		
> 19.136	INTERNATIONAL TOOLS	HSS	DIN 338	ECO PRO	P	M	K	N	 P. 65		
> 19.144	INTERNATIONAL TOOLS	HSS	DIN 338	ECO	P	K			 P. 66		
> 19.145	Phantom	HSS	DIN 338		P	M	K	N	 P. 66		
> 19.146	Phantom	HSS	DIN 338		P	M	K	N	 P. 67		
> 19.147	Phantom	HSS	DIN 338		P	M	K	N	 P. 67		
> 19.149	INTERNATIONAL TOOLS	HSS-E	DIN 338	ECO PRO	P	M	K	N	 P. 67		
> 19.150	Phantom	HSS-E	DIN 338		P	M	K	N	 P. 68		
> 19.156	Phantom	HSS-E	DIN 338	HP2 UNI	P	M	K	N	 P. 68		
> 19.160	Phantom	HM-TIP	DIN 338		P	M	K	N	S	H	 P. 69
> 19.171	Phantom	HSS	DIN 338	ALU				N		 P. 69	
> 19.176	Phantom	HSS-E	DIN 338	INOX	P	M			S	 P. 70	
> 19.370	Phantom	HM	DIN 8039							 P. 70	
> 19.372	Phantom	HM								 P. 70	
> 19.374	Phantom	HM	Z=2							 P. 71	
> 19.377	Phantom									 P. 71	
> 19.540	Phantom	HSS	DIN 333-A							 P. 71	
> 19.910	Phantom	HSS	DIN 338							 P. 72	
> 19.914	Phantom	HSS	DIN 338		P	M	K	N		 P. 72	
> 19.951	Phantom	HSS			P		K	N		 P. 72	
> 19.956	Phantom	HSS-E			P	M	K	N		 P. 73	
> 19.957	Phantom	HSS-E			P	M	K	N		 P. 73	



**> 11.100 INTERNATIONAL TOOLS**

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

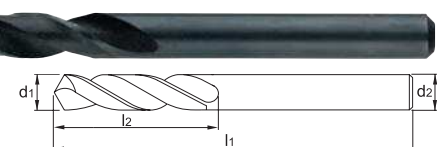
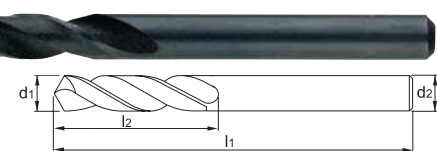
HSS DIN 1897 N ECO

P 11 P 12 P 13 K 31 K 32

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

Ref.	d1	d2	l1	l2
11.100.0200	2	2	38	12
11.100.0210	2.1	2.1	38	12
11.100.0220	2.2	2.2	40	13
11.100.0230	2.3	2.3	40	13
11.100.0240	2.4	2.4	43	14
11.100.0250	2.5	2.5	43	14
11.100.0260	2.6	2.6	43	14
11.100.0270	2.7	2.7	46	16
11.100.0280	2.8	2.8	46	16
11.100.0290	2.9	2.9	46	16
11.100.0300	3	3	46	16
11.100.0310	3.1	3.1	49	18
11.100.0320	3.2	3.2	49	18
11.100.0330	3.3	3.3	49	18
11.100.0340	3.4	3.4	52	20
11.100.0350	3.5	3.5	52	20

Ref.	d1	d2	l1	l2
11.100.0360	3.6	3.6	52	20
11.100.0370	3.7	3.7	52	20
11.100.0380	3.8	3.8	55	22
11.100.0390	3.9	3.9	55	22
11.100.0400	4	4	55	22
11.100.0410	4.1	4.1	55	22
11.100.0420	4.2	4.2	55	22
11.100.0430	4.3	4.3	58	24
11.100.0440	4.4	4.4	58	24
11.100.0450	4.5	4.5	58	24
11.100.0460	4.6	4.6	58	24
11.100.0470	4.7	4.7	58	24
11.100.0480	4.8	4.8	62	26
11.100.0490	4.9	4.9	62	26
11.100.0500	5	5	62	26
11.100.0510	5.1	5.1	62	26



**> 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 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
11.110.0100	1	1	26	6
11.110.0150	1.5	1.5	32	9
11.110.0200	2	2	38	12
11.110.0220	2.2	2.2	40	13
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

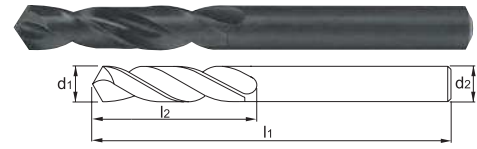
Ref.	d1	d2	l1	l2
11.110.0450	4.5	4.5	58	24
11.110.0490	4.9	4.9	62	26
11.110.0500	5	5	62	26
11.110.0510	5.1	5.1	62	26
11.110.0520	5.2	5.2	62	26
11.110.0550	5.5	5.5	66	28
11.110.0580	5.8	5.8	66	28
11.110.0600	6	6	66	28
11.110.0650	6.5	6.5	70	31
11.110.0700	7	7	74	34
11.110.0750	7.5	7.5	74	34
11.110.0800	8	8	79	37

**NIEUW / NOUVEAU / NUEVO / NEU**

Ref.	d1	d2	l1	l2
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



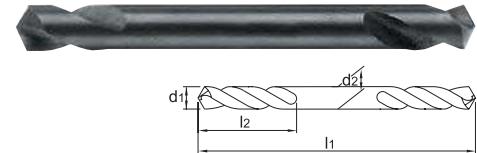
**HSS OX.** **DIN 1897** **N**  $\geq 1,6$   $118^\circ$

<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>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
11.130.0100	1	1	26	6	11.130.0400	4	4	55	22	11.130.0700	7	7	74	34
11.130.0110	1.1	1.1	28	7	11.130.0410	4.1	4.1	55	22	11.130.0750	7.5	7.5	74	34
11.130.0120	1.2	1.2	30	8	11.130.0420	4.2	4.2	55	22	11.130.0780	7.8	7.8	79	37
11.130.0130	1.3	1.3	30	8	11.130.0430	4.3	4.3	58	24	11.130.0800	8	8	79	37
11.130.0140	1.4	1.4	32	9	11.130.0440	4.4	4.4	58	24	11.130.0850	8.5	8.5	79	37
11.130.0150	1.5	1.5	32	9	11.130.0450	4.5	4.5	58	24	11.130.0880	8.8	8.8	84	40
11.130.0160	1.6	1.6	34	10	11.130.0460	4.6	4.6	58	24	11.130.0900	9	9	84	40
11.130.0170	1.7	1.7	34	10	11.130.0470	4.7	4.7	58	24	11.130.0950	9.5	9.5	84	40
11.130.0180	1.8	1.8	36	11	11.130.0480	4.8	4.8	62	26	11.130.0980	9.8	9.8	89	43
11.130.0190	1.9	1.9	36	11	11.130.0490	4.9	4.9	62	26	11.130.1000	10	10	89	43
11.130.0200	2	2	38	12	11.130.0500	5	5	62	26	11.130.1050	10.5	10.5	89	43
11.130.0210	2.1	2.1	38	12	11.130.0510	5.1	5.1	62	26	11.130.1100	11	11	95	47
11.130.0220	2.2	2.2	40	13	11.130.0520	5.2	5.2	62	26	11.130.1150	11.5	11.5	95	47
11.130.0230	2.3	2.3	40	13	11.130.0530	5.3	5.3	62	26	11.130.1200	12	12	102	51
11.130.0240	2.4	2.4	43	14	11.130.0540	5.4	5.4	66	28	11.130.1250	12.5	12.5	102	51
11.130.0250	2.5	2.5	43	14	11.130.0550	5.5	5.5	66	28	11.130.1300	13	13	102	51
11.130.0260	2.6	2.6	43	14	11.130.0560	5.6	5.6	66	28	11.130.1350	13.5	13.5	107	54
11.130.0270	2.7	2.7	46	16	11.130.0570	5.7	5.7	66	28	11.130.1400	14	14	107	54
11.130.0280	2.8	2.8	46	16	11.130.0580	5.8	5.8	66	28	11.130.1450	14.5	14.5	111	56
11.130.0290	2.9	2.9	46	16	11.130.0590	5.9	5.9	66	28	11.130.1500	15	15	111	56
11.130.0300	3	3	46	16	11.130.0600	6	6	66	28	11.130.1550	15.5	15.5	115	58
11.130.0310	3.1	3.1	49	18	11.130.0610	6.1	6.1	70	31	11.130.1600	16	16	115	58
11.130.0320	3.2	3.2	49	18	11.130.0620	6.2	6.2	70	31	11.130.1650	16.5	16.5	119	60
11.130.0330	3.3	3.3	49	18	11.130.0630	6.3	6.3	70	31	11.130.1700	17	17	119	60
11.130.0340	3.4	3.4	52	20	11.130.0640	6.4	6.4	70	31	11.130.1750	17.5	17.5	123	62
11.130.0350	3.5	3.5	52	20	11.130.0650	6.5	6.5	70	31	11.130.1800	18	18	123	62
11.130.0360	3.6	3.6	52	20	11.130.0660	6.6	6.6	70	31	11.130.1850	18.5	18.5	127	64
11.130.0370	3.7	3.7	52	20	11.130.0670	6.7	6.7	70	31	11.130.1900	19	19	127	64
11.130.0380	3.8	3.8	55	22	11.130.0680	6.8	6.8	74	34	11.130.1950	19.5	19.5	131	66
11.130.0390	3.9	3.9	55	22	11.130.0690	6.9	6.9	74	34	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**  $\geq 2,5$   $135^\circ$

<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>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
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



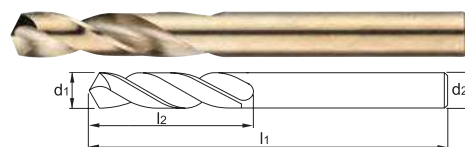
## > 11.150 INTERNATIONAL TOOLS

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

HSS-E	DIN 1897	N			<b>ECO PRO</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>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
11.150.0100	1	1	26	6
11.150.0150	1.5	1.5	32	9
11.150.0200	2	2	38	12
11.150.0220	2.2	2.2	40	13
11.150.0250	2.5	2.5	43	14
11.150.0300	3	3	46	16
11.150.0310	3.1	3.1	49	18
11.150.0320	3.2	3.2	49	18
11.150.0330	3.3	3.3	49	18
11.150.0340	3.4	3.4	52	20
11.150.0350	3.5	3.5	52	20
11.150.0370	3.7	3.7	52	20
11.150.0380	3.8	3.8	55	22

Ref.	d1	d2	l1	l2
11.150.0400	4	4	55	22
11.150.0410	4.1	4.1	55	22
11.150.0420	4.2	4.2	55	22
11.150.0450	4.5	4.5	58	24
11.150.0470	4.7	4.7	58	24
11.150.0480	4.8	4.8	62	26
11.150.0490	4.9	4.9	62	26
11.150.0500	5	5	62	26
11.150.0520	5.2	5.2	62	26
11.150.0550	5.5	5.5	66	28
11.150.0600	6	6	66	28
11.150.0650	6.5	6.5	70	31
11.150.0680	6.8	6.8	74	34



**NIEUW NOUVEAU NUEVO NEU**

Ref.	d1	d2	l1	l2
11.150.0700	7	7	74	34
11.150.0750	7.5	7.5	74	34
11.150.0800	8	8	79	37
11.150.0850	8.5	8.5	79	37
11.150.0900	9	9	84	40
11.150.0950	9.5	9.5	84	40
11.150.1000	10	10	89	43
11.150.1050	10.5	10.5	89	43
11.150.1100	11	11	95	47
11.150.1150	11.5	11.5	95	47
11.150.1200	12	12	102	51
11.150.1250	12.5	12.5	102	51
11.150.1300	13	13	102	51

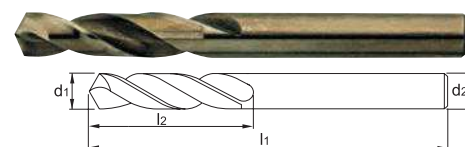
## > 11.160 Phantom

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

HSS-E	DIN 1897	N							
<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 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

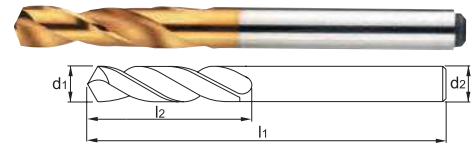
Ref.	d1	d2	l1	l2
11.160.0380	3.8	3.8	55	22
11.160.0390	3.9	3.9	55	22
11.160.0400	4	4	55	22
11.160.0410	4.1	4.1	55	22
11.160.0420	4.2	4.2	55	22
11.160.0430	4.3	4.3	58	24
11.160.0440	4.4	4.4	58	24
11.160.0450	4.5	4.5	58	24
11.160.0460	4.6	4.6	58	24
11.160.0470	4.7	4.7	58	24
11.160.0480	4.8	4.8	62	26
11.160.0490	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



HSS-E **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 ≤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

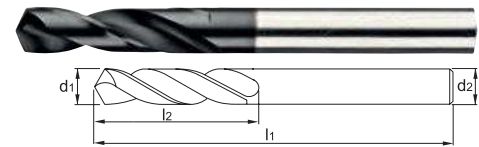
Ref.	d1	d2	l1	l2
11.161.0100	1	1	26	6
11.161.0110	1.1	1.1	28	7
11.161.0120	1.2	1.2	30	8
11.161.0130	1.3	1.3	30	8
11.161.0140	1.4	1.4	32	9
11.161.0150	1.5	1.5	32	9
11.161.0160	1.6	1.6	34	10
11.161.0170	1.7	1.7	34	10
11.161.0180	1.8	1.8	36	11
11.161.0190	1.9	1.9	36	11
11.161.0200	2	2	38	12
11.161.0210	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



HSS-E **TiAlN** DIN 1897 >N 130° **INOX**

<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 52</b> CuAlFe	<b>S 71</b> Ni/Co	<b>S 72</b> 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

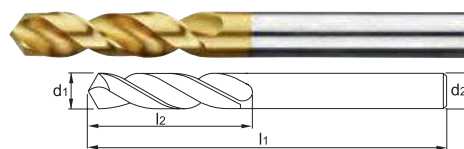
Ref.	d1	d2	l1	l2
11.167.0420	4.2	4.2	55	22
11.167.0430	4.3	4.3	58	24
11.167.0440	4.4	4.4	58	24
11.167.0450	4.5	4.5	58	24
11.167.0460	4.6	4.6	58	24
11.167.0470	4.7	4.7	58	24
11.167.0480	4.8	4.8	62	26
11.167.0490	4.9	4.9	62	26
11.167.0500	5	5	62	26
11.167.0510	5.1	5.1	62	26
11.167.0520	5.2	5.2	62	26
11.167.0530	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



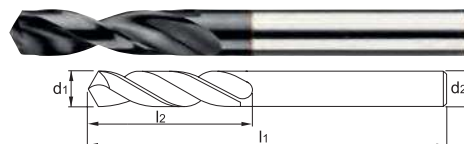
HSS-E TiN DIN 1897 >N 118° HP2 UNI

P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	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 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.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.168.0100	1	1	26	6	11.168.0440	4.4	4.4	58	24	11.168.0780	7.8	7.8	79	37
11.168.0110	1.1	1.1	28	7	11.168.0450	4.5	4.5	58	24	11.168.0790	7.9	7.9	79	37
11.168.0120	1.2	1.2	30	8	11.168.0460	4.6	4.6	58	24	11.168.0800	8	8	79	37
11.168.0130	1.3	1.3	30	8	11.168.0470	4.7	4.7	58	24	11.168.0810	8.1	8.1	79	37
11.168.0140	1.4	1.4	32	9	11.168.0480	4.8	4.8	62	26	11.168.0820	8.2	8.2	79	37
11.168.0150	1.5	1.5	32	9	11.168.0490	4.9	4.9	62	26	11.168.0830	8.3	8.3	79	37
11.168.0160	1.6	1.6	34	10	11.168.0500	5	5	62	26	11.168.0840	8.4	8.4	79	37
11.168.0170	1.7	1.7	34	10	11.168.0510	5.1	5.1	62	26	11.168.0850	8.5	8.5	79	37
11.168.0180	1.8	1.8	36	11	11.168.0520	5.2	5.2	62	26	11.168.0860	8.6	8.6	84	40
11.168.0190	1.9	1.9	36	11	11.168.0530	5.3	5.3	62	26	11.168.0870	8.7	8.7	84	40
11.168.0200	2	2	38	12	11.168.0540	5.4	5.4	66	28	11.168.0880	8.8	8.8	84	40
11.168.0210	2.1	2.1	38	12	11.168.0550	5.5	5.5	66	28	11.168.0890	8.9	8.9	84	40
11.168.0220	2.2	2.2	40	13	11.168.0560	5.6	5.6	66	28	11.168.0900	9	9	84	40
11.168.0230	2.3	2.3	40	13	11.168.0570	5.7	5.7	66	28	11.168.0910	9.1	9.1	84	40
11.168.0240	2.4	2.4	43	14	11.168.0580	5.8	5.8	66	28	11.168.0920	9.2	9.2	84	40
11.168.0250	2.5	2.5	43	14	11.168.0590	5.9	5.9	66	28	11.168.0930	9.3	9.3	84	40
11.168.0260	2.6	2.6	43	14	11.168.0600	6	6	66	28	11.168.0940	9.4	9.4	84	40
11.168.0270	2.7	2.7	46	16	11.168.0610	6.1	6.1	70	31	11.168.0950	9.5	9.5	84	40
11.168.0280	2.8	2.8	46	16	11.168.0620	6.2	6.2	70	31	11.168.0960	9.6	9.6	89	43
11.168.0290	2.9	2.9	46	16	11.168.0630	6.3	6.3	70	31	11.168.0970	9.7	9.7	89	43
11.168.0300	3	3	46	16	11.168.0640	6.4	6.4	70	31	11.168.0980	9.8	9.8	89	43
11.168.0310	3.1	3.1	49	18	11.168.0650	6.5	6.5	70	31	11.168.0990	9.9	9.9	89	43
11.168.0320	3.2	3.2	49	18	11.168.0660	6.6	6.6	70	31	11.168.1000	10	10	89	43
11.168.0330	3.3	3.3	49	18	11.168.0670	6.7	6.7	70	31	11.168.1010	10	10.1	89	43
11.168.0340	3.4	3.4	52	20	11.168.0680	6.8	6.8	74	34	11.168.1020	10.2	10.2	89	43
11.168.0350	3.5	3.5	52	20	11.168.0690	6.9	6.9	74	34	11.168.1030	10.3	10.3	89	43
11.168.0360	3.6	3.6	52	20	11.168.0700	7	7	74	34	11.168.1050	10.5	10.5	89	43
11.168.0370	3.7	3.7	52	20	11.168.0710	7.1	7.1	74	34	11.168.1100	11	11	95	47
11.168.0380	3.8	3.8	55	22	11.168.0720	7.2	7.2	74	34	11.168.1150	11.5	11.5	95	47
11.168.0390	3.9	3.9	55	22	11.168.0730	7.3	7.3	74	34	11.168.1200	12	12	102	51
11.168.0400	4	4	55	22	11.168.0740	7.4	7.4	74	34	11.168.1250	12.5	12.5	102	51
11.168.0410	4.1	4.1	55	22	11.168.0750	7.5	7.5	74	34	11.168.1300	13	13	102	51
11.168.0420	4.2	4.2	55	22	11.168.0760	7.6	7.6	79	37	11.168.1350	13.5	13.5	107	54
11.168.0430	4.3	4.3	58	24	11.168.0770	7.7	7.7	79	37	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)



HSS-E TiAlN DIN 1897 <3° >3° 130°

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	N 52 CuAlFe	N 61 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

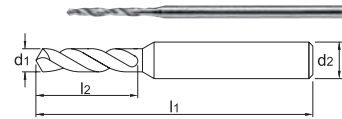
Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.174.0100	1	1	26	6	11.174.0270	2.7	2.7	46	16	11.174.0440	4.4	4.4	58	24
11.174.0110	1.1	1.1	28	7	11.174.0280	2.8	2.8	46	16	11.174.0450	4.5	4.5	58	24
11.174.0120	1.2	1.2	30	8	11.174.0290	2.9	2.9	46	16	11.174.0460	4.6	4.6	58	24
11.174.0130	1.3	1.3	30	8	11.174.0300	3	3	46	16	11.174.0470	4.7	4.7	58	24
11.174.0140	1.4	1.4	32	9	11.174.0310	3.1	3.1	49	18	11.174.0480	4.8	4.8	62	26
11.174.0150	1.5	1.5	32	9	11.174.0320	3.2	3.2	49	18	11.174.0490	4.9	4.9	62	26
11.174.0160	1.6	1.6	34	10	11.174.0330	3.3	3.3	49	18	11.174.0500	5	5	62	26
11.174.0170	1.7	1.7	34	10	11.174.0340	3.4	3.4	52	20	11.174.0510	5.1	5.1	62	26
11.174.0180	1.8	1.8	36	11	11.174.0350	3.5	3.5	52	20	11.174.0520	5.2	5.2	62	26
11.174.0190	1.9	1.9	36	11	11.174.0360	3.6	3.6	52	20	11.174.0530	5.3	5.3	62	26
11.174.0200	2	2	38	12	11.174.0370	3.7	3.7	52	20	11.174.0540	5.4	5.4	66	28
11.174.0210	2.1	2.1	38	12	11.174.0380	3.8	3.8	55	22	11.174.0550	5.5	5.5	66	28
11.174.0220	2.2	2.2	40	13	11.174.0390	3.9	3.9	55	22	11.174.0560	5.6	5.6	66	28
11.174.0230	2.3	2.3	40	13	11.174.0400	4	4	55	22	11.174.0570	5.7	5.7	66	28
11.174.0240	2.4	2.4	43	14	11.174.0410	4.1	4.1	55	22	11.174.0580	5.8	5.8	66	28
11.174.0250	2.5	2.5	43	14	11.174.0420	4.2	4.2	55	22	11.174.0590	5.9	5.9	66	28
11.174.0260	2.6	2.6	43	14	11.174.0430	4.3	4.3	58	24	11.174.0600	6	6	66	28

> **11.174 Phantom**

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.174.0610	6.1	6.1	70	31	11.174.0820	8.2	8.2	79	37	11.174.1100	11	11	95	47
11.174.0620	6.2	6.2	70	31	11.174.0830	8.3	8.3	79	37	11.174.1150	11.5	11.5	95	47
11.174.0630	6.3	6.3	70	31	11.174.0840	8.4	8.4	79	37	11.174.1200	12	12	102	51
11.174.0640	6.4	6.4	70	31	11.174.0850	8.5	8.5	79	37	11.174.1250	12.5	12.5	102	51
11.174.0650	6.5	6.5	70	31	11.174.0860	8.6	8.6	84	40	11.174.1300	13	13	102	51
11.174.0660	6.6	6.6	70	31	11.174.0870	8.7	8.7	84	40	11.174.1350	13.5	13.5	107	54
11.174.0670	6.7	6.7	70	31	11.174.0880	8.8	8.8	84	40	11.174.1400	14	14	107	54
11.174.0680	6.8	6.8	74	34	11.174.0890	8.9	8.9	84	40	11.174.1450	14.5	14.5	111	56
11.174.0690	6.9	6.9	74	34	11.174.0900	9	9	84	40	11.174.1500	15	15	111	56
11.174.0700	7	7	74	34	11.174.0910	9.1	9.1	84	40	11.174.1550	15.5	15.5	115	58
11.174.0710	7.1	7.1	74	34	11.174.0920	9.2	9.2	84	40	11.174.1600	16	16	115	58
11.174.0720	7.2	7.2	74	34	11.174.0930	9.3	9.3	84	40	11.174.1650	16.5	16.5	119	60
11.174.0730	7.3	7.3	74	34	11.174.0940	9.4	9.4	84	40	11.174.1700	17	17	119	60
11.174.0740	7.4	7.4	74	34	11.174.0950	9.5	9.5	84	40	11.174.1750	17.5	17.5	123	62
11.174.0750	7.5	7.5	74	34	11.174.0960	9.6	9.6	89	43	11.174.1800	18	18	123	62
11.174.0760	7.6	7.6	79	37	11.174.0970	9.7	9.7	89	43	11.174.1850	18.5	18.5	127	64
11.174.0770	7.7	7.7	79	37	11.174.0980	9.8	9.8	89	43	11.174.1900	19	19	127	64
11.174.0780	7.8	7.8	79	37	11.174.0990	9.9	9.9	89	43	11.174.1950	19.5	19.5	131	66
11.174.0790	7.9	7.9	79	37	11.174.1000	10	10	89	43	11.174.2000	20	20	131	66
11.174.0800	8	8	79	37	11.174.1020	10.2	10.2	89	43					
11.174.0810	8.1	8.1	79	37	11.174.1050	10.5	10.5	89	43					

> **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  
 118°

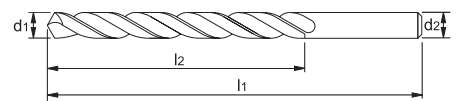
<b>P 11</b> ≤800 N/mm <sup>2</sup>	<b>P 12</b> ≤850 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>P 14</b> ≤1400 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 51</b> Cu	<b>N 52</b> CuAlFe
18-21 E	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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.340.0020	0.2	1	25	1.5	11.340.0070	0.7	1	25	4.8	11.340.0120	1.2	1.5	25	8.5
11.340.0030	0.3	1	25	1.9	11.340.0080	0.8	1.5	25	5.3	11.340.0130	1.3	1.5	25	8.5
11.340.0040	0.4	1	25	3	11.340.0090	0.9	1.5	25	6	11.340.0140	1.4	1.5	25	9.5
11.340.0050	0.5	1	25	3.4	11.340.0100	1	1.5	25	6.8					
11.340.0060	0.6	1	25	3.9	11.340.0110	1.1	1.5	25	7.6					



## > 11.400 INTERNATIONAL TOOLS

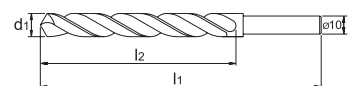
NL ECO HSS Spiraalboor gewalst  
FR Foret HSS ECO laminé  
ES Broca HSS ECO laminada  
DE ECO HSS Spiralbohrer Gewalzt



Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.400.0100	1	1	34	12	11.400.0550	5.5	5.5	93	57	11.400.1000	10	10	133	87
11.400.0110	1.1	1.1	36	14	11.400.0560	5.6	5.6	93	57	11.400.1010	10.1	10.1	133	87
11.400.0120	1.2	1.2	38	16	11.400.0570	5.7	5.7	93	57	11.400.1020	10.2	10.2	133	87
11.400.0130	1.3	1.3	38	16	11.400.0580	5.8	5.8	93	57	11.400.1030	10.3	10.3	133	87
11.400.0140	1.4	1.4	40	18	11.400.0590	5.9	5.9	93	57	11.400.1040	10.4	10.4	133	87
11.400.0150	1.5	1.5	40	18	11.400.0600	6	6	93	57	11.400.1050	10.5	10.5	133	87
11.400.0160	1.6	1.6	43	20	11.400.0610	6.1	6.1	101	63	11.400.1060	10.6	10.6	133	87
11.400.0170	1.7	1.7	43	20	11.400.0620	6.2	6.2	101	63	11.400.1070	10.7	10.7	142	94
11.400.0180	1.8	1.8	46	22	11.400.0630	6.3	6.3	101	63	11.400.1080	10.8	10.8	142	94
11.400.0190	1.9	1.9	46	22	11.400.0640	6.4	6.4	101	63	11.400.1090	10.9	10.9	142	94
11.400.0200	2	2	49	24	11.400.0650	6.5	6.5	101	63	11.400.1100	11	11	142	94
11.400.0210	2.1	2.1	49	24	11.400.0660	6.6	6.6	101	63	11.400.1110	11.1	11.1	142	94
11.400.0220	2.2	2.2	53	27	11.400.0670	6.7	6.7	101	63	11.400.1120	11.2	11.2	142	94
11.400.0230	2.3	2.3	53	27	11.400.0680	6.8	6.8	109	69	11.400.1130	11.3	11.3	142	94
11.400.0240	2.4	2.4	57	30	11.400.0690	6.9	6.9	109	69	11.400.1140	11.4	11.4	142	94
11.400.0250	2.5	2.5	57	30	11.400.0700	7	7	109	69	11.400.1150	11.5	11.5	142	94
11.400.0260	2.6	2.6	57	30	11.400.0710	7.1	7.1	109	69	11.400.1160	11.6	11.6	142	94
11.400.0270	2.7	2.7	61	33	11.400.0720	7.2	7.2	109	69	11.400.1170	11.7	11.7	142	94
11.400.0280	2.8	2.8	61	33	11.400.0730	7.3	7.3	109	69	11.400.1180	11.8	11.8	142	94
11.400.0290	2.9	2.9	61	33	11.400.0740	7.4	7.4	109	69	11.400.1190	11.9	11.9	151	101
11.400.0300	3	3	61	33	11.400.0750	7.5	7.5	109	69	11.400.1200	12	12	151	101
11.400.0310	3.1	3.1	65	36	11.400.0760	7.6	7.6	117	75	11.400.1210	12.1	12.1	151	101
11.400.0320	3.2	3.2	65	36	11.400.0770	7.7	7.7	117	75	11.400.1220	12.2	12.2	151	101
11.400.0330	3.3	3.3	65	36	11.400.0780	7.8	7.8	117	75	11.400.1230	12.3	12.3	151	101
11.400.0340	3.4	3.4	70	39	11.400.0790	7.9	7.9	117	75	11.400.1240	12.4	12.4	151	101
11.400.0350	3.5	3.5	70	39	11.400.0800	8	8	117	75	11.400.1250	12.5	12.5	151	101
11.400.0360	3.6	3.6	70	39	11.400.0810	8.1	8.1	117	75	11.400.1260	12.6	12.6	151	101
11.400.0370	3.7	3.7	70	39	11.400.0820	8.2	8.2	117	75	11.400.1270	12.7	12.7	151	101
11.400.0380	3.8	3.8	75	43	11.400.0830	8.3	8.3	117	75	11.400.1280	12.8	12.8	151	101
11.400.0390	3.9	3.9	75	43	11.400.0840	8.4	8.4	117	75	11.400.1290	12.9	12.9	151	101
11.400.0400	4	4	75	43	11.400.0850	8.5	8.5	117	75	11.400.1300	13	13	151	101
11.400.0410	4.1	4.1	75	43	11.400.0860	8.6	8.6	125	81	11.400.1350	13.5	13.5	160	108
11.400.0420	4.2	4.2	75	43	11.400.0870	8.7	8.7	125	81	11.400.1400	14	14	160	108
11.400.0430	4.3	4.3	80	47	11.400.0880	8.8	8.8	125	81	11.400.1450	14.5	14.5	169	114
11.400.0440	4.4	4.4	80	47	11.400.0890	8.9	8.9	125	81	11.400.1500	15	15	169	114
11.400.0450	4.5	4.5	80	47	11.400.0900	9	9	125	81	11.400.1550	15.5	15.5	178	120
11.400.0460	4.6	4.6	80	47	11.400.0910	9.1	9.1	125	81	11.400.1600	16	16	178	120
11.400.0470	4.7	4.7	80	47	11.400.0920	9.2	9.2	125	81	11.400.1650	16.5	16.5	184	125
11.400.0480	4.8	4.8	86	52	11.400.0930	9.3	9.3	125	81	11.400.1700	17	17	184	125
11.400.0490	4.9	4.9	86	52	11.400.0940	9.4	9.4	125	81	11.400.1750	17.5	17.5	191	130
11.400.0500	5	5	86	52	11.400.0950	9.5	9.5	125	81	11.400.1800	18	18	191	130
11.400.0510	5.1	5.1	86	52	11.400.0960	9.6	9.6	133	87	11.400.1850	18.5	18.5	198	135
11.400.0520	5.2	5.2	86	52	11.400.0970	9.7	9.7	133	87	11.400.1900	19	19	198	135
11.400.0530	5.3	5.3	86	52	11.400.0980	9.8	9.8	133	87	11.400.1950	19.5	19.5	205	140
11.400.0540	5.4	5.4	93	57	11.400.0990	9.9	9.9	133	87	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

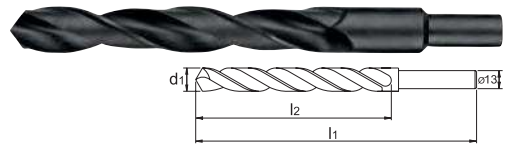


Ref.	d1	l1	l2	Ref.	d1	l1	l2	Ref.	d1	l1	l2
11.410.1050	10.5	133	87	11.410.1250	12.5	151	101	11.410.1450	14.5	169	114
11.410.1100	11	142	94	11.410.1300	13	151	101	11.410.1500	15	169	114
11.410.1150	11.5	142	94	11.410.1350	13.5	160	108	11.410.1550	15.5	178	120
11.410.1200	12	151	101	11.410.1400	14	160	108	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 Ø13 118° ECO

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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

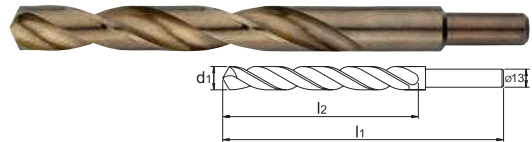
Ref.	d1	l1	l2
11.413.1350	13.5	160	108
11.413.1400	14	160	108
11.413.1450	14.5	169	114
11.413.1500	15	169	114
11.413.1550	15.5	178	120
11.413.1600	16	178	120
11.413.1650	16.5	184	125
11.413.1700	17	184	125

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



HSS-E Ø13 135° ECO PRO

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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 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

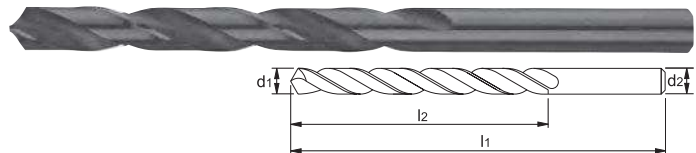
Ref.	d1	l1	l2
11.415.1350	13.5	160	108
11.415.1400	14	160	108
11.415.1450	14.5	169	114
11.415.1500	15	169	114
11.415.1550	15.5	178	120
11.415.1600	16	178	120
11.415.1650	16.5	184	125

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 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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 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

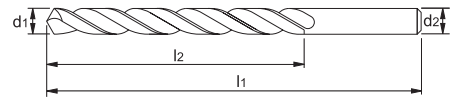
Ref.	d1	d2	l1	l2
11.416.0270	2.7	2.7	61	33
11.416.0280	2.8	2.8	61	33
11.416.0290	2.9	2.9	61	33
11.416.0300	3	3	61	33
11.416.0310	3.1	3.1	65	36
11.416.0320	3.2	3.2	65	36
11.416.0330	3.3	3.3	65	36
11.416.0340	3.4	3.4	70	39
11.416.0350	3.5	3.5	70	39
11.416.0360	3.6	3.6	70	39
11.416.0370	3.7	3.7	70	39
11.416.0380	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



> 11.426 INTERNATIONAL TOOLS

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



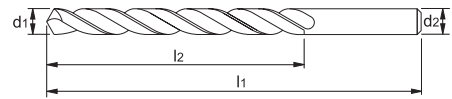
HSS DIN 338 N

<b>P 11</b> ≤500 Nmm²	<b>P 12</b> ≤850 Nmm²	<b>P 13</b> ≤1000 Nmm²	<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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.426.0100	1	1	34	12	11.426.0510	5.1	5.1	86	52	11.426.0920	9.2	9.2	125	81
11.426.0110	1.1	1.1	36	14	11.426.0520	5.2	5.2	86	52	11.426.0930	9.3	9.3	125	81
11.426.0120	1.2	1.2	38	16	11.426.0530	5.3	5.3	86	52	11.426.0940	9.4	9.4	125	81
11.426.0130	1.3	1.3	38	16	11.426.0540	5.4	5.4	93	57	11.426.0950	9.5	9.5	125	81
11.426.0140	1.4	1.4	40	18	11.426.0550	5.5	5.5	93	57	11.426.0960	9.6	9.6	133	87
11.426.0150	1.5	1.5	40	18	11.426.0560	5.6	5.6	93	57	11.426.0970	9.7	9.7	133	87
11.426.0160	1.6	1.6	43	20	11.426.0570	5.7	5.7	93	57	11.426.0980	9.8	9.8	133	87
11.426.0170	1.7	1.7	43	20	11.426.0580	5.8	5.8	93	57	11.426.0990	9.9	9.9	133	87
11.426.0180	1.8	1.8	46	22	11.426.0590	5.9	5.9	93	57	11.426.1000	10	10	133	87
11.426.0190	1.9	1.9	46	22	11.426.0600	6	6	93	57	11.426.1010	10.1	10.1	133	87
11.426.0200	2	2	49	24	11.426.0610	6.1	6.1	101	63	11.426.1020	10.2	10.2	133	87
11.426.0210	2.1	2.1	49	24	11.426.0620	6.2	6.2	101	63	11.426.1030	10.3	10.3	133	87
11.426.0220	2.2	2.2	53	27	11.426.0630	6.3	6.3	101	63	11.426.1040	10.4	10.4	133	87
11.426.0230	2.3	2.3	53	27	11.426.0640	6.4	6.4	101	63	11.426.1050	10.5	10.5	133	87
11.426.0240	2.4	2.4	57	30	11.426.0650	6.5	6.5	101	63	11.426.1060	10.6	10.6	133	87
11.426.0250	2.5	2.5	57	30	11.426.0660	6.6	6.6	101	63	11.426.1070	10.7	10.7	142	94
11.426.0260	2.6	2.6	57	30	11.426.0670	6.7	6.7	101	63	11.426.1080	10.8	10.8	142	94
11.426.0270	2.7	2.7	61	33	11.426.0680	6.8	6.8	109	69	11.426.1090	10.9	10.9	142	94
11.426.0280	2.8	2.8	61	33	11.426.0690	6.9	6.9	109	69	11.426.1100	11	11	142	94
11.426.0290	2.9	2.9	61	33	11.426.0700	7	7	109	69	11.426.1110	11.1	11.1	142	94
11.426.0300	3	3	61	33	11.426.0710	7.1	7.1	109	69	11.426.1120	11.2	11.2	142	94
11.426.0310	3.1	3.1	65	36	11.426.0720	7.2	7.2	109	69	11.426.1130	11.3	11.3	142	94
11.426.0320	3.2	3.2	65	36	11.426.0730	7.3	7.3	109	69	11.426.1140	11.4	11.4	142	94
11.426.0330	3.3	3.3	65	36	11.426.0740	7.4	7.4	109	69	11.426.1150	11.5	11.5	142	94
11.426.0340	3.4	3.4	70	39	11.426.0750	7.5	7.5	109	69	11.426.1160	11.6	11.6	142	94
11.426.0350	3.5	3.5	70	39	11.426.0760	7.6	7.6	117	75	11.426.1170	11.7	11.7	142	94
11.426.0360	3.6	3.6	70	39	11.426.0770	7.7	7.7	117	75	11.426.1180	11.8	11.8	142	94
11.426.0370	3.7	3.7	70	39	11.426.0780	7.8	7.8	117	75	11.426.1190	11.9	11.9	151	101
11.426.0380	3.8	3.8	75	43	11.426.0790	7.9	7.9	117	75	11.426.1200	12	12	151	101
11.426.0390	3.9	3.9	75	43	11.426.0800	8	8	117	75	11.426.1210	12.1	12.1	151	101
11.426.0400	4	4	75	43	11.426.0810	8.1	8.1	117	75	11.426.1220	12.2	12.2	151	101
11.426.0410	4.1	4.1	75	43	11.426.0820	8.2	8.2	117	75	11.426.1230	12.3	12.3	151	101
11.426.0420	4.2	4.2	75	43	11.426.0830	8.3	8.3	117	75	11.426.1240	12.4	12.4	151	101
11.426.0430	4.3	4.3	80	47	11.426.0840	8.4	8.4	117	75	11.426.1250	12.5	12.5	151	101
11.426.0440	4.4	4.4	80	47	11.426.0850	8.5	8.5	117	75	11.426.1260	12.6	12.6	151	101
11.426.0450	4.5	4.5	80	47	11.426.0860	8.6	8.6	125	81	11.426.1270	12.7	12.7	151	101
11.426.0460	4.6	4.6	80	47	11.426.0870	8.7	8.7	125	81	11.426.1280	12.8	12.8	151	101
11.426.0470	4.7	4.7	80	47	11.426.0880	8.8	8.8	125	81	11.426.1290	12.9	12.9	151	101
11.426.0480	4.8	4.8	86	52	11.426.0890	8.9	8.9	125	81	11.426.1300	13	13	151	101
11.426.0490	4.9	4.9	86	52	11.426.0900	9	9	125	81					
11.426.0500	5	5	86	52	11.426.0910	9.1	9.1	125	81					

> 11.430 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

<b>P 11</b> ≤500 Nmm²	<b>P 12</b> ≤850 Nmm²	<b>P 13</b> ≤1000 Nmm²	<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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.430.0100	1	1	34	12	11.430.0200	2	2	49	24	11.430.0300	3	3	61	33
11.430.0110	1.1	1.1	36	14	11.430.0210	2.1	2.1	49	24	11.430.0310	3.1	3.1	65	36
11.430.0120	1.2	1.2	38	16	11.430.0220	2.2	2.2	53	27	11.430.0320	3.2	3.2	65	36
11.430.0130	1.3	1.3	38	16	11.430.0230	2.3	2.3	53	27	11.430.0330	3.3	3.3	65	36
11.430.0140	1.4	1.4	40	18	11.430.0240	2.4	2.4	57	30	11.430.0340	3.4	3.4	70	39
11.430.0150	1.5	1.5	40	18	11.430.0250	2.5	2.5	57	30	11.430.0350	3.5	3.5	70	39
11.430.0160	1.6	1.6	43	20	11.430.0260	2.6	2.6	57	30	11.430.0360	3.6	3.6	70	39
11.430.0170	1.7	1.7	43	20	11.430.0270	2.7	2.7	61	33	11.430.0370	3.7	3.7	70	39
11.430.0180	1.8	1.8	46	22	11.430.0280	2.8	2.8	61	33	11.430.0380	3.8	3.8	75	43
11.430.0190	1.9	1.9	46	22	11.430.0290	2.9	2.9	61	33	11.430.0390	3.9	3.9	75	43







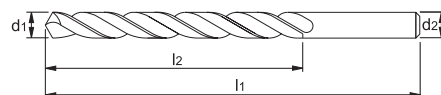
> 11.450 Phantom

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** **≥1,6** **118°**  
**P 11** **P 12** **P 13** **M 21** **K 31** **K 32** **N 41** **N 42** **N 51** **N 61**  
≤500 N/mm<sup>2</sup> ≤350 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850 N/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

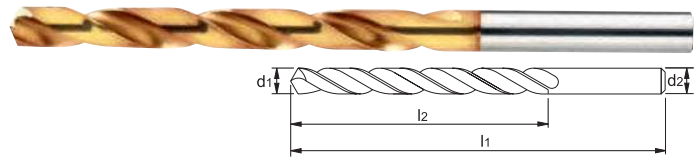






> 11.501 Phantom

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



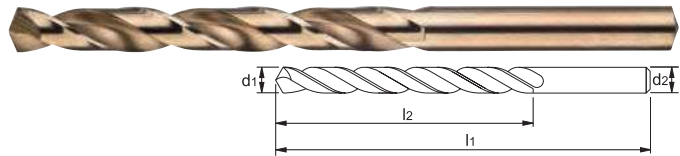
HSS-E TiN DIN 338 N  $\geq 2$  135°

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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

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

> 11.510 Phantom

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



NIEUW NOUVEAU NUEVO NEU

HSS-E 8% DIN 338 N NAS 907 P3 135°

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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

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					



› **11.600 Phantom**

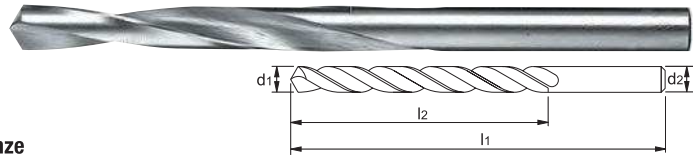
Ref.	d1	d2	l1	l2
11.600.0680	6.8	6.8	109	69
11.600.0690	6.9	6.9	109	69
11.600.0700	7	7	109	69
11.600.0710	7.1	7.1	109	69
11.600.0720	7.2	7.2	109	69
11.600.0730	7.3	7.3	109	69
11.600.0740	7.4	7.4	109	69
11.600.0750	7.5	7.5	109	69
11.600.0760	7.6	7.6	117	75
11.600.0770	7.7	7.7	117	75
11.600.0780	7.8	7.8	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

Ref.	d1	d2	l1	l2
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

› **11.700 Phantom**

NL HSS Spiraalboor messing, brons en zink  
 FR Foret HSS laiton, bronze et zinc  
 ES Broca HSS latón, bronce y cinc  
 DE HSS Spiralbohrer speziell für die Bearbeitung von Messing, Bronze und Zink



**HSS** **DIN 338** **H**

**N 43** **N 51** **N 61**  
 Mg Cu PVC

40-50 F 50-70 E 18-28 E

Ref.	d1	d2	l1	l2
11.700.0100	1	1	34	12
11.700.0110	1.1	1.1	36	14
11.700.0120	1.2	1.2	38	16
11.700.0130	1.3	1.3	38	16
11.700.0140	1.4	1.4	40	18
11.700.0150	1.5	1.5	40	18
11.700.0160	1.6	1.6	43	20
11.700.0170	1.7	1.7	43	20
11.700.0180	1.8	1.8	46	22
11.700.0190	1.9	1.9	46	22
11.700.0200	2	2	49	24
11.700.0210	2.1	2.1	49	24
11.700.0220	2.2	2.2	53	27
11.700.0230	2.3	2.3	53	27
11.700.0240	2.4	2.4	57	30
11.700.0250	2.5	2.5	57	30
11.700.0260	2.6	2.6	57	30
11.700.0270	2.7	2.7	61	33
11.700.0280	2.8	2.8	61	33
11.700.0290	2.9	2.9	61	33
11.700.0300	3	3	61	33
11.700.0310	3.1	3.1	65	36
11.700.0320	3.2	3.2	65	36
11.700.0330	3.3	3.3	65	36
11.700.0340	3.4	3.4	70	39
11.700.0350	3.5	3.5	70	39
11.700.0360	3.6	3.6	70	39
11.700.0370	3.7	3.7	70	39
11.700.0380	3.8	3.8	75	43
11.700.0390	3.9	3.9	75	43
11.700.0400	4	4	75	43
11.700.0410	4.1	4.1	75	43
11.700.0420	4.2	4.2	75	43

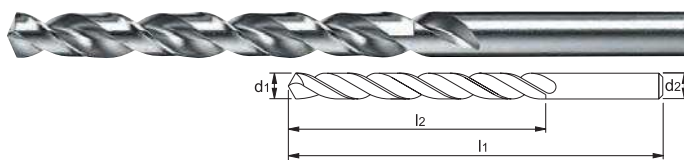
Ref.	d1	d2	l1	l2
11.700.0430	4.3	4.3	80	47
11.700.0440	4.4	4.4	80	47
11.700.0450	4.5	4.5	80	47
11.700.0460	4.6	4.6	80	47
11.700.0470	4.7	4.7	80	47
11.700.0480	4.8	4.8	86	52
11.700.0490	4.9	4.9	86	52
11.700.0500	5	5	86	52
11.700.0510	5.1	5.1	86	52
11.700.0520	5.2	5.2	86	52
11.700.0530	5.3	5.3	86	52
11.700.0540	5.4	5.4	93	57
11.700.0550	5.5	5.5	93	57
11.700.0560	5.6	5.6	93	57
11.700.0570	5.7	5.7	93	57
11.700.0580	5.8	5.8	93	57
11.700.0590	5.9	5.9	93	57
11.700.0600	6	6	93	57
11.700.0610	6.1	6.1	101	63
11.700.0620	6.2	6.2	101	63
11.700.0630	6.3	6.3	101	63
11.700.0640	6.4	6.4	101	63
11.700.0650	6.5	6.5	101	63
11.700.0660	6.6	6.6	101	63
11.700.0670	6.7	6.7	101	63
11.700.0680	6.8	6.8	109	69
11.700.0690	6.9	6.9	109	69
11.700.0700	7	7	109	69
11.700.0710	7.1	7.1	109	69
11.700.0720	7.2	7.2	109	69
11.700.0730	7.3	7.3	109	69
11.700.0740	7.4	7.4	109	69
11.700.0750	7.5	7.5	109	69

Ref.	d1	d2	l1	l2
11.700.0760	7.6	7.6	117	75
11.700.0770	7.7	7.7	117	75
11.700.0780	7.8	7.8	117	75
11.700.0790	7.9	7.9	117	75
11.700.0800	8	8	117	75
11.700.0810	8.1	8.1	117	75
11.700.0820	8.2	8.2	117	75
11.700.0830	8.3	8.3	117	75
11.700.0840	8.4	8.4	117	75
11.700.0850	8.5	8.5	117	75
11.700.0860	8.6	8.6	125	81
11.700.0870	8.7	8.7	125	81
11.700.0880	8.8	8.8	125	81
11.700.0890	8.9	8.9	125	81
11.700.0900	9	9	125	81
11.700.0910	9.1	9.1	125	81
11.700.0920	9.2	9.2	125	81
11.700.0930	9.3	9.3	125	81
11.700.0940	9.4	9.4	125	81
11.700.0950	9.5	9.5	125	81
11.700.0960	9.6	9.6	133	87
11.700.0970	9.7	9.7	133	87
11.700.0980	9.8	9.8	133	87
11.700.0990	9.9	9.9	133	87
11.700.1000	10	10	133	87
11.700.1050	10.5	10.5	133	87
11.700.1100	11	11	142	94
11.700.1150	11.5	11.5	142	94
11.700.1200	12	12	151	101
11.700.1250	12.5	12.5	151	101
11.700.1300	13	13	151	101



> 11.710 Phantom

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



HSS DIN 338 W ALU

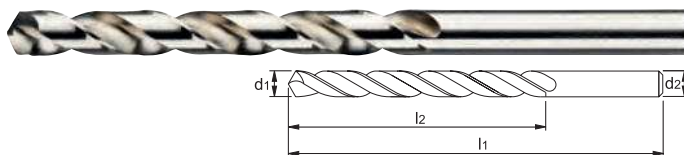
N 41 Alu N 42 Alu >10% N 51 Cu N 61 PVC

50-70 F 40-60 F 35-40 E 18-28 E

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.710.0100	1	1	34	12	11.710.0440	4.4	4.4	80	47	11.710.0780	7.8	7.8	117	75
11.710.0110	1.1	1.1	36	14	11.710.0450	4.5	4.5	80	47	11.710.0790	7.9	7.9	117	75
11.710.0120	1.2	1.2	38	16	11.710.0460	4.6	4.6	80	47	11.710.0800	8	8	117	75
11.710.0130	1.3	1.3	38	16	11.710.0470	4.7	4.7	80	47	11.710.0810	8.1	8.1	117	75
11.710.0140	1.4	1.4	40	18	11.710.0480	4.8	4.8	86	52	11.710.0820	8.2	8.2	117	75
11.710.0150	1.5	1.5	40	18	11.710.0490	4.9	4.9	86	52	11.710.0830	8.3	8.3	117	75
11.710.0160	1.6	1.6	43	20	11.710.0500	5	5	86	52	11.710.0840	8.4	8.4	117	75
11.710.0170	1.7	1.7	43	20	11.710.0510	5.1	5.1	86	52	11.710.0850	8.5	8.5	117	75
11.710.0180	1.8	1.8	46	22	11.710.0520	5.2	5.2	86	52	11.710.0860	8.6	8.6	125	81
11.710.0190	1.9	1.9	46	22	11.710.0530	5.3	5.3	86	52	11.710.0870	8.7	8.7	125	81
11.710.0200	2	2	49	24	11.710.0540	5.4	5.4	93	57	11.710.0880	8.8	8.8	125	81
11.710.0210	2.1	2.1	49	24	11.710.0550	5.5	5.5	93	57	11.710.0890	8.9	8.9	125	81
11.710.0220	2.2	2.2	53	27	11.710.0560	5.6	5.6	93	57	11.710.0900	9	9	125	81
11.710.0230	2.3	2.3	53	27	11.710.0570	5.7	5.7	93	57	11.710.0910	9.1	9.1	125	81
11.710.0240	2.4	2.4	57	30	11.710.0580	5.8	5.8	93	57	11.710.0920	9.2	9.2	125	81
11.710.0250	2.5	2.5	57	30	11.710.0590	5.9	5.9	93	57	11.710.0930	9.3	9.3	125	81
11.710.0260	2.6	2.6	57	30	11.710.0600	6	6	93	57	11.710.0940	9.4	9.4	125	81
11.710.0270	2.7	2.7	61	33	11.710.0610	6.1	6.1	101	63	11.710.0950	9.5	9.5	125	81
11.710.0280	2.8	2.8	61	33	11.710.0620	6.2	6.2	101	63	11.710.0960	9.6	9.6	133	87
11.710.0290	2.9	2.9	61	33	11.710.0630	6.3	6.3	101	63	11.710.0970	9.7	9.7	133	87
11.710.0300	3	3	61	33	11.710.0640	6.4	6.4	101	63	11.710.0980	9.8	9.8	133	87
11.710.0310	3.1	3.1	65	36	11.710.0650	6.5	6.5	101	63	11.710.0990	9.9	9.9	133	87
11.710.0320	3.2	3.2	65	36	11.710.0660	6.6	6.6	101	63	11.710.1000	10	10	133	87
11.710.0330	3.3	3.3	65	36	11.710.0670	6.7	6.7	101	63	11.710.1020	10.2	10.2	133	87
11.710.0340	3.4	3.4	70	39	11.710.0680	6.8	6.8	109	69	11.710.1050	10.5	10.5	133	87
11.710.0350	3.5	3.5	70	39	11.710.0690	6.9	6.9	109	69	11.710.1100	11	11	142	94
11.710.0360	3.6	3.6	70	39	11.710.0700	7	7	109	69	11.710.1150	11.5	11.5	142	94
11.710.0370	3.7	3.7	70	39	11.710.0710	7.1	7.1	109	69	11.710.1200	12	12	151	101
11.710.0380	3.8	3.8	75	43	11.710.0720	7.2	7.2	109	69	11.710.1250	12.5	12.5	151	101
11.710.0390	3.9	3.9	75	43	11.710.0730	7.3	7.3	109	69	11.710.1300	13	13	151	101
11.710.0400	4	4	75	43	11.710.0740	7.4	7.4	109	69	11.710.1400	14	14	160	108
11.710.0410	4.1	4.1	75	43	11.710.0750	7.5	7.5	109	69	11.710.1500	15	15	169	114
11.710.0420	4.2	4.2	75	43	11.710.0760	7.6	7.6	117	75	11.710.1600	16	16	178	120
11.710.0430	4.3	4.3	80	47	11.710.0770	7.7	7.7	117	75					

> 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



HSS-E DIN 338 >N INOX

P 14 ≤1400 N/mm² M 21 INOX ≤850 N/mm² M 22 INOX >850 N/mm² S 71 Ni/Co S 72 Ti

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

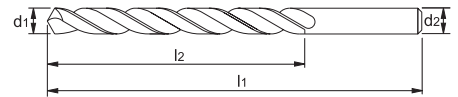
Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.760.0100	1	1	34	12	11.760.0270	2.7	2.7	61	33	11.760.0440	4.4	4.4	80	47
11.760.0110	1.1	1.1	36	14	11.760.0280	2.8	2.8	61	33	11.760.0450	4.5	4.5	80	47
11.760.0120	1.2	1.2	38	16	11.760.0290	2.9	2.9	61	33	11.760.0460	4.6	4.6	80	47
11.760.0130	1.3	1.3	38	16	11.760.0300	3	3	61	33	11.760.0470	4.7	4.7	80	47
11.760.0140	1.4	1.4	40	18	11.760.0310	3.1	3.1	65	36	11.760.0480	4.8	4.8	86	52
11.760.0150	1.5	1.5	40	18	11.760.0320	3.2	3.2	65	36	11.760.0490	4.9	4.9	86	52
11.760.0160	1.6	1.6	43	20	11.760.0330	3.3	3.3	65	36	11.760.0500	5	5	86	52
11.760.0170	1.7	1.7	43	20	11.760.0340	3.4	3.4	70	39	11.760.0510	5.1	5.1	86	52
11.760.0180	1.8	1.8	46	22	11.760.0350	3.5	3.5	70	39	11.760.0520	5.2	5.2	86	52
11.760.0190	1.9	1.9	46	22	11.760.0360	3.6	3.6	70	39	11.760.0530	5.3	5.3	86	52
11.760.0200	2	2	49	24	11.760.0370	3.7	3.7	70	39	11.760.0540	5.4	5.4	93	57
11.760.0210	2.1	2.1	49	24	11.760.0380	3.8	3.8	75	43	11.760.0550	5.5	5.5	93	57
11.760.0220	2.2	2.2	53	27	11.760.0390	3.9	3.9	75	43	11.760.0560	5.6	5.6	93	57
11.760.0230	2.3	2.3	53	27	11.760.0400	4	4	75	43	11.760.0570	5.7	5.7	93	57
11.760.0240	2.4	2.4	57	30	11.760.0410	4.1	4.1	75	43	11.760.0580	5.8	5.8	93	57
11.760.0250	2.5	2.5	57	30	11.760.0420	4.2	4.2	75	43	11.760.0590	5.9	5.9	93	57
11.760.0260	2.6	2.6	57	30	11.760.0430	4.3	4.3	80	47	11.760.0600	6	6	93	57





> 11.770 Phantom

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



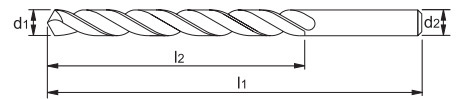
HSS-E DIN 338 TS 130°

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 >s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 52 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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.770.0200	2	2	49	24	11.770.0480	4.8	4.8	86	52	11.770.0680	6.8	6.8	109	69
11.770.0250	2.5	2.5	57	30	11.770.0490	4.9	4.9	86	52	11.770.0690	6.9	6.9	109	69
11.770.0300	3	3	61	33	11.770.0500	5	5	86	52	11.770.0700	7	7	109	69
11.770.0310	3.1	3.1	65	36	11.770.0510	5.1	5.1	86	52	11.770.0750	7.5	7.5	109	69
11.770.0320	3.2	3.2	65	36	11.770.0520	5.2	5.2	86	52	11.770.0780	7.8	7.8	117	75
11.770.0330	3.3	3.3	65	36	11.770.0530	5.3	5.3	86	52	11.770.0800	8	8	117	75
11.770.0340	3.4	3.4	70	39	11.770.0540	5.4	5.4	93	57	11.770.0850	8.5	8.5	117	75
11.770.0350	3.5	3.5	70	39	11.770.0550	5.5	5.5	93	57	11.770.0880	8.8	8.8	125	81
11.770.0360	3.6	3.6	70	39	11.770.0560	5.6	5.6	93	57	11.770.0900	9	9	125	81
11.770.0370	3.7	3.7	70	39	11.770.0570	5.7	5.7	93	57	11.770.0950	9.5	9.5	125	81
11.770.0380	3.8	3.8	75	43	11.770.0580	5.8	5.8	93	57	11.770.0980	9.8	9.8	133	87
11.770.0390	3.9	3.9	75	43	11.770.0590	5.9	5.9	93	57	11.770.1000	10	10	133	87
11.770.0400	4	4	75	43	11.770.0600	6	6	93	57	11.770.1020	10.2	10.2	133	87
11.770.0410	4.1	4.1	75	43	11.770.0610	6.1	6.1	101	63	11.770.1050	10.5	10.5	133	87
11.770.0420	4.2	4.2	75	43	11.770.0620	6.2	6.2	101	63	11.770.1100	11	11	142	94
11.770.0430	4.3	4.3	80	47	11.770.0630	6.3	6.3	101	63	11.770.1150	11.5	11.5	142	94
11.770.0440	4.4	4.4	80	47	11.770.0640	6.4	6.4	101	63	11.770.1200	12	12	151	101
11.770.0450	4.5	4.5	80	47	11.770.0650	6.5	6.5	101	63	11.770.1250	12.5	12.5	151	101
11.770.0460	4.6	4.6	80	47	11.770.0660	6.6	6.6	101	63	11.770.1300	13	13	151	101
11.770.0470	4.7	4.7	80	47	11.770.0670	6.7	6.7	101	63	11.770.1400	14	14	160	108

> 11.774 Phantom

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



HSS-E TiAlN DIN 338 TS 130°

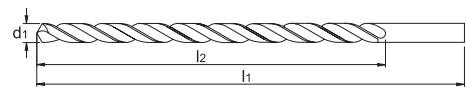
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	P 14 s1400 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 52 CuAlFe
38-42 E	22-48 E	30-40 D	20-34 D	17-22 E	16-20 D	40-45 F	30-36 F	72-85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

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.774.0200	2	2	49	24	11.774.0560	5.6	5.6	93	57	11.774.0950	9.5	9.5	125	81
11.774.0250	2.5	2.5	57	30	11.774.0600	6	6	93	57	11.774.1000	10	10	133	87
11.774.0300	3	3	61	33	11.774.0650	6.5	6.5	101	63	11.774.1020	10.2	10.2	133	87
11.774.0320	3.2	3.2	65	36	11.774.0680	6.8	6.8	109	69	11.774.1050	10.5	10.5	133	87
11.774.0330	3.3	3.3	65	36	11.774.0690	6.9	6.9	109	69	11.774.1100	11	11	142	94
11.774.0350	3.5	3.5	70	39	11.774.0700	7	7	109	69	11.774.1150	11.5	11.5	142	94
11.774.0400	4	4	75	43	11.774.0750	7.5	7.5	109	69	11.774.1200	12	12	151	101
11.774.0420	4.2	4.2	75	43	11.774.0800	8	8	117	75	11.774.1250	12.5	12.5	151	101
11.774.0450	4.5	4.5	80	47	11.774.0850	8.5	8.5	117	75	11.774.1300	13	13	151	101
11.774.0500	5	5	86	52	11.774.0860	8.6	8.6	125	81	11.774.1400	14	14	160	108
11.774.0510	5.1	5.1	86	52	11.774.0870	8.7	8.7	125	81					
11.774.0550	5.5	5.5	93	57	11.774.0900	9	9	125	81					

» 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**

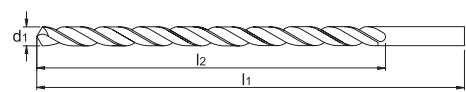
<b>P 11</b> S800 N/mm <sup>2</sup>	<b>P 12</b> S850 N/mm <sup>2</sup>	<b>P 13</b> S1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW
20-25 E	20-25 E	15-20 D	15-20 E	25-30 E

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.810.0200	2	2	85	56	11.810.0390	3.9	3.9	119	78	11.810.0580	5.8	5.8	139	91
11.810.0210	2.1	2.1	85	56	11.810.0400	4	4	119	78	11.810.0590	5.9	5.9	139	91
11.810.0220	2.2	2.2	90	59	11.810.0410	4.1	4.1	119	78	11.810.0600	6	6	139	91
11.810.0230	2.3	2.3	90	59	11.810.0420	4.2	4.2	119	78	11.810.0650	6.5	6.5	148	97
11.810.0240	2.4	2.4	95	62	11.810.0430	4.3	4.3	126	82	11.810.0680	6.8	6.8	156	102
11.810.0250	2.5	2.5	95	62	11.810.0440	4.4	4.4	126	82	11.810.0700	7	7	156	102
11.810.0260	2.6	2.6	95	62	11.810.0450	4.5	4.5	126	82	11.810.0750	7.5	7.5	156	102
11.810.0270	2.7	2.7	100	66	11.810.0460	4.6	4.6	126	82	11.810.0800	8	8	165	109
11.810.0280	2.8	2.8	100	66	11.810.0470	4.7	4.7	126	82	11.810.0850	8.5	8.5	165	109
11.810.0290	2.9	2.9	100	66	11.810.0480	4.8	4.8	132	87	11.810.0900	9	9	175	115
11.810.0300	3	3	100	66	11.810.0490	4.9	4.9	132	87	11.810.0950	9.5	9.5	175	115
11.810.0310	3.1	3.1	106	69	11.810.0500	5	5	132	87	11.810.1000	10	10	184	121
11.810.0320	3.2	3.2	106	69	11.810.0510	5.1	5.1	132	87	11.810.1050	10.5	10.5	184	121
11.810.0330	3.3	3.3	106	69	11.810.0520	5.2	5.2	132	87	11.810.1100	11	11	195	128
11.810.0340	3.4	3.4	112	73	11.810.0530	5.3	5.3	132	87	11.810.1150	11.5	11.5	195	128
11.810.0350	3.5	3.5	112	73	11.810.0540	5.4	5.4	139	91	11.810.1200	12	12	205	134
11.810.0360	3.6	3.6	112	73	11.810.0550	5.5	5.5	139	91	11.810.1250	12.5	12.5	205	134
11.810.0370	3.7	3.7	112	73	11.810.0560	5.6	5.6	139	91	11.810.1300	13	13	205	134
11.810.0380	3.8	3.8	119	78	11.810.0570	5.7	5.7	139	91					

» 11.815 **Phantom**



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



**HSS** **DIN 340** **N**

<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

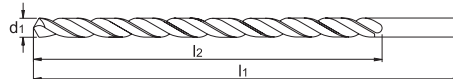
Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.815.0100	1	1	56	33	11.815.0340	3.4	3.4	112	73	11.815.0580	5.8	5.8	139	91
11.815.0110	1.1	1.1	60	37	11.815.0350	3.5	3.5	112	73	11.815.0590	5.9	5.9	139	91
11.815.0120	1.2	1.2	65	41	11.815.0360	3.6	3.6	112	73	11.815.0600	6	6	139	91
11.815.0130	1.3	1.3	65	41	11.815.0370	3.7	3.7	112	73	11.815.0620	6.2	6.2	148	97
11.815.0140	1.4	1.4	70	45	11.815.0380	3.8	3.8	119	78	11.815.0650	6.5	6.5	148	97
11.815.0150	1.5	1.5	70	45	11.815.0390	3.9	3.9	119	78	11.815.0680	6.8	6.8	156	102
11.815.0160	1.6	1.6	76	50	11.815.0400	4	4	119	78	11.815.0700	7	7	156	102
11.815.0170	1.7	1.7	76	50	11.815.0410	4.1	4.1	119	78	11.815.0750	7.5	7.5	156	102
11.815.0180	1.8	1.8	80	53	11.815.0420	4.2	4.2	119	78	11.815.0780	7.8	7.8	165	109
11.815.0190	1.9	1.9	80	53	11.815.0430	4.3	4.3	126	82	11.815.0800	8	8	165	109
11.815.0200	2	2	85	56	11.815.0440	4.4	4.4	126	82	11.815.0850	8.5	8.5	165	109
11.815.0210	2.1	2.1	85	56	11.815.0450	4.5	4.5	126	82	11.815.0880	8.8	8.8	175	115
11.815.0220	2.2	2.2	90	59	11.815.0460	4.6	4.6	126	82	11.815.0900	9	9	175	115
11.815.0230	2.3	2.3	90	59	11.815.0470	4.7	4.7	126	82	11.815.0950	9.5	9.5	175	115
11.815.0240	2.4	2.4	95	62	11.815.0480	4.8	4.8	132	87	11.815.0980	9.8	9.8	184	121
11.815.0250	2.5	2.5	95	62	11.815.0490	4.9	4.9	132	87	11.815.1000	10	10	184	121
11.815.0260	2.6	2.6	95	62	11.815.0500	5	5	132	87	11.815.1050	10.5	10.5	184	121
11.815.0270	2.7	2.7	100	66	11.815.0510	5.1	5.1	132	87	11.815.1100	11	11	195	128
11.815.0280	2.8	2.8	100	66	11.815.0520	5.2	5.2	132	87	11.815.1150	11.5	11.5	195	128
11.815.0290	2.9	2.9	100	66	11.815.0530	5.3	5.3	132	87	11.815.1200	12	12	205	134
11.815.0300	3	3	100	66	11.815.0540	5.4	5.4	139	91	11.815.1250	12.5	12.5	205	134
11.815.0310	3.1	3.1	106	69	11.815.0550	5.5	5.5	139	91	11.815.1300	13	13	205	134
11.815.0320	3.2	3.2	106	69	11.815.0560	5.6	5.6	139	91					
11.815.0330	3.3	3.3	106	69	11.815.0570	5.7	5.7	139	91					



> 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



HSS-E DIN 340 >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

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

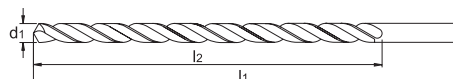
Ref.	d1	d2	l1	l2
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11.820.0510	5.1	5.1	132	87
11.820.0520	5.2	5.2	132	87
11.820.0550	5.5	5.5	139	91
11.820.0600	6	6	139	91
11.820.0650	6.5	6.5	148	97
11.820.0670	6.7	6.7	148	97
11.820.0680	6.8	6.8	156	102
11.820.0700	7	7	156	102
11.820.0750	7.5	7.5	156	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 pointe carb. mét.  
 ES Broca punta MD  
 DE HM-Schneiden Spiralbohrer



HM-TIP DIN 340 N

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 ≤850 N/mm<sup>2</sup> INOX >850 N/mm<sup>2</sup> GG GGG GTS-STW Alu Si>10% CuAlFe GFK/CFK Ni/Co 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
11.840.0200	2	2	85	56
11.840.0250	2.5	2.5	95	62
11.840.0300	3	3	100	66
11.840.0310	3.1	3.1	106	69
11.840.0320	3.2	3.2	106	69
11.840.0330	3.3	3.3	106	69
11.840.0350	3.5	3.5	112	73
11.840.0370	3.7	3.7	112	73
11.840.0380	3.8	3.8	119	78
11.840.0400	4	4	119	78
11.840.0410	4.1	4.1	119	78
11.840.0420	4.2	4.2	119	78
11.840.0450	4.5	4.5	126	82
11.840.0480	4.8	4.8	132	87
11.840.0500	5	5	132	87

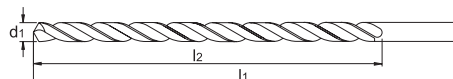
Ref.	d1	d2	l1	l2
11.840.0510	5.1	5.1	132	87
11.840.0520	5.2	5.2	132	87
11.840.0550	5.5	5.5	139	91
11.840.0560	5.6	5.6	139	91
11.840.0600	6	6	139	91
11.840.0610	6.1	6.1	148	97
11.840.0620	6.2	6.2	148	97
11.840.0630	6.3	6.3	148	97
11.840.0640	6.4	6.4	148	97
11.840.0650	6.5	6.5	148	97
11.840.0700	7	7	156	102
11.840.0750	7.5	7.5	156	102
11.840.0800	8	8	165	109
11.840.0850	8.5	8.5	165	109
11.840.0900	9	9	175	115

Ref.	d1	d2	l1	l2
11.840.0950	9.5	9.5	175	115
11.840.1000	10	10	184	121
11.840.1020	10.2	10.2	184	121
11.840.1050	10.5	10.5	184	121
11.840.1100	11	11	195	128
11.840.1150	11.5	11.5	195	128
11.840.1200	12	12	205	134
11.840.1250	12.5	12.5	205	134
11.840.1300	13	13	205	134
11.840.1400	14	14	214	140
11.840.1500	15	15	220	144
11.840.1600	16	16	227	149
11.840.1700	17	17	235	154
11.840.1800	18	18	241	158
11.840.2000	20	20	254	166

> 11.850 Phantom



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



HSS DIN 340 TS

P 11 N 41 N 43 N 61  
 ≤600 N/mm<sup>2</sup> Alu Mg PVC

18-25 E 60-65 F 55-60 E 18-21 E

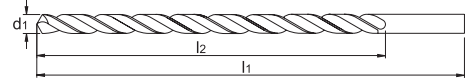
Ref.	d1	d2	l1	l2
11.850.0300	3	3	100	66
11.850.0350	3.5	3.5	112	73
11.850.0400	4	4	119	78
11.850.0450	4.5	4.5	126	82
11.850.0500	5	5	132	87

Ref.	d1	d2	l1	l2
11.850.0550	5.5	5.5	139	91
11.850.0600	6	6	139	91
11.850.0650	6.5	6.5	148	97
11.850.0700	7	7	156	102
11.850.0800	8	8	165	109

Ref.	d1	d2	l1	l2
11.850.0850	8.5	8.5	165	109
11.850.0900	9	9	175	115
11.850.1000	10	10	184	121
11.850.1050	10.5	10.5	184	121
11.850.1200	12	12	205	134



> 11.860 Phantom



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

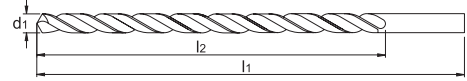
HSS DIN 340 TS 130°

P 11 ≤500 N/mm² P 12 ≤850 N/mm² K 31 GG K 32 GGG GTS-GTW N 42 Alu Si>10% N 52 CuAlFe N 61 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	11.860.0440	4.4	4.4	126	82	11.860.0700	7	7	156	102
11.860.0150	1.5	1.5	70	45	11.860.0450	4.5	4.5	126	82	11.860.0710	7.1	7.1	156	102
11.860.0200	2	2	85	56	11.860.0460	4.6	4.6	126	82	11.860.0720	7.2	7.2	156	102
11.860.0210	2.1	2.1	85	56	11.860.0470	4.7	4.7	126	82	11.860.0730	7.3	7.3	156	102
11.860.0220	2.2	2.2	90	59	11.860.0480	4.8	4.8	132	87	11.860.0740	7.4	7.4	156	102
11.860.0230	2.3	2.3	90	59	11.860.0490	4.9	4.9	132	87	11.860.0750	7.5	7.5	156	102
11.860.0240	2.4	2.4	95	62	11.860.0500	5	5	132	87	11.860.0760	7.6	7.6	165	109
11.860.0250	2.5	2.5	95	62	11.860.0510	5.1	5.1	132	87	11.860.0770	7.7	7.7	165	109
11.860.0260	2.6	2.6	95	62	11.860.0520	5.2	5.2	132	87	11.860.0780	7.8	7.8	165	109
11.860.0270	2.7	2.7	100	66	11.860.0530	5.3	5.3	132	87	11.860.0790	7.9	7.9	165	109
11.860.0280	2.8	2.8	100	66	11.860.0540	5.4	5.4	139	91	11.860.0800	8	8	165	109
11.860.0290	2.9	2.9	100	66	11.860.0550	5.5	5.5	139	91	11.860.0850	8.5	8.5	165	109
11.860.0300	3	3	100	66	11.860.0560	5.6	5.6	139	91	11.860.0870	8.7	8.7	175	115
11.860.0310	3.1	3.1	106	69	11.860.0570	5.7	5.7	139	91	11.860.0900	9	9	175	115
11.860.0320	3.2	3.2	106	69	11.860.0580	5.8	5.8	139	91	11.860.0950	9.5	9.5	175	115
11.860.0330	3.3	3.3	106	69	11.860.0590	5.9	5.9	139	91	11.860.1000	10	10	184	121
11.860.0340	3.4	3.4	112	73	11.860.0600	6	6	139	91	11.860.1020	10.2	10.2	184	121
11.860.0350	3.5	3.5	112	73	11.860.0610	6.1	6.1	148	97	11.860.1050	10.5	10.5	184	121
11.860.0360	3.6	3.6	112	73	11.860.0620	6.2	6.2	148	97	11.860.1100	11	11	195	128
11.860.0370	3.7	3.7	112	73	11.860.0630	6.3	6.3	148	97	11.860.1150	11.5	11.5	195	128
11.860.0380	3.8	3.8	119	78	11.860.0640	6.4	6.4	148	97	11.860.1200	12	12	205	134
11.860.0390	3.9	3.9	119	78	11.860.0650	6.5	6.5	148	97	11.860.1250	12.5	12.5	205	134
11.860.0400	4	4	119	78	11.860.0660	6.6	6.6	148	97	11.860.1300	13	13	205	134
11.860.0410	4.1	4.1	119	78	11.860.0670	6.7	6.7	148	97	11.860.1400	14	14	214	140
11.860.0420	4.2	4.2	119	78	11.860.0680	6.8	6.8	156	102	11.860.1500	15	15	220	144
11.860.0430	4.3	4.3	126	82	11.860.0690	6.9	6.9	156	102	11.860.1600	16	16	227	149

> 11.870 Phantom



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

HSS-E DIN 340 TS 130°

P 11 ≤500 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 K 31 GG K 32 GGG GTS-GTW N 42 Alu Si>10% N 51 Cu N 52 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

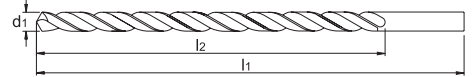
Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.870.0200	2	2	85	56	11.870.0550	5.5	5.5	139	91	11.870.0950	9.5	9.5	175	115
11.870.0250	2.5	2.5	95	62	11.870.0600	6	6	139	91	11.870.1000	10	10	184	121
11.870.0300	3	3	100	66	11.870.0650	6.5	6.5	148	97	11.870.1020	10.2	10.2	184	121
11.870.0330	3.3	3.3	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  
 FR Foret HSS-E TiAlN  
 ES Broca HSS-E TiAlN  
 DE HSS-E Spiralbohrer TiAlN



HSS-E TiAlN DIN 340 TS 130°

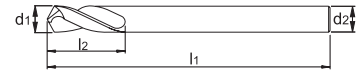
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	P 14 s1400 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	M 22 INOX >s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 52 CuAlFe
38-42 E	22-48 E	30-40 D	20-34 D	17-22 E	16-20 D	40-45 F	30-36 F	72-85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

Ref.	d1	d2	l1	l2	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 Blechsälbohrer



HSS NORM 135°

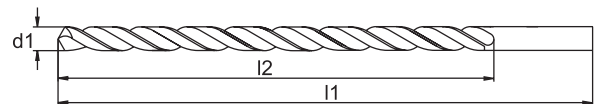
P 11 s800 N/mm <sup>2</sup>	P 12 s850 N/mm <sup>2</sup>	P 13 s1000 N/mm <sup>2</sup>	M 21 INOX s850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.890.4910	4.9	4.9	100	30	11.890.5121	5.1	5.1	210	30	11.890.5710	5.7	5.7	100	30
11.890.4915	4.9	4.9	150	30	11.890.5310	5.3	5.3	100	30	11.890.5715	5.7	5.7	150	30
11.890.5007	5	5	70	30	11.890.5315	5.3	5.3	150	30	11.890.5721	5.7	5.7	210	30
11.890.5010	5	5	100	30	11.890.5321	5.3	5.3	210	30	11.890.5810	5.8	5.8	100	30
11.890.5015	5	5	150	30	11.890.5510	5.5	5.5	100	30	11.890.5815	5.8	5.8	150	30
11.890.5021	5	5	210	30	11.890.5515	5.5	5.5	150	30	11.890.5821	5.8	5.8	210	30
11.890.5110	5.1	5.1	100	30	11.890.5521	5.5	5.5	210	30					
11.890.5115	5.1	5.1	150	30	11.890.5707	5.7	5.7	70	30					

> 11.900 Phantom



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



HSS DIN 1869 N 118°

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 42 Alu Si>10%	N 43 Mg	N 51 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

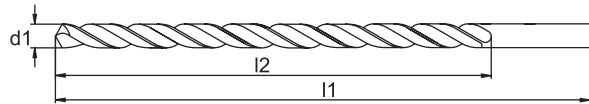
Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.900.0201	2	2	125	85	11.900.0451	4.5	4.5	185	125	11.900.0581	5.8	5.8	205	140
11.900.0251	2.5	2.5	140	95	11.900.0453	4.5	4.5	235	160	11.900.0601	6	6	205	140
11.900.0301	3	3	150	100	11.900.0481	4.8	4.8	195	135	11.900.0603	6	6	260	180
11.900.0303	3	3	190	130	11.900.0501	5	5	195	135	11.900.0651	6.5	6.5	215	150
11.900.0351	3.5	3.5	165	115	11.900.0503	5	5	245	170	11.900.0653	6.5	6.5	275	190
11.900.0353	3.5	3.5	210	145	11.900.0511	5.1	5.1	195	135	11.900.0701	7	7	225	155
11.900.0401	4	4	175	120	11.900.0551	5.5	5.5	205	140	11.900.0703	7	7	290	200
11.900.0403	4	4	220	150	11.900.0553	5.5	5.5	260	180	11.900.0751	7.5	7.5	225	155

› 11.900 **Phantom**

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
11.900.0753	7.5	7.5	290	200	11.900.0901	9	9	250	175	11.900.1003	10	10	340	235
11.900.0801	8	8	240	165	11.900.0903	9	9	320	220	11.900.1101	11	11	280	195
11.900.0803	8	8	305	210	11.900.0951	9.5	9.5	250	175	11.900.1103	11	11	365	250
11.900.0851	8.5	8.5	240	165	11.900.0953	9.5	9.5	320	220	11.900.1201	12	12	295	205
11.900.0853	8.5	8.5	305	210	11.900.1001	10	10	265	185	11.900.1203	12	12	375	260

› 11.920 **Phantom**

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



**HSS** **DIN 1869** **TS**

<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 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
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

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



## > 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

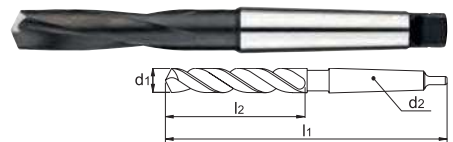


**P 14**  
≤1400 N/mm<sup>2</sup>

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
12.150.1500	15	MK 2	164	66

Ref.	d1	d2	l1	l2
12.150.1600	16	MK 2	168	70
12.150.1700	17	MK 2	171	73
12.150.1800	18	MK 2	175	77
12.150.1900	19	MK 3	201	80
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



## > 12.400 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



**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 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





## > 12.440 Phantom

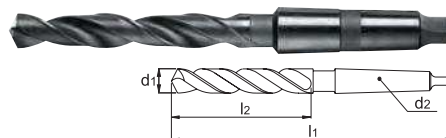
Ref.	d1	d2	l1	l2
12.440.4300	43	MK 4	359	210
12.440.4350	43.5	MK 4	359	210
12.440.4400	44	MK 4	359	210
12.440.4450	44.5	MK 4	359	210
12.440.4500	45	MK 4	359	210
12.440.4550	45.5	MK 4	364	215
12.440.4600	46	MK 4	364	215
12.440.4650	46.5	MK 4	364	215
12.440.4700	47	MK 4	364	215

Ref.	d1	d2	l1	l2
12.440.4750	47.5	MK 4	364	215
12.440.4800	48	MK 4	369	220
12.440.4850	48.5	MK 4	369	220
12.440.4900	49	MK 4	369	220
12.440.4950	49.5	MK 4	369	220
12.440.5000	50	MK 4	369	220
12.440.5100	51	MK 5	412	225
12.440.5200	52	MK 5	412	225
12.440.5300	53	MK 5	412	225

Ref.	d1	d2	l1	l2
12.440.5400	54	MK 5	417	230
12.440.5500	55	MK 5	417	230
12.440.5600	56	MK 5	417	230
12.440.5700	57	MK 5	422	235
12.440.5800	58	MK 5	422	235
12.440.5900	59	MK 5	422	235
12.440.6000	60	MK 5	422	235

## > 12.480 Phantom

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



HSS	DIN 346	N	DIN 228-B	≥12°	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 SiP-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

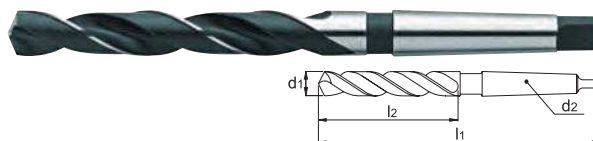
Ref.	d1	d2	l1	l2
12.480.1100	11	MK 2	175	94
12.480.1200	12	MK 2	182	101
12.480.1300	13	MK 2	182	101
12.480.1400	14	MK 2	189	108
12.480.1700	17	MK 3	223	125

Ref.	d1	d2	l1	l2
12.480.1800	18	MK 3	228	130
12.480.1900	19	MK 3	233	135
12.480.2000	20	MK 3	238	140
12.480.2100	21	MK 3	243	145
12.480.2200	22	MK 3	248	150

Ref.	d1	d2	l1	l2
12.480.2300	23	MK 3	253	155
12.480.2600	26	MK 4	286	165
12.480.2800	28	MK 4	291	170
12.480.2900	29	MK 4	296	175

## > 12.500 Phantom

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



HSS-E	DIN 345	N	DIN 228-B	≥12°	118°				
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 51	N 52
≤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	Cu	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

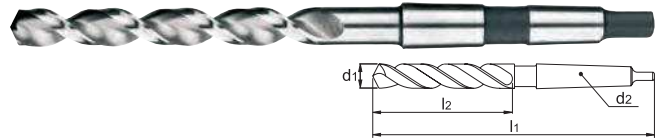
Ref.	d1	d2	l1	l2
12.500.0700	7	MK 1	150	69
12.500.0800	8	MK 1	156	75
12.500.0900	9	MK 1	162	81
12.500.1000	10	MK 1	168	87
12.500.1100	11	MK 1	175	94
12.500.1200	12	MK 1	182	101
12.500.1250	12.5	MK 1	182	101
12.500.1300	13	MK 1	182	101
12.500.1350	13.5	MK 1	189	108
12.500.1400	14	MK 1	189	108
12.500.1450	14.5	MK 2	212	114
12.500.1500	15	MK 2	212	114
12.500.1550	15.5	MK 2	218	120
12.500.1600	16	MK 2	218	120
12.500.1650	16.5	MK 2	223	125
12.500.1700	17	MK 2	223	125
12.500.1750	17.5	MK 2	228	130
12.500.1800	18	MK 2	228	130

Ref.	d1	d2	l1	l2
12.500.1850	18.5	MK 2	233	135
12.500.1900	19	MK 2	233	135
12.500.1950	19.5	MK 2	238	140
12.500.2000	20	MK 2	238	140
12.500.2050	20.5	MK 2	243	145
12.500.2100	21	MK 2	243	145
12.500.2150	21.5	MK 2	248	150
12.500.2200	22	MK 2	248	150
12.500.2250	22.5	MK 2	253	155
12.500.2300	23	MK 2	253	155
12.500.2350	23.5	MK 3	276	155
12.500.2400	24	MK 3	281	160
12.500.2450	24.5	MK 3	281	160
12.500.2500	25	MK 3	281	160
12.500.2550	25.5	MK 3	286	165
12.500.2600	26	MK 3	286	165
12.500.2650	26.5	MK 3	286	165
12.500.2700	27	MK 3	291	170

Ref.	d1	d2	l1	l2
12.500.2750	27.5	MK 3	291	170
12.500.2800	28	MK 3	291	170
12.500.2850	28.5	MK 3	296	175
12.500.2900	29	MK 3	296	175
12.500.2950	29.5	MK 3	296	175
12.500.3000	30	MK 3	296	175
12.500.3100	31	MK 3	301	180
12.500.3200	32	MK 4	334	185
12.500.3300	33	MK 4	334	185
12.500.3400	34	MK 4	339	190
12.500.3500	35	MK 4	339	190
12.500.3600	36	MK 4	344	195
12.500.3700	37	MK 4	344	195
12.500.3800	38	MK 4	349	200
12.500.3900	39	MK 4	349	200
12.500.4000	40	MK 4	349	200

> **12.520 Phantom**

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



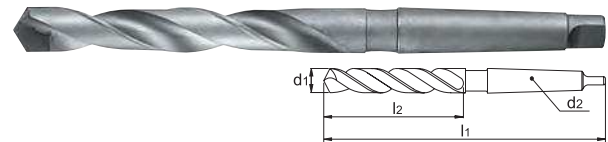
**HSS-E** **DIN 345** **TS** **DIN 228-B**

<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>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 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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.520.1000	10	MK 1	168	87	12.520.1450	14.5	MK 2	212	114	12.520.1900	19	MK 2	233	135
12.520.1050	10.5	MK 1	168	87	12.520.1500	15	MK 2	212	114	12.520.2000	20	MK 2	238	140
12.520.1100	11	MK 1	175	94	12.520.1550	15.5	MK 2	218	120	12.520.2050	20.5	MK 2	243	145
12.520.1150	11.5	MK 1	175	94	12.520.1600	16	MK 2	218	120	12.520.2100	21	MK 2	243	145
12.520.1200	12	MK 1	182	101	12.520.1650	16.5	MK 2	223	125	12.520.2200	22	MK 2	248	150
12.520.1250	12.5	MK 1	182	101	12.520.1700	17	MK 2	223	125	12.520.2250	22.5	MK 2	253	155
12.520.1300	13	MK 1	182	101	12.520.1750	17.5	MK 2	228	130	12.520.2300	23	MK 2	253	155
12.520.1350	13.5	MK 1	189	108	12.520.1800	18	MK 2	228	130	12.520.2400	24	MK 3	281	160
12.520.1400	14	MK 1	189	108	12.520.1850	18.5	MK 2	233	135	12.520.2500	25	MK 3	281	160

> **12.600 Phantom**

NL HM-tip Spiraalboor MK  
FR Foret pointe carb. mét. CM  
ES Broca punta MD CM  
DE HM-Schneiden Spiralbohrer MK



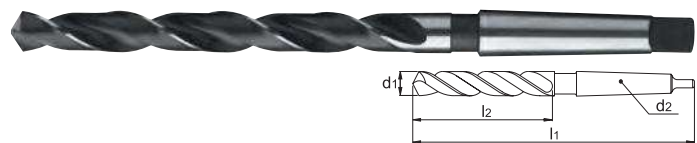
**HM-TIP** **DIN 345** **N** **DIN 228-B**

<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 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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
12.600.1000	10	MK 1	168	87	12.600.1850	18.5	MK 2	233	135	12.600.2700	27	MK 3	291	170
12.600.1050	10.5	MK 1	168	87	12.600.1900	19	MK 2	233	135	12.600.2750	27.5	MK 3	291	170
12.600.1100	11	MK 1	175	94	12.600.1950	19.5	MK 2	238	140	12.600.2800	28	MK 3	291	170
12.600.1150	11.5	MK 1	175	94	12.600.2000	20	MK 2	238	140	12.600.2850	28.5	MK 3	296	175
12.600.1200	12	MK 1	182	101	12.600.2050	20.5	MK 2	243	145	12.600.2900	29	MK 3	296	175
12.600.1250	12.5	MK 1	182	101	12.600.2100	21	MK 2	243	145	12.600.2950	29.5	MK 3	296	175
12.600.1300	13	MK 1	182	101	12.600.2150	21.5	MK 2	248	150	12.600.3000	30	MK 3	296	175
12.600.1350	13.5	MK 1	189	108	12.600.2200	22	MK 2	248	150	12.600.3100	31	MK 3	301	180
12.600.1400	14	MK 1	189	108	12.600.2250	22.5	MK 2	253	155	12.600.3200	32	MK 4	334	185
12.600.1450	14.5	MK 2	212	114	12.600.2300	23	MK 2	253	155	12.600.3300	33	MK 4	334	185
12.600.1500	15	MK 2	212	114	12.600.2350	23.5	MK 3	276	155	12.600.3400	34	MK 4	339	190
12.600.1550	15.5	MK 2	218	120	12.600.2400	24	MK 3	281	160	12.600.3500	35	MK 4	339	190
12.600.1600	16	MK 2	218	120	12.600.2450	24.5	MK 3	281	160	12.600.3600	36	MK 4	344	195
12.600.1650	16.5	MK 2	223	125	12.600.2500	25	MK 3	281	160	12.600.3700	37	MK 4	344	195
12.600.1700	17	MK 2	223	125	12.600.2550	25.5	MK 3	286	165	12.600.3800	38	MK 4	349	200
12.600.1750	17.5	MK 2	228	130	12.600.2600	26	MK 3	286	165	12.600.3900	39	MK 4	349	200
12.600.1800	18	MK 2	228	130	12.600.2650	26.5	MK 3	286	165	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** **DIN 341** **N** **DIN 228-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>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
12.800.1000	10	MK 1	197	116	12.800.1300	13	MK 1	215	134	12.800.1600	16	MK 2	251	153
12.800.1050	10.5	MK 1	197	116	12.800.1350	13.5	MK 1	223	142	12.800.1650	16.5	MK 2	257	159
12.800.1100	11	MK 1	206	125	12.800.1400	14	MK 1	223	142	12.800.1700	17	MK 2	257	159
12.800.1150	11.5	MK 1	206	125	12.800.1450	14.5	MK 2	245	147	12.800.1750	17.5	MK 2	263	165
12.800.1200	12	MK 1	215	134	12.800.1500	15	MK 2	245	147	12.800.1800	18	MK 2	263	165
12.800.1250	12.5	MK 1	215	134	12.800.1550	15.5	MK 2	251	153	12.800.1850	18.5	MK 2	269	171



## > 12.800 Phantom

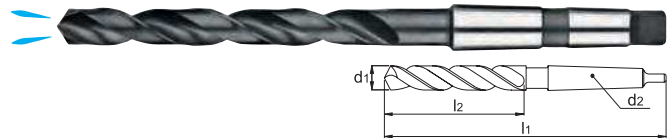
Ref.	d1	d2	l1	l2
12.800.1900	19	MK 2	269	171
12.800.1950	19.5	MK 2	275	177
12.800.2000	20	MK 2	275	177
12.800.2050	20.5	MK 2	282	184
12.800.2100	21	MK 2	282	184
12.800.2150	21.5	MK 2	289	191
12.800.2200	22	MK 2	289	191
12.800.2250	22.5	MK 2	296	198
12.800.2300	23	MK 2	296	198

Ref.	d1	d2	l1	l2
12.800.2350	23.5	MK 3	319	198
12.800.2400	24	MK 3	327	206
12.800.2500	25	MK 3	327	206
12.800.2600	26	MK 3	335	214
12.800.2700	27	MK 3	343	222
12.800.2800	28	MK 3	343	222
12.800.2900	29	MK 3	351	230
12.800.3000	30	MK 3	351	230
12.800.3100	31	MK 3	360	239

Ref.	d1	d2	l1	l2
12.800.3200	32	MK 4	397	248
12.800.3300	33	MK 4	397	248
12.800.3400	34	MK 4	406	257
12.800.3500	35	MK 4	406	257
12.800.3600	36	MK 4	416	267
12.800.3700	37	MK 4	416	267
12.800.3800	38	MK 4	426	277
12.800.3900	39	MK 4	426	277
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	NORM	N	DIN 228-B	118°
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 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	

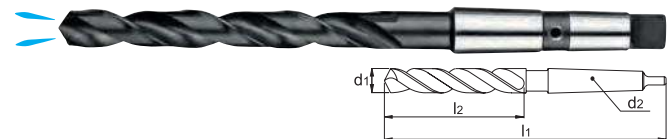
Ref.	d1	d2	l1	l2
12.840.1000	10	MK 2	233	116
12.840.1100	11	MK 2	242	125
12.840.1200	12	MK 2	251	134
12.840.1300	13	MK 2	251	134
12.840.1400	14	MK 2	259	142

Ref.	d1	d2	l1	l2
12.840.1500	15	MK 2	264	147
12.840.1600	16	MK 2	270	153
12.840.1800	18	MK 2	282	165
12.840.2000	20	MK 3	313	177
12.840.2200	22	MK 3	327	191

Ref.	d1	d2	l1	l2
12.840.2400	24	MK 3	342	206
12.840.2500	25	MK 3	342	206
12.840.2600	26	MK 3	350	214
12.840.2800	28	MK 4	385	222
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	NORM	N	DIN 228-B	118°
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 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
12.860.1000	10	MK 2	233	116
12.860.1100	11	MK 2	242	125
12.860.1200	12	MK 2	251	134
12.860.1300	13	MK 2	251	134
12.860.1400	14	MK 2	259	142

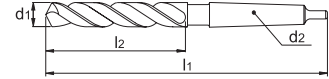
Ref.	d1	d2	l1	l2
12.860.1500	15	MK 2	264	147
12.860.1600	16	MK 2	270	153
12.860.1800	18	MK 2	282	165
12.860.2000	20	MK 3	313	177
12.860.2200	22	MK 3	327	191

Ref.	d1	d2	l1	l2
12.860.2400	24	MK 3	342	206
12.860.2500	25	MK 3	342	206
12.860.2600	26	MK 3	350	214
12.860.2800	28	MK 4	385	222
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



<b>HSS</b>	<b>OX.</b>	<b>DIN 1870</b>	<b>N</b>	<b>DIN 228-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>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

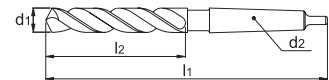
Ref.	d1	d2	l1	l2
12.900.1001	10	MK 1	285	185
12.900.1003	10	MK 1	360	235
12.900.1051	10.5	MK 1	285	185
12.900.1053	10.5	MK 1	360	235
12.900.1101	11	MK 1	300	195
12.900.1103	11	MK 1	375	250
12.900.1151	11.5	MK 1	300	195
12.900.1201	12	MK 1	310	205
12.900.1203	12	MK 1	395	260
12.900.1251	12.5	MK 1	310	205
12.900.1253	12.5	MK 1	395	260
12.900.1301	13	MK 1	310	205
12.900.1303	13	MK 1	395	260
12.900.1351	13.5	MK 1	325	220
12.900.1353	13.5	MK 1	410	275
12.900.1401	14	MK 1	325	220
12.900.1403	14	MK 1	410	275
12.900.1451	14.5	MK 2	340	220
12.900.1453	14.5	MK 2	425	275
12.900.1501	15	MK 2	340	220
12.900.1503	15	MK 2	425	275
12.900.1551	15.5	MK 2	355	230
12.900.1553	15.5	MK 2	445	295
12.900.1601	16	MK 2	355	230

Ref.	d1	d2	l1	l2
12.900.1603	16	MK 2	445	295
12.900.1651	16.5	MK 2	355	230
12.900.1653	16.5	MK 2	445	295
12.900.1701	17	MK 2	355	230
12.900.1703	17	MK 2	445	295
12.900.1751	17.5	MK 2	370	245
12.900.1753	17.5	MK 2	465	310
12.900.1801	18	MK 2	370	245
12.900.1803	18	MK 2	465	310
12.900.1851	18.5	MK 2	370	245
12.900.1853	18.5	MK 2	465	310
12.900.1901	19	MK 2	370	245
12.900.1903	19	MK 2	465	310
12.900.1951	19.5	MK 2	385	260
12.900.1953	19.5	MK 2	490	325
12.900.2001	20	MK 2	385	260
12.900.2003	20	MK 2	490	325
12.900.2051	20.5	MK 2	385	260
12.900.2053	20.5	MK 2	490	325
12.900.2101	21	MK 2	385	260
12.900.2103	21	MK 2	490	325
12.900.2201	22	MK 2	405	270
12.900.2203	22	MK 2	515	345
12.900.2301	23	MK 2	405	270

Ref.	d1	d2	l1	l2
12.900.2303	23	MK 2	515	345
12.900.2401	24	MK 3	440	290
12.900.2403	24	MK 3	555	365
12.900.2501	25	MK 3	440	290
12.900.2503	25	MK 3	555	365
12.900.2601	26	MK 3	440	290
12.900.2603	26	MK 3	555	365
12.900.2701	27	MK 3	460	305
12.900.2801	28	MK 3	460	305
12.900.2803	28	MK 3	580	385
12.900.2901	29	MK 3	460	305
12.900.3001	30	MK 3	460	305
12.900.3003	30	MK 3	580	385
12.900.3201	32	MK 4	505	320
12.900.3203	32	MK 4	635	410
12.900.3501	35	MK 4	530	340
12.900.3801	38	MK 4	555	360
12.900.4001	40	MK 4	555	360
12.900.4003	40	MK 4	695	460
12.900.4201	42	MK 4	555	360
12.900.4501	45	MK 4	585	385
12.900.4503	45	MK 4	735	490
12.900.5001	50	MK 4	605	405

> 12.910 Phantom

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



<b>HSS</b>	<b>OX.</b>	<b>DIN 1870</b>	<b>TS</b>	<b>DIN 228-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>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 E	22-30 E	15-20 D	8-12 C	15-20 D	25-30 D	45-50 F

NIEUW / NOUVEAU / NUEVO / NEU

Ref.	d1	d2	l1	l2
12.910.1005	10	MK 1	500	400
12.910.1205	12	MK 1	500	400
12.910.1405	14	MK 1	500	400
12.910.1407	14	MK 1	650	500
12.910.1505	15	MK 2	600	475
12.910.1507	15	MK 2	725	600
12.910.1605	16	MK 2	600	475

Ref.	d1	d2	l1	l2
12.910.1705	17	MK 2	600	475
12.910.1805	18	MK 2	600	475
12.910.1905	19	MK 2	600	475
12.910.2005	20	MK 2	600	475
12.910.2105	21	MK 2	600	475
12.910.2205	22	MK 2	600	475
12.910.2305	23	MK 2	600	475

Ref.	d1	d2	l1	l2
12.910.2405	24	MK 3	600	475
12.910.2505	25	MK 3	600	475
12.910.2605	26	MK 3	600	475
12.910.2805	28	MK 3	600	475
12.910.3005	30	MK 3	600	475
12.910.3503	35	MK 4	600	450
12.910.3803	38	MK 4	600	475



## > 12.920 Phantom

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



HSS-E	DIN 1870	TS	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>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 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> 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	DIN 1898 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>			
20-25 C	18-22 C	14-20 C			

Ref.	nr.	d1	d3	d2	l1	l2	l3	Ref.	nr.	d1	d3	d2	l1	l2	l3
13.200.0300	3	2.84	4.25	4	100	63	58	13.200.0600	6	5.71	8.25	8	160	114	105
13.200.0400	4	3.78	5.45	5	112	74	68	13.200.0800	8	7.64	11.11	10	207	157	145
13.200.0500	5	4.7	6.58	6.3	122	81	73	13.200.1000	10	9.65	13.79	12.5	245	190	175

## > 13.300 Phantom

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



HSS	DIN 344				
<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>N 41</b> 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	3.2	13.300.0880	8.8	8.8	151	107	5.8	13.300.1275	12.75	12.75	184	134	8.4
13.300.0500	5	5	108	74	3.2	13.300.0900	9	9	151	107	5.8	13.300.1300	13	13	184	134	8.4
13.300.0580	5.8	5.8	116	80	3.9	13.300.0980	9.8	9.8	162	116	6.5	13.300.1375	13.75	13.75	194	142	9.1
13.300.0600	6	6	116	80	3.9	13.300.1000	10	10	162	116	6.5	13.300.1400	14	14	194	142	9
13.300.0680	6.8	6.8	133	93	4.5	13.300.1075	10.75	10.75	173	125	7.1	13.300.1475	14.75	14.75	202	147	9.7
13.300.0700	7	7	133	93	4.5	13.300.1100	11	11	173	125	7.1	13.300.1500	15	15	202	147	9.7
13.300.0780	7.8	7.8	142	100	5.2	13.300.1175	11.75	11.75	184	134	7.8	13.300.1575	15.75	15.75	211	153	10.4
13.300.0800	8	8	142	100	5.2	13.300.1200	12	12	184	134	7.8	13.300.1600	16	16	211	153	10.4



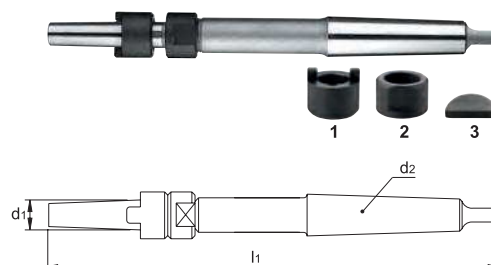


> 13.350 **Phantom**

Ref.	d1	d2	d3	l1
13.350.4800	48	19	42	56
13.350.4960	49.6	19	44	56
13.350.5000	50	19	44	56

> 84.410 **INTERNATIONAL TOOLS**

- NL ECO PRO Opsteekhouder, DIN 217, voor opsteekruimers DIN 219 en opsteekopboor DIN 222, MK
- FR ECO PRO Arbre de montage, DIN 217, pour alésoirs creux DIN 219 et forets creux DIN 222, CM
- ES ECO PRO Porta-escariadores, DIN 217, para escariadores huecos DIN 219 y brocas escariadores huecos DIN 222, CM
- DE ECO PRO Aufsteckhalter, DIN 217, 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	3	25-30	25-35	84.411.0200	84.412.0200	84.413.0200
84.410.0300	3	16	261	3	31-35	36-45	84.411.0300	84.412.0300	84.413.0300
84.410.0400	4	19	298	4	36-42	46-52	84.411.0400	84.412.0400	84.413.0400
84.410.0500	5	22	312	4	43-50	53-62	84.411.0500	84.412.0500	84.413.0500
84.410.0600	6	27	359	5	51-60	63-75	84.411.0600	84.412.0600	84.413.0600
84.410.0700	7	32	376	5	61-71	76-90	84.411.0700	84.412.0700	84.413.0700
84.410.0800	8	40	396	5	72-85	91-100	84.411.0800	84.412.0800	84.413.0800
84.410.0900	9	50	416	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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
13.603.0300	3	3	61	33	13.603.0800	8	8	117	75	13.603.1300	13	10	151	101
13.603.0400	4	4	75	43	13.603.0900	9	9	125	81	13.603.1400	14	10	160	108
13.603.0500	5	5	86	52	13.603.1000	10	10	133	87	13.603.1500	15	10	169	114
13.603.0600	6	6	93	57	13.603.1100	11	10	142	94	13.603.1600	16	10	178	120
13.603.0700	7	7	109	69	13.603.1200	12	10	151	101					

> **13.606 Phantom**



NL **CV Opsteekverzinkfrees 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°**

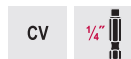


Ref.	d1	Ref.	d1
13.606.0300	3	13.606.0500	5
13.606.0400	4	13.606.0600	6

> **13.610 Phantom**



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



Ref.	d1	l1	Ref.	d1	l1	Ref.	d1	l1
13.610.0600	6	150	13.610.1800	18	150	13.610.2600	26	150
13.610.0800	8	150	13.610.1900	19	150	13.610.2800	28	150
13.610.1000	10	150	13.610.2000	20	150	13.610.3000	30	150
13.610.1200	12	150	13.610.2200	22	150	13.610.3200	32	150
13.610.1400	14	150	13.610.2400	24	150	13.610.3500	35	150
13.610.1600	16	150	13.610.2500	25	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



CV



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



CV



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



HM

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

> **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
13.700.0300	3	2.5	60
13.700.0400	4	3.5	75
13.700.0500	5	4.5	85
13.700.0550	5.5	5	85
13.700.0600	6	5.5	100
13.700.0650	6.5	6	100

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

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

> **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
13.710.0515	5	4.5	150
13.710.0615	6	5.5	150
13.710.0620	6	5.5	200
13.710.0640	6	5.5	400
13.710.0715	7	6.5	150
13.710.0815	8	7.5	150
13.710.0820	8	7.5	200
13.710.0840	8	7.5	400

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

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

> **13.720 Phantom**



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



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

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

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



## > 13.730 Phantom

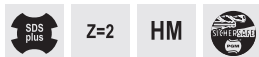
NL SUPER HM-tip Betonboor lang  
FR Foret Béton SUPER pointe carb. mét. version longue  
ES Broca para hormigón SUPER punta MD larga  
DE SUPER HM-Schneiden Betonbohrer lang



Ref.	d1	d2	l1	Ref.	d1	d2	l1	Ref.	d1	d2	l1
13.730.0615	6	5.5	150	13.730.0820	8	7.5	200	13.730.1020	10	9.5	200
13.730.0815	8	7.5	150	13.730.1015	10	9.5	150	13.730.1220	12	10	200

## > 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	Ref.	d1	l1	l2	Ref.	d1	l1	l2
13.740.0411	4	110	50	13.740.1021	10	210	150	13.740.1631	16	310	250
13.740.0511	5	110	50	13.740.1026	10	260	200	13.740.1646	16	450	400
13.740.0516	5	160	100	13.740.1031	10	310	250	13.740.1660	16	600	550
13.740.0551	5.5	110	50	13.740.1046	10	450	400	13.740.1690	16	1000	950
13.740.0552	5.5	160	100	13.740.1116	11	160	100	13.740.1821	18	210	150
13.740.0611	6	110	50	13.740.1216	12	160	100	13.740.1826	18	260	200
13.740.0616	6	160	100	13.740.1221	12	210	150	13.740.1831	18	310	250
13.740.0621	6	210	150	13.740.1226	12	260	200	13.740.1846	18	450	400
13.740.0626	6	260	200	13.740.1231	12	310	250	13.740.1860	18	600	550
13.740.0631	6	310	250	13.740.1246	12	450	400	13.740.1890	18	1000	950
13.740.0651	6.5	110	50	13.740.1316	13	160	100	13.740.2021	20	210	150
13.740.0652	6.5	160	100	13.740.1326	13	260	200	13.740.2026	20	260	200
13.740.0711	7	110	50	13.740.1346	13	450	400	13.740.2031	20	310	250
13.740.0716	7	160	100	13.740.1416	14	160	100	13.740.2046	20	450	400
13.740.0721	7	210	150	13.740.1421	14	210	150	13.740.2090	20	1000	950
13.740.0811	8	110	50	13.740.1426	14	260	200	13.740.2226	22	260	200
13.740.0816	8	160	100	13.740.1431	14	310	250	13.740.2231	22	310	250
13.740.0821	8	210	150	13.740.1446	14	450	400	13.740.2246	22	450	400
13.740.0826	8	260	200	13.740.1516	15	160	100	13.740.2426	24	260	200
13.740.0831	8	310	250	13.740.1521	15	210	150	13.740.2446	24	450	400
13.740.0846	8	450	400	13.740.1526	15	260	200	13.740.2526	25	260	200
13.740.0916	9	160	100	13.740.1546	15	450	400	13.740.2531	25	310	250
13.740.0921	9	210	150	13.740.1616	16	160	100	13.740.2546	25	450	400
13.740.1011	10	110	50	13.740.1621	16	210	150	13.740.2590	25	1000	950
13.740.1016	10	160	100	13.740.1626	16	260	200				

## > 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



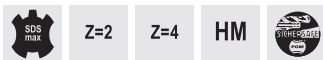
Ref.	d1	l1	l2	Ref.	d1	l1	l2	Ref.	d1	l1	l2
13.744.0511	5	110	50	13.744.1011	10	110	50	13.744.1426	14	260	200
13.744.0516	5	160	100	13.744.1016	10	160	100	13.744.1516	15	160	100
13.744.0611	6	110	50	13.744.1021	10	210	150	13.744.1616	16	160	100
13.744.0616	6	160	100	13.744.1026	10	260	200	13.744.1621	16	210	150
13.744.0621	6	210	150	13.744.1216	12	160	100	13.744.1626	16	260	200
13.744.0811	8	110	50	13.744.1221	12	210	150	13.744.1825	18	250	200
13.744.0816	8	160	100	13.744.1226	12	260	200	13.744.2025	20	250	200
13.744.0821	8	210	150	13.744.1416	14	160	100	13.744.2225	22	250	200
13.744.0826	8	260	200	13.744.1421	14	210	150	13.744.2525	25	250	200



> **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	z	Ref.	d1	l1	l2	z	Ref.	d1	l1	l2	z
13.750.1234	12	340	200	2	13.750.2052	20	520	400	4	13.750.3232	32	320	200	4
13.750.1254	12	540	400	2	13.750.2092	20	920	800	4	13.750.3257	32	570	450	4
13.750.1269	12	690	550	2	13.750.2232	22	320	200	4	13.750.3292	32	920	800	4
13.750.1434	14	340	200	2	13.750.2252	22	520	400	4	13.750.3532	35	320	200	4
13.750.1454	14	540	400	2	13.750.2292	22	920	800	4	13.750.3557	35	570	450	4
13.750.1534	15	340	200	2	13.750.2432	24	320	200	4	13.750.3832	38	320	200	4
13.750.1554	15	540	400	2	13.750.2452	24	520	400	4	13.750.3857	38	570	450	4
13.750.1634	16	340	200	3	13.750.2532	25	320	200	4	13.750.4032	40	320	200	4
13.750.1654	16	540	400	3	13.750.2552	25	520	400	4	13.750.4057	40	570	450	4
13.750.1692	16	920	800	3	13.750.2592	29	920	800	4	13.750.4092	40	920	800	4
13.750.1834	18	340	200	4	13.750.2832	28	320	200	4	13.750.4557	45	570	450	4
13.750.1854	18	540	400	4	13.750.2857	28	570	450	4	13.750.5057	50	570	450	4
13.750.1894	18	940	800	4	13.750.3032	30	320	200	4					
13.750.2032	20	320	200	4	13.750.3057	30	570	450	4					

> **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	z	Ref.	d1	l1	z
13.765.0040	40	85	4	13.765.0068	68	85	6
13.765.0050	50	85	6	13.765.0080	80	85	6

> **13.766 Phantom**

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



13.766.0080



13.766.0300



13.766.0400



13.766.0500



13.766.0811

Ref.	d1	l1	Type	Ref.	d1	l1	Type	Ref.	d1	l1	Type
13.766.0040	40			13.766.0080	80			13.766.0500	8	220	SDS-PLUS
13.766.0050	50			13.766.0300	11.85	95		13.766.0811	8	110	
13.766.0068	68			13.766.0400		110	SDS-PLUS				



> 13.770 **Phantom**

NL **SDS-PLUS Beitel**  
 FR **Burin SDS-PLUS**  
 ES **Cinzel 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 **Cinzel SDS-MAX**  
DE **SDS-MAX Meißel**



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**



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
13.790.0300	3	65
13.790.0400	4	65

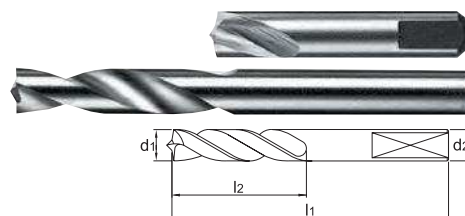
Ref.	d1	l1
13.790.0500	5	65
13.790.0600	6	65

Ref.	d1	l1
13.790.0800	8	105
13.790.1000	10	110



**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



HSS-E

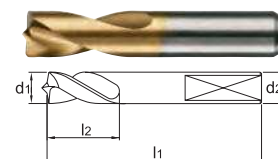
**P 11** **P 12** **P 13** **P 14** **M 21** **M 22**  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> ≤1400 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup>

28-35 30-36 20-27 12-20 14-18 10-15

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
13.800.0844	8	8	44	23	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



HSS-E TiN

**P 11** **P 12** **P 13** **P 14** **M 21** **M 22**  
 ≤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>

28-35 30-36 20-27 12-20 14-18 10-15

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
13.801.0644	6	6	44	16	13.801.0844	8	8	44	23	13.801.1089	10	10	89	43
13.801.0666	6	6	66	28	13.801.0879	8	8	79	37					

**15.095 INTERNATIONAL TOOLS**

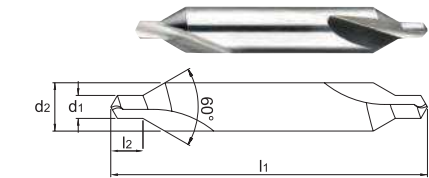
NL **ECO PRO HSS Centerboor 60°**  
 FR **Foret à centrer HSS ECO PRO 60°**  
 ES **Broca de centrar HSS ECO PRO 60°**  
 DE **ECO PRO HSS Zentrierbohrer 60°**



<b>P 11</b> 5600 N/mm <sup>2</sup>	<b>P 12</b> 5850 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



**NIEUW NOUVEAU NUEVO NEU**

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**

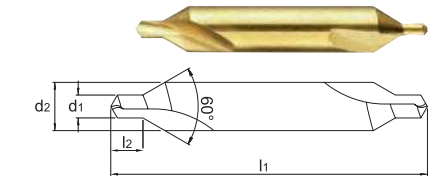
NL **ECO PRO HSS Centerboor TiN, 60°**  
 FR **Foret à centrer HSS ECO PRO TiN, 60°**  
 ES **Broca de centrar HSS ECO PRO TiN, 60°**  
 DE **ECO PRO HSS Zentrierbohrer TiN, 60°**



<b>P 11</b> 5600 N/mm <sup>2</sup>	<b>P 12</b> 5850 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



**NIEUW NOUVEAU NUEVO NEU**

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

**15.100 Phantom**

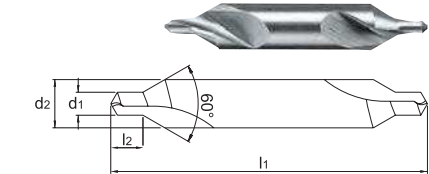
NL **HSS Centerboor 60°**  
 FR **Foret à centrer HSS 60°**  
 ES **Broca de centrar HSS 60°**  
 DE **HSS Zentrierbohrer 60°**



<b>P 11</b> 5600 N/mm <sup>2</sup>	<b>P 12</b> 5850 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

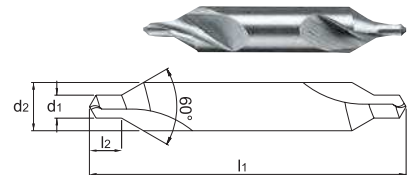


Ref.	d1	d2	l1	l2
15.100.5013	5	12.5	63	6,3-7,2
15.100.5014	5	14	69	6,3-7,2
15.100.5016	5	16	71	6,3-7,2
15.100.6018	6	18	77	8,0-8,9
15.100.6316	6.3	16	71	8,0-8,9
15.100.6320	6.3	20	80	8,0-8,9
15.100.8020	8	20	80	10,1-11,1
15.100.9025	10	25	100	12,8-13,8
15.100.9531	12.5	31.5	125	16,5-17,5



**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°**



HSS-E

<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>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
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

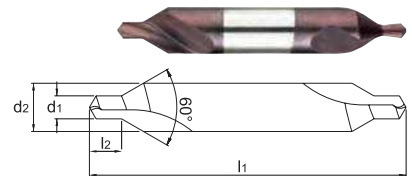
Ref.	d1	d2	l1	l2
15.120.0735	0.75	3.5	35	1,0-1,3
15.120.1040	1	4	35	1,3-1,7
15.120.1231	1.25	3.15	31	1,6-2,0
15.120.1550	1.5	5	40	2,0-2,6
15.120.1640	1.6	4	35	2,0-2,6

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

Ref.	d1	d2	l1	l2
15.120.3180	3.15	8	50	3,9-4,6
15.120.4010	4	10	55	5,0-5,9
15.120.4012	4	12	63	5,0-5,9
15.120.5013	5	12.5	63	6,3-7,2
15.120.5014	5	14	69	6,3-7,2

**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°**



HSS-E

<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>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
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

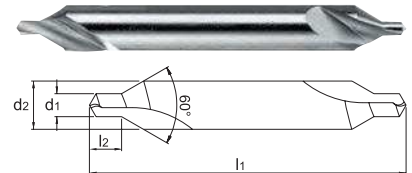
Ref.	d1	d2	l1	l2
15.124.0531	0.5	3.15	25	0,6-0,9
15.124.0831	0.8	3.15	25	1,0-1,3
15.124.1031	1	3.15	31	1,3-1,7
15.124.1231	1.25	3.15	31	1,6-2,0

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
15.124.2563	2.5	6.3	45	3,1-3,8
15.124.3180	3.15	8	50	3,9-4,6

Ref.	d1	d2	l1	l2
15.124.4010	4	10	55	5,0-5,9
15.124.5013	5	12.5	63	6,3-7,2
15.124.6316	6.3	16	71	8,0-8,9
15.124.8020	8	20	80	10,1-11,1

**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**



HSS-E

<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>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
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 D	10-15 D	18-21 E

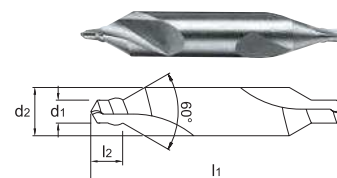
Ref.	d1	d2	l1	l2
15.150.0753	0.75	3.5	60	1,0-1,3
15.150.0756	0.75	3.5	120	1,0-1,3
15.150.1003	1	4	60	1,3-1,7
15.150.1005	1	4	100	1,3-1,7
15.150.1006	1	4	120	1,3-1,7
15.150.1007	1	4	150	1,3-1,7
15.150.1503	1.5	5	60	2,0-2,6
15.150.1505	1.5	5	100	2,0-2,6
15.150.1506	1.5	5	120	2,0-2,6
15.150.1507	1.5	5	150	2,0-2,6
15.150.2004	2	6	80	2,5-3,1
15.150.2005	2	6	100	2,5-3,1

Ref.	d1	d2	l1	l2
15.150.2006	2	6	120	2,5-3,1
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

Ref.	d1	d2	l1	l2
15.150.3015	3	10	100	3,9-4,6
15.150.3016	3	10	120	3,9-4,6
15.150.3017	3	10	150	3,9-4,6
15.150.3158	3.15	8	200	3,9-4,6
15.150.4005	4	10	100	5,0-5,9
15.150.4006	4	10	120	5,0-5,9
15.150.4007	4	10	150	5,0-5,9
15.150.4008	4	10	200	5,0-5,9
15.150.4015	4	12	100	5,0-5,9
15.150.4016	4	12	120	5,0-5,9
15.150.4017	4	12	150	5,0-5,9
15.150.5006	5	14	120	6,3-7,2

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 DIN 333-W NFE 66051-W

P 11 ≤500 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 43 Mg	N 51 Cu	N 61 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

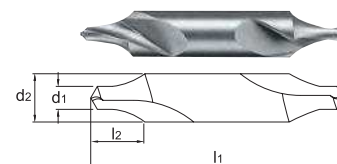
Ref.	d1	d2	l1	l2
15.200.0530	0.5	3	31	0,6-0,9
15.200.0531	0.5	3.15	25	0,6-0,9
15.200.1031	1	3.15	31	1,3-1,7
15.200.1040	1	4	35	1,3-1,7
15.200.1231	1.25	3.15	31	1,6-2,0
15.200.1240	1.25	4	35	1,6-2,0
15.200.1550	1.5	5	40	2,0-2,6
15.200.1640	1.6	4	35	2,0-2,6
15.200.1650	1.6	5	40	2,0-2,6
15.200.2050	2	5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

Ref.	d1	d2	l1	l2
15.200.4013	4	12.5	63	5,0-5,9
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 DIN 333-R NFE 66051-R

P 11 ≤500 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 43 Mg	N 51 Cu	N 61 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	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°



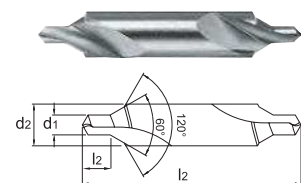
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤350 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
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20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E
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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°



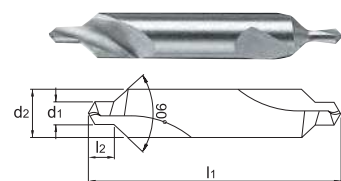
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤350 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 43</b> Mg	<b>N 51</b> Cu	<b>N 61</b> PVC
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20-25 E	15-25 E	16-22 F	25-30 E	20-25 D	50-60 E	60-70 E	45-50 E	25-40 E	18-28 E
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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-Centreerboor 90°  
 FR Foret à pointer NC HSS-E 90°  
 ES Broca de puntear NC HSS-E 90°  
 DE HSS-E NC Anbohrer 90°



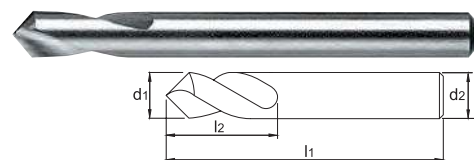
<b>P 11</b> ≤600 N/mm <sup>2</sup>	<b>P 12</b> ≤350 N/mm <sup>2</sup>	<b>P 13</b> ≤1000 N/mm <sup>2</sup>	<b>M 21</b> INOX ≤850N/mm <sup>2</sup>	<b>M 22</b> INOX >850N/mm <sup>2</sup>	<b>K 31</b> GG	<b>K 32</b> GGG GTS-GTW	<b>N 41</b> Alu	<b>N 42</b> Alu Si>10%	<b>N 51</b> Cu	<b>N 52</b> CuAlFe	<b>N 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	18-28 E
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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

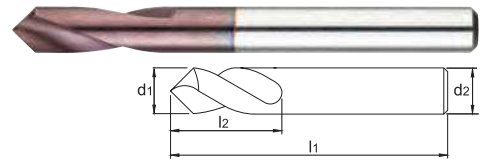
Ref.	d1	d2	l1	l2
15.600.1800	18	18	130	40
15.600.2000	20	20	131	40
15.600.2500	25	25	138	45





15.604 Phantom

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



HSS-E TiAlN 90°

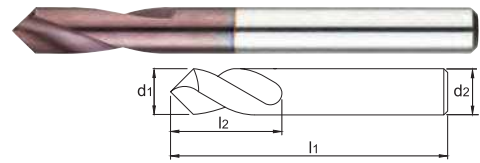
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 43	N 51	N 52
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Mg	Cu	CuAlFe

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
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Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
15.604.0300	3	3	50	10	15.604.0800	8	8	79	25	15.604.1800	18	18	130	40
15.604.0400	4	4	52	12	15.604.1000	10	10	89	25	15.604.2000	20	20	131	40
15.604.0500	5	5	60	15	15.604.1200	12	12	102	30	15.604.2500	25	25	138	45
15.604.0600	6	6	66	20	15.604.1600	16	16	115	35					

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°



NIEUW / NOUVEAU / NUEVO / NEU

HSS-E 8% AlCrN-X 90°

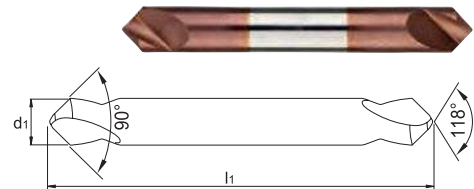
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 43	N 51	N 52
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Mg	Cu	CuAlFe

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
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Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
15.606.0300	3	3	50	10	15.606.0600	6	6	66	20	15.606.1200	12	12	102	30
15.606.0400	4	4	52	12	15.606.0800	8	8	79	25					
15.606.0500	5	5	60	15	15.606.1000	10	10	89	25					

15.611 Phantom

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



HSS-E 90° AlCrN-X

P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 43	N 51	N 52
≤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%	Mg	Cu	CuAlFe

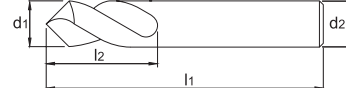
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 D	20-25 D
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Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
15.611.0300	3	3	40	7	15.611.0800	8	8	65	12	15.611.1600	16	16	90	24
15.611.0400	4	4	45	9	15.611.1000	10	10	75	15	15.611.2000	20	20	100	29
15.611.0600	6	6	55	11	15.611.1200	12	12	85	18					



## 15.640 Phantom

NL HSS-E NC-Centreerboor 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



HSS-E 90°

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
≤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	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	CuAlFe	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
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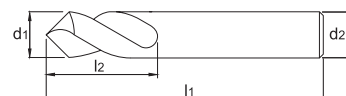
Ref.	d1	d2	l1	l2
15.640.0400	4	4	100	12
15.640.0500	5	5	120	15
15.640.0600	6	6	140	20

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-Centreerboor 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



HSS-E TiAlN 90°

P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 43	N 51	N 52
≤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	GGG GTS-GTW	Alu Si>10%	Mg	Cu	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
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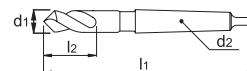
Ref.	d1	d2	l1	l2
15.644.0400	4	4	100	12
15.644.0500	5	5	120	15
15.644.0600	6	6	140	20

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-Centreerboor 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



HSS-E 90° DIN 228-B

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
≤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	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	CuAlFe	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
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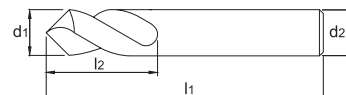
Ref.	d1	d2	l1	l2
15.650.1600	16	MK 2	148	35

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°



HSS-E 120°

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
≤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	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	CuAlFe	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
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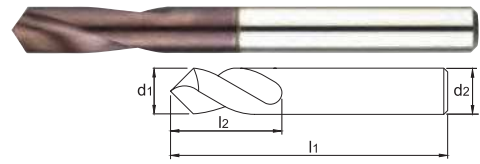
Ref.	d1	d2	l1	l2
15.700.0200	2	2	49	8
15.700.0300	3	3	50	10
15.700.0400	4	4	52	12
15.700.0500	5	5	60	15
15.700.0600	6	6	66	20

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

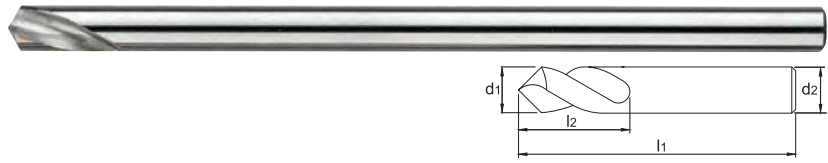
NL HSS-E NC-Centreerboor TiAIN, 120°  
 FR Foret à pointer NC HSS-E TiAIN, 120°  
 ES Broca de puntear NC HSS-E TiAIN, 120°  
 DE HSS-E NC Anbohrer TiAIN, 120°



HSS-E		TiAIN		120°										
<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				
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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
15.704.0300	3	3	50	10	15.704.0800	8	8	79	25	15.704.2000	20	20	131	40
15.704.0400	4	4	52	12	15.704.1000	10	10	89	25	15.704.2500	25	25	138	45
15.704.0500	5	5	60	15	15.704.1200	12	12	102	30					
15.704.0600	6	6	66	20	15.704.1600	16	16	115	35					

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



HSS-E		120°												
<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 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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
15.740.0400	4	4	100	12	15.740.0800	8	8	140	25	15.740.1600	16	16	200	35
15.740.0500	5	5	120	15	15.740.1000	10	10	170	25	15.740.2000	20	20	200	40
15.740.0600	6	6	140	20	15.740.1200	12	12	170	30					

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



HSS-E		TiAIN		120°										
<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				
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	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
15.744.0400	4	4	100	12	15.744.0800	8	8	140	25	15.744.1600	16	16	200	35
15.744.0500	5	5	120	15	15.744.1000	10	10	170	25	15.744.2000	20	20	200	40
15.744.0600	6	6	140	20	15.744.1200	12	12	170	30					



## 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°

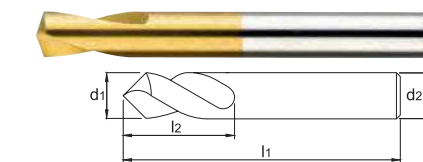
HSS-E TiN 142°

P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 43	N 51	N 52
≤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%	Mg	Cu	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
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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



NIEUW NOUVEAU NUEVO NEU

## 15.820 Phantom

NL HSS-E Centreerboor voor tapgaten, 60°  
 FR Foret à centrer HSS-E pour trous à tarauder, 60°  
 ES Broca escalonada HSS-E para pretaladros con centrage, 60°  
 DE HSS-E Zentrierbohrer für Gewindelöcher, 60°

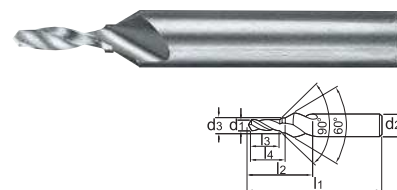
HSS-E 60° DIN 332-2

P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52
≤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	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
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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 Centreerboor voor tapgaten, 60°, met spanvlak  
 FR Foret à centrer HSS-E pour trous à tarauder, 60°, avec méplat  
 ES Broca escalonada HSS-E para pretaladros con centrage, 60°, con plano de arrastre  
 DE HSS-E Zentrierbohrer für Gewindelöcher, 60°, mit ebener Fläche

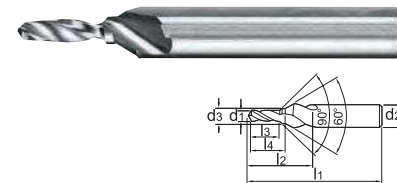
HSS-E 60° DIN 332-2

P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52
≤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	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
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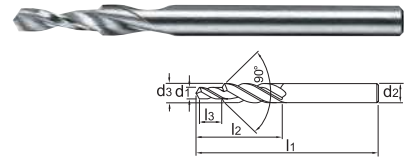
Ref.	M	d1	d3	l1	l2	l4	l3	d2
15.840.0400	4	3.3	4.3	63	23	12.6	11	8
15.840.0500	5	4.2	5.3	67	27	15.1	13	10
15.840.0600	6	5	6.4	71	33	18.9	16	12.5
15.840.0800	8	6.8	8.4	88	41	23	19	14
15.840.1000	10	8.5	10.5	90	47	27.7	23	16

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 Kerngatboor voor tapgaten, 90°
- FR Foret étagé HSS-E pour trous à tarauder, 90°
- ES Broca escalonada HSS-E para pretaladros con centraje, 90°
- DE HSS-E Kernlochbohrer für Gewindelöcher, 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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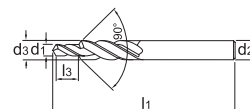
Ref.	M	d1	d3	l1	l2	l3	d2
15.880.0300	3	2.5	3.4	52	20	8	3.4
15.880.0400	4	3.3	4.5	58	24	11	4.5
15.880.0500	5	4.2	5.5	66	28	13	5.5
15.880.0600	6	5	6.6	70	31	16	6.6

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 90°  
 FR Foret étagé HSS-E 90°  
 ES Broca bidiametral HSS-E 90°  
 DE HSS-E Mehrfasenstufenbohrer 90°



HSS-E 90° N

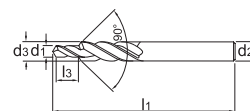
P 11 P 12 P 13 M 21 M 22 K 31 K 32 N 41 N 42 N 51 N 52  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu CuAlFe

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	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2
16.100.0200	2	4.6	2.2	45	6	4.6	16.100.0500	5	10.4	5.3	55	13	10.4
16.100.0250	2.5	5.7	2.7	45	7	5.7	16.100.0600	6	12.4	6.4	63	15	12.4
16.100.0300	3	6.5	3.2	45	9	6.5	16.100.0800	8	16.4	8.4	100	19	12.5
16.100.0400	4	8.6	4.3	50	11	8.6	16.100.1000	10	20.4	10.5	110	23	12.5

## 16.104 Phantom

NL HSS-E Meerfasenboor AlCrN-X, 90°  
 FR Foret étagé HSS-E AlCrN-X, 90°  
 ES Broca bidiametral HSS-E AlCrN-X, 90°  
 DE HSS-E Mehrfasenstufenbohrer AlCrN-X, 90°



NIEUW NOUVEAU NUEVO NEU

HSS-E AlCrN-X 90° N

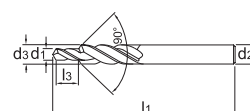
P 11 P 12 P 13 M 21 M 22 K 31 K 32 N 42 N 43 N 51 N 52  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Mg Cu CuAlFe

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	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2
16.104.0300	3	6.5	3.2	45	9	6.5	16.104.0600	6	12.4	6.4	63	15	12.4
16.104.0400	4	8.6	4.3	50	11	8.6	16.104.0800	8	16.4	8.4	100	19	12.5
16.104.0500	5	10.4	5.3	55	13	10.4	16.104.1000	10	20.4	10.5	110	23	12.5

## 16.120 Phantom

NL HSS-E Meerfasenboor 90°  
 FR Foret étagé HSS-E 90°  
 ES Broca bidiametral HSS-E 90°  
 DE HSS-E Mehrfasenstufenbohrer 90°



HSS-E 90° N

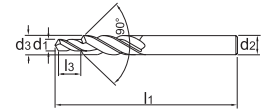
P 11 P 12 P 13 M 21 M 22 K 31 K 32 N 41 N 42 N 51 N 52  
 ≤800 N/mm<sup>2</sup> ≤850 N/mm<sup>2</sup> ≤1000 N/mm<sup>2</sup> INOX ≤850N/mm<sup>2</sup> INOX >850N/mm<sup>2</sup> GG GGG GTS-GTW Alu Alu Si>10% Cu CuAlFe

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	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2
16.120.0400	4	8.6	4.3	110	30	8.6	16.120.0600	6	12.4	6.4	110	30	12.4	16.120.1000	10	20.4	10.5	110	30	12.5
16.120.0500	5	10.4	5.3	110	30	10.4	16.120.0800	8	16.4	8.4	110	30	12.5							

16.124 Phantom

NL HSS-E Meerfasenboor AlCrN-X, 90°  
 FR Foret étagé HSS-E AlCrN-X, 90°  
 ES Broca bidiametral HSS-E AlCrN-X, 90°  
 DE HSS-E Mehrfasenstufenbohrer AlCrN-X, 90°



NIEUW NOUVEAU NUEVO NEU

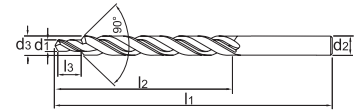
HSS-E AlCrN-X 90° N

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2
16.124.0400	4	8.6	4.3	110	30	8.6	16.124.0600	6	12.4	6.4	110	30	12.4	16.124.1000	10	20.4	10.5	110	30	12.5
16.124.0500	5	10.4	5.3	110	30	10.4	16.124.0800	8	16.4	8.4	110	30	12.5							

16.200 Phantom

NL HSS Meerfasenboor 90°  
 FR Foret étagé HSS 90°  
 ES Broca bidiametral HSS 90°  
 DE HSS Mehrfasenstufenbohrer 90°



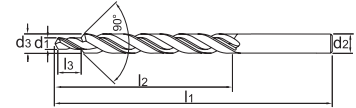
HSS 90° DIN 8374 N

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2
16.200.0300	3	6.6	3.4	101	63	9	6.6	16.200.0500	5	11	5.5	142	94	13	11	16.200.0800	8	17.2	9	191	130	19	17.2
16.200.0400	4	9	4.5	125	81	11	9	16.200.0600	6	13	6.6	151	101	15	13								

16.220 Phantom

NL HSS Meerfasenboor 90°  
 FR Foret étagé HSS 90°  
 ES Broca bidiametral HSS 90°  
 DE HSS Mehrfasenstufenbohrer 90°



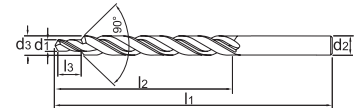
HSS 90° DIN 8374 N

P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 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	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2
16.220.0300	3	6	3.2	93	57	9	6	16.220.0500	5	10	5.3	133	87	13	10	16.220.0800	8	15	8.4	169	114	19	15
16.220.0400	4	8	4.3	117	75	11	8	16.220.0600	6	11.5	6.4	142	94	15	11.5	16.220.1000	10	19	10.5	198	135	23	19

16.250 Phantom

NL HSS Meerfasenboor 90°  
 FR Foret étagé HSS 90°  
 ES Broca bidiametral HSS 90°  
 DE HSS Mehrfasenstufenbohrer 90°



HSS 90° DIN 8378 N

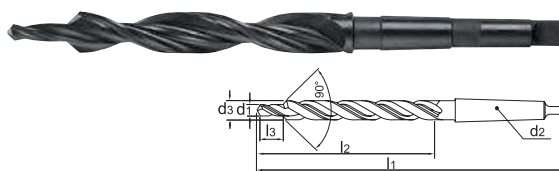
P 11 ≤500 N/mm <sup>2</sup>	P 12 ≤550 N/mm <sup>2</sup>	P 13 ≤1000 N/mm <sup>2</sup>	M 21 INOX ≤850N/mm <sup>2</sup>	K 31 GG	K 32 GGG GTS-GTW	N 42 Alu Si>10%	N 51 Cu	N 61 PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2
16.250.0300	3	3.4	2.5	70	39	8.8	3.4	16.250.0600	6	6.6	5	101	63	16.5	6.6	16.250.1200	12	13.5	10.2	160	108	30	13.5
16.250.0400	4	4.5	3.3	80	47	11.4	4.5	16.250.0800	8	9	6.8	125	81	21	9								
16.250.0500	5	5.5	4.2	93	57	13.6	5.5	16.250.1000	10	11	8.5	142	94	25.5	11								



**16.300 Phantom**

NL HSS Meerfasenboor 90°, MK  
 FR Foret étagé HSS 90°, CM  
 ES Broca bidiametral HSS 90°, CM  
 DE HSS Mehrfasenstufenbohrer 90°, MK

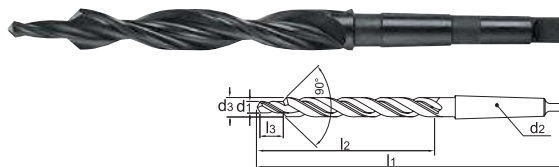


HSS	90°	DIN 8375	N	DIN 228-B				
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2
16.300.0500	5	11	5.5	175	94	13	MK 1	16.300.0800	8	17.2	9	228	130	19	MK 2
16.300.0600	6	13	6.6	182	101	15	MK 1	16.300.1000	10	21.5	11	248	150	23	MK 2

**16.350 Phantom**

NL HSS Meerfasenboor 90°, MK  
 FR Foret étagé HSS 90°, CM  
 ES Broca bidiametral HSS 90°, CM  
 DE HSS Mehrfasenstufenbohrer 90°, MK

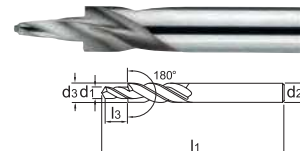


HSS	90°	DIN 8379	N	DIN 228-B				
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d3	d1	l1	l2	l3	d2	Ref.	M	d3	d1	l1	l2	l3	d2
16.350.0800	8	9	6.8	162	81	21	MK 1	16.350.1400	14	15.5	12	218	120	34.5	MK 2
16.350.1000	10	11	8.5	175	94	25.5	MK 1	16.350.1600	16	17.5	14	228	130	38.5	MK 2
16.350.1200	12	13.5	10.2	189	108	30	MK 1	16.350.1800	18	20	15.5	238	140	43.5	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°

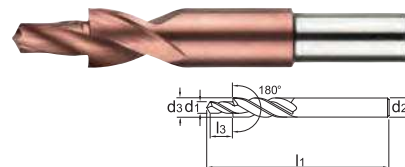


HSS-E	180°								
P 11	P 13	M 21	M 22	K 31	K 32	N 41	N 42	N 51	N 52
≤800 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu	Alu Si>10%	Cu	CuAlFe
25-30 E	16-22 F	8-10 D	6-8 C	25-30 E	20-25 D	60-70 E	50-80 E	30-40 E	10-15 D

Ref.	M	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2
16.500.0300	3	6	3.4	45	9	6	16.500.0600	6	11	6.6	63	15	11
16.500.0400	4	8	4.5	50	11	8	16.500.0800	8	15	9	100	19	12.5
16.500.0500	5	10	5.5	55	13	10	16.500.1000	10	18	11	110	23	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°



**NIEUW / NOUVEAU / NUEVO / NEU**

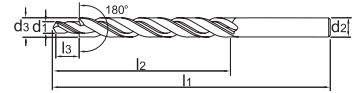
HSS-E	AlCrN-X	180°								
P 11	P 12	P 13	M 21	M 22	K 31	K 32	N 42	N 43	N 51	N 52
≤800 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	INOX >850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Mg	Cu	CuAlFe
35-45 E	25-45 E	20-25 F	10-20 D	10-15 C	40-45 E	30-40 D	75-100 E	60-80 E	40-45 E	20-25 D

Ref.	M	d3	d1	l1	l3	d2	Ref.	M	d3	d1	l1	l3	d2
16.504.0400	4	8	4.5	50	11	8	16.504.0600	6	11	6.6	63	15	11
16.504.0500	5	10	5.5	55	13	10	16.504.0800	8	15	9	100	19	12.5



16.600 Phantom

NL HSS Meerfasenboor 180°  
FR Foret étagé HSS 180°  
ES Broca bidiametral HSS 180°  
DE HSS Mehrfasenstufenbohrer 180°

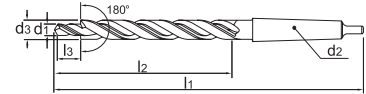


HSS	180°	DIN 8376	N					
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤500 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d3	d1	l1	l3	d2
16.600.0300	3	6	3.4	93	9	6
16.600.0400	4	8	4.5	117	11	8
Ref.	M	d3	d1	l1	l3	d2
16.600.0500	5	10	5.5	133	13	10
16.600.0600	6	11	6.6	142	15	11
Ref.	M	d3	d1	l1	l3	d2
16.600.0800	8	15	9	169	19	15
16.600.1000	10	18	11	191	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

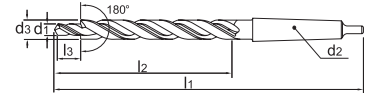


HSS	180°	DIN 8377	N	DIN 228-B				
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤500 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	M	d3	d1	l1	l2	l3	d2
16.700.0500	5	10	5.5	168	87	13	MK 1
16.700.0600	6	11	6.6	175	94	15	MK 1
16.700.0800	8	15	9	212	114	19	MK 2
Ref.	M	d3	d1	l1	l2	l3	d2
16.700.1000	10	18	11	228	130	23	MK 2
16.700.1200	12	20	13.5	238	140	27	MK 2
16.700.1400	14	24	15.5	281	160	31	MK 3
Ref.	M	d3	d1	l1	l2	l3	d2
16.700.1600	16	26	17.5	286	165	35	MK 3
16.700.1800	18	30	20	296	175	39	MK 3
16.700.2000	20	33	22	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	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤500 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.	M	d3	d1	l1	l2	l3	d2
16.730.0800	8	13.5	8.4	189	108	20	MK 1
16.730.1000	10	16.5	10.5	223	125	24	MK 2
Ref.	M	d3	d1	l1	l2	l3	d2
16.730.1200	12	19	13	233	135	28	MK 2
16.730.1400	14	23	15	253	155	32	MK 2
Ref.	M	d3	d1	l1	l2	l3	d2
16.730.1600	16	25	17	281	160	36	MK 3



**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	x0
19.105.3500	MK 1-MK 2-MK 3	25
19.105.9351	MK 1-MK 2-MK 3	10

Ref.	Contents	x0
19.105.9352	MK 1	4
19.105.9353	MK 2	4

**19.113 Phantom**

NL HSS Set Spiraalboren  
 FR Jeu de Forets HSS  
 ES Juego de brocas HSS  
 DE HSS Satz Spiralbohrer



HSS	DIN 1897	N						
<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.	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 Jeu de Forets HSS-E  
ES Juego de brocas HSS-E  
DE HSS-E Satz Spiralbohrer



HSS-E	DIN 1897	N							
<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 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 Jeu de Forets HSS ECO  
ES Juego de brocas HSS ECO  
DE ECO HSS Satz Spiralbohrer



HSS	DIN 338	N				<b>ECO</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>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 Jeu de Forets HSS ECO PRO  
 ES Juego de brocas HSS ECO PRO  
 DE ECO PRO HSS Satz Spiralbohrer



HSS	DIN 338	N				<b>ECO PRO</b>		
<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.	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)

## 19.130 INTERNATIONAL TOOLS

NL ECO HSS Set Spiraalboren  
 FR Jeu de Forets HSS ECO  
 ES Juego de brocas HSS ECO  
 DE ECO HSS Satz Spiralbohrer



HSS	DIN 338	N				<b>ECO</b>	
<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 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.	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  
FR Jeu de Forets HSS ECO PRO  
ES Juego de brocas HSS ECO PRO  
DE ECO PRO HSS Satz Spiralbohrer



HSS	DIN 338	N			ECO PRO		
P 11 S500 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
19.134.1000	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)

**19.136 INTERNATIONAL TOOLS**

NL ECO PRO HSS Set Spiraalboren TiN-tip  
FR Jeu de Forets HSS ECO PRO avec revêtement TiN sur la partie utile  
ES Juego de brocas HSS ECO PRO con punta TiN  
DE ECO PRO HSS Satz Spiralbohrer TiN-Tip



HSS	TiN	DIN 338	N			ECO PRO			
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 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	48-60 E	45-50 G	25-40 D	22-28 D

Ref.	Type	Ø mm
19.136.1000	11.431	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.136.1300	11.431	1-13 mm x 0,5 mm

**NIEUW NOUVEAU NUEVO NEU**



**19.144 INTERNATIONAL TOOLS**

NL ECO HSS Set Spiraalboren gewalst  
 FR Jeu de Forets HSS ECO laminé  
 ES Juego de brocas HSS ECO laminada  
 DE ECO HSS Satz Spiralbohrer Gewalzt



HSS DIN 338 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.	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 Jeu de Forets HSS  
 ES Juego de brocas HSS  
 DE HSS Satz Spiralbohrer



HSS DIN 338 N

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.	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 Jeu de Forets HSS avec revêtement TiN sur la partie utile  
 ES Juego de brocas HSS con punta TiN  
 DE HSS Satz 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
≤500 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	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 Jeu de Forets HSS avec revêtement TiN sur la partie utile (usage à la main)  
 ES Juego de brocas HSS con punta TiN (uso manual)  
 DE HSS Satz Spiralbohrer TiN-Tip (Handgebrauch)



HSS TiN DIN 338 N ≥1,6 118°

P 11	P 12	P 13	M 21	K 31	K 32	N 41	N 42	N 51	N 61
≤500 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	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

**NIEUW / NOUVEAU / NUEVO / NEU**

**19.149 INTERNATIONAL TOOLS**

NL ECO PRO HSS-E Set Spiraalboren  
 FR Jeu de Forets HSS-E ECO PRO  
 ES Juego de brocas HSS-E ECO PRO  
 DE ECO PRO HSS-E Satz Spiralbohrer



HSS-E DIN 338 N 135° ECO PRO

P 11	P 12	P 13	M 21	K 31	K 32	N 51	N 52
≤500 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	Cu	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 Jeu de Forets HSS-E  
ES Juego de brocas HSS-E  
DE HSS-E Satz Spiralbohrer



HSS-E	DIN 338	N				135°			
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 51	N 52
≤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	Cu	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)

## 19.156 Phantom

NL HP2 UNI HSS-E Set Spiraalboren TiN  
FR Jeu de Forets HSS-E HP2 UNI TiN  
ES Juego de brocas HSS-E HP2 UNI TiN  
DE HP2 UNI HSS-E Satz Spiralbohrer TiN



HSS-E	TiN	DIN 338	>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 ≤850N/mm <sup>2</sup>	INOX >850N/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.	Type	Ø mm
19.156.1000	11.568	1-10 mm x 0,5 mm

Ref.	Type	Ø mm
19.156.1300	11.568	1-13 mm x 0,5 mm



19.160 Phantom

NL HM-tip Set Spiraalboren  
FR Jeu de Forets pointe carb. mét.  
ES Juego de brocas punta MD  
DE HM-Schneiden Satz Spiralbohrer



HM-TIP	DIN 338	N															
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				
≤500 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.	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  
FR Jeu de Forets HSS  
ES Juego de brocas HSS  
DE HSS Satz Spiralbohrer



HSS	DIN 338	W				ALU											
N 41	N 42	N 51	N 61														
Alu	Alu Si>10%	Cu	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**  
 FR **Jeu de Forets HSS-E**  
 ES **Juego de brocas HSS-E**  
 DE **HSS-E Satz Spiralbohrer**



HSS-E 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**



PU 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**



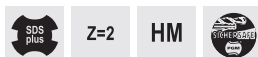
PU HM

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 **HM-tip Set Hamerboren**  
 FR **Jeu de Forets à béton pointe carb. mét.**  
 ES **Juego de brocas martillo punta MD**  
 DE **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**



13.770.1010  
 13.770.1510  
 13.770.2010



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 Centreerboren**  
 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
5600 Nimm²	5850 Nimm²	≤1000 Nimm²	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	NFE 66051A 0,5x3 (5) - 1x4 (5) - 1,5x5 (5) - 2x6 (5) - 2,5x8 (5) - 3x10 (4) - 4x12 (1)
19.540.0001	15.100	DIN 333A (ISO) 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 (ISO) 4x1 (3x) - 5x1,5 (3x) - 6x2 (3x) - 8x2,5 (3x) - 10x3 (2x) - 12x4 (1x)



## 19.910 Phantom

NL HSS Set Spiraalboren links  
FR Jeu de Forets HSS à gauche  
ES Juego de brocas HSS izquierda  
DE HSS Satz Spiralbohrer links



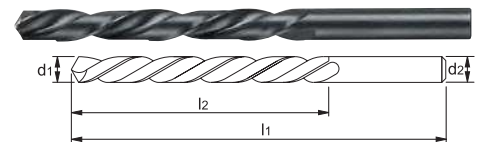
HSS		DIN 338	N					
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

NIEUW NOUVEAU NUEVO NEU

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

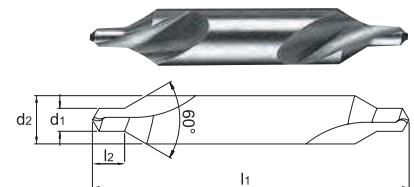


HSS		DIN 338	N					
P 11	P 12	P 13	M 21	K 31	K 32	N 42	N 51	N 61
≤600 N/mm <sup>2</sup>	≤850 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	INOX ≤850 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Cu	PVC
25-27 F	22-30 F	15-20 E	8-12 D	15-20 E	25-30 E	45-50 G	25-40 D	22-28 D

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
19.914.0100	1	1	34	12	19.914.0420	4,2	4,2	75	43	19.914.0750	7,5	7,5	109	69
19.914.0150	1,5	1,5	40	18	19.914.0450	4,5	4,5	80	47	19.914.0800	8	8	117	75
19.914.0200	2	2	49	24	19.914.0500	5	5	86	52	19.914.0850	8,5	8,5	117	75
19.914.0250	2,5	2,5	57	30	19.914.0550	5,5	5,5	93	57	19.914.0900	9	9	125	81
19.914.0300	3	3	61	33	19.914.0600	6	6	93	57	19.914.0950	9,5	9,5	125	81
19.914.0350	3,5	3,5	70	39	19.914.0650	6,5	6,5	101	63	19.914.1000	10	10	133	87
19.914.0400	4	4	75	43	19.914.0700	7	7	109	69					

## 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°

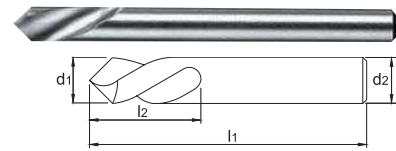


HSS		60°	DIN 333-A	NFE 66051-A			
P 11	P 13	K 31	K 32	N 42	N 43	N 51	N 61
≤600 N/mm <sup>2</sup>	≤1000 N/mm <sup>2</sup>	GG	GGG GTS-GTW	Alu Si>10%	Mg	Cu	PVC
20-25 E	16-22 F	25-30 E	20-25 D	60-70 E	45-50 E	25-40 E	18-28 E

Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
19.951.0531	0,5	3,15	25	0,6-0,9	19.951.2050	2	5	40	2,5-3,1	19.951.3180	3,15	8	50	3,9-4,6
19.951.0735	0,75	3,5	35	1,0-1,3	19.951.2060	2	6	45	2,5-3,1	19.951.4010	4	10	55	5,0-5,9
19.951.1040	1	4	35	1,3-1,7	19.951.2563	2,5	6,3	45	3,1-3,8	19.951.4012	4	12	63	5,0-5,9
19.951.1550	1,5	5	40	2,0-2,6	19.951.2580	2,5	8	50	3,1-3,8	19.951.4013	4	12,5	63	5,0-5,9
19.951.1640	1,6	4	35	2,0-2,6	19.951.3090	3	10	55	3,9-4,6	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°



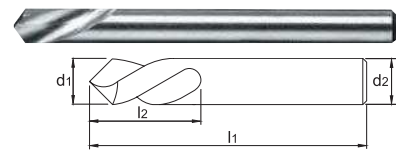
HSS-E 90°

<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 ≤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.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
19.956.0300	3	3	50	10	19.956.0600	6	6	66	20	19.956.1200	12	12	102	30
19.956.0400	4	4	52	12	19.956.0800	8	8	79	25					
19.956.0500	5	5	60	15	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°



HSS-E 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 ≤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.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2	Ref.	d1	d2	l1	l2
19.957.0300	3	3	50	10	19.957.0600	6	6	66	20	19.957.1200	12	12	102	30
19.957.0400	4	4	52	12	19.957.0800	8	8	79	25					
19.957.0500	5	5	60	15	19.957.1000	10	10	89	25					



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

**P 11** = ISO  
5600 N/mm<sup>2</sup>  
25-35 Vc = 25-35  
E FRC = E

FRC									
	A	B	C	D	E	F	G	H	I
d1(mm) #	f (mm/n)								
0,3	0,002	0,003	0,003	0,004	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
0,8	0,005	0,007	0,008	0,009	0,012	0,014	0,016	0,018	0,023
1	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
1,5	0,012	0,014	0,016	0,018	0,020	0,023	0,025	0,032	0,040
2	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
3	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
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
6	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
14	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
16	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
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
22	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
30	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
38	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
45	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
58	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600

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

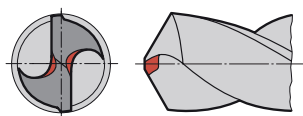
$$n = \frac{Vc \times 1000}{3,14 \times d1} \quad Vc = \frac{n \times 3,14 \times d1}{1000}$$

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	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

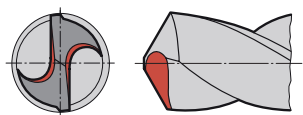
<b>FRC</b>	<b>f (mm/n)</b>	<b>Vc</b>	<b>n=rpm</b>
NL: Voedingscode	NL: Voeding per omwenteling (mm/n)	NL: Snijnsnelheid (m/min)	NL: Spiltoerental (omw/min)
FR: Codification vitesse d'avance	FR: Avance par tour (mm/tr)	FR: Vitesse de coupe (m/min)	FR: Vitesse de broche (tr/min)
ES: Codificación de velocidad 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**

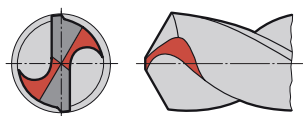
NL Boorpunten volgens DIN 1412  
 FR Affûtage des forets selon DIN 1412  
 ES Afilado de brocas según DIN 1412  
 DE Anschliffformen DIN 1412



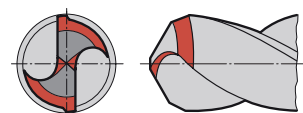
Form A NL **Uitgedunde punt**  
 FR **Pointe amincie**  
 ES **Con alma delgado**  
 DE **Ausgespitzte Querschneide**



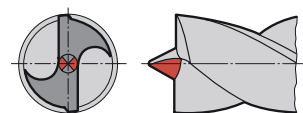
Form B NL **Uitgedunde punt met gecorrigeerde hoofdsnijkant**  
 FR **Pointe amincie avec correction des lèvres**  
 ES **Con alma delgado, corregido**  
 DE **Ausgespitzte Querschneide mit korrigierte Haupschneide**



Form C NL **Kruisaanslijping**  
 FR **Affûtage en croix**  
 ES **Afilado en cruz**  
 DE **Kreuzanschliff**



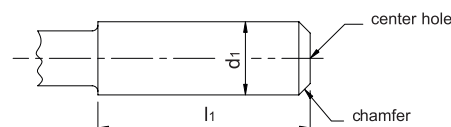
Form D NL **Boorpunt voor grijs gietijzer**  
 FR **Affûtage pour fonte grise**  
 ES **Filo para fundición gris**  
 DE **Anschliff für Grauguss**



Form E NL **Centrepunt**  
 FR **Pointe centrale**  
 ES **Punta de centraje**  
 DE **Zentrumspitze**

**DIN 1835**

NL **Cilindrische schacht**  
 FR **Queue cylindrique**  
 ES **Mango cilíndrico**  
 DE **Zylinderschaft**



Dimensions in mm	
d <sub>1</sub>	l <sub>1</sub>
h6	+2 0
3	28
4	28
5	28
6	36
8	36

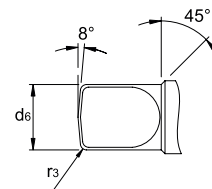
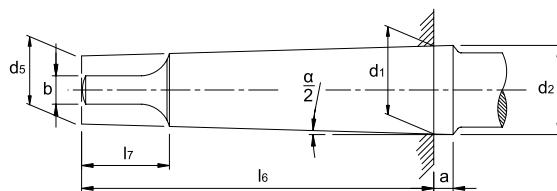
Dimensions in mm	
d <sub>1</sub>	l <sub>1</sub>
h6	+2 0
10	40
12	45
16	48
20	50
25	56

Dimensions in mm	
d <sub>1</sub>	l <sub>1</sub>
h6	+2 0
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 <sub>1</sub>	d ≈ <sup>2</sup>	d ≈ <sup>5</sup>	d <sub>6</sub> max.	l <sub>6</sub> 0 -1	l <sub>7</sub> max.	r <sub>2</sub> max.	r ≈ <sup>3</sup>	$\frac{a}{2}$
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"