

Phantom 

**INTERNATIONAL
TOOLS**

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CHECK OUR INNOVATIONS ON PAGE 6

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

ISO	ISO	NL	FR	ES	DE
		Ongelegerd en gelegeerd staal ≤600 N/mm² 1.0037 (St37), 1.0038 (S235JR G2), 1.00402 (C22), 1.1178 (C30E)	Aciers non-alliés ou faiblement alliés ≤600 N/mm² 1.0037 (A37), 1.0038 (E 24-2 Ne), 1.00402 (1C20), 1.1178 (1C30)	Acero no aleado ≤600 N/mm² 1.0037 (S235JR), 1.0038 (S235JR G2), 1.0402 (F.112), 1.1178 (C30E)	Unlegierter und legierter Stahl ≤600 N/mm² 1.0037 (St37), 1.0038 (S235JR G2), 1.00402 (C22), 1.1178 (C30E)
		Ongelegerd en gelegeerd staal 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)	Aciers non-alliés ou faiblement alliés 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)	Acero no aleado 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)	Unlegierter und legierter Stahl 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)
		Gelegeerd staal 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)	Aciers alliés 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)	Acero aleado 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)	Legierter Stahl 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)
		Gelegeerd staal 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)	Aciers alliés 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)	Acero aleado 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)	Legierter Stahl 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)
		Gehard en inzetgehard staal 50 - 60 HRC 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)	Aciers trempés et Aciers de cémentation alliés 50 - 60 HRC 1.2344 (Z 40 CDV 5), 1.2767 (X45NiCrMo4), 1.2379 (D2), 1.2080 (Z200C12), 1.3343 (Z85WDCV)	Acero templado 50 - 60 HRC 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)	Gehärteter und einsatzgehärteter Stahl, 50-60 HRC 1.2344 (X40CrMoV5), 1.2767 (X45NiCrMo4), 1.2767 (X45NiCrMo4), 1.2379 (X155CrVMo12-1), 1.2080 (X210Cr12), 1.3343 (S6-5-2)
		Roestvaststaal, INOX ≤850 N/mm² 1.4005 (X12CrS13), 1.4104 (X14CrMos17), 1.4105 (X6CrMoS17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)	Aciers inoxydables ≤850 N/mm² 1.4005 (Z11CF13), 1.4104 (Z13CF17), 1.4105 (Z8CF17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)	Acero inoxidable ≤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)	Rostfreier Stahl, INOX ≤850 N/mm² 1.4005 (X12CrS13), 1.4104 (X14CrMos17), 1.4105 (X6CrMoS17), 1.4301 (XCrNi18-10)(304), 1.4305 (X8CrNiS18-9)(303)
		Roestvaststaal, INOX >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)	Aciers inoxydables >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)	Acero inoxidable >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (F.3535-X6CrNiMoTi17-12-2)(316Ti)	Rostfreier Stahl, INOX >850 N/mm² 1.4438 (X2CrNiMo18-15-4)(317), 1.4404 (X2CrNiMo17-12-2)(316L), 1.4571 (X6CrNiMoTi17-12-2)(316Ti)
		Grijs gietijzer GG <260 HB30 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)	Fontes <260 HB30 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)	Fundición gris con grafito laminado GG <260 HB30 0.6015 (FG15), 0.6025 (FG25), 0.6040 (FG40)	Grauguss GG <260 HB30 0.6015 (GG 15), 0.6025 (GG 25), 0.6040 (GG 40)
		Smeedbaar en Nodulair gietijzer <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	Fontes à graphites et malléables <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	Fundición gris con grafito esferoidal <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)	Formbar und dehnbares Gusseisen <260 HB30 0.8145 (GTS-45), 0.8170 (GTS-70-02), 0.7040 (GGG 40), 0.7070 (GGG 70)
		Aluminium en Aluminiumlegeringen 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)	Aluminium et Alliages d'Aluminium 3.0255 (A59050C), 3.2315 (AlMgSi1), 3.3515 (AlMg1)	Aluminio y aleaciones de Aluminio 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)	Aluminium und Aluminiumlegeringen 3.0255 (Al99.5), 3.2315 (AlMgSi1), 3.3515 (AlMg1)
		Gietaluminium Si 10 - 24% 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (G-AISi12), 3.2583 (G-AISi12Cu)	Alliages d'Aluminium Si 10 - 24% 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (G-AISi12), 3.2583 (G-AISi12Cu)	Fundición de Aluminio aleada Si 10 - 24% 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (L-2520,21), 3.2583 (L2530)	Druckguss Si 10 - 24% 3.2131 (G-AISi5Cu1), 3.2153 (G-AISi7Cu3), (3.2573 G-AISi9), 3.2581 (G-AISi12), 3.2583 (G-AISi12Cu)
		Magnesiumlegeringen 3.5200 (MgMn2), 3.5812 (G-MgAl8Zn1), 3.5612 (G-MgAl6Zn1)	Alliages de Magnésium 3.5200 (MgMn2), 3.5812 (AZ81hp), 3.5612 (AZ61)	Aleaciones de Magnesio 3.5200 (MgMn2), 3.5812 (AZ81hp), 3.5612 (AZ61)	Magnesiumlegeringen 3.5200 (MgMn2), 3.5812 (G-MgAl8Zn1), 3.5612 (G-MgAl6Zn1)
		Koper en Koperlegeringen 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)	Cuivres et Alliages de cuivres 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)	Cobre y aleaciones de cobre 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)	Kupfer und Kupferlegeringen 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)
		Koper- en Aluminiumlegering 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (CuBe2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18	Cuivre et Alliages d'Aluminium 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (CuBe1.9) AMPCO® 8, AMPCO® 8 15, AMPCO® 18	Cobre y aleaciones de Aluminio 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (CuBe2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18	Kupfer- und Aluminiumlegeringen 2.0916 (CuAl5), 2.0960 (CuAl9Mn), 2.1050 (CuSn10), 2.0980 (CuAl11Ni), 2.1247 (Cu-Be2) AMPCO® 8, AMPCO® 8 15, AMPCO® 18
		Duroplastic en Thermoplastic PMMA, PVC, PE, PP, PTFE	Duroplastiques et Thermoplastiques PMMA, PVC, PE, PP, PTFE	Duroplásticos en Termoplásticos PMMA, PVC, PE, PP, PTFE	Duroplaste und Thermoplaste PMMA, PVC, PE, PP, PTFE
		Versterkte kunststoffen GFK, CFK	Plastiques réinforcés GFK, CFK	Plásticos reforzados GFK, CFK	Verstärkte Kunststoffe GFK, CFK
		Nikkel- en Cobaltlegeringen Hastelloy, Inconel, Nimonic, Jetalloy	Alliages de Nickel et de Cobalt Hastelloy, Inconel, Nimonic, Jetalloy	Aleaciones de Níquel y Cobalto Hastelloy, Inconel, Nimonic, Jetalloy	Nickel und Kobaltlegeringen Hastelloy, Inconel, Nimonic, Jetalloy
		Titaniumlegeringen 3.7024 (Ti99.5), 3.7114 (TiAl5Sn2.5), 3.7124 (TiCu2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)	Alliages de Titane 3.7024 (T35), 3.7114 (TiAl5Sn2.5), 3.7124 (T-U2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)	Titanio aleado 3.7024 (Ti99.5), 3.7114 (TiAl5Sn2.5), 3.7124 (TiCu2), 3.7154 (TiAl6Zr5), 3.7165 (TiAl6V4), 3.7184 (TiAl4Mo4Sn2.5)	Titanlegeringen 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
	2 snijkanten, centrumsnijdend	2 dents, coupe au centre	2 dientes, corte con centro	2 Schneiden, Zentrumschneidend
	3 snijkanten, centrumsnijdend	3 dents, coupe au centre	3 dientes, corte con centro	3 Schneiden, Zentrumschneidend
	4 snijkanten, centrumsnijdend	4 dents, coupe au centre	4 dientes, con corte centro	4 Schneiden, Zentrumschneidend
	4 snijkanten, niet centrumsnijdend	4 dents, pas de coupe au centre	4 dientes, corte sin centro	4 Schneiden, Nicht Zentrumschneidend
	4 snijkanten, met ongelijke tandverdeling	4 dents, avec denture à pas différentiel	4 dientes, con paso irregular	4 Schneiden, mit ungleicher Zahnteilung
	5 snijkanten, met ongelijke tandverdeling	5 dents, avec denture à pas différentiel	5 dientes, con paso irregular	5 Schneiden, mit ungleicher Zahnteilung
	6 snijkanten, centrumsnijdend	6 dents, coupe au centre	6 dientes, corte con centro	6 Schneiden, Zentrumschneidend
	8 snijkanten, centrumsnijdend	8 dents, coupe au centre	8 dientes, corte con centro	8 Schneiden, Zentrumschneidend
	2 snijkanten, volradius	2 dents, à rayon complet	2 dientes, con radio completo	2 Schneiden, Vollradius
	4 snijkanten, volradius	4 dents, à rayon complet	4 dientes, con radio completo	4 Schneiden, Vollradius
	Routerfrees met 135° boorpunt	Fraise à contourner avec pointe de perçage 135°	Fresa de contornear con punta de taladro 135°	Router mit 135° Bohrspitze
	Routerfrees zonder kopvertanding	Fraise à contourner sans denture en bout	Fresa de contornear sin corte al centro	Router ohne Stirnverzahnung
	Routerfrees met kopvertanding	Fraise à contourner avec denture en bout	Fresa de contornear con corte al centro	Router mit Stirnverzahnung
	Routerfrees 2-snijder	Fraise à contourner 2 dents	Fresa de contornear de 2 labios	Router 2-Schneider
	Ongelijke spiraalhoek	Avec angles d'hélice variables	Con ángulo de hélice desigual	Mit ungleichen Spiralwinkel
VHM SC	Volhardmetaal	Carbure monobloc	Metal duro integral	Vollhartmetall
MG HM	Micro-Grain volhardmetaal	Carbure micrograin	Metal duro micrograno	Micro-Grain Vollhartmetall
NG HM	Nano-Grain volhardmetaal	Carbure Nanograin	Metal duro nanograno	Nano-Grain Vollhartmetall
TiAIN	TiAIN gecoat	Revêtement TiAIN	Recubrimiento TiAIN	TiAIN Beschichtung
TiCN	TiCN gecoat	Revêtement TiCN	Recubrimiento TiCN	TiCN Beschichtung
TiAIN B	TiAIN-B gecoat	Revêtement TiAIN-B	Recubrimiento TiAIN-B	TiAIN-B Beschichtung
AITiN X	AITiN-X gecoat	Revêtement AITiN-X	Recubrimiento AITiN-X	AITiN-X Beschichtung
HR	Ronde tand, fijn	Profil rond, pas fin	Perfil redondo, paso fino	Feiner Verzahnung
WR	Ronde tand, grof	Profil rond, pas ébauche	Perfil redondo	Runder Verzahnung

	NL	FR	ES	DE
DIN 6527	DIN norm	Norme DIN	Norma DIN	DIN Norm
NORM	Fabriek standaard	Standard usine	Estándar de la fábrica	Werksnorm
r	Snijkantradius	Rayon de coupe	Radio de corte	Radius am Schneidenecke
30°	Spiraalhoek	Angle d'hélice	Angulo de hélice	Spiralwinkel
DIN 6535-HB	Cilindrische schacht met Weldon vlak	Queue cylindrique avec méplat type Weldon	Mango cilíndrico con plano de arrastre tipo Weldon	Zylinderschaft mit Mitnahmefläche Tyo Weldon
h6	Cilindrische schacht h6	Queue cylindrique h6	Mango cilíndrico h6	Zylinderschaft h6
r ±0,01	Tolerantie radius	Tolérance rayon	Tolerancia radio	Toleranz Radius
d1 +0,00 -0,03	Tolerantie diameter	Tolérance diamètre	Tolerancia diámetro	Toleranz Durchmesser
d1 h10	Tolerantie h10	Tolérance h10	Tolerancia h10	Toleranz h10
HSC	High Speed Cutting	Usinage à grande vitesse	Mecanizado de alta velocidad	Hochgeschwindigkeitszerspanung
HRC	Frezen voor gehard staal	Fraises pour aciers trempés	Fresas para acero templado	Fräser für gehärtet Stahl
INOX	T.b.v. roestvaststaal	Pour Inox	Para acero inoxidable	Für Rostfreier Stahl
ALU	T.b.v. aluminium	Pour aluminium	Para aluminio	Für Aluminium
	Interpolair frezen	Interpolation	Mecanizado por interpolación	Zirkular Fräsen
	Graveren	Gravure	Grabado	Gravieren
	Mantelfrezen met fasen	Chanfreins longitudinaux	Chaflanes Longitudinales	Konturfasen
	Fase Frezen	Chanfreins longitudinaux	Chaflanes Longitudinales	Konturfasen
	Boren en aanschuinen	Chanfreins directs	Chaflanes Directos	Direkt Fasen
	V-Sleuf frezen	Rainurage en V	Ranura en "V"	"V"-Nuten Fräsen
	Mantelfrezen	Contournage	Contorneado	Konturfräsen
	Centeren	Centrage	Centrado	Zentrieren
	Aanschuinen	Chanfreinage	Chaflanado	Fasen
	Boren	Perçage	Taladrado	Bohren






























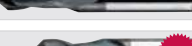















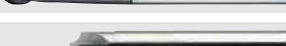


NL **VHM Frezen**
FR **Fraises Broca**
ES **Fresas Metal Duro**
DE **VHM Fräser**

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

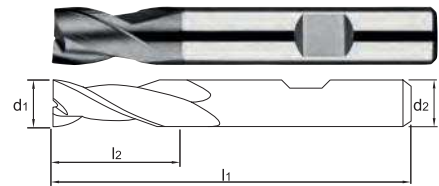
P= pagina
P= page
P= página
P= Seite

> 32.244	Phantom		DIN 6527	P M K N S			P. 3
> 32.250	Phantom		DIN 6527	P M K N S			P. 3
> 32.254	Phantom		DIN 6527	P M K N S			P. 3
> 32.255	Phantom		NORM	P M K N S			P. 4
> 32.256	Phantom		NORM	P M K N S			P. 4
> 32.270	Phantom		NORM	P M K N S			P. 4
> 32.275	Phantom		NORM HSC	P	H		P. 5
> 32.290	Phantom		NORM HSC	P	H		P. 5
> 32.330	Phantom		NORM ALU		N		P. 6
> 32.633	Phantom		NORM ALU		N		P. 6
> 32.750	Phantom		NORM	P M K N			P. 6
> 33.244	Phantom		DIN 6527	P M K N S			P. 7
> 33.250	Phantom		DIN 6527	P M K N S			P. 7
> 33.254	Phantom		DIN 6527	P M K N S			P. 7
> 33.255	Phantom		NORM	P M K N S			P. 8
> 33.256	Phantom		NORM	P M K N S			P. 8
> 33.544	Phantom		DIN 6527 INOX	P M K N S			P. 8
> 33.633	Phantom		NORM ALU		N		P. 9
> 34.244	Phantom		DIN 6527	P M K N S			P. 10
> 34.254	Phantom		DIN 6527	P M K N S			P. 10
> 34.255	Phantom		NORM	P M K N S			P. 10
> 34.256	Phantom		NORM	P M K N S			P. 11
> 34.258	Phantom		DIN 6527 VARI	P M K	H		P. 11
> 34.262	Phantom		DIN 6527 VARI	P M K	H		P. 11
> 34.265	Phantom		NORM VARI	P M K	H		P. 12
> 34.267	Phantom		NORM VARI	P M K	H		P. 12
> 34.268	Phantom		NORM INOX VARI	P M K S			P. 12
> 34.270	Phantom		NORM INOX VARI	P M K S			P. 13
> 34.272	Phantom		NORM INOX VARI	P M K S			P. 13
> 34.275	Phantom		NORM INOX VARI	P M K S			P. 13
> 34.278	Phantom		NORM INOX VARI	P M K S			P. 14
> 34.375	Phantom		NORM	P M K N			P. 14
> 34.400	Phantom		NORM HSC	P	H		P. 14

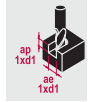
> 34.410	Phantom		HSC	P		H		P. 15		
> 34.424	Phantom		HRC	P		H		P. 15		
> 34.464	Phantom		HRC	P		H		P. 15		
> 34.510	Phantom		HSC	P		H		P. 16		
> 34.515	Phantom		HSC	P		H		P. 16		
> 35.244	Phantom			P	M	K		P. 17		
> 35.484	Phantom		INOX	P	M	S		P. 17		
> 35.540	Phantom		ALU			N		P. 17		
> 35.852	Phantom					N		P. 18		
> 35.860	Phantom					N		P. 18		
> 35.868	Phantom					N		P. 18		
> 35.876	Phantom					N		P. 18		
> 36.130	Phantom		ALU			N		P. 19		
> 36.140	Phantom		ALU			N		P. 19		
> 36.164	Phantom		90°	P	M	N	S		P. 19	
> 36.166	Phantom		90°	P	M	N	S	 NEW	P. 20	
> 36.244	Phantom			P	M	K	N	S		P. 20
> 36.256	Phantom			P	M	K	N	S		P. 20
> 36.275	Phantom		HSC	P		H		P. 21		
> 36.285	Phantom		HRC	P		H		P. 21		
> 36.290	Phantom		HRC	P		H		P. 22		
> 36.345	Phantom		INOX	P	M	K	S		P. 22	
> 36.354	Phantom		HRC	P		H		P. 22		
> 36.430	Phantom			P	M	K			P. 23	

» 32.244 **Phantom**

NL **VHM Schachtfrees, 2-snijder AITiN-X, DIN 6527, kort**
 FR **Fraise à rainurer 2 dents Carbure AITiN-X, DIN 6527, courte**
 ES **Fresa de ranurar de 2 labios MD AITiN-X, DIN 6527, corta**
 DE **VHM Langlochfräser (2-Schneider) AITiN-X, DIN 6527, kurz**



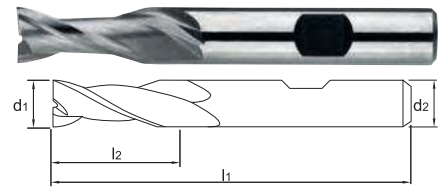
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100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



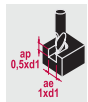
Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.244.0200	2	6	50	3	2	32.244.0600	6	6	54	7	2	32.244.1600	16	16	82	16	2
32.244.0300	3	6	50	4	2	32.244.0800	8	10	58	9	2	32.244.2000	20	20	92	20	2
32.244.0400	4	6	54	5	2	32.244.1000	10	10	66	11	2						
32.244.0500	5	6	54	6	2	32.244.1200	12	12	73	12	2						

» 32.250 **Phantom**

NL **VHM Schachtfrees, 2-snijder DIN 6527, lang**
 FR **Fraise à rainurer 2 dents Carbure DIN 6527, version longue**
 ES **Fresa de ranurar de 2 labios MD DIN 6527, larga**
 DE **VHM Langlochfräser (2-Schneider) DIN 6527, lang**



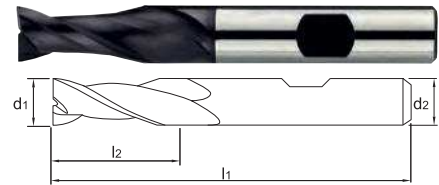
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60-70 J	55-65 I	50-60 H	35-50 H	42-50 H	25-32 G	60-70 I	80-85 I	145-180 J	70-90 H	100-110 J	30-55 H	40-50 F	18-25 F



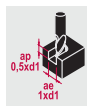
Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.250.0300	3	6	57	7	2	32.250.0600	6	6	57	10	2	32.250.1200	12	12	83	22	2
32.250.0400	4	6	57	8	2	32.250.0800	8	8	63	16	2	32.250.1600	16	16	92	26	2
32.250.0500	5	6	57	10	2	32.250.1000	10	10	72	19	2	32.250.2000	20	20	104	32	2

» 32.254 **Phantom**

NL **VHM Schachtfrees, 2-snijder AITiN-X, DIN 6527, lang**
 FR **Fraise à rainurer 2 dents Carbure AITiN-X, DIN 6527, version longue**
 ES **Fresa de ranurar de 2 labios MD AITiN-X, DIN 6527, larga**
 DE **VHM Langlochfräser (2-Schneider) AITiN-X, DIN 6527, lang**



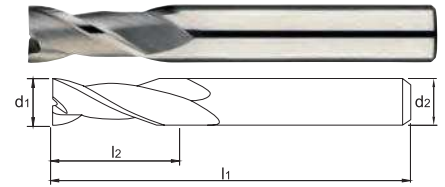
P 11 ≤600 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.254.0300	3	6	57	7	2	32.254.0600	6	6	57	10	2	32.254.1200	12	12	83	22	2
32.254.0400	4	6	57	8	2	32.254.0800	8	8	63	16	2	32.254.1600	16	16	92	26	2
32.254.0500	5	6	57	10	2	32.254.1000	10	10	72	19	2	32.254.2000	20	20	104	32	2

> 32.255 Phantom

NL **VHM Schachtfrees, 2-snijder**
 FR **Fraise à rainurer 2 dents Carbure**
 ES **Fresa de ranurar de 2 labios MD**
 DE **VHM Langlochfräser (2-Schneider)**



MG HM NORM 30° h6 d1 h10

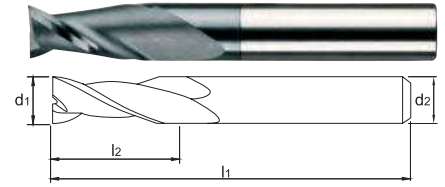
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 72
≤600 N/mm ²	≤850 N/mm ²	≤1000 N/mm ²	≤1400 N/mm ²	INOX ≤850N/mm ²	INOX >850N/mm ²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ti
60-70 J	55-65 J	50-60 H	35-50 H	42-50 H	25-32 G	60-70 J	80-85 I	145-180 J	70-90 H	100-110 J	30-55 H	40-50 F	18-25 F



Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.255.0200	2	3	39	7	2	32.255.0500	5	5	51	16	2	32.255.1000	10	10	70	22	2
32.255.0300	3	3	39	9	2	32.255.0600	6	6	64	19	2	32.255.1200	12	12	76	25	2
32.255.0400	4	4	51	14	2	32.255.0800	8	8	64	21	2						

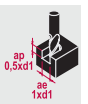
> 32.256 Phantom

NL **VHM Schachtfrees, 2-snijder AlTiN-X**
 FR **Fraise à rainurer 2 dents Carbure AlTiN-X**
 ES **Fresa de ranurar de 2 labios MD AlTiN-X**
 DE **VHM Langlochfräser (2-Schneider) AlTiN-X**



MG HM AlTiN X NORM 30° h6 d1 h10

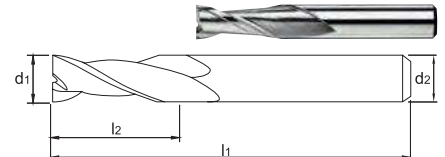
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤600 N/mm ²	≤850 N/mm ²	≤1000 N/mm ²	≤1400 N/mm ²	INOX ≤850N/mm ²	INOX >850N/mm ²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	NiCo	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.256.0100	1	3	39	3	2	32.256.0500	5	5	51	16	2	32.256.1400	14	14	89	30	2
32.256.0150	1.5	3	39	5	2	32.256.0600	6	6	64	19	2	32.256.1600	16	16	89	32	2
32.256.0200	2	3	39	7	2	32.256.0700	7	8	64	19	2	32.256.1800	18	18	100	36	2
32.256.0250	2.5	3	39	7	2	32.256.0800	8	8	64	19	2	32.256.2000	20	20	102	38	2
32.256.0300	3	3	39	9	2	32.256.0900	9	10	70	22	2	32.256.2200	22	25	102	38	2
32.256.0350	3.5	4	50	12	2	32.256.1000	10	10	70	22	2	32.256.2500	25	25	102	38	2
32.256.0400	4	4	51	14	2	32.256.1100	11	11	76	25	2						
32.256.0450	4.5	5	51	14	2	32.256.1200	12	12	76	25	2						

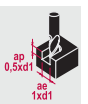
> 32.270 Phantom

NL **VHM Precisie Schachtfrees, 2-snijder**
 FR **Fraise de précision 2 dents Carbure**
 ES **Fresa de precisión MD**
 DE **VHM Präzision Fräser (2-Schneider)**



MG HM NORM 30° h5 d1 h7

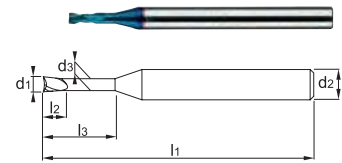
P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 72
≤600 N/mm ²	≤850 N/mm ²	≤1000 N/mm ²	≤1400 N/mm ²	INOX ≤850N/mm ²	INOX >850N/mm ²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ti
60-70 B	55-65 B	50-60 B	35-50 A	42-50 A	25-32 A	60-70 B	80-85 B	145-180 C	70-90 B	100-110 B	30-55 A	40-50 A	18-25 F



Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.270.0030	0.3	3	39	0.8	2	32.270.0130	1.3	3	39	4	2	32.270.0240	2.4	3	39	6	2
32.270.0040	0.4	3	39	1	2	32.270.0140	1.4	3	39	4	2	32.270.0250	2.5	3	39	7	2
32.270.0050	0.5	3	39	1.5	2	32.270.0150	1.5	3	39	4	2	32.270.0260	2.6	3	39	7	2
32.270.0060	0.6	3	39	1.5	2	32.270.0160	1.6	3	39	5	2	32.270.0270	2.7	3	39	7	2
32.270.0070	0.7	3	39	2	2	32.270.0170	1.7	3	39	5	2	32.270.0280	2.8	3	39	7	2
32.270.0080	0.8	3	39	2	2	32.270.0180	1.8	3	39	5	2	32.270.0290	2.9	3	39	7	2
32.270.0090	0.9	3	39	2.5	2	32.270.0190	1.9	3	39	5	2	32.270.0300	3	4	44	10	2
32.270.0100	1	3	39	3	2	32.270.0200	2	3	39	5	2	32.270.0310	3.1	4	44	10	2
32.270.0110	1.1	3	39	3	2	32.270.0210	2.1	3	39	6	2	32.270.0320	3.2	4	44	10	2
32.270.0120	1.2	3	39	4	2	32.270.0220	2.2	3	39	6	2	32.270.0330	3.3	4	44	10	2
32.270.0125	1.25	3	39	4	2	32.270.0230	2.3	3	39	6	2						

▶ **32.275 Phantom**

NL **VHM Precisie HSC Schachtfrees, 2-snijder TiAIN-B, 45-70 HRC**
 FR **Fraise de précision UGV 2 dents Carbure, TiAIN-B, 45-70 HRC**
 ES **Fresa de precisión MAV MD TiAIN-B, 45-70 HRC**
 DE **VHM Präzision HSC Fräser (2-Schneider) TiAIN-B, 45-70 HRC**



P 14 **H 15**
S1400 Nimm² HRC
 55-60 E 20-45 D



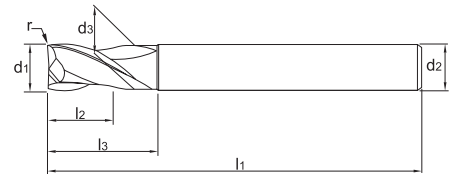
Ref.	d1	d2	d3	l1	l2	l3	z
32.275.0100	0.1	4	0.27	45	0.15	0.3	2
32.275.0101	0.1	4	0.27	45	0.15	0.5	2
32.275.0200	0.2	4	0.27	45	0.3	0.5	2
32.275.0202	0.2	4	0.27	45	0.3	1.5	2
32.275.0300	0.3	4	0.27	45	0.45	1	2
32.275.0302	0.3	4	0.27	45	0.45	1.5	2
32.275.0303	0.3	4	0.27	45	0.45	3	2
32.275.0400	0.4	4	0.37	45	0.6	1	2
32.275.0401	0.4	4	0.37	45	0.6	2	2
32.275.0402	0.4	4	0.37	45	0.6	3	2
32.275.0403	0.4	4	0.37	45	0.6	4	2
32.275.0500	0.5	4	0.45	45	0.7	2	2
32.275.0502	0.5	4	0.45	45	0.7	4	2
32.275.0503	0.5	4	0.45	45	0.7	6	2
32.275.0600	0.6	4	0.55	45	0.9	2	2
32.275.0602	0.6	4	0.55	45	0.9	4	2
32.275.0603	0.6	4	0.55	45	0.9	6	2
32.275.0800	0.8	4	0.75	45	1.2	2	2

Ref.	d1	d2	d3	l1	l2	l3	z
32.275.0801	0.8	4	0.75	45	1.2	4	2
32.275.0802	0.8	4	0.75	45	1.2	6	2
32.275.0803	0.8	4	0.75	45	1.2	8	2
32.275.0804	0.8	4	0.75	45	1.2	12	2
32.275.1000	1	4	0.95	45	1.5	4	2
32.275.1001	1	4	0.95	45	1.5	6	2
32.275.1002	1	4	0.95	45	1.5	8	2
32.275.1003	1	4	0.95	45	1.5	10	2
32.275.1004	1	4	0.95	45	1.5	12	2
32.275.1005	1	4	0.95	55	1.5	16	2
32.275.1006	1	4	0.95	55	1.5	20	2
32.275.1200	1.2	4	1.15	45	1.8	6	2
32.275.1202	1.2	4	1.15	45	1.8	10	2
32.275.1500	1.5	4	1.45	45	2.3	6	2
32.275.1501	1.5	4	1.45	45	2.3	8	2
32.275.1502	1.5	4	1.45	45	2.3	10	2
32.275.1503	1.5	4	1.45	45	2.3	12	2
32.275.1505	1.5	4	1.45	50	2.3	16	2

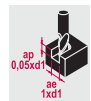
Ref.	d1	d2	d3	l1	l2	l3	z
32.275.1507	1.5	4	1.45	55	2.3	20	2
32.275.2000	2	4	1.95	45	3	6	2
32.275.2001	2	4	1.95	45	3	8	2
32.275.2002	2	4	1.95	45	3	10	2
32.275.2003	2	4	1.95	45	3	12	2
32.275.2005	2	4	1.95	50	3	16	2
32.275.2007	2	4	1.95	55	3	20	2
32.275.2009	2	4	1.95	70	3	30	2
32.275.3000	3	6	2.85	45	4.5	10	2
32.275.3003	3	6	2.85	55	4.5	16	2
32.275.3006	3	6	2.85	65	4.5	25	2
32.275.3009	3	6	2.85	90	4.5	40	2
32.275.4000	4	6	3.85	50	6	12	2
32.275.4002	4	6	3.85	60	6	20	2
32.275.4004	4	6	3.85	70	6	30	2
32.275.4006	4	6	3.85	90	6	40	2
32.275.4008	4	6	3.85	100	6	50	2

▶ **32.290 Phantom**

NL **VHM HSC Torusfrees, 2-snijder TiAIN-B, 45-70 HRC**
 FR **Fraise torique UGV 2 dents Carbure TiAIN-B, 45-70 HRC**
 ES **Fresa tórica MAV MD TiAIN-B, 45-70 HRC**
 DE **VHM HSC Torusträser TiAIN-B, 45-70 HRC**



P 14 **H 15**
S1400 Nimm² HRC
 80-250 B 40-200 B

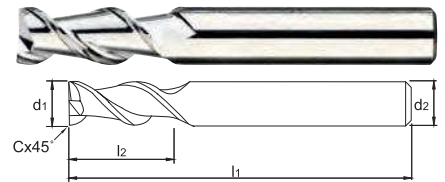


Ref.	d1	d2	d3	l1	l2	l3	r	z
32.290.0111	0.5	4	0.45	45	0.7	1.5	0.05	2
32.290.0112	0.5	4	0.45	45	0.7	2.5	0.05	2
32.290.0113	0.5	4	0.45	45	0.7	4	0.05	2
32.290.0211	0.6	4	0.55	45	0.9	2	0.05	2
32.290.0212	0.6	4	0.55	45	0.9	3	0.05	2
32.290.0213	0.6	4	0.55	45	0.9	4	0.05	2
32.290.0421	0.8	4	0.75	45	1.2	2	0.1	2
32.290.0422	0.8	4	0.75	45	1.2	4	0.1	2
32.290.0423	0.8	4	0.75	45	1.2	6	0.1	2
32.290.0521	1	6	0.95	50	1.5	4	0.1	2
32.290.0522	1	6	0.95	50	1.5	6	0.1	2
32.290.0532	1	6	0.95	50	1.5	6	0.2	2
32.290.0533	1	6	0.95	50	1.5	8	0.2	2
32.290.0631	1.5	6	1.45	50	2.5	4	0.2	2
32.290.0632	1.5	6	1.45	50	2.5	6	0.2	2
32.290.0633	1.5	6	1.45	50	2.5	8	0.2	2
32.290.0634	1.5	6	1.45	50	2.5	10	0.2	2
32.290.0635	1.5	6	1.45	50	2.5	12	0.2	2
32.290.0733	2	6	1.95	50	3	8	0.2	2
32.290.0741	2	6	1.95	50	3	6	0.3	2
32.290.0742	2	6	1.95	50	3	8	0.3	2
32.290.0743	2	6	1.95	55	3	10	0.3	2
32.290.0744	2	6	1.95	55	3	12	0.3	2
32.290.0745	2	6	1.95	55	3	16	0.3	2
32.290.0751	2	6	1.95	55	3	6	0.5	2
32.290.0754	2	6	1.95	55	3	12	0.5	2

Ref.	d1	d2	d3	l1	l2	l3	r	z
32.290.0841	3	6	2.85	55	4	8	0.3	2
32.290.0843	3	6	2.85	55	4	12	0.3	2
32.290.0852	3	6	2.85	55	4	12	0.5	2
32.290.0854	3	6	2.85	55	4	20	0.5	2
32.290.0951	4	6	3.85	55	5	12	0.5	2
32.290.0952	4	6	3.85	55	5	16	0.5	2
32.290.0953	4	6	3.85	55	5	20	0.5	2
32.290.0961	4	6	3.85	55	5	12	1	2
32.290.0963	4	6	3.85	55	5	16	1	2
32.290.1052	6	6	5.85	60	7	20	0.5	2
32.290.1062	6	6	5.85	60	7	20	1	2
32.290.1074	6	6	5.85	60	7	20	1.5	2
32.290.1082	6	6	5.85	60	7	20	2	2
32.290.1152	8	8	7.7	60	9	25	0.5	2
32.290.1162	8	8	7.7	60	9	25	1	2
32.290.1174	8	8	7.7	60	9	25	1.5	2
32.290.1182	8	8	7.7	60	9	25	2	2
32.290.1253	10	10	9.7	70	11	32	0.5	2
32.290.1263	10	10	9.7	70	11	32	1	2
32.290.1273	10	10	9.7	70	11	32	1.5	2
32.290.1285	10	10	9.7	70	11	32	2	2
32.290.1352	12	12	11.7	80	12	38	0.5	2
32.290.1362	12	12	11.7	80	12	38	1	2
32.290.1372	12	12	11.7	80	12	38	1.5	2
32.290.1384	12	12	11.7	80	12	38	2	2

> 32.330 Phantom

NL VHM Schachtfrees, 2-snijder lang, Aluminium
 FR Fraise à rainurer 2 dents Carbure version longue, Aluminium
 ES Fresa de ranurar de 2 labios MD larga, Aluminio
 DE VHM Langlochfräser (2-Schneider) lang, Aluminium

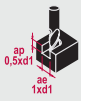


MG HM NORM 45° h6 d1 +0,00 -0,03 ALU

N 41 Alu N 51 Cu N 61 PVC

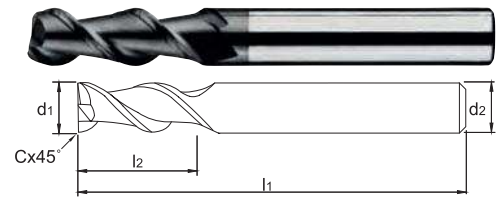
280-350 P 300-400 P 400-600 P

Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z
32.330.0300	3	6	57	8	0,05	2	32.330.0600	6	6	57	13	0,05	2	32.330.1200	12	12	83	26	0,1	2
32.330.0400	4	6	57	11	0,05	2	32.330.0800	8	8	63	19	0,05	2	32.330.1600	16	16	92	32	0,1	2
32.330.0500	5	6	57	13	0,05	2	32.330.1000	10	10	72	22	0,1	2	32.330.2000	20	20	104	38	0,1	2



> 32.633 Phantom

NL VHM Schachtfrees, 2-snijder TiCN, extra lang, Aluminium
 FR Fraise à rainurer 2 dents Carbure TiCN, extra longue, Aluminium
 ES Fresa de ranurar de 2 labios MD TiCN, extra larga, Aluminio
 DE VHM Langlochfräser (2-Schneider) TiCN, extra lang, Aluminium

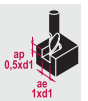


MG HM TiCN NORM 45° h6 d1 +0,00 -0,03 ALU

N 41 Alu N 51 Cu N 61 PVC

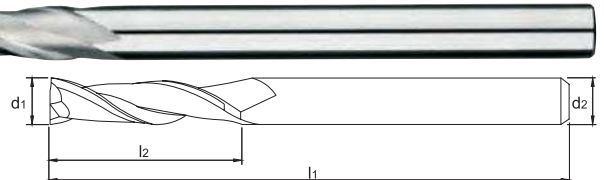
280-350 P 300-400 P 400-600 P

Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z
32.633.0100	1	6	40	3	0,025	2	32.633.0500	5	6	70	22	0,05	2	32.633.1200	12	12	95	38	0,1	2
32.633.0200	2	6	40	6	0,05	2	32.633.0600	6	6	70	22	0,05	2	32.633.1600	16	16	110	52	0,1	2
32.633.0300	3	6	50	11	0,05	2	32.633.0800	8	8	80	28	0,05	2	32.633.2000	20	20	110	55	0,1	2
32.633.0400	4	6	70	16	0,05	2	32.633.1000	10	10	90	32	0,1	2							



> 32.750 Phantom

NL VHM Schachtfrees, 2-snijder extra lang
 FR Fraise à rainurer 2 dents Carbure extra longue
 ES Fresa de ranurar de 2 labios MD extra larga
 DE VHM Langlochfräser (2-Schneider) extra lang

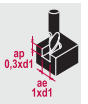


MG HM NORM 30° h6 d1 h10

P 11 5900 N/mm² P 12 5850 N/mm² P 13 51000 N/mm² P 14 51400 N/mm² M 21 INOX <850N/mm² M 22 INOX >850N/mm² K 31 GG K 32 GGS GTS-GTW N 41 Alu N 42 Alu Si>10% N 43 Mg N 51 Cu N 61 PVC

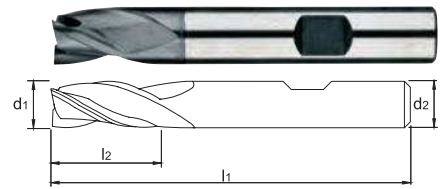
55-65 G 55-65 G 50-60 F 35-50 F 42-50 F 25-32 G 60-70 G 80-85 G 145-180 H 70-90 F 100-110 H 30-55 F 40-50 F

Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
32.750.0300	3	3	75	30	2	32.750.0800	8	8	150	50	2	32.750.1600	16	16	150	65	2
32.750.0400	4	4	75	30	2	32.750.1000	10	10	150	60	2	32.750.1800	18	18	150	65	2
32.750.0500	5	5	100	40	2	32.750.1200	12	12	150	75	2	32.750.2000	20	20	150	65	2
32.750.0600	6	6	150	50	2	32.750.1400	14	14	150	65	2						



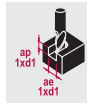
> 33.244 Phantom

NL VHM Schachtfrees, 3-snijder AITiN-X, DIN 6527, kort
 FR Fraise universelle 3 dents Carbure AITiN-X, DIN 6527, courte
 ES Fresa frontal de 3 labios MD AITiN-X, DIN 6527, corta
 DE VHM Universalfräser AITiN-X, DIN 6527, kurz



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11 ≤500 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



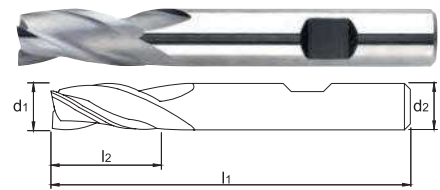
Ref.	d1	d2	l1	l2	z
33.244.0200	2	6	50	3	3
33.244.0300	3	6	50	4	3
33.244.0350	3.5	6	50	4	3
33.244.0400	4	6	54	5	3
33.244.0450	4.5	6	54	5	3
33.244.0500	5	6	54	6	3

Ref.	d1	d2	l1	l2	z
33.244.0600	6	6	54	7	3
33.244.0700	7	10	58	8	3
33.244.0800	8	10	58	9	3
33.244.0900	9	10	66	10	3
33.244.1000	10	10	66	11	3
33.244.1200	12	12	73	12	3

Ref.	d1	d2	l1	l2	z
33.244.1400	14	14	75	14	3
33.244.1600	16	16	82	16	3
33.244.1800	18	18	84	18	3
33.244.2000	20	20	92	20	3

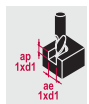
> 33.250 Phantom

NL VHM Schachtfrees, 3-snijder DIN 6527, lang
 FR Fraise universelle 3 dents Carbure DIN 6527, version longue
 ES Fresa frontal de 3 labios MD DIN 6527, larga
 DE VHM Universalfräser DIN 6527, lang



MG HM DIN 6527 30° DIN 6535-HB d1 h10

P 11 ≤500 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 72 Ti
60-70 J	55-65 I	50-60 H	35-50 H	42-50 H	25-32 G	60-70 I	80-85 I	145-180 J	70-90 H	100-110 J	30-55 H	40-50 F	18-25 F



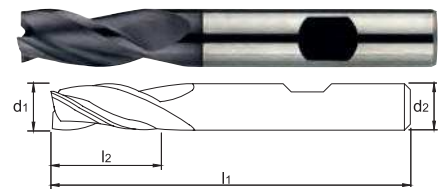
Ref.	d1	d2	l1	l2	z
33.250.0300	3	6	57	7	3
33.250.0400	4	6	57	8	3
33.250.0500	5	6	57	10	3

Ref.	d1	d2	l1	l2	z
33.250.0600	6	6	57	10	3
33.250.0800	8	8	63	16	3
33.250.1000	10	10	72	19	3

Ref.	d1	d2	l1	l2	z
33.250.1200	12	12	83	22	3
33.250.1600	16	16	92	26	3
33.250.2000	20	20	104	32	3

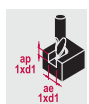
> 33.254 Phantom

NL VHM Schachtfrees, 3-snijder AITiN-X, DIN 6527, lang
 FR Fraise universelle 3 dents Carbure AITiN-X, DIN 6527, version lon-
 gue
 ES Fresa frontal de 3 labios MD AITiN-X, DIN 6527, larga
 DE VHM Universalfräser AITiN-X, DIN 6527, lang



MG HM AITiN X DIN 6527 30° DIN 6535-HB d1 h10

P 11 ≤500 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G

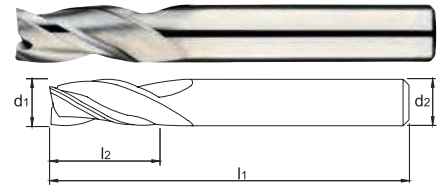


Ref.	d1	d2	l1	l2	z
33.254.0300	3	6	57	7	3
33.254.0400	4	6	57	8	3
33.254.0500	5	6	57	10	3
33.254.0600	6	6	57	10	3
33.254.0800	8	8	63	16	3

Ref.	d1	d2	l1	l2	z
33.254.1000	10	10	72	19	3
33.254.1200	12	12	83	22	3
33.254.1600	16	16	92	26	3
33.254.2000	20	20	104	32	3

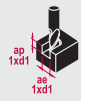
> 33.255 Phantom

NL VHM Schachtfrees, 3-snijder
 FR Fraise universelle 3 dents Carbure
 ES Fresa frontal de 3 labios MD
 DE VHM Universalfräser



MG HM NORM 30° h6

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 72
≤500 N/mm ²	≤550 N/mm ²	≤1000 N/mm ²	≤1400 N/mm ²	INOX ≤550N/mm ²	INOX >550N/mm ²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	Ti
60-70 J	55-65 I	50-60 H	35-50 H	42-50 H	25-32 G	60-70 I	80-85 I	145-180 J	70-90 H	100-110 J	30-55 H	40-50 F	18-25 F



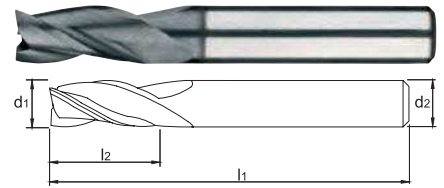
Ref.	d1	d2	l1	l2	z
33.255.0300	3	3	38	7	3
33.255.0400	4	4	50	8	3
33.255.0500	5	5	50	10	3

Ref.	d1	d2	l1	l2	z
33.255.0600	6	6	57	10	3
33.255.0800	8	8	63	16	3
33.255.1000	10	10	72	19	3

Ref.	d1	d2	l1	l2	z
33.255.1200	12	12	83	22	3

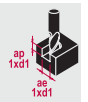
> 33.256 Phantom

NL VHM Schachtfrees, 3-snijder AITiN-X
 FR Fraise universelle 3 dents Carbure AITiN-X
 ES Fresa frontal de 3 labios MD AITiN-X
 DE VHM Universalfräser AITiN-X



MG HM AITiN X NORM 30° h6 d1 +0,00 -0,03

P 11	P 12	P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 61	S 71	S 72
≤500 N/mm ²	≤550 N/mm ²	≤1000 N/mm ²	≤1400 N/mm ²	INOX ≤550N/mm ²	INOX >550N/mm ²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	PVC	NiCo	Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	100-110 K	50-90 I	80-90 G	25-35 H	30-40 G



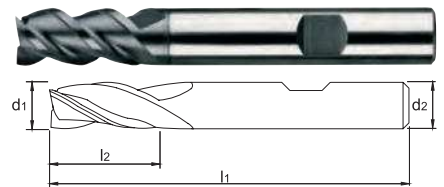
Ref.	d1	d2	l1	l2	z
33.256.0100	1	3	38	3	3
33.256.0150	1.5	3	38	4	3
33.256.0200	2	3	38	6	3
33.256.0250	2.5	3	38	7	3
33.256.0300	3	3	38	7	3
33.256.0350	3.5	3.5	50	7	3
33.256.0400	4	4	50	8	3
33.256.0450	4.5	4.5	50	8	3

Ref.	d1	d2	l1	l2	z
33.256.0500	5	5	50	10	3
33.256.0600	6	6	57	10	3
33.256.0700	7	7	60	13	3
33.256.0800	8	8	63	16	3
33.256.0900	9	9	67	16	3
33.256.1000	10	10	72	19	3
33.256.1100	11	11	83	22	3
33.256.1200	12	12	83	22	3

Ref.	d1	d2	l1	l2	z
33.256.1400	14	14	83	22	3
33.256.1600	16	16	92	26	3
33.256.1800	18	18	92	26	3
33.256.2000	20	20	104	32	3
33.256.2200	22	25	104	38	3
33.256.2500	25	25	104	38	3

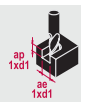
> 33.544 Phantom

NL VHM Schachtfrees, 3-snijder AITiN-X, DIN 6527, lang, roestvaststaal
 FR Fraise universelle 3 dents Carbure AITiN-X, DIN 6527, version longue, Inox
 ES Fresa frontal de 3 labios MD AITiN-X, DIN 6527, larga, acero inoxidable
 DE VHM Universalfräser AITiN-X, DIN 6527, lang, rostfreien Stahl



MG HM AITiN X DIN 6527 45° DIN 6535-HB d1 h10 INOX

P 13	P 14	M 21	M 22	K 31	K 32	N 41	N 42	N 43	N 51	N 52	N 61	S 71	S 72
≤1000 N/mm ²	≤1400 N/mm ²	INOX ≤550N/mm ²	INOX >550N/mm ²	GG	GGG GTS-GTW	Alu	Alu Si>10%	Mg	Cu	CuAlFe	PVC	NiCo	Ti
80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	170-190 K	70-110 I	50-100 H	80-90 G	31-45 H	42-50 G



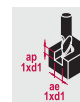
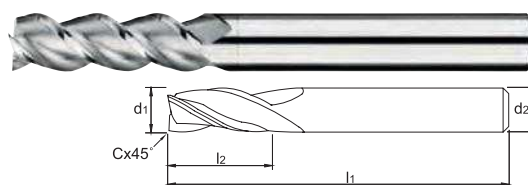
Ref.	d1	d2	l1	l2	z
33.544.0300	3	6	57	7	3
33.544.0400	4	6	57	8	3
33.544.0500	5	6	57	10	3

Ref.	d1	d2	l1	l2	z
33.544.0600	6	6	57	10	3
33.544.0800	8	8	63	16	3
33.544.1000	10	10	72	19	3

Ref.	d1	d2	l1	l2	z
33.544.1200	12	12	83	22	3
33.544.1600	16	16	92	26	3
33.544.2000	20	20	104	32	3

> **33.633 Phantom**

NL **VHM Schachtfrees, 3-snijder TiCN, lang, Aluminium**
 FR **Fraise universelle 3 dents Carbure TiCN, version longue, Aluminium**
 ES **Fresa frontal de 3 labios MD TiCN, larga, Aluminio**
 DE **VHM Universalfräser TiCN, lang, Aluminium**

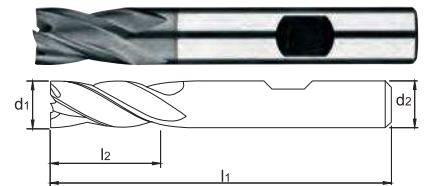


Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z
33.633.0300	3	6	65	4	0,05	3	33.633.0600	6	6	70	22	0,05	3	33.633.1200	12	12	95	38	0,1	3
33.633.0400	4	6	65	16	0,05	3	33.633.0800	8	8	80	28	0,05	3	33.633.1600	16	16	110	52	0,1	3
33.633.0500	5	6	70	22	0,05	3	33.633.1000	10	10	90	32	0,1	3	33.633.2000	20	20	110	55	0,1	3



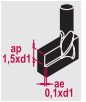
> 34.244 Phantom

NL **VHM Schachtfrees, 4-snijder AITiN-X, DIN 6527, kort**
 FR **Fraise standard 4 dents Carbure AITiN-X, DIN 6527, courte**
 ES **Fresa frontal de varios labios MD AITiN-X, DIN 6527, corta**
 DE **VHM 4 Schneiden-Schaftfräser AITiN-X, DIN 6527, kurz**



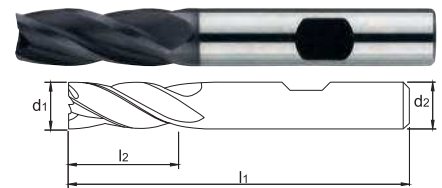
P 11 ≤600 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 NiCo	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G

Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
34.244.0200	2	6	50	4	4	34.244.0600	6	6	54	10	4	34.244.1000	10	10	66	14	4
34.244.0300	3	6	50	5	4	34.244.0700	7	8	58	11	4	34.244.1200	12	12	73	16	4
34.244.0400	4	6	54	8	4	34.244.0800	8	8	58	12	4	34.244.1600	16	16	82	22	4
34.244.0500	5	6	54	9	4	34.244.0900	9	10	66	13	4	34.244.2000	20	20	92	26	4



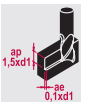
> 34.254 Phantom

NL **VHM Schachtfrees, 4-snijder AITiN-X, DIN 6527, lang**
 FR **Fraise standard 4 dents Carbure AITiN-X, DIN 6527, version longue**
 ES **Fresa frontal de varios labios MD AITiN-X, DIN 6527, larga**
 DE **VHM 4 Schneiden-Schaftfräser AITiN-X, DIN 6527, lang**



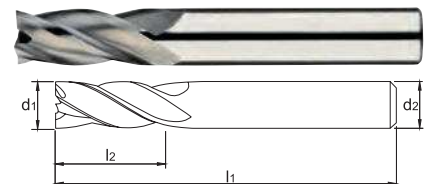
P 11 ≤600 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 NiCo	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G

Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
34.254.0600	6	6	57	13	4	34.254.1000	10	10	72	22	4	34.254.1600	16	16	92	32	4
34.254.0800	8	8	63	19	4	34.254.1200	12	12	83	26	4	34.254.2000	20	20	104	38	4



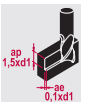
> 34.255 Phantom

NL **VHM Schachtfrees, 4-snijder**
 FR **Fraise standard 4 dents Carbure**
 ES **Fresa frontal de varios labios MD**
 DE **VHM 4 Schneiden-Schaftfräser**



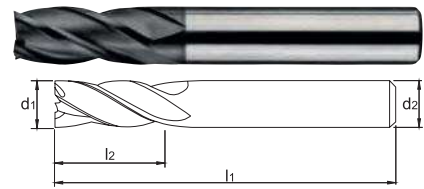
P 11 ≤600 N/mm ²	P 12 ≤850 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 72 Ti
60-70 J	55-65 I	50-60 H	35-50 H	42-50 H	25-32 G	60-70 I	80-85 I	145-180 J	70-90 H	100-110 J	30-55 H	40-50 F	18-25 F

Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
34.255.0300	3	3	32	12	4	34.255.0600	6	6	50	16	4	34.255.1200	12	12	70	22	4
34.255.0400	4	4	40	12	4	34.255.0800	8	8	60	20	4						
34.255.0500	5	5	50	14	4	34.255.1000	10	10	70	22	4						



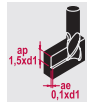
▶ **34.256 Phantom**

NL **VHM Schachtfrees, 4-snijder AITiN-X**
 FR **Fraise standard 4 dents Carbure AITiN-X**
 ES **Fresa frontal de varios labios MD AITiN-X**
 DE **VHM 4 Schneiden-Schaftfräser AITiN-X**



MG HM AITiN X NORM 30° h6 d1 h10

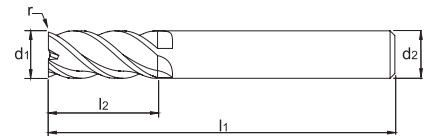
P 11 ≤500 N/mm²
P 12 ≤850 N/mm²
P 13 ≤1000 N/mm²
P 14 ≤1400 N/mm²
M 21 INOX ≤850N/mm²
M 22 INOX >850N/mm²
K 31 GG
K 32 GGG GTS-GTW
N 41 Alu
N 42 Alu Si>10%
N 43 Mg
N 51 Cu
N 61 PVC
S 71 Ni/Co
S 72 Ti



Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
34.256.0100	1	4	40	3	4	34.256.0500	5	5	50	14	4	34.256.1400	14	14	75	25	4
34.256.0150	1.5	4	40	4.5	4	34.256.0600	6	6	50	16	4	34.256.1600	16	16	75	25	4
34.256.0200	2	2	32	8	4	34.256.0700	7	7	60	20	4	34.256.1800	18	18	75	25	4
34.256.0250	2.5	2.5	32	8	4	34.256.0800	8	8	60	20	4	34.256.2000	20	20	100	32	4
34.256.0300	3	3	32	12	4	34.256.0900	9	9	60	20	4	34.256.2200	22	25	100	32	4
34.256.0350	3.5	3.5	32	12	4	34.256.1000	10	10	70	22	4	34.256.2500	25	25	150	45	4
34.256.0400	4	4	40	12	4	34.256.1100	11	11	70	22	4						
34.256.0450	4.5	4.5	50	14	4	34.256.1200	12	12	70	22	4						

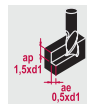
▶ **34.258 Phantom**

NL **VHM Vari-frees, 4-snijder AITiN-X, kort, snijkantradius, staal, 30-45 HRC**
 FR **Fraise Vari 4 dents Carbure AITiN-X, courte, rayon de coupe, acier, 30-45 HRC**
 ES **Fresa Vari MD AITiN-X, corta, radio de corte, acero, 30-45 HRC**
 DE **VHM Fräser mit ungleicher Teilung AITiN-X, kurz, Radius an der Schneidenecke, Stahl, 30-45 HRC**



MG HM AITiN X DIN 6527 h6 d1 +0,00 -0,03

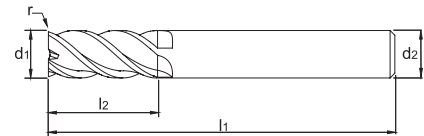
P 11 ≤500 N/mm²
P 12 ≤850 N/mm²
P 13 ≤1000 N/mm²
P 14 ≤1400 N/mm²
H 15 HRC
M 21 INOX ≤850N/mm²
M 22 INOX >850N/mm²
K 31 GG
K 32 GGG GTS-GTW



Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z
34.258.0314	3	6	50	5	0.3	4	34.258.0634	6	6	54	10	0.4	4	34.258.1254	12	12	73	16	0.6	4
34.258.0414	4	6	54	8	0.3	4	34.258.0834	8	8	58	12	0.4	4	34.258.1674	16	16	82	22	0.8	4
34.258.0514	5	6	54	9	0.3	4	34.258.1034	10	10	66	14	0.4	4	34.258.2094	20	20	92	24	0.8	4

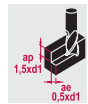
▶ **34.262 Phantom**

NL **VHM Vari-frees, 4-snijder AITiN-X, lang, snijkantradius, staal, 30-45 HRC**
 FR **Fraise Vari 4 dents Carbure AITiN-X, version longue, rayon de coupe, acier, 30-45 HRC**
 ES **Fresa Vari MD AITiN-X, larga, radio de corte, acero, 30-45 HRC**
 DE **VHM Fräser mit ungleicher Teilung AITiN-X, lang, Radius an der Schneidenecke, Stahl, 30-45 HRC**



MG HM AITiN X DIN 6527 h6 d1 +0,00 -0,03

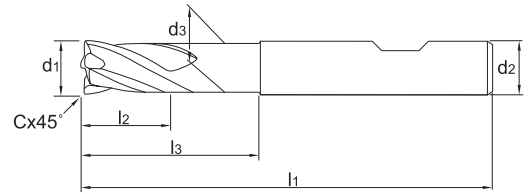
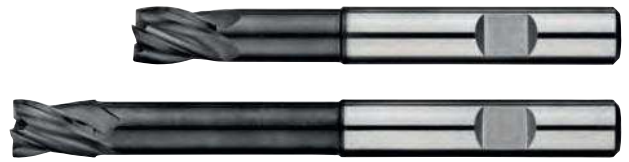
P 11 ≤500 N/mm²
P 12 ≤850 N/mm²
P 13 ≤1000 N/mm²
P 14 ≤1400 N/mm²
H 15 HRC
M 21 INOX ≤850N/mm²
M 22 INOX >850N/mm²
K 31 GG
K 32 GGG GTS-GTW



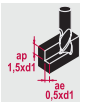
Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z
34.262.0314	3	6	57	8	0.3	4	34.262.0634	6	6	57	13	0.4	4	34.262.1254	12	12	83	26	0.6	4
34.262.0414	4	6	57	11	0.3	4	34.262.0834	8	8	63	19	0.4	4	34.262.1674	16	16	92	32	0.8	4
34.262.0514	5	6	57	13	0.3	4	34.262.1034	10	10	72	22	0.4	4	34.262.2074	20	20	104	38	0.8	4

> 34.265 Phantom

- NL **VHM Vari-frees, 4-snijder AITiN-X, verjongde schacht (nek), staal, 30-45 HRC**
- FR **Fraise Vari 4 dents Carbure AITiN-X, queue détalonnée, acier, 30-45 HRC**
- ES **Fresa Vari MD AITiN-X, mango rebajado (cuello), acero, 30-45 HRC**
- DE **VHM Fräser mit ungleicher Teilung AITiN-X, abgesetztem Schaft, Stahl, 30-45 HRC**



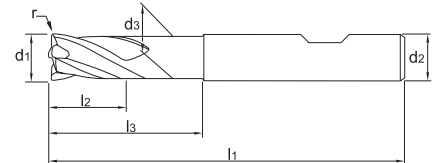
P 11 ≤500 N/mm ²	P 12 ≤550 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	H 15 HRC	M 21 INOX ≤850 N/mm ²	M 22 INOX >850 N/mm ²	K 31 GG	K 32 GGG GTS-GTW
105-150 H	120-150 I	125-140 I	95-110 I	25-40 G	75-96 I	65-80 H	100-120 J	130-140 J



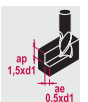
Ref.	d1	d2	d3	l1	l2	l3	c	z	Ref.	d1	d2	d3	l1	l2	l3	c	z	Ref.	d1	d2	d3	l1	l2	l3	c	z
34.265.0317	3	6	2.7	57	7	17	0,1	4	34.265.0830	8	8	7.5	73	12	30	0,15	4	34.265.1264	12	12	11	117	16	64	0,3	4
34.265.0422	4	6	3.7	63	8	22	0,1	4	34.265.0846	8	8	7.5	90	12	46	0,15	4	34.265.1655	16	16	15	109	22	55	0,4	4
34.265.0500	5	6	4.7	67	10	27	0,1	4	34.265.1035	10	10	9.2	82	14	35	0,2	4	34.265.1687	16	16	15	141	22	87	0,4	4
34.265.0620	6	6	5.5	62	10	20	0,15	4	34.265.1055	10	10	9.2	102	14	55	0,2	4									
34.265.0632	6	6	5.5	74	10	32	0,15	4	34.265.1240	12	12	11	93	16	40	0,3	4									

> 34.267 Phantom

- NL **VHM Vari-frees, 4-snijder AITiN-X, verjongde schacht (nek), snijkantradius, staal, 30-45 HRC**
- FR **Fraise Vari 4 dents Carbure AITiN-X, queue détalonnée, rayon de coupe, acier, 30-45 HRC**
- ES **Fresa Vari MD AITiN-X, mango rebajado (cuello), radio de corte, acero, 30-45 HRC**
- DE **VHM Fräser mit ungleicher Teilung AITiN-X, abgesetztem Schaft, Radius an der Schneidenecke, Stahl, 30-45 HRC**



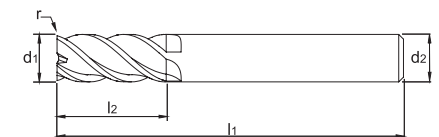
P 11 ≤500 N/mm ²	P 12 ≤550 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	H 15 HRC	M 21 INOX ≤850 N/mm ²	M 22 INOX >850 N/mm ²	K 31 GG	K 32 GGG GTS-GTW
105-150 H	120-150 I	125-140 I	95-110 I	25-40 G	75-96 I	65-80 H	100-120 J	130-140 J



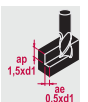
Ref.	d1	d2	d3	l1	l2	l3	r	z	Ref.	d1	d2	d3	l1	l2	l3	r	z	Ref.	d1	d2	d3	l1	l2	l3	r	z
34.267.0314	3	6	2.7	57	7	17	0.3	4	34.267.0834	8	8	7.5	73	12	30	0.5	4	34.267.1256	12	12	11	117	16	64	0.7	4
34.267.0414	4	6	3.7	63	8	22	0.3	4	34.267.0836	8	8	7.5	90	12	46	0.5	4	34.267.1674	16	16	15	109	22	55	1	4
34.267.0514	5	6	4.7	67	10	27	0.3	4	34.267.1034	10	10	9.2	82	14	35	0.7	4	34.267.1676	16	16	15	141	22	87	1	4
34.267.0634	6	6	5.5	62	10	20	0.5	4	34.267.1036	10	10	9.2	102	14	55	0.7	4	34.267.2074	20	20	19	104	26	50	1	4
34.267.0636	6	6	5.5	74	10	32	0.5	4	34.267.1254	12	12	11	93	16	40	0.7	4									

> 34.268 Phantom

- NL **VHM Vari-frees, 4-snijder kort, AITiN-X, snijkantradius, roestvaststaal**
- FR **Fraise Vari 4 dents Carbure courte, AITiN-X, rayon de coupe, Inox**
- ES **Fresa Vari MD corta, AITiN-X, radio de corte, acero inoxidable**
- DE **VHM Fräser mit ungleicher Drallsteigung kurz, AITiN-X, Radius an der Schneidenecke, rostfreien Stahl**



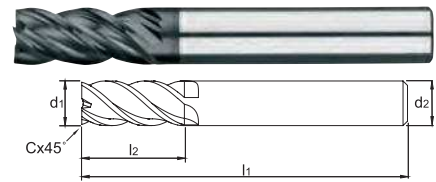
P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850 N/mm ²	M 22 INOX >850 N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 52 CuAlFe	S 71 NiCo	S 72 Ti
125-140 I	95-110 I	75-96 I	65-80 H	100-120 J	130-140 J	50-100 G	25-35 G	80-95 H



Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z
34.268.0300	3	6	54	7	0.3	4	34.268.0600	6	6	54	10	0.5	4	34.268.1200	12	12	73	16	0.7	4
34.268.0400	4	6	54	8	0.3	4	34.268.0800	8	8	58	12	0.5	4	34.268.1600	16	16	82	22	1	4
34.268.0500	5	6	54	10	0.3	4	34.268.1000	10	10	66	14	0.5	4	34.268.2000	20	20	92	26	1	4

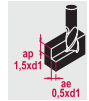
> **34.270 Phantom**

NL **VHM Vari-frees, 4-snijder lang, AlTiN-X, roestvaststaal**
 FR **Fraise Vari 4 dents Carbure version longue, AlTiN-X, Inox**
 ES **Fresa Vari MD larga, AlTiN-X, acero inoxidable**
 DE **VHM Fräser mit ungleicher Drallsteigung lang, AlTiN-X, rostfreien Stahl**



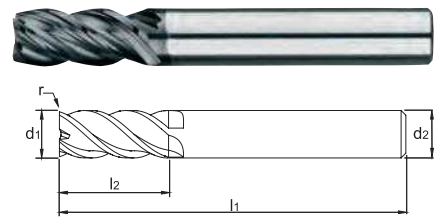
125-140 I | 95-110 I | 75-96 I | 65-80 H | 100-120 J | 130-140 J | 50-100 G | 25-35 G | 80-95 H

Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z
34.270.0300	3	6	57	8	0,1	4	34.270.0800	8	8	63	19	0,1	4	34.270.1600	16	16	92	32	0,2	4
34.270.0400	4	6	57	11	0,1	4	34.270.1000	10	10	72	22	0,1	4	34.270.1800	18	18	92	32	0,2	4
34.270.0500	5	6	57	13	0,1	4	34.270.1200	12	12	83	26	0,1	4	34.270.2000	20	20	104	38	0,2	4
34.270.0600	6	6	57	13	0,1	4	34.270.1400	14	14	83	26	0,2	4	34.270.2500	25	25	104	38	0,2	4



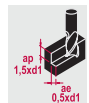
> **34.272 Phantom**

NL **VHM Vari-frees, 4-snijder lang, AlTiN-X, snijkantradius, roestvaststaal**
 FR **Fraise Vari 4 dents Carbure version longue, AlTiN-X, rayon de coupe, Inox**
 ES **Fresa Vari MD larga, AlTiN-X, radio de corte, acero inoxidable**
 DE **VHM Fräser mit ungleicher Drallsteigung lang, AlTiN-X, Radius an der Schneidenecke, rostfreien Stahl**



125-140 I | 95-110 I | 75-96 I | 65-80 H | 100-120 J | 130-140 J | 50-100 G | 25-35 G | 80-95 H

Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z	Ref.	d1	d2	l1	l2	r	z
34.272.0300	3	6	57	8	0.3	4	34.272.0800	8	8	63	19	0.5	4	34.272.1600	16	16	92	32	1	4
34.272.0400	4	6	57	11	0.3	4	34.272.1000	10	10	72	22	0.5	4	34.272.1800	18	18	92	32	1	4
34.272.0500	5	6	57	13	0.3	4	34.272.1200	12	12	83	26	0.7	4	34.272.2000	20	20	104	38	1	4
34.272.0600	6	6	57	13	0.5	4	34.272.1400	14	14	83	26	0.7	4	34.272.2500	25	25	104	38	1	4



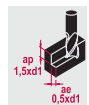
> **34.275 Phantom**

NL **VHM Vari-frees, 4-snijder AlTiN-X, verjongde schacht (nek), roestvaststaal**
 FR **Fraise Vari 4 dents Carbure AlTiN-X, queue détalonnée, Inox**
 ES **Fresa Vari MD AlTiN-X, mango rebajado (cuello), acero inoxidable**
 DE **VHM Fräser mit ungleicher Drallsteigung AlTiN-X, abgesetztem Schaft, rostfreien Stahl**



125-140 I | 95-110 I | 75-96 I | 65-80 H | 100-120 J | 130-140 J | 50-100 G | 25-35 G | 80-95 H

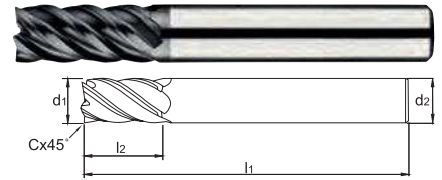
Ref.	d1	d2	d3	l1	l2	l3	c	z	Ref.	d1	d2	d3	l1	l2	l3	c	z	Ref.	d1	d2	d3	l1	l2	l3	c	z
34.275.0317	3	6	2.7	57	7	17	0,1	4	34.275.0830	8	8	7.5	73	12	30	0,1	4	34.275.1264	12	12	11	117	16	64	0,1	4
34.275.0422	4	6	3.7	63	8	22	0,1	4	34.275.0846	8	8	7.5	90	12	45	0,1	4	34.275.1655	16	16	15	109	22	55	0,2	4
34.275.0500	5	6	4.7	67	10	27	0,1	4	34.275.1035	10	10	9.2	82	14	35	0,1	4	34.275.1687	16	16	48	141	22	87	0,2	4
34.275.0620	6	6	5.5	62	10	20	0,1	4	34.275.1055	10	10	9.2	102	14	55	0,1	4									
34.275.0632	6	6	5.5	74	10	32	0,1	4	34.275.1240	12	12	11	93	16	40	0,1	4									



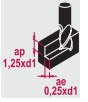


> 34.278 Phantom

NL **VHM Vari-frees, 5-snijder lang, AlTiN-X, roestvaststaal**
 FR **Fraise Vari 5 dents Carbure version longue, AlTiN-X, Inox**
 ES **Fresa Vari MD larga, AlTiN-X, acero inoxidable**
 DE **VHM Fräser mit ungleicher Drallsteigung lang, AlTiN-X, rostfreien Stahl**



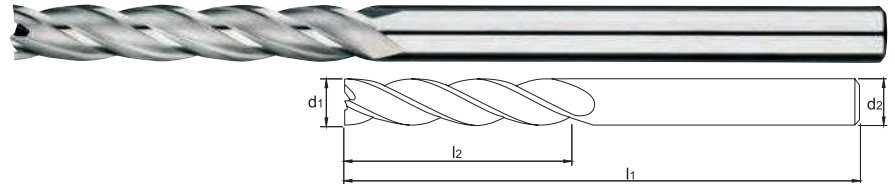
125-140 I 95-110 I 75-96 I 65-80 H 100-120 J 130-140 J 50-100 G 25-35 G 80-95 H



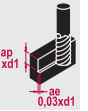
Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z	Ref.	d1	d2	l1	l2	c	z
34.278.0600	6	6	57	13	0,1	5	34.278.1000	10	10	72	22	0,1	5	34.278.1600	16	16	92	32	0,2	5
34.278.0800	8	8	63	19	0,1	5	34.278.1200	12	12	83	26	0,1	5	34.278.2000	20	20	104	38	0,2	5

> 34.375 Phantom

NL **VHM Schachtfrees, 4-snijder extra lang**
 FR **Fraise standard 4 dents Carbure extra longue**
 ES **Fresa frontal de varios labios MD extra larga**
 DE **VHM 4 Schneiden-Schafffräser extra lang**



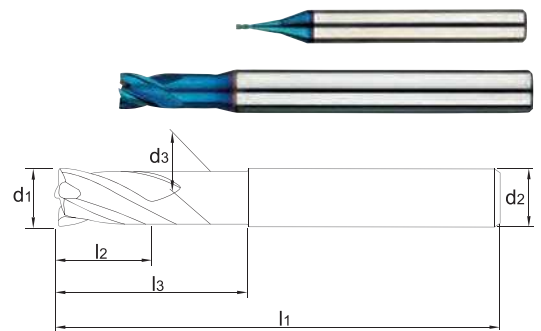
55-65 G 55-65 G 50-60 F 35-50 F 42-50 F 25-32 G 60-70 G 80-85 G 145-180 H 70-90 F 100-110 H 30-55 F 40-50 F



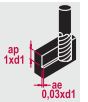
Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z	Ref.	d1	d2	l1	l2	z
34.375.0300	3	3	75	30	4	34.375.0800	8	8	150	50	4	34.375.1600	16	16	150	65	4
34.375.0400	4	4	75	30	4	34.375.1000	10	10	150	60	4	34.375.1800	18	18	150	65	4
34.375.0500	5	5	100	40	4	34.375.1200	12	12	150	75	4	34.375.2000	20	20	150	65	4
34.375.0600	6	6	150	50	4	34.375.1400	14	14	150	65	4						

> 34.400 Phantom

NL **VHM HSC Schachtfrees, 4-snijder TiAlN-B, verjongde schacht (nek), 45-70 HRC**
 FR **Fraise UGV - Usinage Grande Vitesse 4 dents Carbure TiAlN-B, queue détalonnée, 45-70 HRC**
 ES **Fresa integral MAV MD TiAlN-B, mango rebajado (cuello), 45-70 HRC**
 DE **VHM HSC High-Speed Schafffräser TiAlN-B, abgesetztem Schaft, 45-70 HRC**



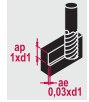
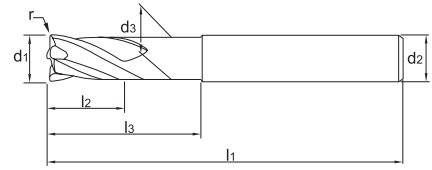
150-210 K 80-120 F



Ref.	d1	d2	d3	l1	l2	l3	z	Ref.	d1	d2	d3	l1	l2	l3	z
34.400.0100	1	6	0.95	50	1.5	3	4	34.400.0800	8	8	7.7	65	8	20	4
34.400.0200	2	6	1.95	50	2	5	4	34.400.1000	10	10	9.7	75	10	25	4
34.400.0300	3	6	2.85	55	3	8	4	34.400.1200	12	12	11.7	85	12	28	4
34.400.0400	4	6	3.85	55	4	10	4	34.400.1600	16	16	15.7	90	16	32	4
34.400.0500	5	6	4.85	55	5	13	4	34.400.2000	20	20	19.7	105	20	40	4
34.400.0600	6	6	5.85	55	6	15	4								

> **34.410 Phantom**

- NL **VHM HSC Torusfrees, 4-snijder verjongde schacht (nek), TiAlN-B, 45-70 HRc**
- FR **Fraise torique UGV 4 dents Carbure queue détalonnée, TiAlN-B, 45-70 HRc**
- ES **Fresa tórica MAV MD mango rebajado (cuello), TiAlN-B, 45-70 HRc**
- DE **VHM HSC Torusfräser abgesetztem Schaft, TiAlN-B, 45-70 HRc**

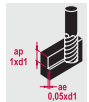
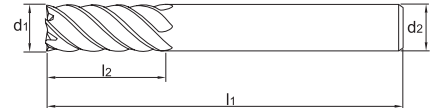


Ref.	d1	d2	d3	l1	l2	l3	r	z
34.410.0605	6	6	5.85	90	9	20	0.5	4
34.410.0610	6	6	5.85	90	9	20	1	4
34.410.0805	8	8	7.7	100	12	25	0.5	4
34.410.0810	8	8	7.7	100	12	25	1	4
34.410.1005	10	10	9.7	100	15	32	0.5	4

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.410.1010	10	10	9.7	100	15	32	1	4
34.410.1020	10	10	9.7	100	15	32	2	4
34.410.1205	12	12	11.7	110	15	38	0.5	4
34.410.1210	12	12	11.7	110	18	38	1	4
34.410.1220	12	12	11.7	110	18	38	2	4

> **34.424 Phantom**

- NL **VHM Schachtfrees, meersnijder AlTiN-X, lang, HRC, 30-65 HRc**
- FR **Fraise standard Carbure AlTiN-X, version longue, HRC, 30-65 HRc**
- ES **Fresa frontal de varios labios MD AlTiN-X, larga, HRC, 30-65 HRc**
- DE **VHM Mehrschneiden-Schaftfräser AlTiN-X, lang, HRC, 30-65 HRc**



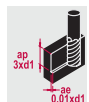
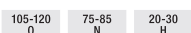
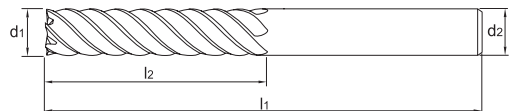
Ref.	d1	d2	l1	l2	z
34.424.0600	6	6	57	13	6
34.424.0700	7	8	63	16	6
34.424.0800	8	8	63	19	6
34.424.0900	9	10	72	19	6

Ref.	d1	d2	l1	l2	z
34.424.1000	10	10	72	22	6
34.424.1200	12	12	83	26	6
34.424.1400	14	16	83	26	6
34.424.1600	16	16	92	32	6

Ref.	d1	d2	l1	l2	z
34.424.1800	18	18	92	32	8
34.424.2000	20	20	104	38	8
34.424.2500	25	25	104	44	8

> **34.464 Phantom**

- NL **VHM Schachtfrees, meersnijder AlTiN-X, extra lang, HRC, 30-65 HRc**
- FR **Fraise standard Carbure AlTiN-X, extra longue, HRC, 30-65 HRc**
- ES **Fresa frontal de varios labios MD AlTiN-X, extra larga, HRC, 30-65 HRc**
- DE **VHM Mehrschneiden-Schaftfräser AlTiN-X, extra lang, HRC, 30-65 HRc**



Ref.	d1	d2	l1	l2	z
34.464.0600	6	6	70	26	6
34.464.0800	8	8	90	36	6
34.464.1000	10	10	100	46	6

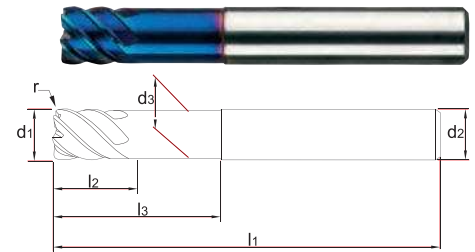
Ref.	d1	d2	l1	l2	z
34.464.1200	12	12	110	56	6
34.464.1600	16	16	130	66	6
34.464.2000	20	20	140	76	6

Ref.	d1	d2	l1	l2	z
34.464.2500	25	25	180	92	6



> 34.510 Phantom

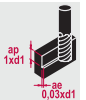
- NL **VHM HSC Torusfrees, 6-snijder verjongde schacht (nek), TiAlN-B, 45-70 HRc**
 FR **Fraise torique UGV - Usinage Grande Vitesse 6 dents Carbure queue Idétalonnée, TiAlN-B, 45-70 HRc**
 ES **Fresa tórica MAV MD mango rebajado (cuello), TiAlN-B, 45-70 HRc**
 DE **VHM HSC Torusfräser abgesetztem Schaft, TiAlN-B, 45-70 HRc**



330-475 K 200-330 I

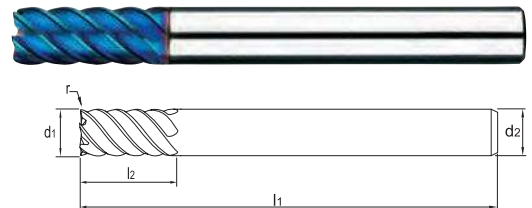
Ref.	d1	d2	d3	l1	l2	l3	r	z
34.510.0620	6	6	5.85	50	6	14	0.5	6
34.510.0820	8	8	7.7	60	8	24	0.5	6

Ref.	d1	d2	d3	l1	l2	l3	r	z
34.510.1030	10	10	9.7	70	10	30	1	6
34.510.1230	12	12	11.7	75	12	30	1	6



> 34.515 Phantom

- NL **VHM HSC Schachtfrees, 6-snijder TiAlN-B, snijkantradius, 45-70 HRc**
 FR **Fraise UGV - Usinage Grande Vitesse 6 dents Carbure TiAlN-B, rayon de coupe, 45-70 HRc**
 ES **Fresa integral MAV MD TiAlN-B, radio de corte, 45-70 HRc**
 DE **VHM HSC High-Speed Schachtfräser TiAlN-B, Radius an der Schneidenecke, 45-70 HRc**



330-475 K 200-330 I

Ref.	d1	d2	l1	l2	r	z
34.515.0621	6	6	70	13	0.5	6
34.515.0622	6	6	70	26	0.5	6
34.515.0821	8	8	90	19	0.5	6
34.515.0822	8	8	90	36	0.5	6
34.515.1021	10	10	100	22	0.5	6
34.515.1032	10	10	100	22	1	6

Ref.	d1	d2	l1	l2	r	z
34.515.1033	10	10	100	46	1	6
34.515.1221	12	12	110	26	0.5	6
34.515.1232	12	12	110	26	1	6
34.515.1233	12	12	110	56	1	6
34.515.1631	16	16	130	32	1	6
34.515.1642	16	16	130	32	1.5	6

Ref.	d1	d2	l1	l2	r	z
34.515.1643	16	16	130	66	1.5	6
34.515.2031	20	20	140	38	1	6
34.515.2042	20	20	140	38	1.5	6
34.515.2053	20	20	140	38	2	6
34.515.2054	20	20	140	76	2	6



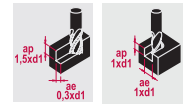
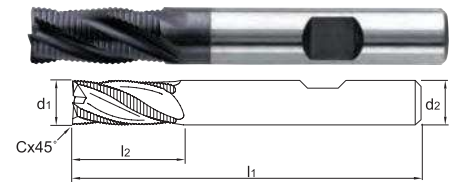
> **35.244 Phantom**

NL **VHM Ruwrees TiAIN, fijn, staal**
 FR **Fraise d'ébauche Carbure TiAIN, pas fin, acier**
 ES **Fresa de desbaste MD TiAIN, paso fino, acero**
 DE **VHM Schruppräser TiAIN, fein, Stahl**

Ref.	d1	d2	l1	l2	c	z
35.244.0400	4	6	55	11	x	3
35.244.0600	6	6	57	13	0,4	3
35.244.0800	8	10	69	19	0,4	3

Ref.	d1	d2	l1	l2	c	z
35.244.1000	10	10	72	22	0,6	4
35.244.1200	12	12	83	26	0,6	4
35.244.1400	14	12	83	26	0,6	4

Ref.	d1	d2	l1	l2	c	z
35.244.1600	16	16	92	32	0,6	4
35.244.2000	20	20	104	38	0,6	4
35.244.2500	25	25	121	45	0,6	5



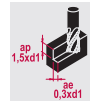
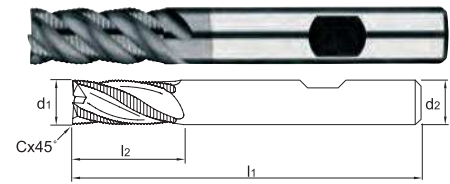
> **35.484 Phantom**

NL **VHM Ruwrees TiAIN, fijn, roestvaststaal, 30-40 Hrc**
 FR **Fraise d'ébauche Carbure TiAIN, pas fin, Inox, 30-40 HRC**
 ES **Fresa de desbaste MD TiAIN, paso fino, acero inoxidable, 30-40 Hrc**
 DE **VHM Schruppräser TiAIN, fein, rostfreien Stahl, 30-40 Hrc**

Ref.	d1	d2	l1	l2	c	z
35.484.0400	4	6	57	11	0,1	3
35.484.0500	5	6	57	13	0,15	4
35.484.0600	6	6	57	16	0,15	4

Ref.	d1	d2	l1	l2	c	z
35.484.0800	8	8	63	16	0,2	4
35.484.1000	10	10	72	22	0,2	4
35.484.1200	12	12	83	26	0,2	4

Ref.	d1	d2	l1	l2	c	z
35.484.1400	14	14	83	26	0,2	5
35.484.1600	16	16	92	32	0,2	5
35.484.2000	20	20	104	38	0,2	6



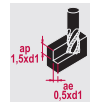
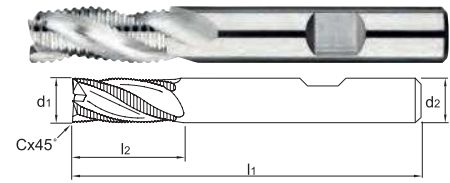
> **35.540 Phantom**

NL **VHM Ruwrees rond, Aluminium**
 FR **Fraise d'ébauche Carbure ronde, Aluminium**
 ES **Fresa de desbaste MD redondo, Aluminio**
 DE **VHM Schruppräser rund, Aluminium**

Ref.	d1	d2	l1	l2	c	z
35.540.0600	6	6	57	13	0,6	3
35.540.0800	8	8	63	16	0,6	3

Ref.	d1	d2	l1	l2	c	z
35.540.1000	10	10	72	22	0,6	3
35.540.1200	12	12	83	26	0,6	3

Ref.	d1	d2	l1	l2	c	z
35.540.1600	16	16	92	32	0,9	3
35.540.2000	20	20	104	38	0,9	3



> 35.852 Phantom

NL **VHM Router zonder kopvertanding**
 FR **Fraise à contourner Carbure sans denture en bout**
 ES **Fresa de contornear MD sin corte al centro**
 DE **VHM Router ohne Kopfverzahnung**



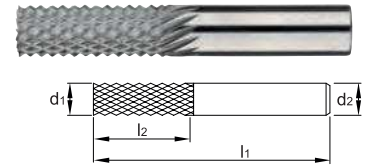
N 62
GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.852.0300	3	3	45	13
35.852.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.852.0600	6	6	63	19
35.852.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.852.1000	10	10	63	25
35.852.1200	12	12	75	30



> 35.860 Phantom

NL **VHM Router met kopvertanding**
 FR **Fraise à contourner Carbure avec denture en bout**
 ES **Fresa de contornear MD con corte al centro**
 DE **VHM Router mit Stirnverzahnung**



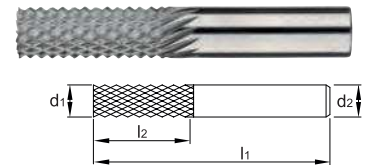
N 62
GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.860.0300	3	3	45	13
35.860.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.860.0600	6	6	63	19
35.860.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.860.1000	10	10	63	25
35.860.1200	12	12	75	30



> 35.868 Phantom

NL **VHM Router met boorpunt**
 FR **Fraise à contourner Carbure avec pointe de perçage**
 ES **Fresa de contornear MD con punta de taladro**
 DE **VHM Router mit Bohrspitze**



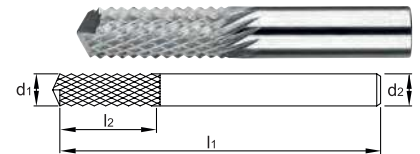
N 62
GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.868.0300	3	3	45	13
35.868.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.868.0600	6	6	63	19
35.868.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.868.1000	10	10	63	25
35.868.1200	12	12	75	30



> 35.876 Phantom

NL **VHM Router twee snijkanten, kopvertanding**
 FR **Fraise à contourner Carbure à deux taillants, denture en bout**
 ES **Fresa de contornear MD con dos labios, corte al centro**
 DE **VHM Router zwei Schneiden, Kopfverzahnung**



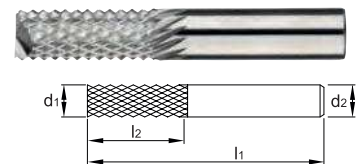
N 62
GFK/CFK

100-200

Ref.	d1	d2	l1	l2
35.876.0300	3	3	45	13
35.876.0400	4	4	50	16

Ref.	d1	d2	l1	l2
35.876.0600	6	6	63	19
35.876.0800	8	8	63	25

Ref.	d1	d2	l1	l2
35.876.1000	10	10	63	25
35.876.1200	12	12	75	30



> **36.130 Phantom**

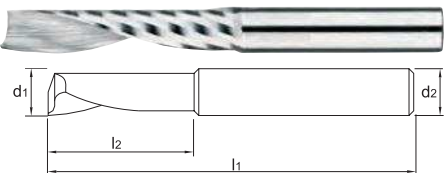
NL **VHM Eensnijderfrees Aluminium**
FR **Fraise à 1 dent Carbure Aluminium**
ES **Fresa frontal de 1 labio MD Aluminium**
DE **VHM Einzahnfräser Aluminium**



300-450 H 300-450 H

Ref.	d1	d2	l1	l2	z
36.130.0201	2	2	50	8	1
36.130.0202	2	6	64	8	1
36.130.0251	2.5	2.5	50	8	1
36.130.0252	2.5	6	64	8	1
36.130.0301	3	3	50	8	1
36.130.0302	3	6	64	8	1
36.130.0303	3	3	64	12	1
36.130.0304	3	6	64	12	1

Ref.	d1	d2	l1	l2	z
36.130.0401	4	4	64	8	1
36.130.0402	4	4	64	12	1
36.130.0403	4	4	64	20	1
36.130.0404	4	6	64	20	1
36.130.0405	4	4	64	30	1
36.130.0501	5	5	64	16	1
36.130.0502	5	6	64	16	1
36.130.0503	5	5	64	30	1



> **36.140 Phantom**

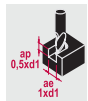
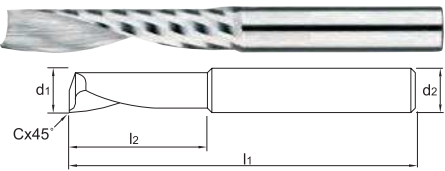
NL **VHM Eensnijderfrees Aluminium**
FR **Fraise à 1 dent Carbure Aluminium**
ES **Fresa frontal de 1 labio MD Aluminium**
DE **VHM Einzahnfräser Aluminium**



300-450 H 145-220 I 300-450 H

Ref.	d1	d2	l1	l2	c	z
36.140.0200	2	3	50	8	0,05	1
36.140.0250	2.5	3	40	12	0,05	1
36.140.0300	3	3	50	12	0,05	1

Ref.	d1	d2	l1	l2	c	z
36.140.0400	4	4	60	15	0,1	1
36.140.0500	5	5	60	17	0,1	1
36.140.0600	6	6	65	20	0,1	1



Ref.	d1	d2	l1	l2	c	z
36.140.0800	8	8	65	22	0,15	1
36.140.1000	10	10	75	25	0,15	1
36.140.1200	12	12	80	30	0,15	1

> **36.164 Phantom**

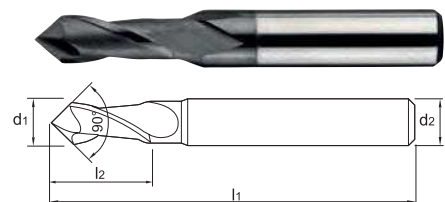
NL **VHM Multi-frees AlTiN-X, 90°**
FR **Fraise Multi Carbure AlTiN-X, 90°**
ES **Fresa para ranuras MD AlTiN-X, 90°**
DE **VHM Multifräser AlTiN-X, 90°**



70-75 S 40-60 S 35-40 S 30-35 Q 30-35 Q 25-30 P 150-180 S 120-150 S 50-120 S 150-180 S 20-25 P 30-35 P

Ref.	d1	d2	l1	l2	z
36.164.0300	3	4	50	6	2
36.164.0400	4	5	50	8	2
36.164.0500	5	6	50	10	2
36.164.0600	6	8	60	12	2

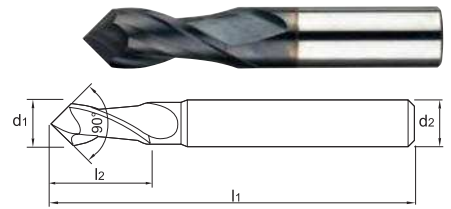
Ref.	d1	d2	l1	l2	z
36.164.0800	8	10	70	16	2
36.164.1000	10	12	70	18	2
36.164.1200	12	12	70	20	2
36.164.1400	14	14	80	24	2



Ref.	d1	d2	l1	l2	z
36.164.1600	16	16	80	26	2
36.164.2000	20	20	100	32	2

> 36.166 Phantom

NL **VHM Multi-Plus frees AITiN-X, 90°**
 FR **Fraise Multi Plus Carbure AITiN-X, 90°**
 ES **Fresa Multi Plus MD AITiN-X, 90°**
 DE **VHM Multi-Plus Fräser AITiN-X, 90°**



P 11 ≤500 N/mm ²	P 12 ≤550 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	N 41 Alu	N 42 Alu Si>10%	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
70-75 S	40-60 S	35-40 S	30-35 Q	30-35 Q	25-30 P	150-180 S	120-150 S	50-120 S	150-180 S	20-25 P	30-35 P

NIEUW / NOUVEAU / NUEVO / NEU

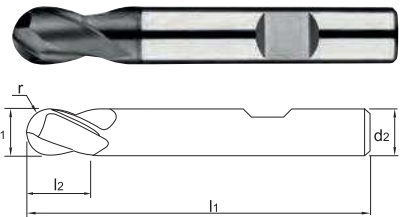
Ref.	d1	d2	l1	l2	z
36.166.0050	0.5	3	39	1	2
36.166.0100	1	3	39	2	2
36.166.0150	1.5	3	39	3	2
36.166.0200	2	3	39	4	2
36.166.0250	2.5	3	39	5	2

Ref.	d1	d2	l1	l2	z
36.166.0300	3	4	50	6	2
36.166.0400	4	5	50	8	2
36.166.0500	5	6	50	10	2
36.166.0600	6	8	60	12	2
36.166.0800	8	10	70	16	2

Ref.	d1	d2	l1	l2	z
36.166.1000	10	12	70	18	2
36.166.1200	12	12	70	20	2
36.166.1600	16	16	80	26	2
36.166.2000	20	20	100	32	2

> 36.244 Phantom

NL **VHM Radiusfrees, 2-snijder AITiN-X, DIN 6527, kort**
 FR **Fraise à rayon 2 dents Carbure AITiN-X, DIN 6527, courte**
 ES **Fresa de punta esférica MD AITiN-X, DIN 6527, corta**
 DE **VHM 2 Schneiden Radiusfräser AITiN-X, DIN 6527, kurz**



P 11 ≤500 N/mm ²	P 12 ≤550 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



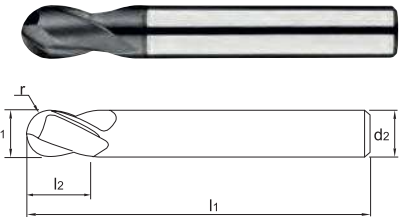
Ref.	d1	d2	l1	l2	r	z
36.244.0200	2	6	50	3	1	2
36.244.0300	3	6	50	4	1.5	2
36.244.0400	4	6	54	5	2	2
36.244.0500	5	6	54	6	2.5	2

Ref.	d1	d2	l1	l2	r	z
36.244.0600	6	6	54	7	3	2
36.244.0800	8	8	58	9	4	2
36.244.1000	10	10	66	11	5	2
36.244.1200	12	12	73	12	6	2

Ref.	d1	d2	l1	l2	r	z
36.244.1400	14	14	75	14	7	2
36.244.1600	16	16	82	16	8	2
36.244.1800	18	18	84	18	9	2
36.244.2000	20	20	92	20	10	2

> 36.256 Phantom

NL **VHM Radiusfrees, 2-snijder TiAIN**
 FR **Fraise à rayon 2 dents Carbure TiAIN**
 ES **Fresa de punta esférica MD TiAIN**
 DE **VHM 2 Schneiden Radiusfräser TiAIN**



P 11 ≤500 N/mm ²	P 12 ≤550 N/mm ²	P 13 ≤1000 N/mm ²	P 14 ≤1400 N/mm ²	M 21 INOX ≤850N/mm ²	M 22 INOX >850N/mm ²	K 31 GG	K 32 GGG GTS-GTW	N 41 Alu	N 42 Alu Si>10%	N 43 Mg	N 51 Cu	N 61 PVC	S 71 Ni/Co	S 72 Ti
100-115 K	95-110 J	80-100 I	55-80 I	50-65 I	35-44 H	100-120 J	130-140 J	240-300 K	120-150 I	160-180 K	50-90 I	80-90 G	25-35 H	30-40 G



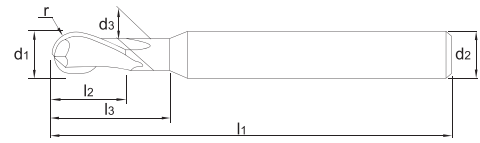
Ref.	d1	d2	l1	l2	r	z
36.256.0100	1	3	39	3	0.5	2
36.256.0150	1.5	3	39	5	0.75	2
36.256.0200	2	3	39	6	1	2
36.256.0250	2.5	3	39	7	1.25	2
36.256.0300	3	3	39	12	1.5	2
36.256.0350	3.5	4	51	12	1.75	2
36.256.0400	4	4	51	14	2	2
36.256.0450	4.5	5	51	14	2.25	2

Ref.	d1	d2	l1	l2	r	z
36.256.0500	5	5	51	16	2.5	2
36.256.0600	6	6	64	19	3	2
36.256.0700	7	7	64	19	3.5	2
36.256.0800	8	8	64	19	4	2
36.256.0900	9	10	70	22	4.5	2
36.256.1000	10	10	70	22	5	2
36.256.1100	11	11	70	25	5.5	2
36.256.1200	12	12	76	25	6	2

Ref.	d1	d2	l1	l2	r	z
36.256.1400	14	14	89	30	7	2
36.256.1600	16	16	89	32	8	2
36.256.1800	18	18	102	36	9	2
36.256.2000	20	20	102	38	10	2
36.256.2200	22	22	102	38	11	2
36.256.2500	25	25	102	38	12.5	2

> **36.275 Phantom**

- NL **VHM Precisie HSC Radiusrees, 2-snijder TiAlN-B, 45-70 HRc**
- FR **Fraise à rayon de précision UGV - Usinage Grande 2 dents Carbure TiAlN-B, 45-70 HRc**
- ES **Fresa de punta esférica de precisión MAV MD TiAlN-B, 45-70 HRc**
- DE **VHM Präzisions HSC Radiusfräser (2-Schneider) TiAlN-B, 45-70 HRc**



P 14
 S1400 Nimm²

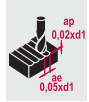
H 15
 HRC

75-275
 U

75-160
 T

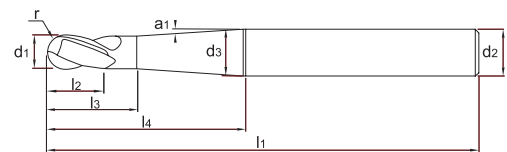
Ref.	d1	d2	d3	l1	l2	l3	r	z
36.275.0030	0.3	4		40	0.5		0,15	2
36.275.0040	0.4	4		40	0.6		0.2	2
36.275.0050	0.5	4		40	0.7		0.25	2
36.275.0060	0.6	4		40	0.9		0.3	2
36.275.0070	0.7	4		40	1.1		0.35	2
36.275.0080	0.8	4		40	1.2		0.4	2
36.275.0090	0.9	4		40	1.4		0.45	2
36.275.0100	1	6	0.95	50	1.5	3	0.5	2
36.275.0150	1.5	6	1.45	50	2	4	0.75	2

Ref.	d1	d2	d3	l1	l2	l3	r	z
36.275.0200	2	6	1.95	50	2.5	5	1	2
36.275.0250	2.5	6	2.4	50	3	7	1.25	2
36.275.0300	3	6	2.85	60	4	10	1.5	2
36.275.0400	4	6	3.85	60	5	10	2	2
36.275.0500	5	6	4.85	60	6	12	2.5	2
36.275.0600	6	6	5.85	60	7	15	3	2
36.275.0800	8	8	7.7	80	9	15	4	2
36.275.1000	10	10	9.7	80	11	25	5	2
36.275.1200	12	12	11.7	80	14	25	6	2



> **36.285 Phantom**

- NL **VHM Precisie Radiusrees, 2-snijder AlTiN-X, HRC, 30-65 HRc**
- FR **Fraise à rayon de précision 2 dents Carbure AlTiN-X, HRC, 30-65 HRc**
- ES **Fresa de punta esférica de precisión MD AlTiN-X, HRC, 30-65 HRc**
- DE **VHM Präzisions-Radiusfräser (2-Schneider) AlTiN-X, HRC, 30-65 HRc**



P 13
 S1000 Nimm²

P 14
 S1400 Nimm²

H 15
 HRC

75-200
 X

60-110
 W

80-135
 V

Ref.	d1	d2	d3	l1	l2	l3	l4	r	z	α1
36.285.0111	1	6	2	60	2	4	23	0.5	2	1°30'
36.285.0112	1	6	4.3	60	2	4	23	0.5	2	5°
36.285.0113	1	6	5	80	2	4	42	0.5	2	3°
36.285.0221	2	6	2.9	60	4	6	23	1	2	1°30'
36.285.0222	2	6	5	60	4	6	23	1	2	5°
36.285.0223	2	6	5.7	80	4	6	41	1	2	3°
36.285.0331	3	6	5.3	90	6	8	52	1.5	2	1°30'
36.285.0333	3	6	5.6	70	6	8	32	1.5	2	3°
36.285.0441	4	6	6	90	8	10	49	2	2	1°30'
36.285.0443	4	6	6	70	8	10	28	2	2	3°

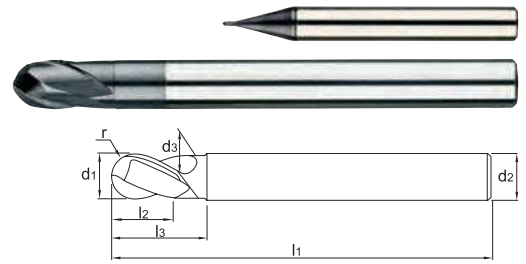
Ref.	d1	d2	d3	l1	l2	l3	l4	r	z	α1
36.285.0551	5	8	7	110	10	12	61	2.5	2	1°30'
36.285.0553	5	8	8	90	10	12	41	2.5	2	3°
36.285.0661	6	8	8	110	12	15	53	3	2	1°30'
36.285.0663	6	8	8	90	12	15	34	3	2	3°
36.285.0871	8	10	10	120	14	17	55	4	2	1°30'
36.285.0873	8	10	10	100	14	17	36	4	2	3°
36.285.1081	10	12	12	130	18	21	59	5	2	1°30'
36.285.1083	10	12	12	110	18	21	40	5	2	3°
36.285.1291	12	16	15	160	22	25	83	6	2	1°30'
36.285.1293	12	16	16	140	22	25	63	6	2	3°





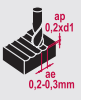
> 36.290 Phantom

NL **VHM Precisie Radiusrees, 2-snijder AITiN-X, HRC, 30-65 HRC**
 FR **Fraise à rayon de précision 2 dents Carbure AITiN-X, HRC, 30-65 HRC**
 ES **Fresa de punta esférica de precisión MD AITiN-X, HRC, 30-65 HRC**
 DE **VHM Präzisions-Radiusfräser (2-Schneider) AITiN-X, HRC, 30-65 HRC**



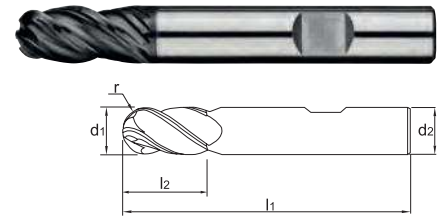
Ref.	d1	d2	d3	l1	l2	l3	r	z
36.290.0100	1	6	0.95	50	1	2.2	0.5	2
36.290.0120	1.2	4	1.1	50	1.2	2.6	0.6	2
36.290.0150	1.5	4	1.4	50	1.5	3	0.75	2
36.290.0200	2	6	1.9	50	2	4	1	2
36.290.0250	2.5	6	2.4	60	2.5	5	1.25	2
36.290.0300	3	6	2.9	60	3	6	1.5	2
36.290.0400	4	6	3.9	70	4	8	2	2
36.290.0500	5	6	4.9	80	5	10	2.5	2
36.290.0600	6	6	5.9	90	6	12	3	2
36.290.0700	7	8	6.9	90	7	14	3.5	2

Ref.	d1	d2	d3	l1	l2	l3	r	z
36.290.0800	8	8	7.9	100	8	16	4	2
36.290.0900	9	10	8.9	100	9	18	4.5	2
36.290.1000	10	10	9.9	100	10	20	5	2
36.290.1200	12	12	11.9	110	12	24	6	2
36.290.1400	14	14	13.8	110	14	28	7	2
36.290.1600	16	16	15.8	140	16	32	8	2
36.290.1800	18	18	17.8	140	18	36	9	2
36.290.2000	20	20	19.8	160	20	40	10	2
36.290.2500	25	25	24.8	180	25	50	12.5	2



> 36.345 Phantom

NL **VHM Radiusrees, 4-snijder AITiN-X, lang, roestvaststaal**
 FR **Fraise à rayon 4 dents Carbure AITiN-X, version longue, Inox**
 ES **Fresa de punta esférica MD AITiN-X, larga, acero inoxidable**
 DE **VHM 4 Schneiden Radiusfräser AITiN-X, lang, rostfreien Stahl**



Ref.	d1	d2	l1	l2	r	z
36.345.0300	3	6	57	8	1.5	4
36.345.0400	4	6	57	11	2	4
36.345.0500	5	6	57	13	2.5	4

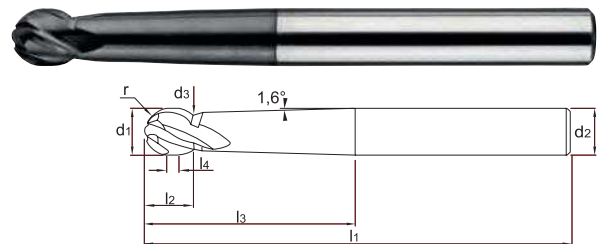
Ref.	d1	d2	l1	l2	r	z
36.345.0600	6	6	57	13	3	4
36.345.0800	8	8	63	19	4	4
36.345.1000	10	10	72	22	5	4

Ref.	d1	d2	l1	l2	r	z
36.345.1200	12	12	83	26	6	4
36.345.1600	16	16	92	32	8	4



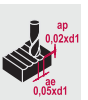
> 36.354 Phantom

NL **VHM Precisie Radiusrees Radiusrees, 4-snijder, AITiN-X, 30-65 HRC**
 FR **Fraise à rayon de précision 4 dents Carbure Fraise à rayon, AITiN-X, 30-65 HRC**
 ES **Fresa de punta esférica de precisión MD Fresa de punta esférica, AITiN-X, 30-65 HRC**
 DE **VHM Präzisions-Radiusfräser 4 Schneiden Radiusfräser, AITiN-X, 30-65 HRC**



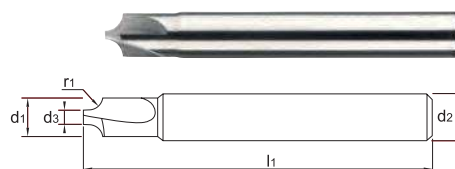
Ref.	d1	d2	d3	l1	l2	l3	l4	r	z
36.354.0500	5	6	4.1	80	6	43	2	2.5	4
36.354.0600	6	6	4.7	100	7	30	2	3	4
36.354.0800	8	8	6.5	100	9	36	3	4	4

Ref.	d1	d2	d3	l1	l2	l3	l4	r	z
36.354.1000	10	10	8.2	100	11	43	3	5	4
36.354.1200	12	12	9.8	100	13	52	3	6	4
36.354.1600	16	16	13.4	150	15	61	3	8	4



> **36.430 Phantom**

NL **VHM Radiusrees, 4-snijder Kwarthol frees**
 FR **Fraise à rayon 4 dents Carbone Fraise à 1/4 de cercle concave**
 ES **Fresa de punta esférica MD Fresa semicóncava de 1/4 de círculo**
 DE **VHM 4 Schneiden Radiusfräser Viertelrund-Profilfräser**



Ref.	r	d1	d2	d3	l1	z
36.430.0100	1	6	6	0.9	50	4
36.430.0150	1.5	6	6	0.9	50	4
36.430.0200	2	6	6	0.9	50	4
36.430.0250	2.5	8	8	0.9	60	4

Ref.	r	d1	d2	d3	l1	z
36.430.0300	3	8	8	1.9	60	4
36.430.0350	3.5	10	10	1.9	60	4
36.430.0400	4	10	10	1.9	60	4
36.430.0450	4.5	12	12	1.9	70	4

Ref.	r	d1	d2	d3	l1	z
36.430.0500	5	12	12	1.9	70	4
36.430.0600	6	16	16	3.9	80	4
36.430.0800	8	20	20	3.9	80	4

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

P 11 = ISO
 5600 Nmm²
 25-35 E Vc = 25-35
 FRC = E

FRC																								
d1 (mm)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
	fz (mm/z)																							
0,3	0,001	0,001	0,001	0,002	0,003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,012	0,015	-	-	-
0,5	0,001	0,001	0,002	0,003	0,006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,019	0,024	-	-	-
0,8	0,002	0,002	0,003	0,005	0,008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,030	0,039	-	-	-
1	0,002	0,006	0,004	0,006	0,009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,037	0,048	0,012	0,008	0,008
1,5	0,003	0,008	0,005	0,009	0,012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,041	0,054	-	-	0,011
2	0,004	0,010	0,007	0,012	0,016	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,011	0,027	-	0,011	0,022	0,035	0,040	0,044	0,057	0,028	0,014	0,026
3	0,006	0,015	0,010	0,016	0,039	0,003	0,004	0,007	0,010	0,010	0,010	0,011	0,027	0,035	-	0,022	0,035	0,040	0,055	0,067	0,091	0,043	0,023	0,026
5	0,008	0,026	0,015	0,026	-	0,009	0,010	0,014	0,020	0,020	0,022	0,027	0,035	0,044	0,048	0,035	0,040	0,055	0,065	0,111	0,156	0,052	0,031	0,045
6	0,010	0,030	0,026	0,032	-	0,011	0,013	0,017	0,024	0,025	0,027	0,035	0,044	0,059	0,059	0,040	0,055	0,065	0,080	0,122	0,174	0,059	0,039	0,060
8	0,015	0,038	0,030	0,040	-	0,016	0,019	0,024	0,032	0,032	0,035	0,044	0,055	0,078	0,067	0,055	0,065	0,080	0,105	0,132	0,189	0,067	0,060	0,090
10	0,026	0,043	0,038	0,045	-	0,021	0,025	0,030	0,038	0,039	0,044	0,055	0,065	0,098	0,071	0,065	0,080	0,105	0,135	0,142	0,199	0,075	0,080	0,120
12	0,030	0,051	0,043	0,060	-	0,026	0,030	0,036	0,046	0,048	0,052	0,065	0,085	0,097	0,078	0,080	0,105	0,135	0,150	0,142	0,212	0,082	0,101	0,150
16	0,032	0,051	0,043	0,060	-	0,032	0,038	0,045	0,054	0,058	0,063	0,085	0,100	0,099	0,117	0,105	0,135	0,150	0,168	-	-	0,092	0,120	0,180
20	0,037	0,051	0,043	0,060	-	0,038	0,045	0,057	0,066	0,070	0,080	0,100	0,135	0,120	-	0,135	0,150	0,168	0,180	-	-	-	-	0,200
22	0,037	0,051	0,043	0,060	-	0,045	0,057	0,066	0,070	0,080	0,100	0,135	0,150	0,128	-	0,150	0,168	0,180	0,200	-	-	-	-	-
25	0,040	0,051	0,043	0,060	-	0,057	0,066	0,070	0,073	0,100	0,135	0,150	0,168	0,135	-	0,168	0,180	0,200	0,220	-	-	-	-	0,109

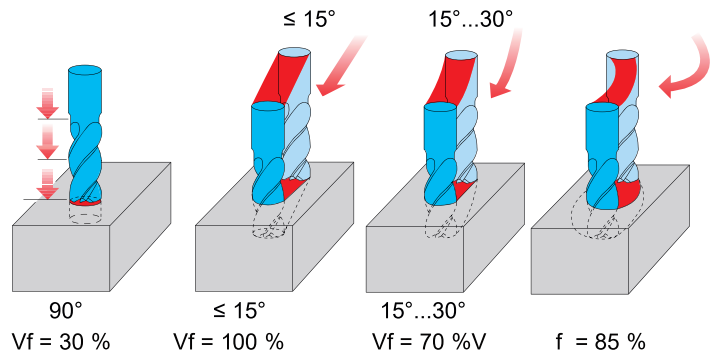
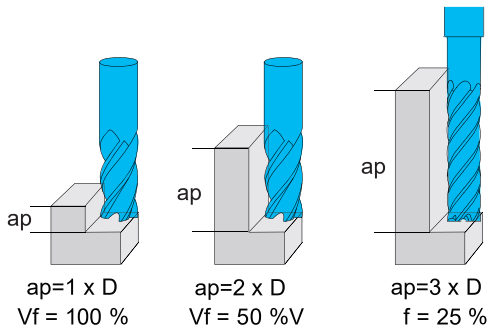
NL Toerentabel
 FR Tableau des vitesses de rotation
 ES Tabla de número de revoluciones
 DE Drehzahltable

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

Vc (m/min)																		
d1 (mm)	5	8	10	12	15	20	25	30	35	40	50	60	70	80	90	100	110	120
	n = rpm																	
1	1592	2546	3183	3820	4775	6366	7958	9549	11141	12732	15915	19099	22282	25465	28648	31831	35014	38197
1,5	1061	1698	2122	2546	3183	4244	5305	6366	7427	8588	10610	12732	14854	16977	19099	21221	23343	25465
2	796	1273	1592	1910	2387	3183	3937	4775	5570	6366	7958	9549	11141	12732	14324	15915	17507	19099
2,5	637	1019	1273	1528	1910	2546	3183	3820	4456	5093	6366	7639	8913	10186	11459	12732	14006	15279
3	531	849	1061	1273	1592	2122	2653	3183	3714	4244	5305	6366	7427	8488	9549	10610	11671	12732
3,5	455	728	909	1091	1364	1819	2274	2728	3183	3638	4547	5457	6366	7276	8185	9095	10004	10913
4	398	637	796	955	1194	1592	1989	2387	2785	3183	3979	4775	5570	6366	7162	7958	8754	9549
4,5	354	566	707	849	1061	1415	1768	2122	2476	2829	3537	4244	4951	5659	6366	7074	7781	8488
5	318	509	637	764	955	1273	1592	1910	2228	2546	3183	3820	4456	5093	5730	6366	7003	7639
5,5	289	463	579	694	868	1157	1447	1739	2026	2315	2894	3472	4051	4630	5209	5787	6366	6945
6	265	424	531	637	796	1061	1326	1592	1857	2122	2653	3183	3714	4244	4775	5305	5836	6366
7	227	364	455	546	682	909	1137	1364	1592	1819	2274	2728	3183	3638	4093	4547	5002	5457
8	199	318	398	477	597	796	995	1194	1393	1592	1989	2387	2785	3183	3581	3979	4377	4775
9	177	283	354	424	531	707	884	1061	1238	1415	1768	2122	2476	2829	3183	3537	3890	4244
10	159	255	318	382	477	637	796	955	1114	1273	1592	1910	2228	2546	2865	3183	3501	3820
11	145	321	289	347	434	579	723	868	1013	1157	1447	1736	2026	2315	2604	2894	3183	3472
12	133	212	265	318	398	531	663	796	928	1061	1326	1592	1857	2122	2387	2653	2918	3183
13	122	196	245	294	367	490	612	735	857	979	1224	1469	1714	1959	2204	2449	2693	2938
14	114	182	227	273	341	455	568	682	796	909	1137	1364	1592	1819	2046	2274	2501	2728
15	106	170	212	255	318	424	531	637	743	849	1061	1273	1485	1698	1910	2122	2334	2546
16	99	159	199	239	298	398	497	597	696	796	995	1194	1393	1592	1790	1989	2188	2387
18	88	141	177	212	265	354	442	531	619	707	884	1061	1238	1415	1592	1768	1945	2122
20	80	127	159	191	239	318	398	477	557	637	796	955	1114	1273	1432	1592	1751	1910
22	72	116	145	174	217	289	362	434	506	579	723	868	1013	1157	1302	1447	1592	1736
24	66	106	133	159	199	265	332	398	464	531	663	796	928	1061	1194	1326	1459	1592
25	64	102	127	153	191	255	318	382	446	509	637	764	891	1019	1146	1273	1401	1528


FRC	fz (mm/z)	Vc	n= rpm
NL: Voedingscode	NL: Voeding per tand (mm/z)	NL: Snijnelheid (m/min)	NL: Spiltoerental (omw/min)
EN: Feed Rate Code	EN: Feed per tooth (mm/z)	EN: cutting speed (m/min)	EN: Spindle R.P.M. (rev/min)
ES: Codificación de velocidad de avance	ES: Avance por diente (mm/z)	ES: Velocidad de corte (m/min)	ES: Velocidad del husillo (rpm)
FR: Codification vitesse d'avance	FR: Avance par dent (mm/z)	FR: Vitesse de coupe (m/min)	FR: Vitesse de broche (tr/min)


NL Voedingswaarde aanpassing
 FR Modification des avances
 ES Modificación de avances
 DE Vorschubanpassung



NL Formules
 FR Formules
 ES Fórmulas
 DE Formeln

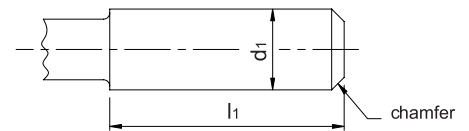
Vc	NL: Snijnsnelheid (m/min) FR: Vitesse de coupe (m/min) ES: Velocidad de corte (m/min) DE: Schnittgeschwindigkeit (m/min)	$Vc = \frac{p \times D \times n}{1000}$
n	NL: Toerental (omw/min) FR: Vitesse de tour (tr/min) ES: Número de revoluciones (rpm) DE: Umdrehung (U/min)	$n = \frac{Vc \times 1000}{p \times D}$
fz	NL: Voeding per tand (mm/z) FR: Avance par dent (mm/z) ES: Avance por diente (mm/z) DE: Vorschub pro Zahn (mm/z)	$fz = \frac{vf}{n \times z}$
Vf	NL: Toerental (omw/min) FR: Vitesse de tour (tr/min) ES: Número de revoluciones (rpm) DE: Umdrehung (U/min)	$vf = (n) \times (z) \times (fz)$
D(eff)	NL: Toerental (omw/min) FR: Vitesse de tour (tr/min) ES: Número de revoluciones (rpm) DE: Umdrehung (U/min)	$D(eff) = 2 \times D \times ap - ap^2$

$\pi = 3.14$ $D =$  (mm) $z =$ no. of flutes
 mb. de dents
 no. de dientes
 Zähnezahl

$ap =$  (mm)

DIN 6535 HA

NL Cilindrische schacht
FR Queue cylindrique
ES Mango cilíndrico
DE Zylinderschaft



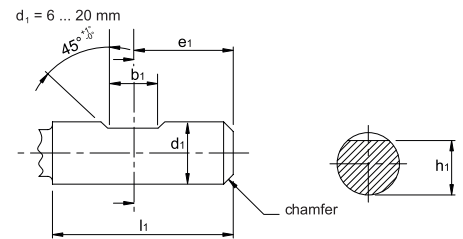
Dimensions in mm	
d_1	l_1
h6	+2 0
3	28
4	28
5	28
6	36
8	36

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

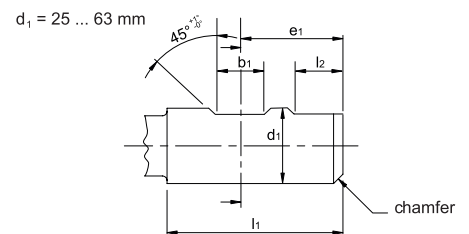
Dimensions in mm	
d_1	l_1
h6	+2 0
32	60
40	70
50	80
63	90

DIN 6535 HB

NL Cilindrische schacht "Weldon"
FR Queue cylindrique "Weldon"
ES Mango cilíndrico "Weldon"
DE Zylinderschaft "Weldon"



Dimensions in mm					
d_1	b_1	e_1	h_1	l_1	l_2
h6	+0.05 0	0 -1	h11	+2 0	+1 0
6	4.2	18	4.8	36	-
8	5.5	18	6.6	36	-
10	7	20	8.4	40	-
12	8	22.5	10.4	45	-
16	10	24	14.2	48	-
20	11	25	18.2	50	-



Dimensions in mm					
d_1	b_1	e_1	h_1	l_1	l_2
h6	+0.05 0	0 -1	h11	+2 0	+1 0
25	12	32	23	56	17
32	14	36	30	60	19
40	14	40	38	70	19
50	18	45	47.8	80	23
63	18	50	60.8	90	23

NL **Vergelijking Hardheid**
 FR **Comparaison de la dureté**
 ES **Comparación de dureza**
 DE **Vergleich der Härte**

Dimensions in mm			
(N/mm ²)	HRc	HB30	HV10
240		71	75
255		76	80
270		81	85
285		86	90
305		90	95
320		95	100
335		100	105
350		105	110
370		109	115
385		114	120
400		119	125
415		124	130
430		128	135
450		133	140
465		138	145
480		143	150
495		147	155
510		152	160
530		157	165
545		162	170
560		166	175
575		171	180
595		176	185
610		181	190
625		185	195
640		190	200
660		195	205
675		199	210
690		204	215
705		209	220
720		214	225
740		219	230
755		223	235
770		228	240
785		233	245
800	22	238	250
820	23	242	255
835	24	247	260
860	25	255	268
870	26	258	272
900	27	266	280

Dimensions in mm			
(N/mm ²)	HRc	HB30	HV10
920	28	273	287
940	29	278	293
970	30	287	302
995	31	295	310
1020	32	301	317
1050	33	311	327
1080	34	319	336
1110	35	328	345
1140	36	337	355
1170	37	346	364
1200	38	354	373
1230	39	363	382
1260	40	372	392
1300	41	383	403
1330	42	393	413
1360	43	402	423
1400	44	413	434
1440	45	424	446
1480	46	435	458
1530	47	449	473
1570	48	460	484
1620	49	472	497
1680	50	488	514
1730	51	501	527
1790	52	517	544
1845	53	532	560
1910	54	549	578
1980	55	567	596
2050	56	584	615
2140	57	607	639
2180	58	622	655
	59		675
	60		698
	61		720
	62		745
	63		773
	64		800
	65		829
	66		864
	67		900
	68		940

