



Performance in Cutting Tools



Performance in Cutting Tools

WICHTIGE INFORMATIONEN

Important Information

WER SIND WIR

About us

Im Januar 2016 entschieden Gert Mader und Harald Wirth das Know How in der Entwicklung, Herstellung und im Vertrieb von Zerspanungswerkzeugen in der **WM-TOOLS GmbH & Co.KG** zu bündeln. Die Firma WM-TOOLS stellt qualitativ hochwertige *Zerspanungswerkzeuge* her. Unsere Kernkompetenzen liegen in der Entwicklung, Produktion und dem Vertrieb von Bohrwerkzeugen, Fräswerkzeugen und Reibwerkzeugen. Ob *Fräswerkzeuge*, *Bohrwerkzeuge* oder *Reibwerkzeuge* aus Vollhartmetall, mit spezieller Beschichtung abgestimmt auf ihre Einsatzbedingungen und Bedürfnisse – wir haben eine Lösung für Ihre Zerspanungsaufgabe. Wir produzieren ausschließlich in Europa und haben den gesamten Fertigungsprozess in unserer Hand. Nur so ist es uns möglich, den höchsten Qualitätsstandard unserer Produkte sicherzustellen.

Unsere Kernkompetenzen liegen in der *Entwicklung, Produktion* und dem *Vertrieb* von *Bohrern*, *Fräsern*, *Reibahlen*, *Sonderwerkzeugen*. Qualität und Innovation bedeuten daher: Wir richten uns nach Ihnen. Ihre Zufriedenheit und Ihre Sicherheit sind unser Antrieb. Unsere Performance ist Ihr Gewinn. Wir sind Spezialisten im Bereich der Zerspanung mit geometrisch bestimmten Schneiden. Unsere Kunden aus verschiedensten industriellen Branchen schätzen die innovativen Komplettlösungen aus einer Hand. Zusammen mit ausgewählten Lieferanten und dem Know-How unserer Mitarbeiter gestalten wir wirtschaftliche und zukunftsorientierte Zerspanungsprozesse.

WICHTIGE INFORMATIONEN

Important Information

WERKZEUGSORTIMENT

Product range

VHM-FRÄSER · VHM-BOHRER · VHM-SENKER UND REIBAHLEN
VHM-SONDERWERKZEUGE · PKD-CBN-SONDERWERKZEUGE

SONDERANFERTIGUNGEN

Special Tools

Wir produzieren Sonderwerkzeuge speziell nach Ihren Anforderungen. Welche Hightech-Lösung auch immer die richtige für Ihre Anforderung ist – wir entwickeln sie. Schnell, zuverlässig und konkurrenzfähig.

TOOLSERVICE

Tool Service

Selbst ein Werkzeug von WM-TOOLS verliert irgendwann seine optimale Schärfe und Oberflächengüte. Deshalb bieten wir unseren Kunden einen Nachschleif- und Nachbeschichtungsservice an. So machen wir aus einem gebrauchten Werkzeug wieder ein neues Werkzeug. Sie erhalten wieder 100 % Schnittleistung. Für einen Bruchteil der Kosten einer Neuanschaffung.

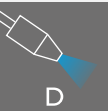
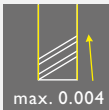
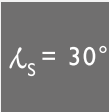
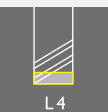
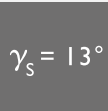
BERATUNGSKOMPETENZ

Consulting

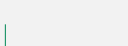
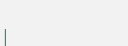
Wer genau versteht, kann die optimale Lösung bieten. Anwendungstechnik: Wir bieten Lösungen und Know-how auch für die anspruchsvollsten Materialien und Bearbeitungsaufgaben. Schnittwertempfehlungen: Für die Auswahl des richtigen und passenden Werkzeuges für Ihre spezielle Anwendung



BEARBEITUNGSSYMBOL E
Machining Symbols



UNIVERSAL
Universal

12 - 13					$\lambda_s = 30^\circ$	$\gamma_s = 13^\circ$									
14 - 15					$\lambda_s = 45^\circ$	$\gamma_s = 13^\circ$									
16 - 17					$\lambda_s = 30^\circ$	$\gamma_s = 13^\circ$									
18 - 19			HPC			$\lambda_s = 43^\circ$	$\gamma_s = 13^\circ$								
20 - 21			HPC			$\lambda_s = 35^\circ$	$\gamma_s = 13^\circ$								
22 - 23			HPC			$\lambda_s = 45^\circ$	$\gamma_s = 13^\circ$								
24 - 25					$\lambda_s = 45^\circ$	$\gamma_s = 13^\circ$									
26 - 27					$\lambda_s = 48^\circ$	$\gamma_s = 13^\circ$									
28 - 33					$\lambda_s = 30^\circ$	$\gamma_s = 13^\circ$			$3 \times D$	$h7$					
34 - 39					$\lambda_s = 30^\circ$	$\gamma_s = 13^\circ$			$5 \times D$	$h7$					

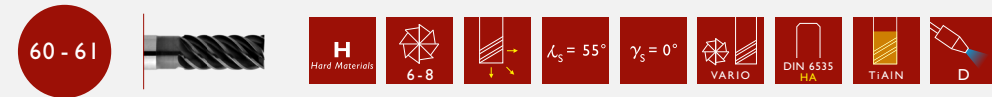
NICHT ROSTENDE METALLE
Non - Rusting Metals

42 - 43		VA Non-Rusting Materials	HPC			$\lambda_s = 36^\circ$	$\gamma_s = 11^\circ$					
44 - 45		VA Non-Rusting Materials	HPC			$\lambda_s = 46^\circ$	$\gamma_s = 11^\circ$					

TI-TITAN
Titanium Alloys

48 - 51		TI Titanium Alloys	HPC			$\lambda_s = 38^\circ$	$\gamma_s = 14^\circ$					
52 - 55		TI Titanium Alloys	HPC			$\lambda_s = 38^\circ$	$\gamma_s = 14^\circ$					

Hard Materials



Non - Ferrous Metals



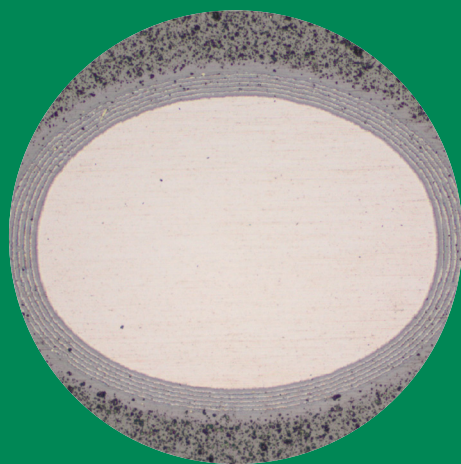
+49(0)8265/9692-16



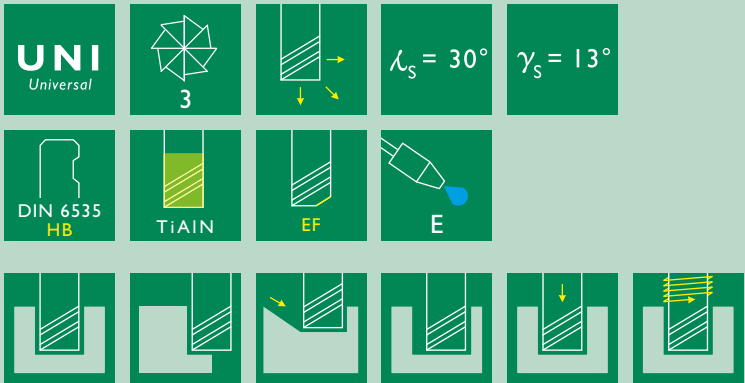
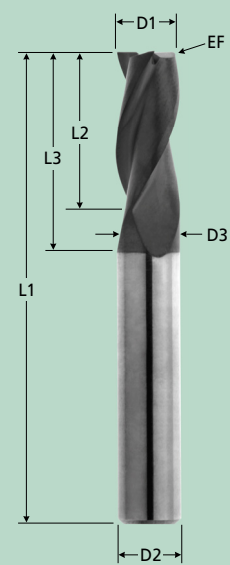
+49(0)8265/9692-21

info@wm-tools.de

[illegible]



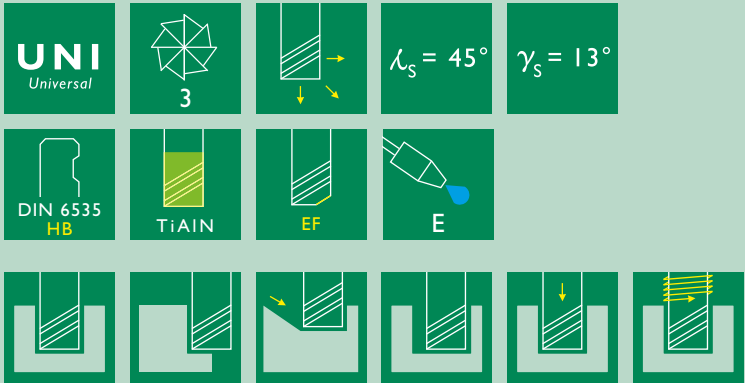
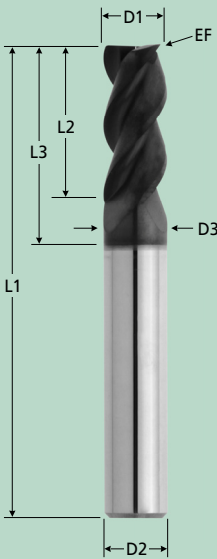
VHM-UNIVERSAL-SCHAFTFRÄSER
Solid carbide universal end mill



Artikel-Nr. Order No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0330L.D030.F010	3.0	6.0	2.9	57.0	8.0	15.0	0.1	17,50	*
F0330L.D040.F010	4.0	6.0	3.9	57.0	11.0	16.0	0.1	17,50	*
F0330L.D050.F010	5.0	6.0	4.9	57.0	13.0	19.0	0.1	17,50	*
F0330L.D060.F010	6.0	6.0	5.9	57.0	13.0	19.0	0.1	17,50	*
F0330L.D080.F020	8.0	8.0	7.8	64.0	21.0	25.0	0.1	22,00	*
F0330L.D100.F020	10.0	10.0	9.8	72.0	22.0	30.0	0.1	28,00	*
F0330L.D120.F030	12.0	12.0	11.7	83.0	26.0	36.0	0.1	42,00	*
F0330L.D140.F030	14.0	14.0	13.7	83.0	26.0	36.0	0.1	54,00	
F0330L.D160.F030	16.0	16.0	15.5	92.0	36.0	42.0	0.1	75,00	*
F0330L.D180.F030	18.0	18.0	17.5	92.0	36.0	42.0	0.1	92,00	
F0330L.D200.F030	20.0	20.0	19.5	104.0	41.0	52.0	0.1	117,00	*
F0330L.D250.F040	25.0	25.0	-	126.0	55.0	-	0.1	291,00	
F0330XL.D060.F010	6.0	6.0	-	72.0	24.0	-	0.1	23,50	
F0330XL.D080.F010	8.0	8.0	-	88.0	38.0	-	0.1	33,50	
F0330XL.D100.F010	10.0	10.0	-	95.0	45.0	-	0.1	41,00	
F0330XL.D120.F010	12.0	12.0	-	110.0	53.0	-	0.1	61,00	
F0330XL.D160.F010	16.0	16.0	-	123.0	63.0	-	0.1	93,00	
F0330XL.D200.F010	20.0	20.0	-	141.0	75.0	-	0.1	165,00	

F0330L · SCHNITTDATEN Cutting Data

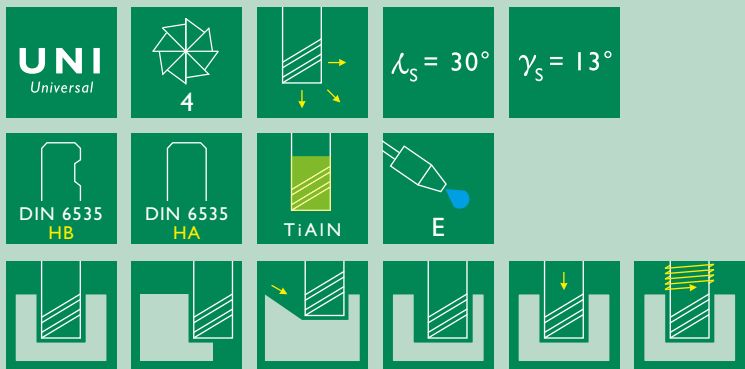
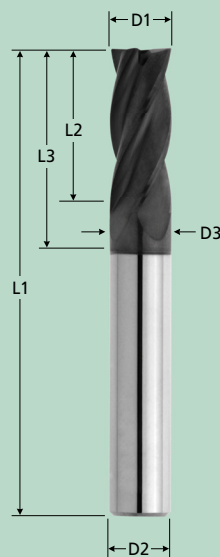
Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	3	100	0.01	1.5	3.0
	4.0	3	100	0.015	2.0	4.0
	5.0	3	100	0.018	2.5	5.0
	6.0	3	100	0.02	3.0	6.0
	8.0	3	100	0.025	4.0	8.0
	10.0	3	100	0.03	5.0	10.0
	12.0	3	100	0.035	6.0	12.0
	14.0	3	100	0.04	7.0	14.0
	16.0	3	100	0.045	8.0	16.0
	18.0	3	100	0.05	9.0	18.0
	20.0	3	100	0.06	10.0	20.0
	25.0	3	100	0.09	12.5	25.0
P2.2 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1100 N/mm²	3.0	3	70	0.01	1.5	3.0
	4.0	3	70	0.015	2.0	4.0
	5.0	3	70	0.018	2.5	5.0
	6.0	3	70	0.02	3.0	6.0
	8.0	3	70	0.025	4.0	8.0
	10.0	3	70	0.03	5.0	10.0
	12.0	3	70	0.035	6.0	12.0
	14.0	3	70	0.04	7.0	14.0
	16.0	3	70	0.045	8.0	16.0
	18.0	3	70	0.05	9.0	18.0
	20.0	3	70	0.06	10.0	20.0
	25.0	3	70	0.09	12.5	25.0
P2.3 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1300 N/mm²	3.0	3	50	0.01	1.5	3.0
	4.0	3	50	0.015	2.0	4.0
	5.0	3	50	0.018	2.5	5.0
	6.0	3	50	0.02	3.0	6.0
	8.0	3	50	0.025	4.0	8.0
	10.0	3	50	0.03	5.0	10.0
	12.0	3	50	0.035	6.0	12.0
	14.0	3	50	0.04	7.0	14.0
	16.0	3	50	0.045	8.0	16.0
	18.0	3	50	0.05	9.0	18.0
	20.0	3	50	0.06	10.0	20.0
	25.0	3	50	0.09	12.5	25.0
M2.1 ROSTFREIE STÄHLE Stainless steel Aust.	3.0	3	40	0.008	1.5	3.0
	4.0	3	40	0.01	2.0	4.0
	5.0	3	40	0.012	2.5	5.0
	6.0	3	40	0.015	3.0	6.0
	8.0	3	40	0.018	4.0	8.0
	10.0	3	40	0.02	5.0	10.0
	12.0	3	40	0.025	6.0	12.0
	14.0	3	40	0.03	7.0	14.0
	16.0	3	40	0.035	8.0	16.0
	18.0	3	40	0.04	9.0	18.0
	20.0	3	40	0.045	10.0	20.0
	25.0	3	40	0.06	12.5	25.0
K1.2 GUSSEISEN Cast Iron	3.0	3	120	0.01	1.5	3.0
	4.0	3	120	0.012	2.0	4.0
	5.0	3	120	0.015	2.5	5.0
	6.0	3	120	0.02	3.0	6.0
	8.0	3	120	0.025	4.0	8.0
	10.0	3	120	0.03	5.0	10.0
	12.0	3	120	0.035	6.0	12.0
	14.0	3	120	0.04	7.0	14.0
	16.0	3	120	0.05	8.0	16.0
	18.0	3	120	0.055	9.0	18.0
	20.0	3	120	0.06	10.0	20.0
	25.0	3	120	0.08	12.5	25.0



Artikel-Nr. Order No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0345L.D030.F010	3.0	6.0	2.9	57.0	8.0	15.0	0.1	17,50	*
F0345L.D040.F010	4.0	6.0	3.9	57.0	11.0	16.0	0.1	17,50	*
F0345L.D050.F010	5.0	6.0	4.9	57.0	13.0	19.0	0.1	17,50	*
F0345L.D060.F010	6.0	6.0	5.9	57.0	13.0	19.0	0.1	17,50	*
F0345L.D080.F010	8.0	8.0	7.8	64.0	21.0	25.0	0.1	22,00	*
F0345L.D100.F010	10.0	10.0	9.8	72.0	22.0	30.0	0.1	28,00	*
F0345L.D120.F010	12.0	12.0	11.7	83.0	26.0	36.0	0.1	42,00	*
F0345L.D140.F010	14.0	14.0	13.7	83.0	26.0	36.0	0.1	54,00	
F0345L.D160.F010	16.0	16.0	15.5	92.0	36.0	42.0	0.1	75,00	*
F0345L.D180.F010	18.0	18.0	17.5	92.0	36.0	42.0	0.1	92,00	
F0345L.D200.F010	20.0	20.0	19.5	104.0	41.0	52.0	0.1	117,00	*
F0345L.D250.F010	25.0	25.0	-	126.0	55.0	-	0.1	291,00	
F0345M.D060.F010	6.0	6.0	-	62.0	18.0	-	0.1	22,00	
F0345M.D080.F010	8.0	8.0	-	68.0	24.0	-	0.1	31,00	
F0345M.D100.F010	10.0	10.0	-	80.0	30.0	-	0.1	41,00	
F0345M.D120.F010	12.0	12.0	-	93.0	36.0	-	0.1	60,00	
F0345M.D140.F010	14.0	14.0	-	99.0	42.0	-	0.1	82,00	
F0345M.D160.F010	16.0	16.0	-	108.0	48.0	-	0.1	93,00	
F0345M.D180.F010	18.0	18.0	-	114.0	54.0	-	0.1	137,00	
F0345M.D200.F010	20.0	20.0	-	126.0	60.0	-	0.1	165,00	

F0345L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	3	100	0.01	1.5	3.0
	4.0	3	100	0.015	2.0	4.0
	5.0	3	100	0.018	2.5	5.0
	6.0	3	100	0.02	3.0	6.0
	8.0	3	100	0.025	4.0	8.0
	10.0	3	100	0.03	5.0	10.0
	12.0	3	100	0.035	6.0	12.0
	14.0	3	100	0.04	7.0	14.0
	16.0	3	100	0.045	8.0	16.0
	18.0	3	100	0.05	9.0	18.0
P2.2 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1100 N/mm²	20.0	3	100	0.06	10.0	20.0
	25.0	3	100	0.09	12.5	25.0
	3.0	3	70	0.01	1.5	3.0
	4.0	3	70	0.015	2.0	4.0
	5.0	3	70	0.018	2.5	5.0
	6.0	3	70	0.02	3.0	6.0
	8.0	3	70	0.025	4.0	8.0
	10.0	3	70	0.03	5.0	10.0
	12.0	3	70	0.035	6.0	12.0
	14.0	3	70	0.04	7.0	14.0
P2.3 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1300 N/mm²	16.0	3	70	0.045	8.0	16.0
	18.0	3	70	0.05	9.0	18.0
	20.0	3	70	0.06	10.0	20.0
	25.0	3	70	0.09	12.5	25.0
	3.0	3	50	0.01	1.5	3.0
	4.0	3	50	0.015	2.0	4.0
	5.0	3	50	0.018	2.5	5.0
	6.0	3	50	0.02	3.0	6.0
	8.0	3	50	0.025	4.0	8.0
	10.0	3	50	0.03	5.0	10.0
M2.1 ROSTFREIE STÄHLE Stainless steel Aust.	12.0	3	50	0.035	6.0	12.0
	14.0	3	50	0.04	7.0	14.0
	16.0	3	50	0.045	8.0	16.0
	18.0	3	50	0.05	9.0	18.0
	20.0	3	50	0.06	10.0	20.0
	25.0	3	50	0.09	12.5	25.0
	3.0	3	40	0.008	1.5	3.0
	4.0	3	40	0.01	2.0	4.0
	5.0	3	40	0.012	2.5	5.0
	6.0	3	40	0.015	3.0	6.0
K1.2 GUSSEISEN Cast Iron	8.0	3	40	0.018	4.0	8.0
	10.0	3	40	0.02	5.0	10.0
	12.0	3	40	0.025	6.0	12.0
	14.0	3	40	0.03	7.0	14.0
	16.0	3	40	0.035	8.0	16.0
	18.0	3	40	0.04	9.0	18.0
	20.0	3	40	0.045	10.0	20.0
	25.0	3	40	0.06	12.5	25.0
	3.0	3	120	0.01	1.5	3.0
	4.0	3	120	0.012	2.0	4.0
	5.0	3	120	0.015	2.5	5.0
	6.0	3	120	0.02	3.0	6.0
	8.0	3	120	0.025	4.0	8.0
	10.0	3	120	0.03	5.0	10.0
	12.0	3	120	0.035	6.0	12.0
	14.0	3	120	0.04	7.0	14.0
	16.0	3	120	0.05	8.0	16.0
	18.0	3	120	0.055	9.0	18.0
	20.0	3	120	0.06	10.0	20.0
	25.0	3	120	0.08	12.5	25.0
Korrekturversatz correction	Ae ≤ 0,8 x d		VC = + 20 %		fz = + 10 %	



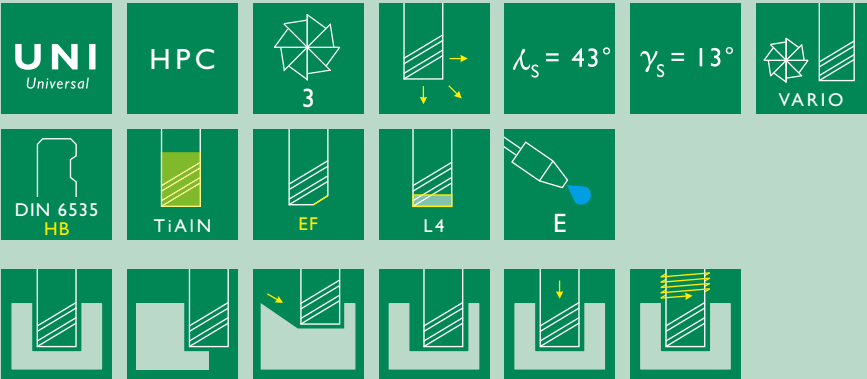
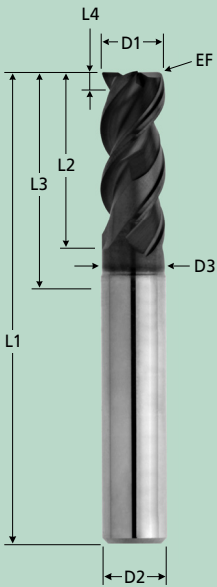
Artikel-Nr. Order No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Preis €	Lagerware Stock
F0430L.D020.F000.HA	2.0	2.0	-	32.0	8.0	-	12,50	*
F0430L.D030.F000.HA	3.0	3.0	-	38.0	12.0	-	12,50	*
F0430L.D040.F000.HA	4.0	4.0	-	40.0	12.0	-	12,50	*
F0430L.D050.F000.HA	5.0	5.0	-	50.0	15.0	-	14,75	*
F0430L.D060.F000	6.0	6.0	5.9	58.0	16.0	19.0	17,50	*
F0430L.D080.F000	8.0	8.0	7.8	63.0	21.0	25.0	22,00	*
F0430L.D100.F000	10.0	10.0	9.7	72.0	25.0	30.0	28,00	*
F0430L.D120.F000	12.0	12.0	11.7	83.0	28.0	36.0	42,00	
F0430L.D160.F000	16.0	16.0	15.5	92.0	35.0	42.0	75,00	*
F0430L.D200.F000	20.0	20.0	19.5	104.0	40.0	52.0	117,00	

F0430L · SCHNITTDATEN *Cutting Data*

Material <i>Processing Material</i>	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE <i>Construction steel</i> ≤ 850 N/mm²	3.0	4	60	0.01	4.5	0.3
	4.0	4	60	0.015	6.0	0.4
	5.0	4	60	0.018	7.5	0.5
	6.0	4	60	0.02	9.0	0.6
	8.0	4	60	0.025	12.0	0.8
	10.0	4	60	0.03	15.0	1.0
	12.0	4	60	0.035	18.0	1.2
	14.0	4	60	0.04	21.0	1.4
	16.0	4	60	0.045	24.0	1.6
	18.0	4	60	0.05	27.0	1.8
P2.2 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1100 N/mm²	20.0	4	60	0.06	30.0	2.0
	25.0	4	60	0.09	37.5	2.5
	3.0	4	50	0.01	4.5	0.3
	4.0	4	50	0.015	6.0	0.4
	5.0	4	50	0.018	7.5	0.5
	6.0	4	50	0.02	9.0	0.6
	8.0	4	50	0.025	12.0	0.8
	10.0	4	50	0.03	15.0	1.0
	12.0	4	50	0.035	18.0	1.2
	14.0	4	50	0.04	21.0	1.4
P2.3 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1300 N/mm²	16.0	4	50	0.045	24.0	1.6
	18.0	4	50	0.05	27.0	1.8
	20.0	4	50	0.06	30.0	2.0
	25.0	4	50	0.09	37.5	2.5
	3.0	4	45	0.01	4.5	0.3
	4.0	4	45	0.015	6.0	0.4
	5.0	4	45	0.018	7.5	0.5
	6.0	4	45	0.02	9.0	0.6
	8.0	4	45	0.025	12.0	0.8
	10.0	4	45	0.03	15.0	1.0
M2.1 ROSTFREIE STÄHLE <i>Stainless steel</i> Aust.	12.0	4	45	0.035	18.0	1.2
	14.0	4	45	0.04	21.0	1.4
	16.0	4	45	0.045	24.0	1.6
	18.0	4	45	0.05	27.0	1.8
	20.0	4	45	0.06	30.0	2.0
	25.0	4	45	0.09	37.5	2.5
	3.0	4	50	0.008	4.5	0.3
	4.0	4	50	0.01	6.0	0.4
	5.0	4	50	0.012	7.5	0.5
	6.0	4	50	0.015	9.0	0.6
K1.2 GUSSEISEN <i>Cast Iron</i>	8.0	4	50	0.02	12.0	0.8
	10.0	4	50	0.025	15.0	1.0
	12.0	4	50	0.03	18.0	1.2
	14.0	4	50	0.035	21.0	1.4
	16.0	4	50	0.04	24.0	1.6
	18.0	4	50	0.045	27.0	1.8
	20.0	4	50	0.05	30.0	2.0
	25.0	4	50	0.08	37.5	2.5
	3.0	4	35	0.008	4.5	0.3
	4.0	4	35	0.01	6.0	0.4

F0343L

VHM-HPC-SCHAFTFRÄSER
Solid carbide high performance end mill

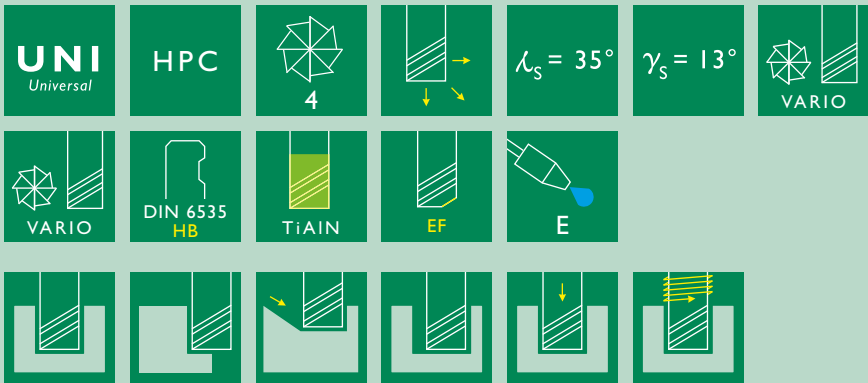
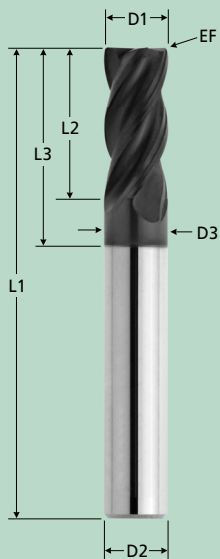


Artikel-Nr. Order No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	EF (mm)	Preis €	Lagerware Stock
F0343L.D010.F010	1.0	6.0	0.95	57.0	2.5	5.0	1.3	0.1	22,50	*
F0343L.D015.F010	1.5	6.0	1.44	57.0	4.0	7.5	1.95	0.1	22,50	
F0343L.D020.F010	2.0	6.0	1.92	57.0	5.0	10.0	2.6	0.1	22,50	*
F0343L.D025.F010	2.5	6.0	2.4	57.0	6.5	12.5	3.25	0.1	22,50	*
F0343L.D030.F010	3.0	6.0	2.9	57.0	8.0	15.0	3.9	0.1	22,50	*
F0343L.D035.F010	3.5	6.0	3.4	57.0	11.0	16.0	4.5	0.1	22,50	
F0343L.D040.F010	4.0	6.0	3.9	57.0	11.0	16.0	5.2	0.1	22,50	*
F0343L.D045.F010	4.5	6.0	4.4	57.0	13.0	19.0	5.8	0.1	22,50	
F0343L.D050.F010	5.0	6.0	4.9	57.0	13.0	19.0	6.5	0.1	22,50	*
F0343L.D055.F010	5.5	6.0	5.4	57.0	13.0	19.0	7.1	0.1	22,50	
F0343L.D060.F010	6.0	6.0	5.9	57.0	13.0	19.0	7.8	0.1	22,50	*
F0343L.D065.F020	6.5	8.0	6.3	63.0	19.0	25.0	8.4	0.2	27,90	
F0343L.D070.F020	7.0	8.0	6.8	63.0	19.0	25.0	9.1	0.2	27,90	*
F0343L.D075.F020	7.5	8.0	7.3	63.0	19.0	25.0	9.7	0.2	27,90	
F0343L.D080.F020	8.0	8.0	7.8	63.0	19.0	25.0	10.4	0.2	27,90	*
F0343L.D085.F020	8.5	10.0	8.2	72.0	22.0	30.0	11.0	0.2	47,10	
F0343L.D090.F020	9.0	10.0	8.7	72.0	22.0	30.0	11.7	0.2	47,10	
F0343L.D095.F020	9.5	10.0	9.2	72.0	22.0	30.0	12.3	0.2	47,10	
F0343L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	13.0	0.2	47,10	*
F0343L.D120.F020	12.0	12.0	11.7	83.0	26.0	36.0	15.6	0.2	63,90	*
F0343L.D140.F020	14.0	14.0	13.7	83.0	26.0	36.0	18.2	0.2	59,00	
F0343L.D160.F020	16.0	16.0	15.5	92.0	32.0	42.0	20.8	0.2	146,50	*
F0343L.D180.F020	18.0	18.0	17.5	92.0	32.0	42.0	23.4	0.2	154,00	
F0343L.D200.F020	20.0	20.0	19.5	104.0	38.0	52.0	26.0	0.2	171,50	*
F0343M.D040.F010	4.0	6.0	-	62.0	16.0	-	5.2	0.1	31,50	
F0343M.D050.F010	5.0	6.0	-	62.0	17.0	-	6.5	0.1	31,50	
F0343M.D060.F010	6.0	6.0	-	62.0	18.0	-	7.8	0.1	31,50	
F0343M.D080.F020	8.0	8.0	-	68.0	24.0	-	10.4	0.2	39,50	
F0343M.D100.F020	10.0	10.0	-	80.0	30.0	-	13.0	0.2	71,50	
F0343M.D120.F020	12.0	12.0	-	93.0	36.0	-	15.6	0.2	95,50	
F0343M.D140.F020	14.0	14.0	-	99.0	42.0	-	18.2	0.2	124,00	
F0343M.D160.F020	16.0	16.0	-	108.0	48.0	-	20.8	0.2	194,50	
F0343M.D180.F020	18.0	18.0	-	114.0	54.0	-	23.4	0.2	247,50	
F0343M.D200.F020	20.0	20.0	-	126.0	60.0	-	26.0	0.2	286,50	

F0343L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	3	190	0.015	3.0	3.0
	4.0	3	190	0.02	4.0	4.0
	5.0	3	190	0.025	5.0	5.0
	6.0	3	190	0.03	6.0	6.0
	8.0	3	190	0.035	8.0	8.0
	10.0	3	190	0.045	10.0	10.0
	12.0	3	190	0.055	12.0	12.0
	14.0	3	190	0.06	14.0	14.0
	16.0	3	190	0.07	16.0	16.0
	18.0	3	190	0.08	18.0	18.0
	20.0	3	190	0.09	20.0	20.0
	25.0	3	190	0.1	25.0	25.0
P2.2 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1100 N/mm²	3.0	3	100	0.01	3.0	3.0
	4.0	3	100	0.015	4.0	4.0
	5.0	3	100	0.018	5.0	5.0
	6.0	3	100	0.02	6.0	6.0
	8.0	3	100	0.03	8.0	8.0
	10.0	3	100	0.04	10.0	10.0
	12.0	3	100	0.05	12.0	12.0
	14.0	3	100	0.055	14.0	14.0
	16.0	3	100	0.06	16.0	16.0
	18.0	3	100	0.07	18.0	18.0
	20.0	3	100	0.08	20.0	20.0
	25.0	3	100	0.1	25.0	25.0
P4.2 KALTARBEITSSTÄHLE Cold working steel ≤ 1600 N/mm²	3.0	3	90	0.01	3.0	3.0
	4.0	3	90	0.015	4.0	4.0
	5.0	3	90	0.02	5.0	5.0
	6.0	3	90	0.025	6.0	6.0
	8.0	3	90	0.035	8.0	8.0
	10.0	3	90	0.045	10.0	10.0
	12.0	3	90	0.05	12.0	12.0
	14.0	3	90	0.055	14.0	14.0
	16.0	3	90	0.06	16.0	16.0
	18.0	3	90	0.07	18.0	18.0
	20.0	3	90	0.075	20.0	20.0
	25.0	3	90	0.09	25.0	25.0
M 2.1 ROSTFREIE STÄHLE Stainless steel Aust.	3.0	3	80	0.007	3.0	3.0
	4.0	3	80	0.01	4.0	4.0
	5.0	3	80	0.015	5.0	5.0
	6.0	3	80	0.02	6.0	6.0
	8.0	3	80	0.025	8.0	8.0
	10.0	3	80	0.03	10.0	10.0
	12.0	3	80	0.035	12.0	12.0
	14.0	3	80	0.04	14.0	14.0
	16.0	3	80	0.045	16.0	16.0
	18.0	3	80	0.055	18.0	18.0
	20.0	3	80	0.065	20.0	20.0
	25.0	3	80	0.08	25.0	25.0
S 2.2 INCONEL 625	3.0	3	30	0.005	3.0	3.0
	4.0	3	30	0.008	4.0	4.0
	5.0	3	30	0.01	5.0	5.0
	6.0	3	30	0.012	6.0	6.0
	8.0	3	30	0.015	8.0	8.0
	10.0	3	30	0.02	10.0	10.0
	12.0	3	30	0.025	12.0	12.0
	14.0	3	30	0.03	14.0	14.0
	16.0	3	30	0.035	16.0	16.0
	18.0	3	30	0.04	18.0	18.0
	20.0	3	30	0.045	20.0	20.0
	25.0	3	30	0.055	25.0	25.0
Korrekturversatz correction	Ae ≤ 0,8*d		VC= +20%		fz= +10%	

VHM-HPC-SCHAFTFRÄSER
Solid carbide high performance end mill



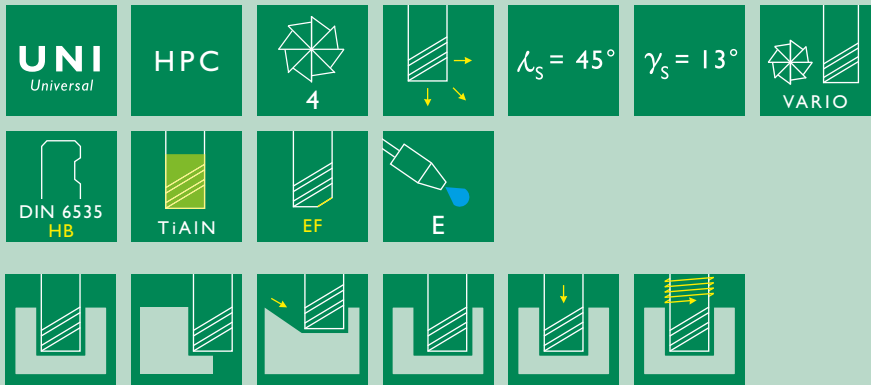
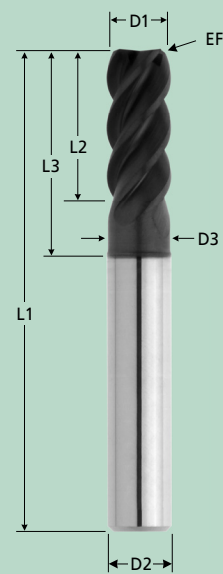
Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0435L.D030.F010	3.0	6.0	-	57.0	8.0	-	0.1	19,00	*
F0435L.D040.F010	4.0	6.0	-	57.0	11.0	-	0.1	19,00	*
F0435L.D050.F010	5.0	6.0	4.9	57.0	13.0	18.0	0.1	19,00	*
F0435L.D060.F010	6.0	6.0	5.9	57.0	13.0	18.0	0.1	19,00	*
F0435L.D080.F020	8.0	8.0	7.8	63.0	21.0	25.0	0.2	27,00	*
F0435L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	37,00	*
F0435L.D120.F020	12.0	12.0	11.7	83.0	26.0	36.0	0.3	49,50	*
F0435L.D140.F030	14.0	14.0	13.7	83.0	26.0	36.0	0.3	69,00	
F0435L.D160.F030	16.0	16.0	15.5	92.0	36.0	42.0	0.3	88,00	*
F0435L.D180.F030	18.0	18.0	17.5	92.0	36.0	42.0	0.3	99,00	
F0435L.D200.F030	20.0	20.0	19.5	103.0	41.0	52.0	0.3	128,00	*
F0435L.D250.F040	25.0	25.0	24.5	126.0	55.0	66.0	0.4	215,00	*
F0435M.D060.F010	6.0	6.0	-	62.0	18.0	-	0.1	20,50	
F0435M.D080.F020	8.0	8.0	-	68.0	24.0	-	0.2	31,50	
F0435M.D100.F020	10.0	10.0	-	80.0	30.0	-	0.2	44,50	
F0435M.D120.F030	12.0	12.0	-	93.0	36.0	-	0.3	61,50	
F0435M.D140.F030	14.0	14.0	-	93.0	36.0	-	0.3	94,50	
F0435M.D160.F030	16.0	16.0	-	108.0	48.0	-	0.3	104,50	
F0435M.D180.F030	18.0	18.0	-	108.0	48.0	-	0.3	121,00	
F0435M.D200.F030	20.0	20.0	-	126.0	60.0	-	0.3	151,00	

F0435L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	4	180	0.015	3.0	3.0
	4.0	4	180	0.02	4.0	4.0
	5.0	4	180	0.03	5.0	5.0
	6.0	4	180	0.03	6.0	6.0
	8.0	4	180	0.04	8.0	8.0
	10.0	4	180	0.065	10.0	10.0
	12.0	4	180	0.07	12.0	12.0
	14.0	4	180	0.08	14.0	14.0
	16.0	4	180	0.09	16.0	16.0
	18.0	4	180	0.1	18.0	18.0
	20.0	4	180	0.11	20.0	20.0
	25.0	4	180	0.15	25.0	25.0
P2.2 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1300 N/mm²	3.0	4	140	0.01	3.0	3.0
	4.0	4	140	0.015	4.0	4.0
	5.0	4	140	0.02	5.0	5.0
	6.0	4	140	0.025	6.0	6.0
	8.0	4	140	0.03	8.0	8.0
	10.0	4	140	0.05	10.0	10.0
	12.0	4	140	0.06	12.0	12.0
	14.0	4	140	0.065	14.0	14.0
	16.0	4	140	0.07	16.0	16.0
	18.0	4	140	0.075	18.0	18.0
	20.0	4	140	0.08	20.0	20.0
	25.0	4	140	0.09	25.0	25.0
P3.2 HOCHLEGIERTE STÄHLE High alloy steel ≤ 1600 N/mm²	3.0	4	60	0.01	3.0	3.0
	4.0	4	60	0.015	4.0	4.0
	5.0	4	60	0.02	5.0	5.0
	6.0	4	60	0.025	6.0	6.0
	8.0	4	60	0.03	8.0	8.0
	10.0	4	60	0.05	10.0	10.0
	12.0	4	60	0.06	12.0	12.0
	14.0	4	60	0.055	14.0	14.0
	16.0	4	60	0.065	16.0	16.0
	18.0	4	60	0.07	18.0	18.0
	20.0	4	60	0.085	20.0	20.0
	25.0	4	60	0.095	25.0	25.0
P4.2 KALTARBEITSSTÄHLE Cold working steel 12% Chrom	3.0	4	80	0.01	3.0	3.0
	4.0	4	80	0.02	4.0	4.0
	5.0	4	80	0.025	5.0	5.0
	6.0	4	80	0.03	6.0	6.0
	8.0	4	80	0.04	8.0	8.0
	10.0	4	80	0.06	10.0	10.0
	12.0	4	80	0.07	12.0	12.0
	14.0	4	80	0.075	14.0	14.0
	16.0	4	80	0.085	16.0	16.0
	18.0	4	80	0.09	18.0	18.0
	20.0	4	80	0.1	20.0	20.0
	25.0	4	80	0.12	25.0	25.0
K1.2 GUSSEISEN Cast Iron	3.0	4	150	0.015	3.0	3.0
	4.0	4	150	0.02	4.0	4.0
	5.0	4	150	0.025	5.0	5.0
	6.0	4	150	0.03	6.0	6.0
	8.0	4	150	0.05	8.0	8.0
	10.0	4	150	0.07	10.0	10.0
	12.0	4	150	0.08	12.0	12.0
	14.0	4	150	0.05	14.0	14.0
	16.0	4	150	0.09	16.0	16.0
	18.0	4	150	0.095	18.0	18.0
	20.0	4	150	0.1	20.0	20.0
	25.0	4	150	0.15	25.0	25.0
Korrekturversatz correction	Ae ≤ 0,8 x d		VC= +20%		fz= +10%	

F0445L

VHM-HPC-SCHAFTFRÄSER
Solid carbide high performance end mill



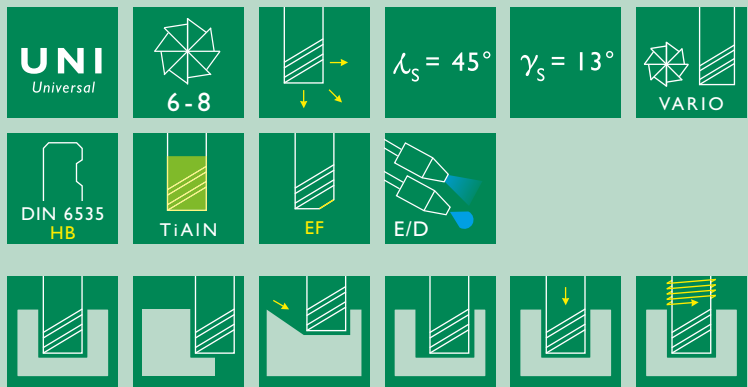
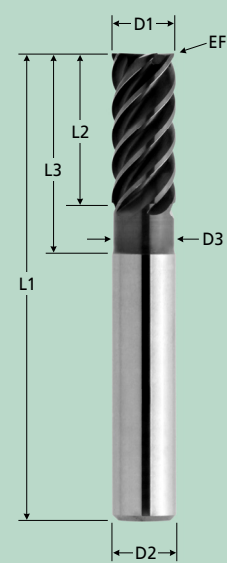
Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0445L.D030.F010	3.0	6.0	-	57.0	8.0	-	0.1	19,00	*
F0445L.D040.F010	4.0	6.0	-	57.0	11.0	-	0.1	19,00	*
F0445L.D050.F010	5.0	6.0	4.9	57.0	13.0	18.0	0.1	19,00	*
F0445L.D060.F010	6.0	6.0	5.9	57.0	13.0	18.0	0.1	19,00	*
F0445L.D080.F020	8.0	8.0	7.8	64.0	21.0	25.0	0.2	27,00	*
F0445L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	37,00	*
F0445L.D120.F030	12.0	12.0	11.7	83.0	26.0	36.0	0.3	49,50	*
F0445L.D140.F030	14.0	14.0	13.7	83.0	26.0	36.0	0.3	69,00	
F0445L.D160.F030	16.0	16.0	15.5	92.0	36.0	42.0	0.3	88,00	*
F0445L.D180.F030	18.0	18.0	17.5	92.0	36.0	42.0	0.3	99,00	
F0445L.D200.F030	20.0	20.0	19.5	104.0	41.0	52.0	0.3	128,00	*
F0445L.D250.F040	25.0	25.0	24.5	126.0	55.0	66.0	0.4	215,00	*
F0445M.D060.F010	6.0	6.0	-	62.0	18.0	-	0.1	20,50	
F0445M.D080.F020	8.0	8.0	-	68.0	24.0	-	0.2	31,50	
F0445M.D100.F020	10.0	10.0	-	80.0	30.0	-	0.2	44,50	
F0445M.D120.F030	12.0	12.0	-	93.0	36.0	-	0.3	61,50	
F0445M.D140.F030	14.0	14.0	-	93.0	36.0	-	0.3	94,50	
F0445M.D160.F030	16.0	16.0	-	108.0	48.0	-	0.3	104,50	
F0445M.D180.F030	18.0	18.0	-	108.0	48.0	-	0.3	121,00	
F0445M.D200.F030	20.0	20.0	-	126.0	60.0	-	0.3	151,00	

F0445L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	4	220	0.015	3.0	3.0
	4.0	4	220	0.025	4.0	4.0
	5.0	4	220	0.03	5.0	5.0
	6.0	4	220	0.04	6.0	6.0
	8.0	4	220	0.045	8.0	8.0
	10.0	4	220	0.065	10.0	10.0
	12.0	4	220	0.07	12.0	12.0
	14.0	4	220	0.09	14.0	14.0
	16.0	4	220	0.1	16.0	16.0
	18.0	4	220	0.11	18.0	18.0
P2.2 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1300 N/mm²	20.0	4	220	0.12	20.0	20.0
	25.0	4	220	0.15	25.0	25.0
	3.0	4	150	0.01	3.0	3.0
	4.0	4	150	0.02	4.0	4.0
	5.0	4	150	0.025	5.0	5.0
	6.0	4	150	0.03	6.0	6.0
	8.0	4	150	0.04	8.0	8.0
	10.0	4	150	0.055	10.0	10.0
	12.0	4	150	0.065	12.0	12.0
	14.0	4	150	0.07	14.0	14.0
P3.2 HOCHLEGIERTE STÄHLE High alloy steel ≤ 1600 N/mm²	16.0	4	150	0.085	16.0	16.0
	18.0	4	150	0.09	18.0	18.0
	20.0	4	150	0.1	20.0	20.0
	25.0	4	150	0.12	25.0	25.0
	3.0	4	70	0.01	3.0	3.0
	4.0	4	70	0.02	4.0	4.0
	5.0	4	70	0.025	5.0	5.0
	6.0	4	70	0.03	6.0	6.0
	8.0	4	70	0.04	8.0	8.0
	10.0	4	70	0.05	10.0	10.0
P4.2 KALTARBEITSSTÄHLE Cold working steel 12% Chrom	12.0	4	70	0.06	12.0	12.0
	14.0	4	70	0.07	14.0	14.0
	16.0	4	70	0.08	16.0	16.0
	18.0	4	70	0.09	18.0	18.0
	20.0	4	70	0.1	20.0	20.0
	25.0	4	70	0.13	25.0	25.0
	3.0	4	80	0.01	3.0	3.0
	4.0	4	80	0.02	4.0	4.0
	5.0	4	80	0.025	5.0	5.0
	6.0	4	80	0.03	6.0	6.0
K1.2 GUSSEISEN Cast Iron	8.0	4	80	0.04	8.0	8.0
	10.0	4	80	0.06	10.0	10.0
	12.0	4	80	0.07	12.0	12.0
	14.0	4	80	0.075	14.0	14.0
	16.0	4	80	0.085	16.0	16.0
	18.0	4	80	0.09	18.0	18.0
	20.0	4	80	0.1	20.0	20.0
	25.0	4	80	0.12	25.0	25.0
	3.0	4	180	0.015	3.0	3.0
	4.0	4	180	0.025	4.0	4.0
	5.0	4	180	0.03	5.0	5.0
	6.0	4	180	0.035	6.0	6.0
	8.0	4	180	0.05	8.0	8.0
	10.0	4	180	0.07	10.0	10.0
	12.0	4	180	0.08	12.0	12.0
	14.0	4	180	0.09	14.0	14.0
	16.0	4	180	0.1	16.0	16.0
	18.0	4	180	0.11	18.0	18.0
	20.0	4	180	0.12	20.0	20.0
	25.0	4	180	0.15	25.0	25.0
Korrekturversatz correction	Ae ≤ 0,8 x d		VC = + 20 %		fz = + 10 %	

F0645L

VHM-UNIVERSAL-SCHLICHTFRÄSER
Solid carbide universal finishing end mill

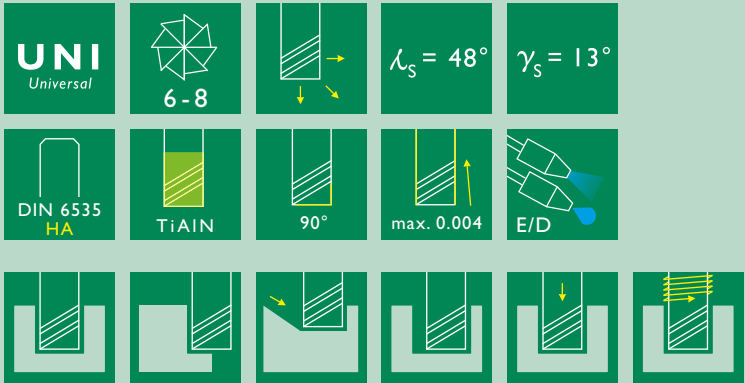
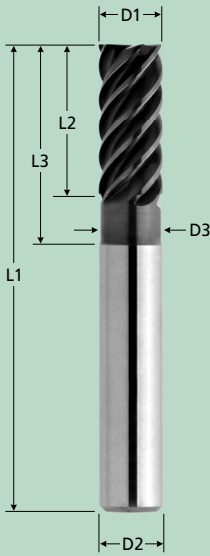


Artikel-Nr. Order No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Z flutes	Preis €	Lagerware Stock
F0645L.D040.F010	4.0	6.0	3.9	57.0	11.0	16.0	0.1	6	18,50	*
F0645L.D050.F010	5.0	6.0	4.9	57.0	13.0	19.0	0.1	6	18,50	*
F0645L.D060.F010	6.0	6.0	5.9	57.0	13.0	19.0	0.1	6	18,50	*
F0645L.D080.F010	8.0	8.0	7.8	64.0	21.0	25.0	0.1	6	27,00	*
F0645L.D100.F010	10.0	10.0	9.7	72.0	22.0	30.0	0.1	6	37,00	*
F0645L.D120.F010	12.0	12.0	11.7	83.0	26.0	36.0	0.1	6	49,50	*
F0645L.D140.F010	14.0	14.0	13.7	83.0	26.0	36.0	0.1	6	69,00	
F0645L.D160.F010	16.0	16.0	15.5	92.0	36.0	42.0	0.1	6	78,90	*
F0645L.D180.F010	18.0	18.0	17.5	92.0	36.0	42.0	0.1	8	90,50	
F0645L.D200.F010	20.0	20.0	19.5	104.0	41.0	52.0	0.1	8	110,50	*
F0645L.D250.F010	25.0	25.0	-	126.0	55.0	-	0.1	8	259,00	
F0645M.D040.F010	4.0	6.0	-	62.0	16.0	-	0.1	6	18,90	*
F0645M.D050.F010	5.0	6.0	-	62.0	18.0	-	0.1	6	18,90	*
F0645M.D060.F010	6.0	6.0	-	62.0	18.0	-	0.1	6	18,90	*
F0645M.D080.F010	8.0	8.0	-	68.0	24.0	-	0.1	6	27,30	*
F0645M.D100.F010	10.0	10.0	-	80.0	30.0	-	0.1	6	35,80	*
F0645M.D120.F010	12.0	12.0	-	93.0	36.0	-	0.1	6	56,00	*
F0645M.D140.F010	14.0	14.0	-	99.0	42.0	-	0.1	6	75,50	
F0645M.D160.F010	16.0	16.0	-	108.0	48.0	-	0.1	6	85,00	*
F0645M.D180.F010	18.0	18.0	-	114.0	54.0	-	0.1	8	103,00	
F0645M.D200.F010	20.0	20.0	-	126.0	60.0	-	0.1	8	115,00	*

F0645L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	6	220	0.01	0.01	0.15
	4.0	6	220	0.01	0.015	0.2
	5.0	6	220	0.015	0.02	0.3
	6.0	6	220	0.02	0.025	0.3
	8.0	6	220	0.025	0.04	0.4
	10.0	6	220	0.03	0.05	0.5
	12.0	6	220	0.045	0.06	0.6
	14.0	6	220	0.045	0.07	0.7
	16.0	6	220	0.05	0.08	0.8
	18.0	6	220	0.055	0.09	0.9
	20.0	8	220	0.06	0.1	1.0
	25.0	8	220	0.09	0.13	1.3
P2.2 VERGÜTUNGSSTÄHLE Heat treatable steel ≤ 1300 N/mm²	3.0	6	200	0.01	6.0	0.15
	4.0	6	200	0.015	8.0	0.2
	5.0	6	200	0.02	10.0	0.3
	6.0	6	200	0.025	12.0	0.3
	8.0	6	200	0.04	16.0	0.4
	10.0	6	200	0.05	20.0	0.5
	12.0	6	200	0.06	24.0	0.6
	14.0	6	200	0.07	28.0	0.7
	16.0	6	200	0.08	32.0	0.8
	18.0	6	200	0.09	36.0	0.9
	20.0	8	200	0.1	40.0	1.0
	25.0	8	200	0.13	50.0	1.3
P3.2 HOCHLEGIERTE STÄHLE High alloy steel ≤ 1600 N/mm²	3.0	6	180	0.01	6.0	0.15
	4.0	6	180	0.015	8.0	0.2
	5.0	6	180	0.02	10.0	0.3
	6.0	6	180	0.025	12.0	0.3
	8.0	6	180	0.04	16.0	0.4
	10.0	6	180	0.05	20.0	0.5
	12.0	6	180	0.06	24.0	0.6
	14.0	6	180	0.07	28.0	0.7
	16.0	6	180	0.08	32.0	0.8
	18.0	6	180	0.09	36.0	0.9
	20.0	8	180	0.1	40.0	1.0
	25.0	8	180	0.13	50.0	1.3
P4.2 KALTARBEITSSTÄHLE Cold working steel 12% Chrom	3.0	6	170	0.01	6.0	0.15
	4.0	6	170	0.015	8.0	0.2
	5.0	6	170	0.02	10.0	0.3
	6.0	6	170	0.025	12.0	0.3
	8.0	6	170	0.04	16.0	0.4
	10.0	6	170	0.05	20.0	0.5
	12.0	6	170	0.06	24.0	0.6
	14.0	6	170	0.07	28.0	0.7
	16.0	6	170	0.08	32.0	0.8
	18.0	6	170	0.09	36.0	0.9
	20.0	8	170	0.1	40.0	1.0
	25.0	8	170	0.13	50.0	1.3
K1.2 GUSSEISEN Cast Iron	3.0	6	220	0.015	6.0	3.0
	4.0	6	220	0.025	8.0	4.0
	5.0	6	220	0.03	10.0	5.0
	6.0	6	220	0.035	12.0	6.0
	8.0	6	220	0.05	16.0	8.0
	10.0	6	220	0.07	20.0	10.0
	12.0	6	220	0.08	24.0	12.0
	14.0	6	220	0.09	28.0	14.0
	16.0	6	220	0.1	32.0	16.0
	18.0	6	220	0.11	36.0	18.0
	20.0	8	220	0.12	40.0	20.0
	25.0	8	220	0.15	50.0	25.0

VHM-HPC-PRÄZISIONS-SCHLICHTFRÄSER
Solid carbide high performance precision finishing end mill

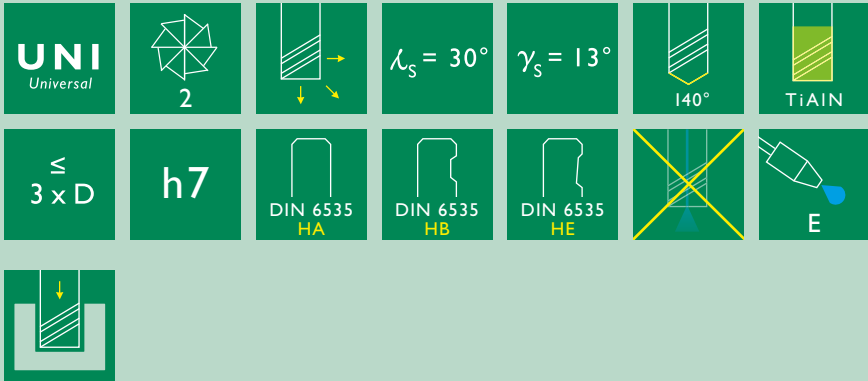
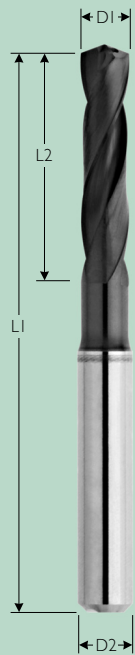


Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Z flutes	Preis €	Lagerware Stock
F0648L.D060.F000	6.0	6.0	5.9	57.0	13.0	19.0	6	24,50	*
F0648L.D080.F000	8.0	8.0	7.8	63.0	19.0	25.0	6	29,50	*
F0648L.D100.F000	10.0	10.0	9.7	72.0	22.0	30.0	6	46,50	*
F0648L.D120.F000	12.0	12.0	11.7	83.0	26.0	36.0	6	68,50	*
F0648L.D160.F000	16.0	16.0	15.5	92.0	32.0	42.0	8	118,50	*
F0648L.D200.F000	20.0	20.0	19.5	104.0	38.0	52.0	8	134,50	*
F0648XL.D060.F000	6.0	6.0	-	80.0	33.0	-	6	46,50	
F0648XL.D080.F000	8.0	8.0	-	100.0	40.0	-	6	66,50	
F0648XL.D100.F000	10.0	10.0	-	100.0	55.0	-	6	89,50	
F0648XL.D120.F000	12.0	12.0	-	120.0	65.0	-	6	109,50	
F0648XL.D160.F000	16.0	16.0	-	150.0	85.0	-	8	299,50	
F0648XL.D200.F000	20.0	20.0	-	160.0	100.0	-	8	361,00	

F0648L · SCHNITTDATEN *Cutting Data*

Material <i>Processing Material</i>	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P2.2 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1100 N/mm²	3.0	6	200	0.01	6.0	0.15
	4.0	6	200	0.015	8.0	0.2
	5.0	6	200	0.02	10.0	0.25
	6.0	6	200	0.025	12.0	0.3
	8.0	6	200	0.04	16.0	0.4
	10.0	6	200	0.05	20.0	0.5
	12.0	6	200	0.06	24.0	0.6
	14.0	6	200	0.07	28.0	0.7
	16.0	6	200	0.08	32.0	0.8
	18.0	6	200	0.09	36.0	0.9
	20.0	6	200	0.1	40.0	1.0
	25.0	6	200	0.13	50.0	1.2
P4.2 KALTARBEITSSTÄHLE <i>Cold working steel</i> 12% Chrom	3.0	6	170	0.01	6.0	0.15
	4.0	6	170	0.015	8.0	0.2
	5.0	6	170	0.02	10.0	0.25
	6.0	6	170	0.025	12.0	0.3
	8.0	6	170	0.04	16.0	0.4
	10.0	6	170	0.05	20.0	0.5
	12.0	6	170	0.06	24.0	0.6
	14.0	6	170	0.07	28.0	0.7
	16.0	6	170	0.08	32.0	0.8
	18.0	6	170	0.09	36.0	0.9
	20.0	6	170	0.1	40.0	1.0
	25.0	6	170	0.13	50.0	1.2
M1.3 ROSTFREIE STÄHLE <i>Stainless steel</i>	3.0	6	100	0.01	6.0	0.15
	4.0	6	100	0.02	8.0	0.2
	5.0	6	100	0.025	10.0	0.25
	6.0	6	100	0.02	12.0	0.3
	8.0	6	100	0.03	16.0	0.4
	10.0	6	100	0.04	20.0	0.5
	12.0	6	100	0.05	24.0	0.6
	14.0	6	100	0.06	28.0	0.7
	16.0	6	100	0.07	32.0	0.8
	18.0	6	100	0.08	36.0	0.9
	20.0	6	100	0.09	40.0	1.0
	25.0	6	100	0.12	50.0	1.2
S2.3 HOCHWARMFESTE LEGIERUNGEN ???????????????? INCONEL 718	3.0	6	40	0.01	6.0	0.15
	4.0	6	40	0.02	8.0	0.2
	5.0	6	40	0.025	10.0	0.25
	6.0	6	40	0.015	12.0	0.3
	8.0	6	40	0.02	16.0	0.4
	10.0	6	40	0.025	20.0	0.5
	12.0	6	40	0.03	24.0	0.6
	14.0	6	40	0.035	28.0	0.7
	16.0	6	40	0.04	32.0	0.8
	18.0	6	40	0.045	36.0	0.9
	20.0	6	40	0.05	40.0	1.0
	25.0	6	40	0.08	50.0	1.2
K1.2 GUSSEISEN <i>Cast Iron</i>	3.0	6	220	0.015	6.0	0.15
	4.0	6	220	0.025	8.0	0.2
	5.0	6	220	0.03	10.0	0.25
	6.0	6	220	0.035	12.0	0.3
	8.0	6	220	0.05	16.0	0.4
	10.0	6	220	0.07	20.0	0.5
	12.0	6	220	0.08	24.0	0.6
	14.0	6	220	0.09	28.0	0.7
	16.0	6	220	0.1	32.0	0.8
	18.0	6	220	0.11	36.0	0.9
	20.0	6	220	0.12	40.0	1.0
	25.0	6	220	0.15	50.0	1.2

VHM-UNIVERSAL-SPIRALBOHRER
Solid carbide drill



Artikel-Nr. Order No.	Gewindebohrer Taps	Gewindeformer Forming taps	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware Stock
B2003.0100.3D.HA		M1.1	1.0	3.0	38.0	3.0	25,00	*	*	
B2003.0110.3D.HA	M1.4	M1.2	1.1	3.0	38.0	3.0	25,00	*	*	
B2003.0120.3D.HA			1.2	3.0	38.0	3.0	25,00	*	*	
B2003.0130.3D.HA			1.3	3.0	38.0	3.0	25,00	*	*	
B2003.0140.3D.HA			1.4	3.0	38.0	3.0	25,00	*	*	
B2003.0150.3D.HA			1.5	3.0	50.0	7.0	27,50	*	*	
B2003.0160.3D.HA	M2		1.6	3.0	50.0	7.0	27,50	*	*	
B2003.0170.3D.HA			1.7	3.0	50.0	9.0	27,50	*	*	
B2003.0180.3D.HA			1.8	3.0	50.0	9.0	27,50	*	*	
B2003.0190.3D.HA	M2.3		1.9	3.0	50.0	9.0	27,50	*	*	
B2003.0200.3D.HA			2.0	3.0	50.0	10.0	27,50	*	*	
B2003.0210.3D.HA			2.1	3.0	50.0	10.0	27,50	*	*	
B2003.0220.3D.HA			2.2	3.0	50.0	10.0	27,50	*	*	
B2003.0230.3D.HA			2.3	3.0	50.0	10.0	27,50	*	*	
B2003.0240.3D.HA			2.4	3.0	50.0	10.0	27,50	*	*	
B2003.0250.3D.HA	M3		2.5	3.0	50.0	14.0	27,50	*	*	
B2003.0260.3D.HA			2.6	3.0	50.0	14.0	27,50	*	*	
B2003.0270.3D.HA			2.7	3.0	50.0	14.0	27,50	*	*	
B2003.0280.3D.HA		M3	2.8	3.0	50.0	14.0	27,50	*	*	
B2003.0290.3D.HA	M3.5	M3 x 0.25	2.9	3.0	50.0	14.0	27,50	*	*	

Artikel-Nr. Order No.	Gewindebohrer Taps	Gewindeformer Forming taps	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware Stock
B2003.0300.3D.HA			3.0	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0310.3D.HA			3.1	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0320.3D.HA			3.2	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0330.3D.HA	M4	M3.5 x 0.5	3.3	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0340.3D.HA			3.4	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0350.3D.HA	M4 x 0.5		3.5	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0360.3D.HA			3.6	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0370.3D.HA	M4.5	M4	3.7	6.0	62.0	14.0	25,50	29,50	29,50	
B2003.0380.3D.HA		M4 x 0.5	3.8	6.0	66.0	17.0	25,50	29,50	29,50	
B2003.0390.3D.HA			3.9	6.0	66.0	17.0	25,50	29,50	29,50	
B2003.0400.3D.HA	M4.5 x 0.5		4.0	6.0	66.0	17.0	25,50	29,50	29,50	
B2003.0410.3D.HA			4.1	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0420.3D.HA	M5	M4.5	4.2	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0430.3D.HA		M4.5 x 0,5	4.3	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0440.3D.HA			4.4	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0450.3D.HA	M5 x 0.5		4.5	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0460.3D.HA	M5.5		4.6	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0470.3D.HA		M5 x 0.75	4.7	6.0	66.0	19.0	25,50	29,50	29,50	
B2003.0480.3D.HA		M5 x 0.5	4.8	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0490.3D.HA			4.9	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0500.3D.HA	M6 / M5.5 x 0.5		5.0	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0510.3D.HA		M5.5	5.1	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0520.3D.HA	M6 x 0.75		5.2	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0530.3D.HA		M5.5 x 0.5	5.3	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0540.3D.HA			5.4	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0550.3D.HA	M6 x 0.5		5.5	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0560.3D.HA		M6	5.6	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0570.3D.HA		M6 x 0.75	5.7	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0580.3D.HA		M6 x 0.5	5.8	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0590.3D.HA			5.9	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0600.3D.HA	M7		6.0	6.0	66.0	24.0	25,50	29,50	29,50	
B2003.0610.3D.HA			6.1	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0620.3D.HA	M7 x 0.75		6.2	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0630.3D.HA			6.3	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0640.3D.HA			6.4	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0650.3D.HA			6.5	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0660.3D.HA		M7	6.6	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0670.3D.HA		M7 x 0.75	6.7	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0680.3D.HA	M8	M7 x 0.5	6.8	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0690.3D.HA			6.9	8.0	79.0	28.0	41,00	45,00	45,00	
B2003.0700.3D.HA	M8 x 1.0		7.0	8.0	79.0	28.0	41,00	45,00	45,00	

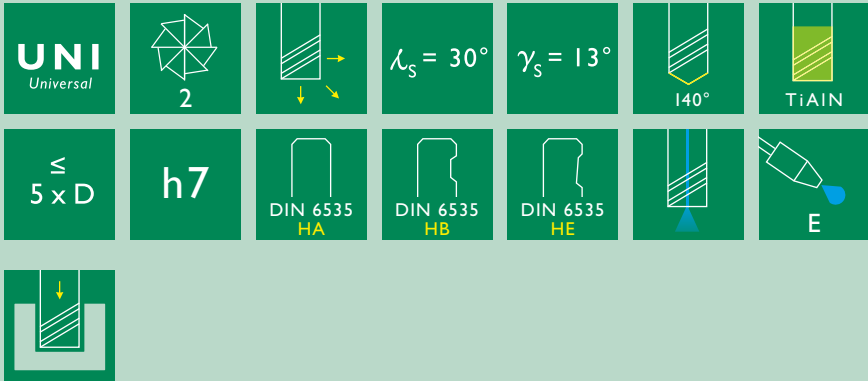
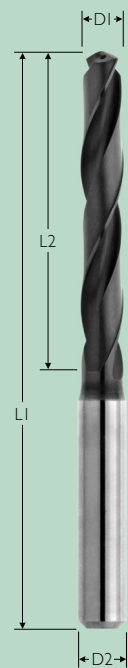
Artikel-Nr. <i>Order No.</i>	Gewindebohrer <i>Taps</i>	Gewindeformer <i>Forming taps</i>	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware <i>Stock</i>
B2003.0710.3D.HA			7.1	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0720.3D.HA	M8 x 0.75		7.2	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0730.3D.HA			7.3	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0740.3D.HA			7.4	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0750.3D.HA	M8 x 0.5		7.5	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0760.3D.HA		M8 x 1.0	7.6	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0770.3D.HA		M8 x 0.75	7.7	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0780.3D.HA	M9	M8 x 0.5	7.8	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0790.3D.HA			7.9	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0800.3D.HA	M9 x 1.0		8.0	8.0	79.0	32.0	41,00	45,00	45,00	
B2003.0810.3D.HA			8.1	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0820.3D.HA	M9 x 0.75		8.2	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0830.3D.HA			8.3	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0840.3D.HA			8.4	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0850.3D.HA	M10		8.5	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0860.3D.HA		M9 x 1.0	8.6	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0870.3D.HA		M9 x 0.75	8.7	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0880.3D.HA	M10 x 1.25	M9 x 0.5	8.8	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0890.3D.HA			8.9	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0900.3D.HA	M10 x 1.0		9.0	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0910.3D.HA			9.1	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0920.3D.HA	M10 x 0.75		9.2	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0930.3D.HA			9.3	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0940.3D.HA			9.4	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0950.3D.HA	M11		9.5	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0960.3D.HA		M10 x 1.0	9.6	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0970.3D.HA		M10 x 0.75	9.7	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0980.3D.HA		M10 x 0.5	9.8	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.0990.3D.HA			9.9	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.1000.3D.HA	M11 x 1.0		10.0	10.0	89.0	38.0	53,00	57,00	57,00	
B2003.1020.3D.HA	M12 / M11 x 0.75		10.2	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1030.3D.HA			10.3	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1040.3D.HA			10.4	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1050.3D.HA	M12 x 1.5		10.5	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1060.3D.HA		M11 x 1.0	10.6	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1070.3D.HA		M11 x 0.75	10.7	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1080.3D.HA	M12 x 1.25		10.8	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1090.3D.HA			10.9	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1100.3D.HA	M12 x 1.0		11.0	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1120.3D.HA			11.2	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1150.3D.HA			11.5	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1180.3D.HA			11.8	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1200.3D.HA	M14		12.0	12.0	102.0	40.0	67,00	71,00	71,00	
B2003.1230.3D.HA			12.3	14.0	107.0	43.0	98,00	104,00	104,00	
B2003.1250.3D.HA	M14 x 1.5		12.5	14.0	107.0	43.0	98,00	104,00	104,00	

Artikel-Nr. <i>Order No.</i>	Gewindebohrer <i>Taps</i>	Gewindeformer <i>Forming taps</i>	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware <i>Stock</i>
B2003.1280.3D.HA	M14 x 1.25		12.8	14.0	107.0	43.0	98,00	104,00	104,00	
B2003.1300.3D.HA	M14 x 1.0		13.0	14.0	107.0	43.0	98,00	104,00	104,00	
B2003.1350.3D.HA			13.5	14.0	107.0	43.0	98,00	104,00	104,00	
B2003.1380.3D.HA			13.8	14.0	107.0	43.0	98,00	104,00	104,00	
B2003.1400.3D.HA	M16 / M15 x 1.0		14.0	14.0	107.0	43.0	98,00	104,00	104,00	
B2003.1450.3D.HA	M16 x 1.5		14.5	16.0	115.0	45.0	122,00	128,00	128,00	
B2003.1480.3D.HA			14.8	16.0	115.0	45.0	122,00	128,00	128,00	
B2003.1500.3D.HA	M16 x 1.0		15.0	16.0	115.0	45.0	122,00	128,00	128,00	
B2003.1550.3D.HA	M18		15.5	16.0	115.0	45.0	122,00	128,00	128,00	
B2003.1580.3D.HA			15.8	16.0	115.0	45.0	122,00	128,00	128,00	
B2003.1600.3D.HA	M18 x 2.0		16.0	16.0	115.0	45.0	122,00	128,00	128,00	
B2003.1650.3D.HA			16.5	18.0	123.0	51.0	153,00	159,00	159,00	
B2003.1680.3D.HA			16.8	18.0	123.0	51.0	153,00	159,00	159,00	
B2003.1700.3D.HA			17.0	18.0	123.0	51.0	153,00	159,00	159,00	
B2003.1750.3D.HA	M20		17.5	18.0	123.0	51.0	153,00	159,00	159,00	
B2003.1780.3D.HA			17.8	18.0	123.0	51.0	153,00	159,00	159,00	
B2003.1800.3D.HA			18.0	18.0	123.0	51.0	153,00	159,00	159,00	
B2003.1850.3D.HA			18.5	20.0	131.0	55.0	187,00	193,00	193,00	
B2003.1900.3D.HA			19.0	20.0	131.0	55.0	187,00	193,00	193,00	
B2003.1950.3D.HA	M22		19.5	20.0	131.0	55.0	187,00	193,00	193,00	
B2003.1980.3D.HA			19.8	20.0	131.0	55.0	187,00	193,00	193,00	
B2003.2000.3D.HA			20.0	20.0	131.0	55.0	187,00	193,00	193,00	

Material <i>Processing Material</i>	D (mm)	Z <i>flutes</i>	Vc m/min	fz (mm)
P1.1 BAUSTÄHLE <i>Construction steel</i> ≤ 850 N/mm²	1.0 - 1.5	2	90	0.025
	1.6 - 2.0	2	90	0.03
	2.1 - 2.5	2	90	0.045
	2.5 - 3.0	2	90	0.06
	3.1 - 4.0	2	90	0.07
	4.0 - 5.0	2	90	0.09
	5.1 - 6.0	2	90	0.12
	6.0 - 8.0	2	90	0.15
	8.0 - 10.0	2	90	0.185
	10.1 - 14.0	2	90	0.22
	14.1 - 16.0	2	90	0.25
	16.1 - 18.0	2	90	0.27
	18.1 - 20.0	2	90	0.29
P2.2 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1100 N/mm²	1.0 - 1.5	2	75	0.01
	1.6 - 2.0	2	75	0.02
	2.1 - 2.5	2	75	0.025
	2.5 - 3.0	2	75	0.03
	3.1 - 4.0	2	75	0.04
	4.0 - 5.0	2	75	0.055
	5.1 - 6.0	2	75	0.065
	6.0 - 8.0	2	75	0.07
	8.0 - 10.0	2	75	0.1
	10.1 - 14.0	2	75	0.12
	14.1 - 16.0	2	75	0.13
	16.1 - 18.0	2	75	0.19
	18.1 - 20.0	2	75	0.21
P2.3 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1300 N/mm²	1.0 - 1.5	2	60	0.01
	1.6 - 2.0	2	60	0.02
	2.1 - 2.5	2	60	0.025
	2.5 - 3.0	2	60	0.03
	3.1 - 4.0	2	60	0.04
	4.0 - 5.0	2	60	0.055
	5.1 - 6.0	2	60	0.065
	6.0 - 8.0	2	60	0.07
	8.0 - 10.0	2	60	0.1
	10.1 - 14.0	2	60	0.12
	14.1 - 16.0	2	60	0.13
	16.1 - 18.0	2	60	0.19
	18.1 - 20.0	2	60	0.21

Material <i>Processing Material</i>	D (mm)	Z <i>flutes</i>	Vc m/min	fz (mm)
P4.2 KALTARBEITSSTÄHLE <i>Cold working steel</i> 12% Chrom	1.0 - 1.5	2	40	0.01
	1.6 - 2.0	2	40	0.02
	2.1 - 2.5	2	40	0.025
	2.5 - 3.0	2	40	0.03
	3.1 - 4.0	2	40	0.04
	4.0 - 5.0	2	40	0.055
	5.1 - 6.0	2	40	0.065
	6.0 - 8.0	2	40	0.07
	8.0 - 10.0	2	40	0.1
	10.1 - 14.0	2	40	0.12
	14.1 - 16.0	2	40	0.13
	16.1 - 18.0	2	40	0.19
	18.1 - 20.0	2	40	0.21
K1.2 GUSSEISEN <i>Cast Iron</i>	1.0 - 1.5	2	95	0.025
	1.6 - 2.0	2	95	0.035
	2.1 - 2.5	2	95	0.045
	2.5 - 3.0	2	95	0.065
	3.1 - 4.0	2	95	0.095
	4.0 - 5.0	2	95	0.13
	5.1 - 6.0	2	95	0.155
	6.0 - 8.0	2	95	0.185
	8.0 - 10.0	2	95	0.23
	10.1 - 14.0	2	95	0.3
	14.1 - 16.0	2	95	0.35
	16.1 - 18.0	2	95	0.39
	18.1 - 20.0	2	95	0.41

VHM-UNIVERSAL-SPIRALBOHRER
Solid carbide universal spiral drill



Artikel-Nr. Order No.	Gewindebohrer Taps	Gewindeformer Forming taps	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware Stock
B2005.0100.5D.HA		M1.1	1.0	3.0	55.0	7.0	49,00	*	*	
B2005.0110.5D.HA	M1.4	M1.2	1.1	3.0	55.0	10.0	49,00	*	*	
B2005.0120.5D.HA			1.2	3.0	55.0	10.0	49,00	*	*	
B2005.0130.5D.HA			1.3	3.0	55.0	10.0	49,00	*	*	
B2005.0140.5D.HA			1.4	3.0	55.0	10.0	49,00	*	*	
B2005.0150.5D.HA			1.5	3.0	55.0	10.0	44,00	*	*	
B2005.0160.5D.HA	M2		1.6	3.0	55.0	13.0	44,00	*	*	
B2005.0170.5D.HA			1.7	3.0	55.0	13.0	44,00	*	*	
B2005.0180.5D.HA			1.8	3.0	55.0	13.0	44,00	*	*	
B2005.0190.5D.HA	M2.3		1.9	3.0	55.0	13.0	44,00	*	*	
B2005.0200.5D.HA			2.0	3.0	57.0	16.0	44,00	*	*	
B2005.0210.5D.HA			2.1	3.0	57.0	16.0	44,00	*	*	
B2005.0220.5D.HA			2.2	3.0	57.0	16.0	44,00	*	*	
B2005.0230.5D.HA			2.3	3.0	57.0	16.0	44,00	*	*	
B2005.0240.5D.HA			2.4	3.0	57.0	16.0	44,00	*	*	
B2005.0250.5D.HA	M3		2.5	3.0	57.0	16.0	44,00	*	*	
B2005.0260.5D.HA			2.6	3.0	57.0	19.0	44,00	*	*	
B2005.0270.5D.HA			2.7	3.0	57.0	19.0	44,00	*	*	
B2005.0280.5D.HA		M3	2.8	3.0	57.0	19.0	44,00	*	*	
B2005.0290.5D.HA	M3.5	M3 x 0.25	2.9	3.0	57.0	18.0	44,00	*	*	

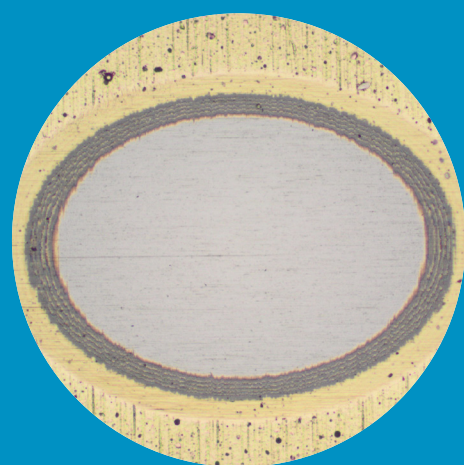
Artikel-Nr. Order No.	Gewindebohrer Taps	Gewindeformer Forming taps	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware Stock
B2005.0300.5D.HA			3.0	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0310.5D.HA			3.1	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0320.5D.HA			3.2	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0330.5D.HA	M4	M3.5 x 0.5	3.3	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0340.5D.HA			3.4	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0350.5D.HA	M4 x 0.5		3.5	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0360.5D.HA			3.6	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0370.5D.HA	M4.5	M4	3.7	6.0	66.0	23.0	44,00	48,00	48,00	
B2005.0380.5D.HA		M4 x 0.5	3.8	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0390.5D.HA			3.9	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0400.5D.HA	M4.5 x 0.5		4.0	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0410.5D.HA			4.1	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0420.5D.HA	M5	M4.5	4.2	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0430.5D.HA		M4.5 x 0.5	4.3	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0440.5D.HA			4.4	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0450.5D.HA	M5 x 0.5		4.5	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0460.5D.HA	M5.5		4.6	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0470.5D.HA		M5 x 0.75	4.7	6.0	74.0	29.0	44,00	48,00	48,00	
B2005.0480.5D.HA		M5 x 0.5	4.8	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0490.5D.HA			4.9	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0500.5D.HA	M6 / M5.5 x 0.5		5.0	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0510.5D.HA		M5.5	5.1	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0520.5D.HA	M6 x 0.75		5.2	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0530.5D.HA		M5.5 x 0.5	5.3	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0540.5D.HA			5.4	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0550.5D.HA	M6 x 0.5		5.5	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0560.5D.HA		M6	5.6	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0570.5D.HA		M6 x 0.75	5.7	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0580.5D.HA		M6 x 0.5	5.8	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0590.5D.HA			5.9	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0600.5D.HA	M7		6.0	6.0	82.0	35.0	44,00	48,00	48,00	
B2005.0610.5D.HA			6.1	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0620.5D.HA	M7 x 0.75		6.2	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0630.5D.HA			6.3	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0640.5D.HA			6.4	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0650.5D.HA			6.5	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0660.5D.HA		M7	6.6	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0670.5D.HA		M7 x 0.75	6.7	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0680.5D.HA	M8	M7 x 0.5	6.8	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0690.5D.HA			6.9	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0700.5D.HA	M8 x 1.0		7.0	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0710.5D.HA			7.1	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0720.5D.HA	M8 x 0.75		7.2	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0730.5D.HA			7.3	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0740.5D.HA			7.4	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0750.5D.HA	M8 x 0.5		7.5	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0760.5D.HA		M8 x 1.0	7.6	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0770.5D.HA		M8 x 0.75	7.7	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0780.5D.HA	M9	M8 x 0.5	7.8	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0790.5D.HA			7.9	8.0	91.0	43.0	59,00	63,00	63,00	

Artikel-Nr. <i>Order No.</i>	Gewindebohrer <i>Taps</i>	Gewindeformer <i>Forming taps</i>	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware <i>Stock</i>
B2005.0800.5D.HA	M9 x 1.0		8.0	8.0	91.0	43.0	59,00	63,00	63,00	
B2005.0810.5D.HA			8.1	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0820.5D.HA	M9 x 0.75		8.2	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0830.5D.HA			8.3	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0840.5D.HA			8.4	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0850.5D.HA	M10		8.5	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0860.5D.HA		M9 x 1.0	8.6	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0870.5D.HA		M9 x 0.75	8.7	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0880.5D.HA	M10 x 1.25	M9 x 0.5	8.8	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0890.5D.HA			8.9	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0900.5D.HA	M10 x 1.0		9.0	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0910.5D.HA			9.1	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0920.5D.HA	M10 x 0.75		9.2	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0930.5D.HA			9.3	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0940.5D.HA			9.4	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0950.5D.HA	M11		9.5	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0960.5D.HA		M10 x 1.0	9.6	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0970.5D.HA		M10 x 0.75	9.7	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0980.5D.HA		M10 x 0.5	9.8	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.0990.5D.HA			9.9	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.1000.5D.HA	M11 x 1.0		10.0	10.0	103.0	49.0	68,00	72,00	72,00	
B2005.1020.5D.HA	M12 / M11 x 0.75		10.2	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1030.5D.HA			10.3	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1040.5D.HA			10.4	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1050.5D.HA	M12 x 1.5		10.5	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1060.5D.HA		M11 x 1.0	10.6	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1070.5D.HA		M11 x 0.75	10.7	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1080.5D.HA	M12 x 1.25		10.8	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1090.5D.HA			10.9	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1100.5D.HA	M12 x 1.0		11.0	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1120.5D.HA			11.2	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1150.5D.HA			11.5	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1180.5D.HA			11.8	12.0	118.0	56.0	95,00	99,00	99,00	
B2005.1300.5D.HA	M14 x 1.0		13.0	14.0	124.0	60.0	131,00	137,00	137,00	
B2005.1350.5D.HA			13.5	14.0	124.0	60.0	131,00	137,00	137,00	
B2005.1380.5D.HA			13.8	14.0	124.0	60.0	131,00	137,00	137,00	
B2005.1400.5D.HA	M16 / M15 x 1.0		14.0	14.0	124.0	60.0	131,00	137,00	137,00	
B2005.1450.5D.HA	M16 x 1.5		14.5	16.0	133.0	63.0	175,00	181,00	181,00	
B2005.1480.5D.HA			14.8	16.0	133.0	63.0	175,00	181,00	181,00	
B2005.1500.5D.HA	M16 x 1.0		15.0	16.0	133.0	63.0	175,00	181,00	181,00	
B2005.1550.5D.HA	M18		15.5	16.0	133.0	63.0	175,00	181,00	181,00	
B2005.1580.5D.HA			15.8	16.0	133.0	63.0	175,00	181,00	181,00	

Artikel-Nr. <i>Order No.</i>	Gewindebohrer <i>Taps</i>	Gewindeformer <i>Forming taps</i>	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	Preis HA HA €	Preis HB HB €	Preis HE HE €	Lagerware <i>Stock</i>
B2005.1600.5D.HA	M18 x 2.0		16.0	16.0	133.0	63.0	175,00	181,00	181,00	
B2005.1650.5D.HA			16.5	18.0	143.0	71.0	237,00	243,00	243,00	
B2005.1680.5D.HA			16.8	18.0	143.0	71.0	237,00	243,00	243,00	
B2005.1700.5D.HA			17.0	18.0	143.0	71.0	237,00	243,00	243,00	
B2005.1750.5D.HA	M20		17.5	18.0	143.0	71.0	237,00	243,00	243,00	
B2005.1780.5D.HA			17.8	18.0	143.0	71.0	237,00	243,00	243,00	
B2005.1800.5D.HA			18.0	18.0	143.0	71.0	237,00	243,00	243,00	
B2005.1850.5D.HA			18.5	20.0	153.0	77.0	295,00	301,00	301,00	
B2005.1900.5D.HA			19.0	20.0	153.0	77.0	295,00	301,00	301,00	
B2005.1950.5D.HA	M22		19.5	20.0	153.0	77.0	295,00	301,00	301,00	
B2005.1980.5D.HA			19.8	20.0	153.0	77.0	295,00	301,00	301,00	
B2005.2000.5D.HA			20.0	20.0	153.0	77.0	295,00	301,00	301,00	

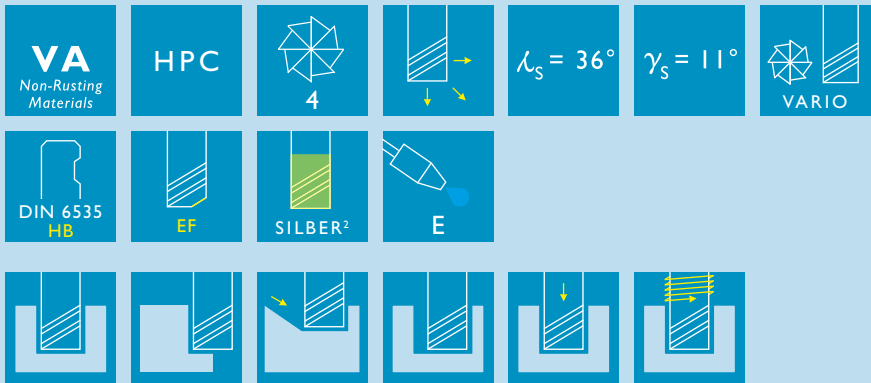
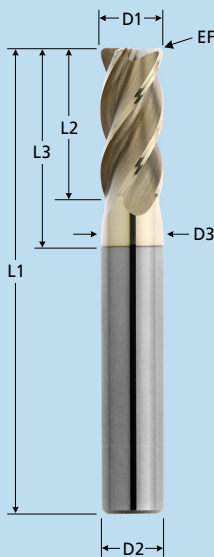
Material <i>Processing Material</i>	D (mm)	Z <i>flutes</i>	Vc m/min	fz (mm)
P1.1 BAUSTÄHLE <i>Construction steel</i> ≤ 850 N/mm²	1.0 - 1.5	2	115	0.02
	1.6 - 2.0	2	115	0.03
	2.1 - 2.5	2	115	0.04
	2.5 - 3.0	2	115	0.05
	3.1 - 4.0	2	115	0.07
	4.0 - 5.0	2	115	0.1
	5.1 - 6.0	2	115	0.125
	6.0 - 8.0	2	115	0.15
	8.0 - 10.0	2	115	0.19
	10.1 - 14.0	2	115	0.22
	14.1 - 16.0	2	115	0.25
	16.1 - 18.0	2	115	0.275
	18.1 - 20.0	2	115	0.3
P2.2 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1100 N/mm²	1.0 - 1.5	2	90	0.01
	1.6 - 2.0	2	90	0.018
	2.1 - 2.5	2	90	0.022
	2.5 - 3.0	2	90	0.028
	3.1 - 4.0	2	90	0.04
	4.0 - 5.0	2	90	0.055
	5.1 - 6.0	2	90	0.065
	6.0 - 8.0	2	90	0.085
	8.0 - 10.0	2	90	0.105
	10.1 - 14.0	2	90	0.13
	14.1 - 16.0	2	90	0.17
	16.1 - 18.0	2	90	0.19
	18.1 - 20.0	2	90	0.22
P2.3 VERGÜTUNGSSTÄHLE <i>Heat treatable steel</i> ≤ 1300 N/mm²	1.0 - 1.5	2	75	0.01
	1.6 - 2.0	2	75	0.02
	2.1 - 2.5	2	75	0.023
	2.5 - 3.0	2	75	0.028
	3.1 - 4.0	2	75	0.035
	4.0 - 5.0	2	75	0.052
	5.1 - 6.0	2	75	0.062
	6.0 - 8.0	2	75	0.08
	8.0 - 10.0	2	75	0.11
	10.1 - 14.0	2	75	0.135
	14.1 - 16.0	2	75	0.17
	16.1 - 18.0	2	75	0.2
	18.1 - 20.0	2	75	0.22
P4.2 KALTARBEITSSTÄHLE <i>Cold working steel</i> 12% Chrom	1.0 - 1.5	2	45	0.01
	1.6 - 2.0	2	45	0.02
	2.1 - 2.5	2	45	0.025
	2.5 - 3.0	2	45	0.03
	3.1 - 4.0	2	45	0.04
	4.0 - 5.0	2	45	0.055
	5.1 - 6.0	2	45	0.065
	6.0 - 8.0	2	45	0.075
	8.0 - 10.0	2	45	0.105
	10.1 - 14.0	2	45	0.12
	14.1 - 16.0	2	45	0.17
	16.1 - 18.0	2	45	0.2
	18.1 - 20.0	2	45	0.22

Material <i>Processing Material</i>	D (mm)	Z <i>flutes</i>	Vc m/min	fz (mm)
M2.1 ROSTFREIE STÄHLE <i>Stainless steel</i>	1.0 - 1.5	2	50	0.025
	1.6 - 2.0	2	50	0.033
	2.1 - 2.5	2	50	0.04
	2.5 - 3.0	2	50	0.05
	3.1 - 4.0	2	50	0.06
	4.0 - 5.0	2	50	0.07
	5.1 - 6.0	2	50	0.085
	6.0 - 8.0	2	50	0.09
	8.0 - 10.0	2	50	0.1
	10.1 - 14.0	2	50	0.12
	14.1 - 16.0	2	50	0.17
	16.1 - 18.0	2	50	0.2
	18.1 - 20.0	2	50	0.22
S1.2 TITANLEGIERUNGEN <i>Titanium alloys</i> Ti Gr.3/ Gr.4	1.0 - 1.5	2	30	0.01
	1.6 - 2.0	2	30	0.012
	2.1 - 2.5	2	30	0.015
	2.5 - 3.0	2	30	0.02
	3.1 - 4.0	2	30	0.03
	4.0 - 5.0	2	30	0.04
	5.1 - 6.0	2	30	0.06
	6.0 - 8.0	2	30	0.08
	8.0 - 10.0	2	30	0.09
	10.1 - 14.0	2	30	0.1
	14.1 - 16.0	2	30	0.12
	16.1 - 18.0	2	30	0.16
	18.1 - 20.0	2	30	0.2
K1.2 GUSSEISEN <i>Cast Iron</i>	1.0 - 1.5	2	120	0.022
	1.6 - 2.0	2	120	0.04
	2.1 - 2.5	2	120	0.05
	2.5 - 3.0	2	120	0.07
	3.1 - 4.0	2	120	0.09
	4.0 - 5.0	2	120	0.13
	5.1 - 6.0	2	120	0.15
	6.0 - 8.0	2	120	0.18
	8.0 - 10.0	2	120	0.22
	10.1 - 14.0	2	120	0.29
	14.1 - 16.0	2	120	0.35
	16.1 - 18.0	2	120	0.37
	18.1 - 20.0	2	120	0.41



**NICHT
ROSTENDE
METALLE**

Stainless Metals



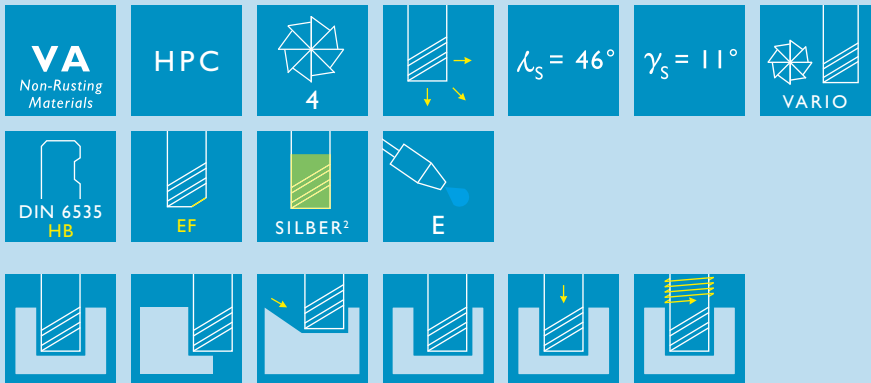
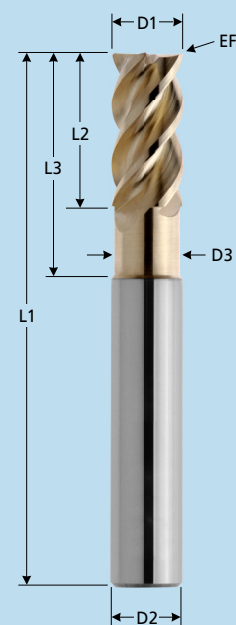
Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0436L.D030.F010	3.0	6.0	-	57.0	8.0	-	0.1	19,00	*
F0436L.D040.F010	4.0	6.0	-	57.0	11.0	-	0.1	19,00	*
F0436L.D050.F010	5.0	6.0	4.9	57.0	13.0	18.0	0.1	19,00	*
F0436L.D060.F010	6.0	6.0	5.9	57.0	13.0	18.0	0.1	19,00	*
F0436L.D080.F020	8.0	8.0	7.8	63.0	21.0	25.0	0.2	27,00	*
F0436L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	37,00	*
F0436L.D120.F020	12.0	12.0	11.7	83.0	26.0	36.0	0.3	49,50	*
F0436L.D140.F030	14.0	14.0	13.7	83.0	26.0	36.0	0.3	69,00	
F0436L.D160.F030	16.0	16.0	15.5	92.0	36.0	42.0	0.3	88,00	*
F0436L.D180.F030	18.0	18.0	17.5	92.0	36.0	42.0	0.3	99,00	
F0436L.D200.F030	20.0	20.0	19.5	103.0	41.0	52.0	0.3	128,00	*
F0436L.D250.F040	25.0	25.0	24.5	126.0	55.0	66.0	0.4	215,00	*
F0436M.D060.F010	6.0	6.0	-	62.0	18.0	-	0.1	20,50	
F0436M.D080.F020	8.0	8.0	-	68.0	24.0	-	0.2	32,50	
F0436M.D100.F020	10.0	10.0	-	80.0	30.0	-	0.2	44,50	
F0436M.D120.F030	12.0	12.0	-	93.0	36.0	-	0.3	61,50	
F0436M.D140.F030	14.0	14.0	-	93.0	36.0	-	0.3	94,50	
F0436M.D160.F030	16.0	16.0	-	108.0	48.0	-	0.3	104,50	
F0436M.D180.F030	18.0	18.0	-	108.0	48.0	-	0.3	121,00	
F0436M.D200.F030	20.0	20.0	-	126.0	60.0	-	0.3	151,00	

F0436L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	4	180	0.015	3.0	3.0
	4.0	4	180	0.02	4.0	4.0
	5.0	4	180	0.025	5.0	5.0
	6.0	4	180	0.03	6.0	6.0
	8.0	4	180	0.04	8.0	8.0
	10.0	4	180	0.06	10.0	10.0
	12.0	4	180	0.07	12.0	12.0
	14.0	4	180	0.08	14.0	14.0
	16.0	4	180	0.09	16.0	16.0
	18.0	4	180	0.1	18.0	18.0
	20.0	4	180	0.11	20.0	20.0
	25.0	4	180	0.13	25.0	25.0
P4.2 KALTARBEITSSTÄHLE Cold working steel ≤ 1300 N/mm²	3.0	4	90	0.015	3.0	3.0
	4.0	4	90	0.02	4.0	4.0
	5.0	4	90	0.025	5.0	5.0
	6.0	4	90	0.03	6.0	6.0
	8.0	4	90	0.04	8.0	8.0
	10.0	4	90	0.055	10.0	10.0
	12.0	4	90	0.065	12.0	12.0
	14.0	4	90	0.07	14.0	14.0
	16.0	4	90	0.075	16.0	16.0
	18.0	4	90	0.08	18.0	18.0
	20.0	4	90	0.09	20.0	20.0
	25.0	4	90	0.12	25.0	25.0
M 2.1 ROSTFREIE STÄHLE Stainless steel ≤ 1600 N/mm²	3.0	4	80	0.008	3.0	3.0
	4.0	4	80	0.016	4.0	4.0
	5.0	4	80	0.025	5.0	5.0
	6.0	4	80	0.03	6.0	6.0
	8.0	4	80	0.04	8.0	8.0
	10.0	4	80	0.05	10.0	10.0
	12.0	4	80	0.06	12.0	12.0
	14.0	4	80	0.07	14.0	14.0
	16.0	4	80	0.08	16.0	16.0
	18.0	4	80	0.09	18.0	18.0
	20.0	4	80	0.1	20.0	20.0
	25.0	4	80	0.13	25.0	25.0
S 2.2 INCONEL 625	3.0	4	30	0.006	3.0	3.0
	4.0	4	30	0.011	4.0	4.0
	5.0	4	30	0.013	5.0	5.0
	6.0	4	30	0.016	6.0	6.0
	8.0	4	30	0.021	8.0	8.0
	10.0	4	30	0.03	10.0	10.0
	12.0	4	30	0.033	12.0	12.0
	14.0	4	30	0.035	14.0	14.0
	16.0	4	30	0.04	16.0	16.0
	18.0	4	30	0.047	18.0	18.0
	20.0	4	30	0.053	20.0	20.0
	25.0	4	30	0.065	25.0	25.0
S 1.2 TITANLEGIERUNGEN Titanium alloys Ti Gr.3/ Ti Gr.4	3.0	4	45	0.008	3.0	3.0
	4.0	4	45	0.012	4.0	4.0
	5.0	4	45	0.016	5.0	5.0
	6.0	4	45	0.02	6.0	6.0
	8.0	4	45	0.025	8.0	8.0
	10.0	4	45	0.04	10.0	10.0
	12.0	4	45	0.045	12.0	12.0
	14.0	4	45	0.05	14.0	14.0
	16.0	4	45	0.055	16.0	16.0
	18.0	4	45	0.065	18.0	18.0
	20.0	4	45	0.07	20.0	20.0
	25.0	4	45	0.09	25.0	25.0
Korrekturversatz correction	Ae≤ 0,4 x d		Vc= +20%		fz= +10%	
	Ae≤ 0,4 x d		Vc= +10%		fz= +10%	
	Ap= 1,5 x d					

F0446L

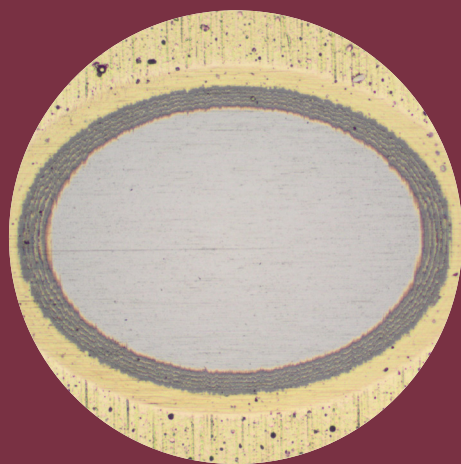
VHM-HPC-SCHAFTFRÄSER
Solid carbide high performance end mill



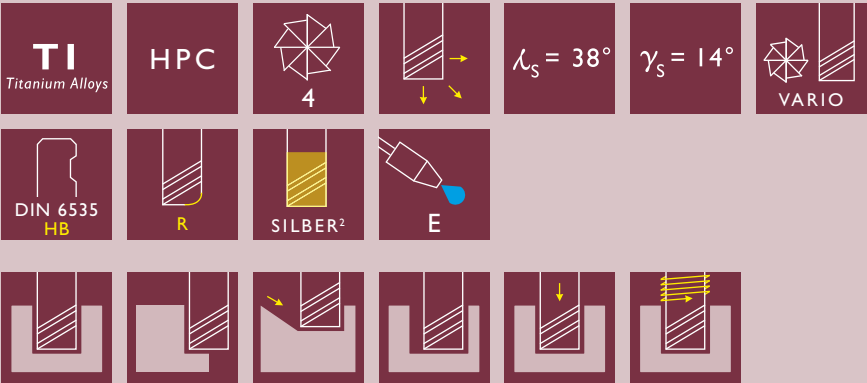
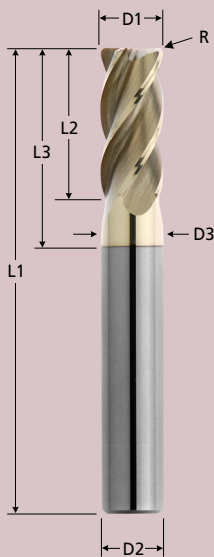
Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0446L.D030.F010	3.0	6.0	-	57.0	8.0	-	0.1	19,00	*
F0446L.D040.F010	4.0	6.0	-	57.0	11.0	-	0.1	19,00	*
F0446L.D050.F010	5.0	6.0	4.9	57.0	13.0	18.0	0.1	19,00	*
F0446L.D060.F010	6.0	6.0	5.9	57.0	13.0	18.0	0.1	19,00	*
F0446L.D080.F020	8.0	8.0	7.8	64.0	21.0	25.0	0.2	27,00	*
F0446L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	37,00	*
F0446L.D120.F030	12.0	12.0	11.7	83.0	26.0	36.0	0.3	49,50	*
F0446L.D140.F030	14.0	14.0	13.7	83.0	26.0	36.0	0.3	69,00	
F0446L.D160.F030	16.0	16.0	15.5	92.0	36.0	42.0	0.3	88,00	*
F0446L.D180.F030	18.0	18.0	17.5	92.0	36.0	42.0	0.3	99,00	
F0446L.D200.F030	20.0	20.0	19.5	104.0	41.0	52.0	0.3	128,00	*
F0446L.D250.F040	25.0	25.0	24.5	126.0	55.0	66.0	0.4	215,00	*
F0446M.D060.F010	6.0	6.0	-	62.0	18.0	-	0.1	20,50	
F0446M.D080.F020	8.0	8.0	-	68.0	24.0	-	0.2	31,50	
F0446M.D100.F020	10.0	10.0	-	80.0	30.0	-	0.2	44,50	
F0446M.D120.F030	12.0	12.0	-	93.0	36.0	-	0.3	61,50	
F0446M.D140.F030	14.0	14.0	-	93.0	36.0	-	0.3	94,50	
F0446M.D160.F030	16.0	16.0	-	108.0	48.0	-	0.3	104,50	
F0446M.D180.F030	18.0	18.0	-	108.0	48.0	-	0.3	121,00	
F0446M.D200.F030	20.0	20.0	-	126.0	60.0	-	0.3	151,00	

F0446L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P1.1 BAUSTÄHLE Construction steel ≤ 850 N/mm²	3.0	4	220	0.015	3.0	3.0
	4.0	4	220	0.02	4.0	4.0
	5.0	4	220	0.025	5.0	5.0
	6.0	4	220	0.03	6.0	6.0
	8.0	4	220	0.04	8.0	8.0
	10.0	4	220	0.06	10.0	10.0
	12.0	4	220	0.07	12.0	12.0
	14.0	4	220	0.08	14.0	14.0
	16.0	4	220	0.09	16.0	16.0
	18.0	4	220	0.1	18.0	18.0
	20.0	4	220	0.11	20.0	20.0
	25.0	4	220	0.13	25.0	25.0
P4.2 KALTARBEITSSTÄHLE Cold working steel ≤ 1300 N/mm²	3.0	4	100	0.015	3.0	3.0
	4.0	4	100	0.02	4.0	4.0
	5.0	4	100	0.025	5.0	5.0
	6.0	4	100	0.03	6.0	6.0
	8.0	4	100	0.04	8.0	8.0
	10.0	4	100	0.06	10.0	10.0
	12.0	4	100	0.065	12.0	12.0
	14.0	4	100	0.07	14.0	14.0
	16.0	4	100	0.075	16.0	16.0
	18.0	4	100	0.08	18.0	18.0
	20.0	4	100	0.09	20.0	20.0
	25.0	4	100	0.12	25.0	25.0
M 2.1 ROSTFREIE STÄHLE Stainless steel ≤ 1600 N/mm²	3.0	4	100	0.008	3.0	3.0
	4.0	4	100	0.016	4.0	4.0
	5.0	4	100	0.025	5.0	5.0
	6.0	4	100	0.03	6.0	6.0
	8.0	4	100	0.04	8.0	8.0
	10.0	4	100	0.05	10.0	10.0
	12.0	4	100	0.06	12.0	12.0
	14.0	4	100	0.07	14.0	14.0
	16.0	4	100	0.08	16.0	16.0
	18.0	4	100	0.09	18.0	18.0
	20.0	4	100	0.1	20.0	20.0
	25.0	4	100	0.13	25.0	25.0
S 2.2 INCONEL 625	3.0	4	35	0.006	3.0	3.0
	4.0	4	35	0.011	4.0	4.0
	5.0	4	35	0.013	5.0	5.0
	6.0	4	35	0.016	6.0	6.0
	8.0	4	35	0.021	8.0	8.0
	10.0	4	35	0.03	10.0	10.0
	12.0	4	35	0.033	12.0	12.0
	14.0	4	35	0.035	14.0	14.0
	16.0	4	35	0.04	16.0	16.0
	18.0	4	35	0.047	18.0	18.0
	20.0	4	35	0.053	20.0	20.0
	25.0	4	35	0.065	25.0	25.0
S 1.2 TITANLEGIERUNGEN Titanium alloys Ti Gr.3/ Ti Gr.4	3.0	4	50	0.008	3.0	3.0
	4.0	4	50	0.012	4.0	4.0
	5.0	4	50	0.016	5.0	5.0
	6.0	4	50	0.02	6.0	6.0
	8.0	4	50	0.025	8.0	8.0
	10.0	4	50	0.04	10.0	10.0
	12.0	4	50	0.045	12.0	12.0
	14.0	4	50	0.05	14.0	14.0
	16.0	4	50	0.055	16.0	16.0
	18.0	4	50	0.065	18.0	18.0
	20.0	4	50	0.07	20.0	20.0
	25.0	4	50	0.09	25.0	25.0
Korrekturversatz correction	Ae≤ 0,4 x d		Vc= +20%		fz= +10%	
	Ae≤ 0,4 x d					
	Ap= 1,5 x d		Vc= +10%		fz= +10%	



TI-TITAN
Titanium Alloys



Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	R (mm)	Preis €	Lagerware Stock
FT438L.D040.R010	4.0	6.0	3.9	57.0	11.0	17.0	0.1	26,80	*
FT438L.D040.R020	4.0	6.0	3.9	57.0	11.0	17.0	0.2	26,80	
FT438L.D040.R040	4.0	6.0	3.9	57.0	11.0	17.0	0.4	26,80	
FT438L.D040.R050	4.0	6.0	3.9	57.0	11.0	17.0	0.5	26,80	
FT438L.D040.R100	4.0	6.0	3.9	57.0	11.0	17.0	1.0	26,80	
FT438L.D050.R010	5.0	6.0	4.9	57.0	13.0	19.0	0.1	26,80	*
FT438L.D050.R050	5.0	6.0	4.9	57.0	13.0	19.0	0.5	26,80	
FT438L.D050.R100	5.0	6.0	4.9	57.0	13.0	19.0	1.0	26,80	
FT438L.D060.R010	6.0	6.0	5.9	57.0	13.0	19.0	0.1	26,80	*
FT438L.D060.R040	6.0	6.0	5.9	57.0	13.0	19.0	0.4	26,80	
FT438L.D060.R050	6.0	6.0	5.9	57.0	13.0	19.0	0.5	26,80	
FT438L.D060.R060	6.0	6.0	5.9	57.0	13.0	19.0	0.6	26,80	
FT438L.D060.R080	6.0	6.0	5.9	57.0	13.0	19.0	0.8	26,80	
FT438L.D060.R100	6.0	6.0	5.9	57.0	13.0	19.0	1.0	26,80	
FT438L.D080.R020	8.0	8.0	7.8	63.0	21.0	25.0	0.2	35,10	*
FT438L.D080.R050	8.0	8.0	7.8	63.0	21.0	25.0	0.5	35,10	
FT438L.D080.R080	8.0	8.0	7.8	63.0	21.0	25.0	0.8	35,10	
FT438L.D080.R100	8.0	8.0	7.8	63.0	21.0	25.0	1.0	35,10	
FT438L.D080.R120	8.0	8.0	7.8	63.0	21.0	25.0	1.2	35,10	
FT438L.D080.R150	8.0	8.0	7.8	63.0	21.0	25.0	1.5	35,10	
FT438L.D080.R200	8.0	8.0	7.8	63.0	21.0	25.0	2.0	35,10	

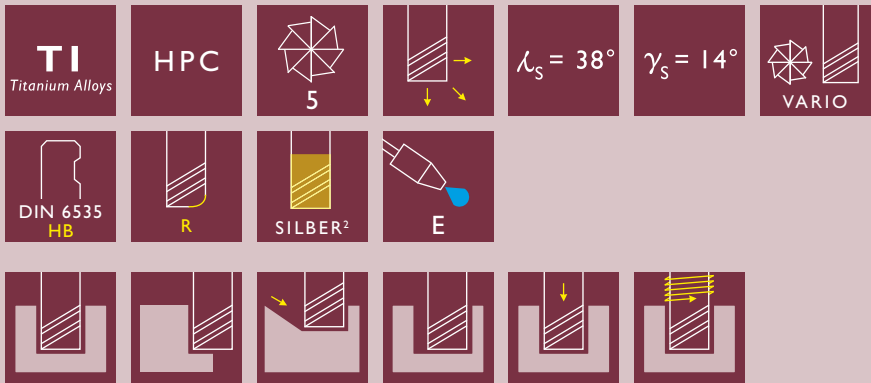
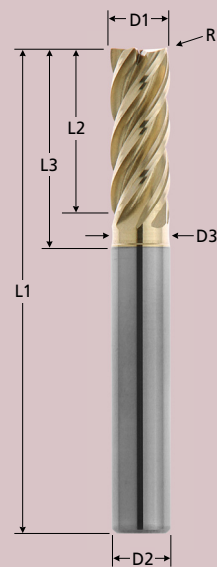
Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	R (mm)	Preis €	Lagerware Stock
FT438L.D100.R020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	49,50	*
FT438L.D100.R030	10.0	10.0	9.7	72.0	22.0	30.0	0.3	49,50	
FT438L.D100.R050	10.0	10.0	9.7	72.0	22.0	30.0	0.5	49,50	
FT438L.D100.R100	10.0	10.0	9.7	72.0	22.0	30.0	1.0	49,50	
FT438L.D100.R120	10.0	10.0	9.7	72.0	22.0	30.0	1.2	49,50	
FT438L.D100.R150	10.0	10.0	9.7	72.0	22.0	30.0	1.5	49,50	
FT438L.D100.R160	10.0	10.0	9.7	72.0	22.0	30.0	1.6	49,50	
FT438L.D100.R200	10.0	10.0	9.7	72.0	22.0	30.0	2.0	49,50	
FT438L.D120.R020	12.0	12.0	11.7	83.0	26.0	36.0	0.2	68,50	*
FT438L.D120.R030	12.0	12.0	11.7	83.0	26.0	36.0	0.3	68,50	
FT438L.D120.R050	12.0	12.0	11.7	83.0	26.0	36.0	0.5	68,50	
FT438L.D120.R100	12.0	12.0	11.7	83.0	26.0	36.0	1.0	68,50	
FT438L.D120.R120	12.0	12.0	11.7	83.0	26.0	36.0	1.2	68,50	
FT438L.D120.R150	12.0	12.0	11.7	83.0	26.0	36.0	1.5	68,50	
FT438L.D120.R160	12.0	12.0	11.7	83.0	26.0	36.0	1.6	68,50	
FT438L.D120.R200	12.0	12.0	11.7	83.0	26.0	36.0	2.0	68,50	
FT438L.D120.R250	12.0	12.0	11.7	83.0	26.0	36.0	2.5	68,50	
FT438L.D120.R400	12.0	12.0	11.7	83.0	26.0	36.0	4.0	68,50	
FT438L.D160.R030	16.0	16.0	15.5	92.0	36.0	42.0	0.3	119,50	*
FT438L.D160.R100	16.0	16.0	15.5	92.0	36.0	42.0	1.0	119,50	
FT438L.D160.R160	16.0	16.0	15.5	92.0	36.0	42.0	1.6	119,50	
FT438L.D160.R200	16.0	16.0	15.5	92.0	36.0	42.0	2.0	119,50	
FT438L.D160.R250	16.0	16.0	15.5	92.0	36.0	42.0	2.5	119,50	
FT438L.D160.R320	16.0	16.0	15.5	92.0	36.0	42.0	3.2	119,50	
FT438L.D160.R400	16.0	16.0	15.5	92.0	36.0	42.0	4.0	119,50	
FT438L.D200.R030	20.0	20.0	19.5	104.0	41.0	52.0	0.3	194,00	*
FT438L.D200.R100	20.0	20.0	19.5	104.0	41.0	52.0	1.0	194,00	
FT438L.D200.R200	20.0	20.0	19.5	104.0	41.0	52.0	2.0	194,00	
FT438L.D200.R400	20.0	20.0	19.5	104.0	41.0	52.0	4.0	194,00	
FT438L.D200.R500	20.0	20.0	19.5	104.0	41.0	52.0	5.0	194,00	
FT438L.D200.R630	20.0	20.0	19.5	104.0	41.0	52.0	6.3	194,00	

Material <i>Processing Material</i>	D (mm)	Z <i>flutes</i>	Vc m/min	fz (mm)	ap (mm)	ae (mm)
S1.1 REINTITAN <i>Pure Titanium</i> Ti 99,5/ Ti Gr.1	3.0	4	100	0.015	3.0	3.0
	4.0	4	100	0.02	4.0	4.0
	5.0	4	100	0.025	5.0	5.0
	6.0	4	100	0.03	6.0	6.0
	8.0	4	100	0.035	8.0	8.0
	10.0	4	100	0.045	10.0	10.0
	12.0	4	100	0.055	12.0	12.0
	14.0	4	100	0.065	14.0	14.0
	16.0	4	100	0.08	8.0	16.0
	18.0	4	100	0.085	9.0	18.0
	20.0	4	100	0.095	10.0	20.0
	25.0	4	100	0.12	12.5	25.0
S1.2 TITANLEGIERUNGEN <i>Titanium alloys</i> Ti Gr.3/ Ti Gr.4	3.0	4	90	0.01	3.0	3.0
	4.0	4	90	0.015	4.0	4.0
	5.0	4	90	0.02	5.0	5.0
	6.0	4	90	0.025	6.0	6.0
	8.0	4	90	0.03	8.0	8.0
	10.0	4	90	0.04	10.0	10.0
	12.0	4	90	0.05	12.0	12.0
	14.0	4	90	0.06	14.0	14.0
	16.0	4	90	0.065	8.0	16.0
	18.0	4	90	0.075	9.0	18.0
	20.0	4	90	0.08	10.0	20.0
	25.0	4	90	0.1	12.5	25.0
S1.3 TITANLEGIERUNGEN <i>Titanium alloys</i> TiAl6V4/Gr.5	3.0	4	70	0.007	3.0	3.0
	4.0	4	70	0.01	4.0	4.0
	5.0	4	70	0.015	5.0	5.0
	6.0	4	70	0.02	6.0	6.0
	8.0	4	70	0.025	8.0	8.0
	10.0	4	70	0.035	10.0	10.0
	12.0	4	70	0.04	12.0	12.0
	14.0	4	70	0.045	14.0	14.0
	16.0	4	70	0.05	8.0	16.0
	18.0	4	70	0.06	9.0	18.0
	20.0	4	70	0.065	10.0	20.0
	25.0	4	70	0.08	12.5	25.0
S2.2 INCONEL 625	3.0	4	50	0.01	1.5	3.0
	4.0	4	50	0.015	2.0	4.0
	5.0	4	50	0.02	2.5	5.0
	6.0	4	50	0.025	3.0	6.0
	8.0	4	50	0.03	4.0	8.0
	10.0	4	50	0.035	5.0	10.0
	12.0	4	50	0.04	6.0	12.0
	14.0	4	50	0.045	7.0	14.0
	16.0	4	50	0.05	8.0	16.0
	18.0	4	50	0.055	9.0	18.0
	20.0	4	50	0.06	10.0	20.0
	25.0	4	50	0.085	12.5	25.0
S2.3 INCONEL 718	3.0	4	40	0.005	1.5	3.0
	4.0	4	40	0.008	2.0	4.0
	5.0	4	40	0.012	2.5	5.0
	6.0	4	40	0.015	3.0	6.0
	8.0	4	40	0.02	4.0	8.0
	10.0	4	40	0.025	5.0	10.0
	12.0	4	40	0.03	6.0	12.0
	14.0	4	40	0.035	7.0	14.0
	16.0	4	40	0.04	8.0	16.0
	18.0	4	40	0.045	9.0	18.0
	20.0	4	40	0.06	10.0	20.0
	25.0	4	40	0.085	12.5	25.0



VHM-SCHAFTFRÄSER

Solid carbide end mill



Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	R (mm)	Preis €	Lagerware Stock
FT538L.D040.R010	4.0	6.0	3.9	57.0	11.0	17.0	0.1	26,80	*
FT538L.D040.R020	4.0	6.0	3.9	57.0	11.0	17.0	0.2	26,80	
FT538L.D040.R040	4.0	6.0	3.9	57.0	11.0	17.0	0.4	26,80	
FT538L.D040.R050	4.0	6.0	3.9	57.0	11.0	17.0	0.5	26,80	
FT538L.D040.R100	4.0	6.0	3.9	57.0	11.0	17.0	1.0	26,80	
FT538L.D050.R010	5.0	6.0	4.9	57.0	13.0	19.0	0.1	26,80	*
FT538L.D050.R050	5.0	6.0	4.9	57.0	13.0	19.0	0.5	26,80	
FT538L.D050.R100	5.0	6.0	4.9	57.0	13.0	19.0	1.0	26,80	
FT538L.D060.R010	6.0	6.0	5.9	57.0	13.0	19.0	0.1	26,80	*
FT538L.D060.R040	6.0	6.0	5.9	57.0	13.0	19.0	0.4	26,80	
FT538L.D060.R050	6.0	6.0	5.9	57.0	13.0	19.0	0.5	26,80	
FT538L.D060.R060	6.0	6.0	5.9	57.0	13.0	19.0	0.6	26,80	
FT538L.D060.R080	6.0	6.0	5.9	57.0	13.0	19.0	0.8	26,80	
FT538L.D060.R100	6.0	6.0	5.9	57.0	13.0	19.0	1.0	26,80	
FT538L.D080.R020	8.0	8.0	7.8	63.0	21.0	25.0	0.2	35,10	*
FT538L.D080.R050	8.0	8.0	7.8	63.0	21.0	25.0	0.5	35,10	
FT538L.D080.R080	8.0	8.0	7.8	63.0	21.0	25.0	0.8	35,10	
FT538L.D080.R100	8.0	8.0	7.8	63.0	21.0	25.0	1.0	35,10	
FT538L.D080.R120	8.0	8.0	7.8	63.0	21.0	25.0	1.2	35,10	
FT538L.D080.R150	8.0	8.0	7.8	63.0	21.0	25.0	1.5	35,10	
FT538L.D080.R200	8.0	8.0	7.8	63.0	21.0	25.0	2.0	35,10	

Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	R (mm)	Preis €	Lagerware Stock
FT538L.D100.R020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	55,80	*
FT538L.D100.R030	10.0	10.0	9.7	72.0	22.0	30.0	0.3		
FT538L.D100.R050	10.0	10.0	9.7	72.0	22.0	30.0	0.5		
FT538L.D100.R100	10.0	10.0	9.7	72.0	22.0	30.0	1.0		
FT538L.D100.R120	10.0	10.0	9.7	72.0	22.0	30.0	1.2		
FT538L.D100.R150	10.0	10.0	9.7	72.0	22.0	30.0	1.5		
FT538L.D100.R160	10.0	10.0	9.7	72.0	22.0	30.0	1.6		
FT538L.D100.R200	10.0	10.0	9.7	72.0	22.0	30.0	2.0		
FT538L.D120.R030	12.0	12.0	11.7	83.0	26.0	36.0	0.3	72,50	*
FT538L.D120.R050	12.0	12.0	11.7	83.0	26.0	36.0	0.5		
FT538L.D120.R100	12.0	12.0	11.7	83.0	26.0	36.0	1.0		
FT538L.D120.R120	12.0	12.0	11.7	83.0	26.0	36.0	1.2		
FT538L.D120.R150	12.0	12.0	11.7	83.0	26.0	36.0	1.5		
FT538L.D120.R160	12.0	12.0	11.7	83.0	26.0	36.0	1.6		
FT538L.D120.R200	12.0	12.0	11.7	83.0	26.0	36.0	2.0		
FT538L.D120.R250	12.0	12.0	11.7	83.0	26.0	36.0	2.5		
FT538L.D120.R400	12.0	12.0	11.7	83.0	26.0	36.0	4.0		
FT538L.D160.R030	16.0	16.0	15.5	92.0	36.0	42.0	0.3	129,50	*
FT538L.D160.R100	16.0	16.0	15.5	92.0	36.0	42.0	1.0		
FT538L.D160.R160	16.0	16.0	15.5	92.0	36.0	42.0	1.6		
FT538L.D160.R200	16.0	16.0	15.5	92.0	36.0	42.0	2.0		
FT538L.D160.R250	16.0	16.0	15.5	92.0	36.0	42.0	2.5		
FT538L.D160.R320	16.0	16.0	15.5	92.0	36.0	42.0	3.2		
FT538L.D160.R400	16.0	16.0	15.5	92.0	36.0	42.0	4.0		
FT538L.D200.R030	20.0	20.0	19.5	104.0	41.0	52.0	0.3	209,90	*
FT538L.D200.R100	20.0	20.0	19.5	104.0	41.0	52.0	1.0		
FT538L.D200.R200	20.0	20.0	19.5	104.0	41.0	52.0	2.0		
FT538L.D200.R400	20.0	20.0	19.5	104.0	41.0	52.0	4.0		
FT538L.D200.R500	20.0	20.0	19.5	104.0	41.0	52.0	5.0		
FT538L.D200.R630	20.0	20.0	19.5	104.0	41.0	52.0	6.3		

Material <i>Processing Material</i>	D (mm)	Z <i>flutes</i>	Vc m/min	fz (mm)	ap (mm)	ae (mm)
S1.1 REINTITAN <i>Pure Titanium</i> Ti 99,5/ Ti Gr.1	3.0	5	100	0.015	3.0	1.5
	4.0	5	100	0.03	4.0	2.0
	5.0	5	100	0.025	5.0	2.5
	6.0	5	100	0.03	6.0	3.0
	8.0	5	100	0.035	8.0	4.0
	10.0	5	100	0.045	10.0	5.0
	12.0	5	100	0.055	12.0	6.0
	14.0	5	100	0.065	14.0	7.0
	16.0	5	100	0.08	16.0	8.0
	18.0	5	100	0.085	18.0	9.0
	20.0	5	100	0.095	20.0	10.0
	25.0	5	100	0.11	25.0	12.5
S1.2 TITANLEGIERUNGEN <i>Titanium alloys</i> TiAl6V4/ Ti Gr.5	3.0	5	90	0.007	3.0	1.5
	4.0	5	90	0.01	4.0	2.0
	5.0	5	90	0.015	5.0	2.5
	6.0	5	90	0.02	6.0	3.0
	8.0	5	90	0.025	8.0	4.0
	10.0	5	90	0.035	10.0	5.0
	12.0	5	90	0.04	12.0	6.0
	14.0	5	90	0.045	14.0	7.0
	16.0	5	90	0.05	16.0	8.0
	18.0	5	90	0.06	18.0	9.0
	20.0	5	90	0.065	20.0	10.0
	25.0	5	90	0.08	25.0	12.5
S2.2 Inconel 625	3.0	5	50	0.01	3.0	1.5
	4.0	5	50	0.015	4.0	2.0
	5.0	5	50	0.02	5.0	2.5
	6.0	5	50	0.025	6.0	3.0
	8.0	5	50	0.03	8.0	4.0
	10.0	5	50	0.035	10.0	5.0
	12.0	5	50	0.04	12.0	6.0
	14.0	5	50	0.045	14.0	7.0
	16.0	5	50	0.05	16.0	8.0
	18.0	5	50	0.055	18.0	9.0
	20.0	5	50	0.06	20.0	10.0
	25.0	5	50	0.07	25.0	12.5
S2.3 INCONEL 718	3.0	5	40	0.005	3.0	1.5
	4.0	5	40	0.008	4.0	2.0
	5.0	5	40	0.012	5.0	2.5
	6.0	5	40	0.015	6.0	3.0
	8.0	5	40	0.02	8.0	4.0
	10.0	5	40	0.025	10.0	5.0
	12.0	5	40	0.03	12.0	6.0
	14.0	5	40	0.035	14.0	7.0
	16.0	5	40	0.04	16.0	8.0
	18.0	5	40	0.045	18.0	9.0
	20.0	5	40	0.05	20.0	10.0
	25.0	5	40	0.065	25.0	12.5
M1.2 ROSTFREI STÄHLE <i>Stainless steel</i>	3.0	5	100	0.012	3.0	1.5
	4.0	5	100	0.015	4.0	2.0
	5.0	5	100	0.02	5.0	2.5
	6.0	5	100	0.025	6.0	3.0
	8.0	5	100	0.03	8.0	4.0
	10.0	5	100	0.035	10.0	5.0
	12.0	5	100	0.04	12.0	6.0
	14.0	5	100	0.045	14.0	7.0
	16.0	5	100	0.05	16.0	8.0
	18.0	5	100	0.06	18.0	9.0
	20.0	5	100	0.07	20.0	10.0
	25.0	5	100	0.09	25.0	12.5



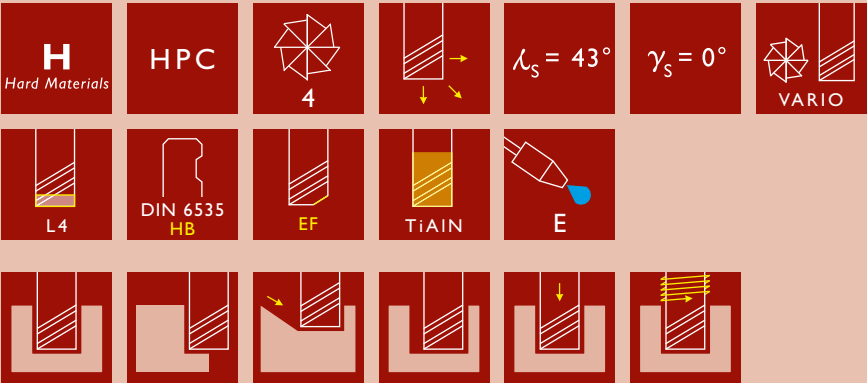
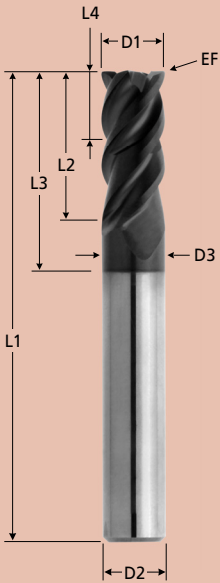
**GEHÄRTETE
MATERIALIEN**
Hard Materials



F0443L

VHM-HARTFRÄSER

Solid carbide end mill for processing hard materials

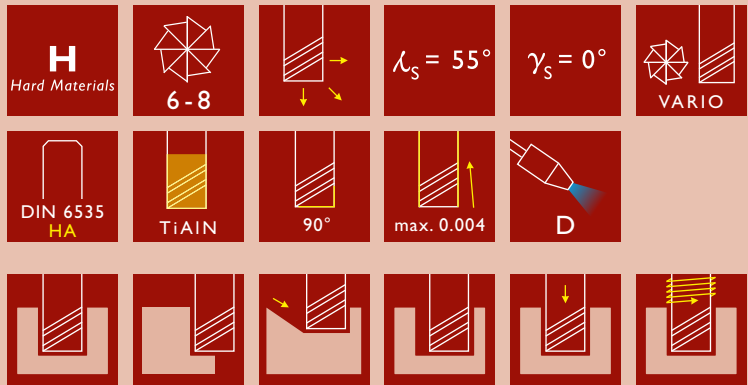
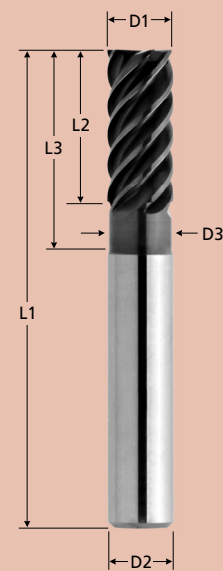


Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	EF (mm)	Preis €	Lagerware Stock
F0443L.D030.F010	3.0	6.0	-	57.0	8.0	-	3.6	0.1	19,90	*
F0443L.D040.F010	4.0	6.0	-	57.0	11.0	-	4.8	0.1	19,90	*
F0443L.D050.F010	5.0	6.0	4.9	57.0	13.0	18.0	6.0	0.1	19,90	*
F0443L.D060.F010	6.0	6.0	5.9	57.0	13.0	18.0	7.2	0.1	19,90	*
F0443L.D080.F020	8.0	8.0	7.8	64.0	21.0	25.0	9.6	0.2	32,00	*
F0443L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	12.0	0.2	42,00	*
F0443L.D120.F030	12.0	12.0	11.7	83.0	26.0	36.0	14.4	0.3	64,00	*
F0443L.D140.F030	14.0	14.0	13.7	83.0	26.0	36.0	16.8	0.3	85,00	
F0443L.D160.F030	16.0	16.0	15.5	92.0	36.0	42.0	19.2	0.3	121,00	*
F0443L.D180.F030	18.0	18.0	17.5	92.0	36.0	42.0	21.6	0.3	165,00	
F0443L.D200.F030	20.0	20.0	19.5	104.0	41.0	52.0	24.0	0.3	181,00	*
F0443M.D040.F010	4.0	6.0	-	62.0	16.0	-	4.8	0.1	27,50	
F0443M.D050.F010	5.0	6.0	-	62.0	17.0	-	6.0	0.1	27,50	
F0443M.D060.F010	6.0	6.0	-	62.0	18.0	-	7.2	0.1	27,50	
F0443M.D080.F020	8.0	8.0	-	68.0	24.0	-	9.6	0.2	41,50	
F0443M.D100.F020	10.0	10.0	-	80.0	30.0	-	12.0	0.2	61,50	
F0443M.D120.F030	12.0	12.0	-	93.0	36.0	-	14.4	0.3	71,00	
F0443M.D140.F030	14.0	14.0	-	99.0	42.0	-	16.8	0.3	76,50	
F0443M.D160.F030	16.0	16.0	-	108.0	48.0	-	19.2	0.3	142,00	
F0443M.D180.F030	18.0	18.0	-	114.0	54.0	-	21.6	0.3	194,00	
F0443M.D200.F030	20.0	20.0	-	126.0	60.0	-	24.0	0.3	211,00	

F0443L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
P2.3 HOCHLEGIERTE STÄHLE High alloy steel ≤ 1400 N/mm²	3.0	4	120	0.01	3.0	3.0
	4.0	4	120	0.015	4.0	4.0
	5.0	4	120	0.02	5.0	5.0
	6.0	4	120	0.025	6.0	6.0
	8.0	4	120	0.03	8.0	8.0
	10.0	4	120	0.035	10.0	10.0
	12.0	4	120	0.04	12.0	12.0
	14.0	4	120	0.045	14.0	14.0
	16.0	4	120	0.05	8.0	16.0
	18.0	4	120	0.055	9.0	18.0
	20.0	4	120	0.06	10.0	20.0
	25.0	4	120	0.08	12.5	25.0
H1.2 GEHÄRTETE STÄHLE Hardened steel ≤ 52 HRC	3.0	4	75	0.008	3.0	3.0
	4.0	4	75	0.01	4.0	4.0
	5.0	4	75	0.012	5.0	5.0
	6.0	4	75	0.017	6.0	6.0
	8.0	4	75	0.02	8.0	8.0
	10.0	4	75	0.025	10.0	10.0
	12.0	4	75	0.03	12.0	12.0
	14.0	4	75	0.035	14.0	14.0
	16.0	4	75	0.04	8.0	16.0
	18.0	4	75	0.045	9.0	18.0
	20.0	4	75	0.05	10.0	20.0
	25.0	4	75	0.07	12.5	25.0
H1.2 GEHÄRTETE STÄHLE Hardened steel ≤ 56 HRC	3.0	4	55	0.008	3.0	3.0
	4.0	4	55	0.01	4.0	4.0
	5.0	4	55	0.012	5.0	5.0
	6.0	4	55	0.017	6.0	6.0
	8.0	4	55	0.02	8.0	8.0
	10.0	4	55	0.025	10.0	10.0
	12.0	4	55	0.03	12.0	12.0
	14.0	4	55	0.035	14.0	14.0
	16.0	4	55	0.04	8.0	16.0
	18.0	4	55	0.045	9.0	18.0
	20.0	4	55	0.05	10.0	20.0
	25.0	4	55	0.07	12.5	25.0
H1.3 GEHÄRTETE STÄHLE Hardened steel ≤ 60 HRC	3.0	4	30	0.004	1.5	3.0
	4.0	4	30	0.006	2.0	4.0
	5.0	4	30	0.007	2.5	5.0
	6.0	4	30	0.008	3.0	6.0
	8.0	4	30	0.01	4.0	8.0
	10.0	4	30	0.015	5.0	10.0
	12.0	4	30	0.02	6.0	12.0
	14.0	4	30	0.025	5.0	14.0
	16.0	4	30	0.03	5.0	16.0
	18.0	4	30	0.035	6.0	18.0
	20.0	4	30	0.04	6.0	20.0
	25.0	4	30	0.06	8.0	25.0
H1.4 Gehärtete Stähle Hardened steel ≤ 60 HRC	3.0	4	25	0.004	1.5	3.0
	4.0	4	25	0.006	2.0	4.0
	5.0	4	25	0.007	2.5	5.0
	6.0	4	25	0.008	3.0	6.0
	8.0	4	25	0.01	4.0	8.0
	10.0	4	25	0.015	5.0	10.0
	12.0	4	25	0.02	6.0	12.0
	14.0	4	25	0.025	5.0	14.0
	16.0	4	25	0.03	5.0	16.0
	18.0	4	25	0.035	6.0	18.0
	20.0	4	25	0.04	6.0	20.0
	25.0	4	25	0.06	8.0	25.0
Korrekturversatz correction	Ae ≤ 0,4 x d	Vc = + 20 %	fz = + 20 %			
	Ae ≤ 0,2 x d	Vc = + 20 %	fz = + 20 %			
	Ap = 1,5 x d	Vc = + 20 %	fz = + 20 %			
	Ae ≤ 0,4 x d	Vc = Vc	fz = fz			
	Ap = 1,5 x d	Vc = Vc	fz = fz			

VHM-HARTFRÄSER
Solid carbide end mill for processing hard materials



Verjüngung max. 0.004 mm um planparallele
Flächen zu erzeugen (90° Winkel)

Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	D3 (mm)	Z flutes	Preis €	Lagerware Stock
F0655L.D040.F000	4.0	6.0	-	57.0	11.0	-	6	23,50	*
F0655L.D050.F000	5.0	6.0	4.9	57.0	13.0	18.0	6	23,50	*
F0655L.D060.F000	6.0	6.0	5.9	57.0	13.0	18.0	6	23,50	*
F0655L.D080.F000	8.0	8.0	7.8	64.0	21.0	25.0	6	29,50	*
F0655L.D100.F000	10.0	10.0	9.7	72.0	22.0	30.0	6	46,50	*
F0655L.D120.F000	12.0	12.0	11.7	83.0	26.0	36.0	6	68,50	*
F0655L.D140.F000	14.0	14.0	13.7	83.0	26.0	36.0	6	78,50	
F0655L.D160.F000	16.0	16.0	15.5	92.0	36.0	42.0	8	118,50	*
F0655L.D180.F000	18.0	18.0	17.5	92.0	36.0	42.0	8	124,50	
F0655L.D200.F000	20.0	20.0	19.5	104.0	41.0	52.0	8	134,50	*
F0330L.D250.F040	25.0	25.0	24.5	126.0	55.0	66.0	8	279,50	
F0655M.D060.F000	6.0	6.0	-	62.0	18.0	-	6	27,50	
F0655M.D080.F000	8.0	8.0	-	68.0	24.0	-	6	35,00	
F0655M.D100.F000	10.0	10.0	-	80.0	30.0	-	6	64,50	
F0655M.D120.F000	12.0	12.0	-	93.0	36.0	-	6	79,50	
F0655M.D140.F000	14.0	14.0	-	99.0	42.0	-	6	92,50	
F0655M.D160.F000	16.0	16.0	-	108.0	48.0	-	8	109,50	
F0655M.D180.F000	18.0	18.0	-	114.0	54.0	-	8	142,50	
F0655M.D200.F000	20.0	20.0	-	126.0	60.0	-	8	159,50	

F0655L · SCHNITTDATEN Cutting Data

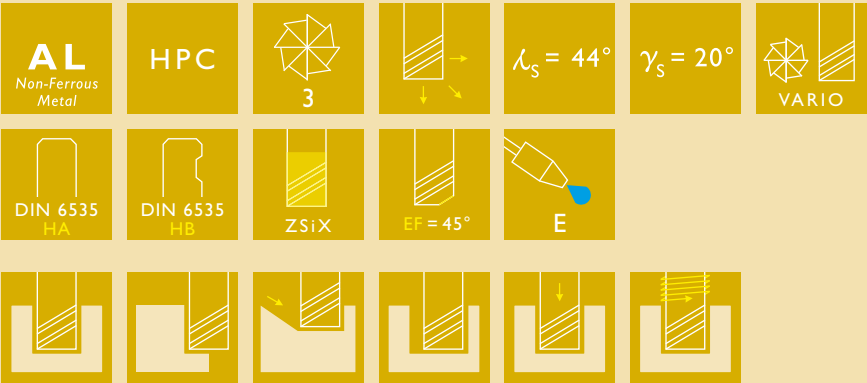
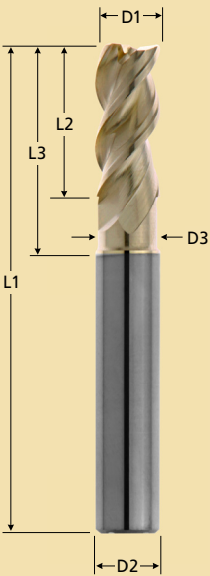
Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
HI.1 GEHÄRTETE STÄHLE Hardened steel ≤ 48 HRC	3.0	6	80	0.01	4.5	0.1
	4.0	6	80	0.015	6.0	0.1
	5.0	6	80	0.02	7.5	0.1
	6.0	6	80	0.025	9.0	0.1
	8.0	6	80	0.035	12.0	0.15
	10.0	6	80	0.04	15.0	0.15
	12.0	6	80	0.05	18.0	0.15
	14.0	6	80	0.06	21.0	0.2
	16.0	8	80	0.07	24.0	0.2
	18.0	8	80	0.085	27.0	0.3
	20.0	8	80	0.1	30.0	0.3
HI.2 GEHÄRTETE STÄHLE Hardened steel ≤ 52 HRC	25.0	8	80	0.12	37.0	0.3
	3.0	6	75	0.01	4.5	0.1
	4.0	6	75	0.015	6.0	0.1
	5.0	6	75	0.02	7.5	0.1
	6.0	6	75	0.025	9.0	0.1
	8.0	6	75	0.035	12.0	0.15
	10.0	6	75	0.04	15.0	0.15
	12.0	6	75	0.05	18.0	0.15
	14.0	6	75	0.06	21.0	0.2
	16.0	8	75	0.07	24.0	0.2
	18.0	8	75	0.085	27.0	0.3
HI.2 GEHÄRTETE STÄHLE Hardened steel ≤ 56 HRC	20.0	8	75	0.1	30.0	0.3
	25.0	8	75	0.12	37.0	0.3
	3.0	6	70	0.01	4.5	0.1
	4.0	6	70	0.015	6.0	0.1
	5.0	6	70	0.02	7.5	0.1
	6.0	6	70	0.025	9.0	0.1
	8.0	6	70	0.035	12.0	0.15
	10.0	6	70	0.04	15.0	0.15
	12.0	6	70	0.05	18.0	0.15
	14.0	6	70	0.06	21.0	0.2
	16.0	8	70	0.07	24.0	0.2
HI.3 GEHÄRTETE STÄHLE Hardened steel ≤ 60 HRC	18.0	8	70	0.085	27.0	0.3
	20.0	8	70	0.1	30.0	0.3
	25.0	8	70	0.12	37.0	0.3
	3.0	6	60	0.01	4.5	0.1
	4.0	6	60	0.015	6.0	0.1
	5.0	6	60	0.02	7.5	0.1
	6.0	6	60	0.025	9.0	0.1
	8.0	6	60	0.035	12.0	0.15
	10.0	6	60	0.04	15.0	0.15
	12.0	6	60	0.05	18.0	0.15
	14.0	6	60	0.06	21.0	0.2
HI.4 GEHÄRTETE STÄHLE Hardened steel ≤ 60 HRC	16.0	8	60	0.07	24.0	0.2
	18.0	8	60	0.085	27.0	0.3
	20.0	8	60	0.1	30.0	0.3
	25.0	8	60	0.12	37.0	0.3
	3.0	6	45	0.01	4.5	0.1
	4.0	6	45	0.015	6.0	0.1
	5.0	6	45	0.02	7.5	0.1
	6.0	6	45	0.025	9.0	0.1
	8.0	6	45	0.035	12.0	0.15
	10.0	6	45	0.04	15.0	0.15
	12.0	6	45	0.05	18.0	0.15



NE-METALLE
Non - Ferrous Metals

F0344L

VHM-HPC-SCHAFTFRÄSER
Solid carbide high performance end mill



Artikel-Nr. Order-No.	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	EF (mm)	Preis €	Lagerware Stock
F0344L.D030.F010	3.0	6.0	2.9	57.0	8.0	12.0	0.1	29,50	*
F0344L.D040.F010	4.0	6.0	3.9	57.0	13.0	17.0	0.1	29,50	*
F0344L.D050.F010	5.0	6.0	4.9	57.0	13.0	18.0	0.1	29,50	*
F0344L.D060.F020	6.0	6.0	5.9	57.0	19.0	19.0	0.2	29,50	*
F0344L.D080.F020	8.0	8.0	7.8	63.0	21.0	25.0	0.2	38,50	*
F0344L.D100.F020	10.0	10.0	9.7	72.0	22.0	30.0	0.2	64,50	*
F0344L.D120.F020	12.0	12.0	11.7	83.0	26.0	36.0	0.2	83,00	*
F0344L.D140.F020	14.0	14.0	13.7	83.0	26.0	36.0	0.2	139,00	
F0344L.D160.F020.HB	16.0	16.0	15.5	92.0	36.0	42.0	0.2	145,00	*
F0344L.D180.F020.HB	18.0	18.0	17.5	92.0	36.0	42.0	0.2	169,00	
F0344L.D200.F020.HB	20.0	20.0	19.5	104.0	41.0	52.0	0.2	234,00	*
F0344M.D060.F020	6.0	6.0	5.9	62.0	18.0	24.0	0.2	37,00	
F0344M.D080.F020	8.0	8.0	7.8	68.0	24.0	30.0	0.2	49,00	
F0344M.D100.F020	10.0	10.0	9.7	80.0	30.0	38.0	0.2	79,00	
F0344M.D120.F020	12.0	12.0	11.7	93.0	36.0	46.0	0.2	99,00	
F0344M.D140.F020	14.0	14.0	13.7	93.0	36.0	46.0	0.2	179,00	
F0344M.D160.F020.HB	16.0	16.0	15.5	108.0	48.0	58.0	0.2	209,00	
F0344M.D180.F020.HB	18.0	18.0	17.5	108.0	48.0	58.0	0.2	249,00	
F0344M.D200.F020.HB	20.0	20.0	19.5	126.0	60.0	74.0	0.2	296,00	
F0344XL.D060.F020	6.0	6.0	5.9	80.0	13.0	42.0	0.2	45,00	
F0344XL.D080.F020	8.0	8.0	7.8	100.0	21.0	62.0	0.2	59,00	
F0344XL.D100.F020	10.0	10.0	9.7	100.0	22.0	62.0	0.2	81,00	
F0344XL.D120.F020	12.0	12.0	11.7	120.0	26.0	73.0	0.2	115,00	
F0344XL.D140.F020	14.0	14.0	13.7	120.0	26.0	73.0	0.2	179,00	
F0344XL.D160.F020.HB	16.0	16.0	15.5	150.0	36.0	100.0	0.2	251,00	
F0344XL.D180.F020.HB	18.0	18.0	17.5	150.0	36.0	100.0	0.2	295,00	
F0344XL.D200.F020.HB	20.0	20.0	19.5	150.0	41.0	100.0	0.2	315,00	

F0344L · SCHNITTDATEN Cutting Data

Material Processing Material	D (mm)	Z flutes	Vc m/min	fz (mm)	ap (mm)	ae (mm)
N1.1 ALU-KNETLERGIERUNGEN Aluminium wrought alloys	3.0	3	600	0.02	3.0	3.0
	4.0	3	600	0.035	4.0	4.0
	5.0	3	600	0.04	5.0	5.0
	6.0	3	600	0.045	6.0	6.0
	8.0	3	600	0.06	8.0	8.0
	10.0	3	600	0.065	10.0	10.0
	12.0	3	600	0.07	12.0	12.0
	14.0	3	600	0.08	14.0	14.0
	16.0	3	600	0.09	16.0	16.0
	18.0	3	600	0.1	18.0	18.0
	20.0	3	600	0.12	20.0	20.0
	25.0	3	600	0.19	25.0	25.0
N1.4 ALU-GUSS-LEGIERUNGEN Aluminium cast alloys 5%-12% Si	3.0	3	360	0.015	3.0	3.0
	4.0	3	360	0.03	4.0	4.0
	5.0	3	360	0.035	5.0	5.0
	6.0	3	360	0.04	6.0	6.0
	8.0	3	360	0.05	8.0	8.0
	10.0	3	360	0.06	10.0	10.0
	12.0	3	360	0.07	12.0	12.0
	14.0	3	360	0.09	14.0	14.0
	16.0	3	360	0.12	16.0	16.0
	18.0	3	360	0.15	18.0	18.0
	20.0	3	360	0.17	20.0	20.0
	25.0	3	360	0.19	25.0	25.0
N1.5 ALU-GUSS-LEGIERUNGEN Aluminum cast alloys ≤ 12% Si	3.0	3	240	0.015	3.0	3.0
	4.0	3	240	0.03	4.0	4.0
	5.0	3	240	0.035	5.0	5.0
	6.0	3	240	0.04	6.0	6.0
	8.0	3	240	0.05	8.0	8.0
	10.0	3	240	0.06	10.0	10.0
	12.0	3	240	0.07	12.0	12.0
	14.0	3	240	0.09	14.0	14.0
	16.0	3	240	0.12	16.0	16.0
	18.0	3	240	0.15	18.0	18.0
	20.0	3	240	0.17	20.0	20.0
	25.0	3	240	0.19	25.0	25.0
N2.1 KUPFER Cooper	3.0	3	150	0.01	3.0	3.0
	4.0	3	150	0.02	4.0	4.0
	5.0	3	150	0.025	5.0	5.0
	6.0	3	150	0.03	6.0	6.0
	8.0	3	150	0.04	8.0	8.0
	10.0	3	150	0.05	10.0	10.0
	12.0	3	150	0.06	12.0	12.0
	14.0	3	150	0.07	14.0	14.0
	16.0	3	150	0.08	16.0	16.0
	18.0	3	150	0.1	18.0	18.0
	20.0	3	150	0.12	20.0	20.0
	25.0	3	150	0.14	25.0	25.0
N2.5 AMPCO	3.0	3	60	0.01	3.0	3.0
	4.0	3	60	0.02	4.0	4.0
	5.0	3	60	0.025	5.0	5.0
	6.0	3	60	0.03	6.0	6.0
	8.0	3	60	0.04	8.0	8.0
	10.0	3	60	0.05	10.0	10.0
	12.0	3	60	0.06	12.0	12.0
	14.0	3	60	0.07	14.0	14.0
	16.0	3	60	0.08	16.0	16.0
	18.0	3	60	0.1	18.0	18.0
	20.0	3	60	0.12	20.0	20.0
	25.0	3	60	0.14	25.0	25.0
Korrekturversatz correction	Ae ≤ 0,4 x d		VC = + 20 %		fz = +10 %	

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat.-No.	 DIN	 AFNOR	 BS
P	Free-machining steels							
I.1	> 500	9			1.0711	9 S 20	-	220 M 07
	380 - 570	8			1.0715	9 SMn 28	S 250	230 M 07
	380 - 570	8			1.0718	9 SMnPb 28	S 250 Pb	-
	360 - 530	9			1.0721	10 S 20	10 F1	210 M 15
	360 - 530	9			1.0722	10 SPb 20	10 PbF 2	-
	380 - 570	8			1.0723	15 S 20	-	210 A 15
	390 - 590	7			1.0736	9 SMn 36	S 300	240 M 07
	390 - 580	7			1.0737	9 SMnPb 36	S 300 Pb	-
	580 - 730	8			1.0726	35 S 20	35 MF 4	212 M 36
	660 - 800	7			1.0727	45 S 20	45 MF 4	212 M 44
	740 - 880	7			1.0728	60 S 20	60 MF 4	-
P	Alloyed structural steels							
I.1	440 - 590	24			1.5415	15 Mo 3	15 D 3	1501-240
	450 - 590	21			1.5423	16 Mo 5	-	1503 - 245 - 420
	490 - 640	20			1.5622	14 Ni 6	16 N 6	-
	530 - 710	20			1.5680	12 Ni 19	Z 18 N 5	-
	450 - 660	20			1.7335	13 CrMo 4 4	15 CD 3.5	1501- 620 Gr. 27
	540 - 690	20			1.7337	16 CrMo 4 4	15 CD 4.5	1501-620 Gr. 27
	480 - 630	18			1.7380	10 CrMo 9 10	10 CD 9.10	1501-622 Gr. 31; 45
	700 - 850	16			1.7709	21 CrMoV 5 7	-	-
	490 - 640	20			1.7715	14 MoV 6 3	14 Mo 6	1503 - 660 - 440
P	Construction steels							
I.1	> 500	25			1.0037	St 37- 2	-	-
	410 - 560	21			1.0044	St 44 - 2	E 28 - 2	4360 - 43 B
	340 - 470	25			1.0116	St 37- 3	E 24 - 3; E 24 - 4	4360 - 40 C
	410 - 560	21			1.0144	St 44 - 3	E 28 - 3; E 28 - 4	4360 - 43 C
	470 - 610	19			1.0050	St 50 - 2	A 50 - 2	4360 - 50 B
	490 - 630	21			1.0570	St 52 - 3	E 36 - 3; E 36 - 4	4360 - 50 B
	570 - 710	15			1.0060	St 60 - 2	A 60 - 2	4360 - SSE; SS
	340 - 470	25	< 82		1.0038	RSt37- 2	E 24 - 2 Ne	4360 40 C
P	Steel castings							
I.2	> 380	25			1.0420	GS - 38	-	AM 1
	700 - 800				1.1118	GS - 24 Mn 6	-	-
	480 - 620	20			1.1120	GS - 20 Mn 5	-	-
	> 500	22			1.5419	GS - 22 Mo 4	-	245
	> 500				1.5633	GS - 24 Ni 8	-	-
	> 500				1.5681	GS -10 Ni 19	-	-
	> 500				1.6309	GS - 20 Mn MoNi 5 5	-	-
	< 850	10			1.6582	GS - 34 CrNiMo 6	-	-
	> 800	11			1.6748	GS - 40 NiCrMo 6 5 6	-	-
	> 800				1.6750	GS - 20 NiCrMo 3 7	-	-
	> 800				1.6760	GS - 22 NiMoCr 5 6	-	-
	490 - 640	20			1.7357	GS -17 CrMo 5 5	-	621
	> 500	18			1.7379	GS -18 CrMo 9 10	-	622

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Free-machining steels					
-	CF 9 S 22	-	SUM 21	-	1212
-	CF 9 SMn 28	11SMn28	SUM 22	1912	1213
-	CF 9 SMnPb 2	11SMnPb28	SUM 22 L	1914	12 L 13
-	CF 10 S 20	10S20	-	-	1108
-	CF 10 SPb 20	10SPb20	-	-	11 L 08
-	-	F.210.F	SUM 32	1922	-
1B	CF 9 SMn 36	12SMn36	-	-	1215
-	CF 9 SMnPb 36	12SMNPb36	-	1926	12 L 14
8M	-	F210G	-	1957	1140
-	-	-	-	1973	1146
-	-	-	-	-	-
Alloyed structural steels					
-	16 Mo 3	16Mo3	-	2912	A 204 Gr. A
-	16 Mo 5	16Mo5	-	-	4520
-	14 Ni 6	15Ni6	-	-	A 350 - LF 5
-	-	-	-	-	2515
-	14 CrMo 4 5	14CrMo45	-	2216	A182-F11; F12
-	15 CrMo 4 5	-	-	2216	A387 Gr. 12 C
-	12 CrMo 9 10	-	-	2218	A 182 - F22
-	-	-	-	-	-
-	-	13MoCrV6	-	-	-
Construction steels					
-	-	-	STKM 12 C	-	-
-	Fe 430 B FN	-	SM 41 B	1412	A 570 Gr. 40
-	Fe 360 D FF	-	-	1312; 1313	A 573 Gr. 58
-	Fe 430 D FF	-	SM 41 C	1412; 1414	A 573 Gr. 70
-	Fe 490	-	SS 50	2172	A 570 Gr. 50
-	Fe 510 B; C; D	-	SM 50 YA	2132	-
-	Fe 590; Fe 600	-	SM 58	-	-
1A	-	-	STKM 12A; C	1311	A570.36
Steel castings					
-	-	-	-	-	A 27
-	-	-	-	-	-
-	-	F.8310	-	-	-
-	-	-	SCPH 11	-	-
-	-	-	-	-	-
-	-	-	-	-	A 757
-	-	-	-	-	-
24	-	-	SNCM 9	2541	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	F-8383	SCPH 21	-	A 217
-	-	-	SCPH 32	-	-

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
P	Case hardening steels							
1.1	< 500	15		< 82	1.0301	C 10	AF 34 C 10; XC 10	045 M 10
	< 500	13		< 82	1.0401	C 15	AF 34 C 12; XC 18	080 M 15
	< 500	14		< 82	1.1121	CK 10	XC 10	045 M 10
	< 500	13		< 82	1.1141	CK 15	XC 15; XC 18	080 M 15
	< 500	15		< 82	1.7012	13 Cr 2	-	-
	500 - 700	10		82 - 96	1.7015	15 Cr 3	12 C 3	523 M 15
	500 - 700	11		82 - 96	1.5732	14 NiCr 10	14 NC 11	-
	700 - 850	10	< 24		1.5752	14 NiCr 14	12 NC 15	655 M 13
	700 - 850	7	< 24		1.5860	14 NiCr 18	-	-
	700 - 850	9	< 24		1.5919	15 CrNi 6	16 NC 6	S 107
	700 - 850	7	< 24		1.5920	18 NiCr 8	20 NC 6	-
	700 - 850	10	< 24		1.6523	21 NiCrMo 2	20 NCD 2	805 M 20
	700 - 850	8	< 24		1.6587	17 CrNiMo 6	18 NCD 6	820 A 16
	700 - 850	10	< 24		1.7131	16 MnCr 5	16 MC 5	527 M 17
	700 - 850	10	< 24		1.7139	16 MnCrS 5	-	-
	700 - 850	8	< 24		1.7147	20 MnCr 5	20 MC 5	-
	700 - 850	8	< 24		1.7149	20 MnCrS 5	-	-
	700 - 850	10	< 24		1.7262	15 CrMo 5	12 CD 4	-
	700 - 850	8	< 24		1.7264	20 CrMo 5	18 CD 4	-
	700 - 850	8	< 24		1.7271	23 CrMoB 3 3	-	-
	500 - 700	10	< 24		1.7311	20 CrMo 2	-	-
	700 - 850	10	< 24		1.7321	20 MoCr 4	-	-
	700 - 850	10	< 24		1.7323	20 MoCrS 4	-	-
	700 - 850	8	< 24		1.7325	25 MoCr 4	-	-
	700 - 850	8	< 24		1.7326	25 MoCrS 4	-	-
	< 500	13		< 82	1.0402	C22	CC20	050 A 20
P	spring steels							
2.1	< 850	6	< 24		1.0904	55 Si 7	55 S 7	250 A 53
	< 850	6	< 24		1.0961	60 SiCr 7	60 SC 7	
	< 850	6	< 24		1.1231	CK 67	XC 68	060 A 67
	< 850	6	< 24		1.1248	CK 75	XC 75	060 A 78
	< 850	6	< 24		1.1274	CK 101	XC 100	060 A 96
	< 850	5	< 24		1.7103	67 SiCr 5	-	-
	< 850	6	< 24		1.7176	55 Cr 3	55 C 3	527 A 60
	< 850	10	< 24		1.8159	50 CrV 4	50 CV 4	735 A 50
	< 850	6	< 24		1.5026	55 Si 7	55 S 7	250 A 53
P	Alloyed heat-treatable steels							
2.2	< 800	22	< 21		1.1133	20 Mn 5	20 M 5	120 M 19
	< 800	11	< 21		1.7735	14 CrMoV 6 9	15 CDV 6	-
	< 800		< 21		1.3505	100 Cr 6	100 C 6	534 A 99
	< 800	12	< 21		1.5120	38 MnSi 4	-	-
	< 800	12	< 21		1.5121	46 MnSi 4	-	-
	< 800	12	< 21		1.5141	53 MnSi 4	-	-
	< 800	13	< 21		1.5710	36 NiCr 6	35 NC 6	640 A 35
	< 800		< 21		1.6546	40 NiCrMo 2 2	40 NCD 2	311-Type 7
	< 800		< 21		1.6565	40 NiCrMo 6	-	311-Type 6

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Case hardening steels					
-	C 10	-	S 10 C	-	1010
-	C 15; C 16	F.111	-	1350	1015
-	C10	-	S 10 C; S 9 CK	1265	1010
32C	C 15; C 16	C15K	S 15 C; S 15 CK	1370	1015
-	-	-	-	-	-
-	-	-	SCR 415 (H)	-	5015
-	16 NiCr 11	15NiCr11	SNC 415 (H)	-	3415
36A	-	-	SNC 815 (H)	-	3310; 9314
-	-	-	-	-	-
-	16 CrNi 4	-	-	-	-
-	-	-	-	-	-
362	20 NiCrMo 2	20 NiCrMo 2	SNCM 220 (H)	2506	8620
-	18 NiCrMo 7	14 NiCrMo 13	-	-	-
-	16 MnCr 5	16 MnCr 5	SCR 415	2511	5115
-	-	-	-	-	-
-	20 MnCr 5	-	SMnC 420 (H)	-	5120
-	-	-	-	-	-
-	12 CrMo 4	F.155	SCM 415 (H)	-	-
-	-	-	SCM 421	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
2C	C20; C21	F.112	-	1450	1020
spring steels					
45	55 Si 8	-	-	2085; 2090	9255
-	60 SiCr 8	-	SUP 7	-	9262
-	C 70	-	-	1770	1070
-	C 75	-	-	1774; 1778	1078; 1080
-	-	-	SUP 4	1870	1095
-	-	-	-	-	-
48	55 Cr 3	-	SUP 9 (A)	2253	5155
47	51 CrV 4	51CrV4	SUP 10	2230	6150
-	55 Si 8	-	-	2085; 2090	9255
Alloyed heat-treatable steels					
-	G 22 Mn 3	-	-	-	1022; 1518
-	-	-	-	-	-
31	100 Cr 6	-	SUJ 2	2258	52100
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
111A	-	-	SNC 236	-	3135
-	40 NiCrMo 2 (KB)	40NiCrMo2	SNCM 240	-	8740
-	-	-	SNCM 439	-	4340

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
P	Alloyed heat-treatable steels							
2.2	< 800	14	< 21		1.7003	38 Cr 2	38 C 2	-
	< 800	12	< 21		1.7006	46 Cr 2	42 C 2	-
	< 800	15	< 21		1.7020	32 Cr 2	-	-
	< 800	14	< 21		1.7030	28 Cr 4	-	530 A 30
	< 800	14	< 21		1.7033	34 Cr 4	32 C 4	530 A 32
	< 800	14	< 21		1.7218	25 CrMo 4	25 CD 4 S	1717 CDS 110
	< 800	12	< 21		1.7220	34 CrMo 4	35 CD 4	708 A 37
	< 800	10	< 21		1.7223	41 CrMo 4	42 CD 4 TS	708 M 40
	< 800	10	< 21		1.7225	42 CrMo 4	42 CD 4 TS	708 M 40
	< 800	9	< 21		1.7228	50 CrMo 4	-	708 A 47
	> 800 - 1000	12	> 21 - 30		1.1157	40 Mn 4	35 M 5	150 M 36
	> 800 - 1000	14	> 21 - 30		1.1165	30 Mn 5	35 M 5	120 M 36
	> 800 - 1000	10	> 21 - 30		1.1167	36 Mn 5	40 M 5	150 M 36
	> 800 - 1000	13	> 21 - 30		1.1170	28 Mn 5	20 M 5	150 M 28
	> 800 - 1000	12	> 21 - 30		1.3561	44 Cr 2	-	-
	> 800 - 1000	12	> 21 - 30		1.3563	43 CrMo 4	-	-
	> 800 - 1000	11	> 21 - 30		1.3565	48 CrMo 4	-	817 M 40
	> 800 - 1000	12	> 21 - 30		1.5120	38 MnSi 4	-	-
	> 800 - 1000	12	> 21 - 30		1.5121	46 MnSi 4	-	-
	> 800 - 1000	12	> 21 - 30		1.5122	37 MnSi 4	-	-
	> 800 - 1000	11	> 21 - 30		1.5131	50 MnSi 4	-	-
	> 800 - 1000	12	> 21 - 30		1.5141	53 MnSi 4	-	-
	> 800 - 1000	11	> 21 - 30		1.5223	42 MnV 7	-	-
	> 800 - 1000	13	> 21 - 30		1.5710	36 NiCr 6	35 NC 6	640 A 35
	> 800 - 1000	12	> 21 - 30		1.5736	36 NiCr 10	30 NC 11	-
	> 800 - 1000	11	> 21 - 30		1.5755	31 NiCr 14	18 NC 13	653 M 31
	> 800 - 1000	11	> 21 - 30		1.6511	36 CrNiMo 4	40 NCD 3	816 M 40
	> 800 - 1000	13	> 21 - 30		1.6513	28 NiCrMo 4	-	-
	> 800 - 1000	14	> 21 - 30		1.7003	38 Cr 2	38 C 2	-
	> 800 - 1000	13	> 21 - 30		1.7006	46 Cr 2	42 C 2	-
	> 800 - 1000	12	> 21 - 30		1.7030	28 Cr 4	-	530 A 30
	> 800 - 1000	14	> 21 - 30		1.7033	34 Cr 4	32 C 4	530 A 32
	> 800 - 1000	13	> 21 - 30		1.7034	37 Cr 4	38 C 4	530 A 36
	> 800 - 1000	12	> 21 - 30		1.7035	41 Cr 4	42 C 4	530 M 40
	> 800 - 1000	14	> 21 - 30		1.7218	25 CrMo 4	25 CD 4 S	1717 CDS 110
	> 800 - 1000	14	> 21 - 30		1.7220	34 CrMo 4	35 CD 4	708 A 37
	> 800 - 1000		> 21 - 30		1.7223	41 CrMo 4	42 CD 4 TS	708 M 40
	> 800 - 1000	12	> 21 - 30		1.7225	42 CrMo 4	42 CD 4 TS	708 M 40
	> 800 - 1000	13	> 21 - 30		1.7228	50 CrMo 4	-	708 A 47
	> 800 - 1000	13	> 21 - 30		1.7561	42 CrV 6	-	-
	> 800 - 1000	11	> 21 - 30		1.7735	14 CrMoV 6 9	15 CDV 6	-
	> 800 - 1000	10	> 24 - 30		1.8159	50 CrV 4	50 CV 4	735 A 50
2.3	> 1000 - 1300	10	> 30 - 40		1.3563	43 CrMo 4	-	-
	> 1000 - 1300	9	> 30 - 40		1.3565	48 CrMo 4	-	817 M 40
	> 1000 - 1300	11	> 30 - 40		1.5120	38 MnSi 4	-	-
	> 1000 - 1300	11	> 30 - 40		1.5121	46 MnSi 4	-	-
	> 1000 - 1300	11	> 30 - 40		1.5122	37 MnSi 4	-	-

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Alloyed heat-treatable steels					
-	38 Cr 2	-	-	-	-
-	45 Cr 2	-	-	-	5045
-	-	-	-	-	-
-	-	-	-	-	5130
18B	34 Cr 4 (KB)	35Cr4	SCr 430 (H)		5132
-	25 CrMo 4 (KB)	55Cr3	SCM 420; SCM 430	2225	4130
19B	35 CrMo 4	34CrMo4	SCM 432; SCCrM 3	2234	4135; 4137
19A	41 CrMo 4	42CrMo4	SCM 440	2244	4142; 4140
19A	41 CrMo 4	F-1252	SCM 440	2244	4142; 4140
-	-	-	SCM 445 (H)	-	4150
15	-	-	-	-	1039
-	-	-	SMn 433 H; SCMn 2	-	1330
-	-	-	SMn 438 H; SCMn3	2120	1335
14A	C 28 Mn	-	SCMn 1	-	1330
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	SNC 836	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
111A	-	-	SNC 236	-	3135
-	35 NiCr 9	-	SNC 631 (H)	-	3435
-	-	-	SNC 836	-	-
110	38 NiCrMo 4 (KB)	33NiCrMo4	SNC 836	-	9840
-	-	-	-	-	-
-	38 Cr 2	-	-	-	-
-	45 Cr 2	-	-	-	5045
-	-	-	-	-	5130
18B	34 Cr 4 (KB)	35Cr4	SCr 430 (H)	-	5132
-	38 Cr 4	-	SCr 435 (H)	-	5135
18	41 Cr 4	42Cr4	SCr 440 (H)	-	5140
-	25 CrMo 4 (KB)	55Cr3	SCM 420; SCM 430	2225	4130
19B	35 CrMo 4	34CrMo4	SCM 432; SCCrM 3	2234	4135; 4137
19A	41 CrMo 4	42CrMo4	SCM 440	2244	4142; 4140
19A	41 CrMo 4	F-1252	SCM 440	2244	4142; 4140
-	-	-	SCM 445 (H)	-	4150
-	-	-	-	-	-
-	-	-	-	-	-
47	51 CrV 4	51CrV4	SUP 10	2230	6150
-	-	-	-	-	-
-	-	-	SNC 836	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

WM code	Rm N/mm²	A5 %	HRC	HB	Mat.-Nr. Mat.-No.	 DIN	 AFNOR	 BS
P Alloyed heat-treatable steels								
2.3	> 1000 - 1300	10	> 30 - 40		1.5223	42 MnV 7	-	-
	> 1000 - 1300	11	> 30 - 40		1.5710	36 NiCr 6	35 NC 6	640 A 35
	> 1000 - 1300		> 30 - 40		1.5736	36 NiCr 10	30 NC 11	-
	> 1000 - 1300	7	> 30 - 40		1.5864	35 NiCr 18	-	-
	> 1000 - 1300	10	> 30 - 40		1.6511	36 CrNiMo 4	40 NCD 3	816 M 40
	> 1000 - 1300	9	> 30 - 40		1.6580	30 CrNiMo 8	30 CND 8	823 M 30
	> 1000 - 1300	9	> 30 - 40		1.6582	34 CrNiMo 6	35 NCD 6	817 M 40
	> 1000 - 1300	12	> 30 - 40		1.7033	34 Cr 4	32 C 4	530 A 32
	> 1000 - 1300	11	> 30 - 40		1.7034	37 Cr 4	38 C 4	530 A 36
	> 1000 - 1300	11	> 30 - 40		1.7035	41 Cr 4	42 C 4	530 M 40
	> 1000 - 1300		> 30 - 40		1.7045	42 Cr 4	42 C 4 TS	530 A 40
	> 1000 - 1300	12	> 30 - 40		1.7218	25 CrMo 4	25 CD 4 S	1717 CDS 110
	> 1000 - 1300	11	> 30 - 40		1.7220	34 CrMo 4	35 CD 4	708 A 37
	> 1000 - 1300	11	> 30 - 40		1.7223	41 CrMo 4	42 CD 4 TS	708 M 40
	> 1000 - 1300	10	> 30 - 40		1.7225	42 CrMo 4	42 CD 4 TS	708 M 40
	> 1000 - 1300	9	> 30 - 40		1.7228	50 CrMo 4	-	708 A 47
	> 1000 - 1300	9	> 30 - 40		1.7361	32 CrMo 12	30 CD 12	722 M 24
	> 1000 - 1300	10	> 30 - 40		1.7561	42 CrV 6	-	-
	> 1000 - 1300	9	> 30 - 40		1.7707	30 CrMoV 9	-	-
	> 1000 - 1300	10	> 30 - 40		1.7735	14 CrMoV 6 9	15 CDV 6	-
	> 1000 - 1300	9	> 30 - 40		1.8159	50 CrV 4	50 CV 4	735 A 50
	> 1000 - 1300	8	> 30 - 40		1.8161	58 CrV 4	-	-
P Unalloyed heat-treatable steels								
2.2	< 800	20	< 21		1.0402	C 22	AF 42 C 20	050 A 20
	< 800	19	< 21		1.0406	C 25	AF 50 C 30	070 M 26
	< 800	17	< 21		1.0501	C 35	AF 55 C 35	060 A 35
	< 800	14	< 21		1.0503	C 45	AF 65 C 45	080 M 46
	< 800	16	< 21		1.0511	C 40	AF 60 C 40	-
	< 800	18	< 21		1.0528	C 30	-	-
	< 800	20	< 21		1.1151	Ck 22	XC 25; XC 18	050 A 20
	< 800	19	< 21		1.1158	Ck 25	XC 25	070 M 26
	< 800	18	< 21		1.1178	Ck 30	-	-
	< 800	17	< 21		1.1181	Ck 35	XC 38 H1; XC 32	080 M 36
	< 800	16	< 21		1.1186	Ck 40	XC 42 H1	080 M 40
	< 800	14	< 21		1.1191	Ck 45	XC 42	080 M 46
	> 800 - 1000	12	> 21 - 30		1.0535	C 55	-	070 M 55
	> 800 - 1000	13	> 21 - 30		1.0540	C 50	-	-
	> 800 - 1000	11	> 21 - 30		1.0601	C 60	CC 55	080 A 62
	> 800 - 1000	12	> 21 - 30		1.1203	Ck 55	XC 55	070 M 55
	> 800 - 1000	13	> 21 - 30		1.1206	Ck 50	XC 48 H1	080 M 50
	> 800 - 1000	11	> 21 - 30		1.1221	Ck 60	XC 60	080 A 62
P Cold work tool steels								
4.2	760		19		1.2067	100 Cr 6	Y 100 C 6	BL 3
	750		99	99	1.2101	62 SiMnCr 4	-	-
	760		19		1.2103	58 SiCr 8	-	-
	760		19		1.2108	90 CrSi 5	-	-
	720			97	1.2162	21 MnCr 5	20 NC 5	-

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Alloyed heat-treatable steels					
-	-	-	-	-	-
111A	-	-	SNC 236	-	3135
-	35 NiCr 9	-	SNC 631 (H)	-	3435
-	-	-	-	-	-
110	38 NiCrMo 4 (KB)	33 NiCrMo 4	SNC 836	-	9840
-	30 NiCrMo 8		SNCM 431	-	-
24	35 NiCrMo 6 (KW)		SNCM 447	2541	4340
18B	34 Cr 4 (KB)	35 Cr 4	SCr 430 (H)	-	5132
-	38 Cr 4	-	SCr 435 (H)	-	5135
18	41 Cr 4	42 Cr 4	SCr 440 (H)	-	5140
-	41 Cr 4	42 Cr 4	SCr 440	2245	5140
-	25 CrMo 4 (KB)	55 Cr 3	SCM 420; SCM 430	2225	4130
19B	35 CrMo 4	34 CrMo 4	SCM 432; SCCrM 3	2234	4135; 4137
19A	41 CrMo 4	42 CrMo 4	SCM 440	2244	4142; 4140
19A	41 CrMo 4	F-1252	SCM 440	2244	4142; 4140
-	-	-	SCM 445 (H)	-	4150
40B	31 CrMo 12	F.124.A	-	2240	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
47	51 CrV 4	51 CrV 4	SUP10	2230	6150
-	-	-	-	-	-
Unalloyed heat-treatable steels					
2D	C 20; C 21	F.112	-	1450	1020
-	C 25	-	-		1025
-	C 35	F.113	-	1550	1035
-	C 45	F.114	-	1650	1045
-	C 40	-	-	-	1040
-	-	-	-	-	-
-	C 20	-	S 20 C; S 20 CK	-	1023
-	C 25	-	S 25 C	-	1025
-	-	-	-	-	-
-	C 35	-	S 35 C	1572	1035
-	C 40	-	S 40 C	-	1040
-	C 45	C45K	S 45 C	1672	1045
-	C 55	-	-	1655	1055
-	-	-	-	-	-
43D	C 60	-	-	-	1060
-	C 50	C55K	S 55 C	-	1055
-	-	-	-	-	1050
43D	C 60	-	S 58 C	1665; 1678	1060
Cold work tool steels					
-	-	100 Cr 6	-	-	L3
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	SCR 420 H		

WM code	Rm N/mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
P	Cold work tool steels							
4.2	730			98	1.2210	115 CRV 3	100 C 3	-
	730			98	1.2330	35 CrMo 4	34 CD 4	708 A 37
	750			99	1.2332	47 CrMo 4	42 CD 4	709 M 40
	760		19		1.2419	105 WCr 6	105 WC 13	-
	720			97	1.2510	100 MnCrW 4	90 MWCV 5	BO 1
	730			98	1.2516	120 W 4	110 WC 20	BF 1
	750			99	1.2542	45 WCrV 7	-	BS 1
	750			99	1.2550	60 WCrV 7	55 WC 20	-
	830		23		1.2721	50 NiCr 13	50 NiCr 13	-
	670			95	1.2735	15 NiCr 14	10 NC 12	-
	710			97	1.2762	75 CrMoNiW 6 7	-	-
	750			99	1.2826	60 MnSiCr 4	-	-
	760		19		1.2833	100 V 1	Y1 105 V	BW 2
	730			98	1.2842	90 MnCrV 8	90 MV 8	BO 2
	830		23		1.2080	X 210 Cr 12	Z 200 C 12	BD 3
	380			63	1.2341	X 6 CrMo 4	-	-
	760		19		1.2363	X 100 CrMoV 5 1	Z 100 CDV 5	BA 2
	640 - 840	18			1.5662	X8 Ni9	9 Ni	1501.509
	760		19		1.2379	X 155 CrVMo12 1	Z 160 CDV 12	BD 2
	760		19		1.2436	X 210 CrW 12	-	-
	760		19		1.2601	X 165 CrMoV 12	-	-
P	Unalloyed tool steels							
4.1	640			93	1.1520	C 70 W1	-	-
	640			93	1.1525	C 80 W1	Y1 90; Y1 80	-
	640			93	1.1545	C 105 W1	Y1 105	-
	640			93	1.1620	C 70 W2	-	-
	640			93	1.1625	C 80 W2	Y1 80	BW 1B
	640			93	1.1645	C 105 W2	Y1 105	-
	660			94	1.1654	C 110 W	-	-
	710			97	1.1663	C 125 W	Y2 120	-
	760		19		1.1673	C 135 W	Y2 140	-
	640			93	1.1730	C 45 W	Y3 42	-
	760		19		1.1740	C 60 W	Y3 55	-
	730			98	1.1744	C 67 W	-	-
	730			98	1.1750	C 75 W	-	BW 1A
	570			88	1.1820	C 55 W	-	-
	750			99	1.1830	C 85 W	Y3 90	-
P	Hot work tool steels							
3.1	< 770				1.2311	40 CrMnMo 7	-	-
	< 770				1.2312	40 CrMnMoS 8 6	-	-
	< 770				1.2711	54 NiCrMoV 6	55 NCDV 6	-
	< 800				1.2713	55 NiCrMoV 6	55 NCDV 7	Bh 224
	< 800				1.2738	40 CrMnNiMo 8	-	-
	< 840				1.2744	57 NiCrMoV 77	-	-
	< 860				1.2764	X 19 NiCrMo 4	-	-
	< 870				1.2767	X 45 NiCrMo 4	Y 35 NCD 16	-
	< 770				1.2083	X 42 Cr 13	Z 40 C 14	-

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
-	107 CrV 3 KU	-	-	-	L2
-	35 CrMo 4	-	-	2234	4135
-	40 CrMo 4	-	-	2244	4142
-	107 WVr 5 KU	105 WCr 5	SKS 31	-	-
-	95 MnWCr 5 KU	-	SKS 3	2140	O1
-	110 W 4 KU	-	-	-	-
-	45 WCrV 8 KU	45 WCrSi 8	-	2710	S 1
-	55 WCrV 8 KU	-	-	-	-
-	-	-	-	-	-
-	-	-	SNC 22	-	-
-	-	-	-	-	-
-	102 V 2 KU	-	SKS 43	-	W 210
-	90 MnVCr 8 KU	-	-	-	O 2
-	X 210 Cr 13 KU	X210Cr12	SKD 1	-	D 3
-	-	-	-	-	-
-	X 100 CrMoV 5 1 KU	-	SKD 12	2260	A 2
-	X 10Ni9	XBNi09	STBL 690	-	A353
-	X 155 CrVMo 12 1KU	-	SKD 11	-	D 2
-	X 215 CrW 12 1 KU	X210CrW12	SKD 2	2312	-
-	X 165 CrMoV 12 KU	X160CrMoV12	-	2310	-
-	-	-	-	-	-
-	C 80 KU	-	-	-	W 108
-	C 100 KU	-	-	-	W 110
-	-	-	-	-	-
-	C 80 KU	-	SKC 3; SK 5; SK 6	-	W 1
-	C 100 KU	-	SK 3	-	-
-	-	-	-	-	-
-	C 120 KU	-	SK 2	-	W 112
-	C 140 KU	-	SK 1	-	-
-	-	-	-	-	-
-	-	-	SK 7	-	-
-	-	-	-	-	-
-	-	-	-	-	W 1
-	-	-	-	-	-
-	-	-	SK 5	-	-
-	35 CrMo 8	-	-	-	-
-	40 CrMnMo 7	F-5302	-	-	-
-	-	-	-	-	-
-	-	F.520.S	SKT 4	-	L 6
-	-	-	-	-	P 20
-	-	-	-	-	-
-	-	-	-	-	-
-	42 NiCrMo 15 7	-	-	-	-
-	X 41 Cr 13 KU	F-5263	SUS 420 J 2	-	-

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
P	Hot work tool steels							
3.1	< 800				1.2343	X 38 CrMoV 5 1	Z 38 CDV 5	BH 11
	< 800				1.2344	X 40 CrMoV 5 1	Z 40 CDV 5	BH 13
	< 800				1.2365	X 32 CrMoV 3 3	Z32CDV 28	BH 10
	< 800				1.2567	X 30 WCrV 5 3	Z32 WCV 5	-
	< 800				1.2581	X 30 WCrV 9 3	Z30 WCV 9	BH 21
	< 770				1.2885	X 32 CrMoV 3 3 3	-	BH 10 A
	< 840				1.2316	X 36 CrMo 17	-	-
	1080	16	> 29		Toolox 33	-	-	-
	1250	10	43		Hardox 400	-	-	-
	1450	13	45		Toolox 44	-	-	-
P	Nitriding steels							
3.2	< 1000	14	< 30		1.8504	34 CrAl 6	-	-
	< 1000	12	< 30		1.8506	34 CrAlS 5	-	-
	< 1000	14	< 30		1.8507	34 CrAlMo 5	30 CAD 6.12	905 M 31
	< 1000	12	< 30		1.8509	41 CrAlMo 7	40 CAD 6.12	905 M 39
	> 1000	10	> 30		1.8515	31 CrMo 12	30 CD 12	722 M 24
	> 1000	9	> 30		1.8519	31 CrMoV 9	-	-
	> 1000	10	> 30		1.8521	15 CrMoV 5 9	-	-
	> 1000	8	> 30		1.8523	39 CrMoV 13 9	-	897 M 39
	> 1000	12	> 30		1.8550	34 CrAlNi 7	-	-
M	Stainless steels - ferritic							
1.1	400 - 600	17			1.4002	X 6 CrAl 13	Z 6 CA 13	405 S 17
	380 - 560	25			1.4512	X 5 CrTi 12	Z 6 CT 12	409 S 19
	400 - 600	19			1.4000	X 6 Cr 13	Z 6 C 13	403 S 17
	450 - 600	18			1.4016	X 6 Cr 17	Z 8 C 17	430 S 15
	500 - 700	12			1.4742	X 10 CrAlSi 18	Z 10 CAS 18	430 S 15
	450 - 630	18			1.4113	X 6 CrMo 17	Z 8 CD 17.01	434 S 17
	420 - 600	23			1.4510	X 3 CrTi 17	Z 8 CT 17	-
	400 - 600	20			1.4521	X 2 CrMoTi 18-2	Z 3 CDT 18 - 02	-
	450 - 650	15			1.4724	X 10 CrAlSi 13	Z 13 C 13	-
	520 - 720	15			1.4762	X 10 CrAl 24	Z 10 CAS 24	-
M	Stainless steels - austenitic							
2.1	750 - 950	40			1.4372	X 12 CrMnNiN 17 - 7 - 5	Z 12 CMN 17- 07 Az	-
	680 - 880	35			1.4373	X 12 CrMnNiN 18 - 9 - 5	-	284 S 16
	600 - 950	40			1.4310	X 10 CrNi 18 - 8; X 12 CrNi 17 7	Z 11 CN 17- 08	301 S 21
	630 - 850	35			1.4318	X 2 CrNiN 18 - 7	Z 3 CN 18 - 07 Az	-
	500 - 700	35			1.4305	X 10 CrNiS 18 9	Z 10 CNF 18.09	303 S 21
	600 - 951	36			1.4350	X 5 CrNi 18 9	Z 6 CN 18.09	304 S 31
	520 - 720	45			1.4301	X 5 CrNi 18 9	Z 6 CN 18.09	304 S 15
	460 - 680	45			1.4306	X 2 CrNi 19 11	Z 2 CN 18.10	304 S 12
	550 - 750	40			1.4311	X 2 CrNiN 18 10	Z 2 CN 18.10	304 S 62
	510 - 710	45			1.4948	X 6 CrNi 18 - 11	-	304 S 50
	520 - 700	45			1.4307	X 2 CrNi 18 - 9	Z 2 CN 19 - 09	-
	500 - 750	40			1.4315	X 5 CrNiN 19 - 9	-	-
	500 - 650	45			1.4303	X 5 CrNi 18 12	Z 8 CN 18.12	305 S 19
	500 - 700	33			1.4833	X 12 CrNi 23 - 13	Z 15 CN 23 - 13	309 S 24
	500 - 700	33			1.4845	X 8 CrNi 25 - 21	Z 8 CN 25 - 20	310 S 24

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Hot work tool steels					
-	X 37 CrMoV 5 1 KU	F-5317	SKD 6	-	H 11
-	X 40 CrMoV 5 1 1 KU	F-5318	SKD 61	-	H 13
-	X 30 CrMoV 12 27 KU	F-5313	SKD 7	-	H 10
-	X 30 WCrV 5 3 KU	-	SKD 4	-	-
-	X 30 WCrV 9 3 KU	X 30 WCrV 9	SKD 5	-	H 21
-	-	F-5314	-	-	-
-	X 38 CrMo 16 1 KU	F-5267	-	-	-
-	-	-	-	-	Toolox 33
-	-	-	-	-	Hardox 400
-	-	-	-	-	Toolox 44
Nitriding steels					
-	-	-	-	-	-
-	-	-	-	-	-
-	34 CrAlMo 7	-	-	-	A 355 Cl. D
41B	41 CrAlMo 7	41 CrAlMo 7	SACM 645	2940	A 355 Cl. A
-	31 CrAlMo 12	-	-	2240	-
-	-	-	-	-	-
-	-	-	-	-	-
40C	39 CrMoV 13 9	-	-	-	-
-	-	-	-	-	-
Stainless steels					
-	X 6 CrAl 13	-	SUS 405	2302	405
-	X 6 CrTi 12	-	SUH 409	-	409
-	X 6 Cr 13	F.3110	SUS 403	2301	403
960	X 8 Cr 17	F.3113	SUS 430	2320	430
60	X 8 Cr 17	F-3153	SUS 430; SUH 21	-	430
-	X 8 CrMo 17	F.3116	SUS 434	2325	434
-	X 6 CrTi 17	-	SUS 430 LX	-	XM 8; 430 Ti
-	-	F-3123	SUS 444	2326	444
-	-	F-3152	-	-	-
-	X 16 Cr 26	F.3154	SUH 446	-	446
Stainless steels					
-	-	-	-	-	201
-	-	-	-	-	202
-	X 10 CrNi 18-8	F-3517	SUS 301	2331	301
-	-	-	-	-	301LN
58 M	X 10 CrNi 18 9	F.3508	SUS 303	2346	303
58 E	X 5 CrNi 18 10	F.3551	SUS 302	-	304
58 E	X 5 CrNi 18 10	F.3551	SUS 304	2332; 2333	304; 304 H
-	X 2 CrNi 18 11	F.3503	SCS 19	2352; 2333	304 L
-	X 2 CrNiN 18 11	-	SUS 304 LN	2371	304 LN
-	-	-	-	-	304 H
-	-	-	-	-	304 L
-	-	-	-	-	304 N
-	X 8 CrNi 19 10	-	SUS 305	-	308; 305
-	X 6 CrNi 23 14	-	SUS 309S	-	309 S
-	X 6 CrNi 25 20	F.331	SUS 310S	2361	310 S

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
M	Stainless steels - austenitic							
2.1	550 - 750	30			1.4841	X 15 CrNiSi 25 - 21	Z 15 CNS 25 - 20	314 S 25
	520 - 680	40			1.4401	X 5 CrNiMo 18 10	Z 6 CND 17.11	316 S 16
	530 - 730	40			1.4436	X 5 CrNiMo 17 13 3	Z 6 CND 17.12	316 S 16
	520 - 680	40			1.4404	X 2 CrNiMo 17 13 2	Z 2 CND 17.12	316 S 11
	520 - 700	40			1.4435	X 2 CrNiMo 18 14 3	Z 2 CND 17.13	317 S 12
	520 - 700	40			1.4432	X 2 CrNiMo 17-12 - 3	Z 3 CND 17- 02 - 03	316 S 13
	580 - 780	40			1.4406	X 2 CrNiMoN 17 12 2	Z 2 CND 17.12 AZ	316 S 61
	580 - 780	35			1.4429	X 2 CrNiMoN 17 13 3	Z 2 CND 17.13 AZ	316 S 62
	490 - 740	40			1.4573	X 10 CrNiMoTi 18 12	-	320 S 33
	520 - 690	40			1.4571	X 6 CrNiMoTi 17 12 2	Z 6 CNT 17.12	320 S 31
	520 - 720	40			1.4580	X 6 CrNiMoNb 17 12 2	Z 6 CNDNb 17.12	318 S 17
	550 - 700	35			1.4438	X 2 CrNiMo 18 16 4	Z 2 CND 19.15	317 S 12
	580 - 780	35			1.4439	X 2 CrNiMoN 17-13 - 5	Z 3 CNDNb 17-14 - 05	-
	490 - 740	40			1.4583	X 10 CrNiMoNb 18 12	-	-
	500 - 720	40			1.4541	X 6 CrNiTi 18 10	Z 6 CNT 18.10	321 S 12
	500 - 720	40			1.4878	X 8 CrNiTi 18 -10	Z 6 CNT 18 -10	321 S 31
	500 - 720	40			1.4550	X 6 CrNiNb 18 10	Z 6 CNNb 18.10	347 S 17
	500 - 700	40			1.4563	X 1 NiCrMoCu 31- 27- 4	Z 2 NCDU 31- 27	-
	520 - 730	35			1.4539	X 1 NiCrMoCu 25 - 20 - 5	Z 2 NCDU 25 - 20	904 S 13
	550 - 750	30			1.4864	X 12 NiCrSi 35 -16	Z 20 NCS 33 -16	NA 17
	620 - 880	20			1.4460	X 8 CrNiMo 27 5	Z 5 CND 27- 05	-
	500 - 740	30			1.4546	X 5 CrNiNb 18 10	Z 6 CNNb 18.10	347 S 18
M	Stainless steels - DUPLEX							
3.1	340 - 950	20			1.4462	X 2 CrNiMoN 22-5-3	Z 3 CND 22 - 05 Az	318 S 13
	630 - 850	20			1.4362	X 2 CrNiN 23-4	Z 3 CN 23 - 04 Az	-
	730 -1000	15			1.4410	X 2 CrNiMoN 25-7-4	Z 3 CND 25 - 06	-
	730 -1000	17			1.4507	X 2 CrNiMoCuN 25-6-3	Z 3 CNDU 25 - 06	-
	730 -1000	17			1.4507	X 2 CrNiMoCuN 25-6-3	Z 3 CNDU 25 - 06	-
M	Stainless steels - martensitic							
1.2	> 600	20			1.4006	X 10 Cr13	Z 12 C 13	410 S 21
	650 - 850	12			1.4005	X 12 CrS 13	Z 12 CF 13	416 S 21
	> 700	15			1.4021	X 20 Cr 13	Z 20 C 13	420 S 37
	> 740	15			1.4028	X 30 Cr 13	Z 30 C 13	420 S 45
	> 760	12			1.4031	X 38 Cr 13	Z 40 C 14	
	> 780	12			1.4034	X 46 Cr 13	Z 40 CM	420 S 45
	> 850	12			1.4116	X 50 CrMoV 15	Z 50 CD 15	-
	> 900	12			1.4122	X 39 CrMo 17-1	Z 38 CD 16 - 01	-
	780 - 1100	11			1.4313	X 5 CrNi 13 4	Z 5 CN 13.4	425 C 11
	840 - 1100	14			1.4418	X 4 CrNiMo 6-5-1	Z 6 CND 16 - 05 - 01	-
	> 650	14			1.4024	X15Cr13	Z 12 C 13 M	420 S 29
	640 - 840	11			1.4104	X 14 CrMoS 17	Z 13 CF 17	-
	750 - 950	14			1.4057	X 17 CrNi 16 2	Z 15 CN 16.02	431 S 29
					1.4747	X 80 CrNiSi 20	Z 80 CSN 20.02	443 S 65
	< 900				1.4125	X 105 CrMo 17	Z 100 CD 17	-
M	Stainless steels - hardened							
1.3	>1275	5			1.4542	X 5 CrNiCuNb 16 - 4	Z 7 CNU 15 - 05	-
	>1030	19			1.4568	X7CrNiAl17-7	Z 9 CNA 17- 07	301 S 81

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Stainless steels - austenitic					
-	-	F.3310	SUH 310	-	314
58J	X 5 CrNiMo 17 12	F.3543	SUS 316	2347	316
-	X 5 CrNiMo 17 13	F.3538	SUS 316	2343	316
-	X 2 CrNiMo 17 12	F.3533	SUS 316 L	2348	316 L
-	X 2 CrNiMo 17 13	-	SCS 16; SUS 316 L	2353	316 L
-	X 2 CrNiMo 17-12-3	F-3537	-	-	316 L
58C	X 2 CrNiMoN 17 12	F-3542	SUS 316 LN	-	316 LN
-	X 2 CrNiMoN 17 13	F-3543	SUS 316 LN	2375	316 LN
-	X 6 CrNiMoTi 17 13	-	SUS 316 Ti	-	316 Ti
58J	X 6 CrNiMoTi 17 12	F.3535	SUS 316 Ti	2350	316 Ti
-	X 6 CrNiMoNb 17 12	F.3536	-	-	316 Cb
-	X 2 CrNiMo 18 15	F-3539	SUS 317 L	2367	317 L
-	-	F-3544	-	-	317 LMN
-	X 6 CrNiMoNb 17 13	-	-	-	318
58B	X 6 CrNiTi 18 11	F.3553; F.3523	SUS 321	2337	321
-	-	-	SUS 321	-	321 H
58F	X 6 CrNiNb 18 11	F.3552; F.3524	SUS 347	2338	347
-	-	-	-	2584	B 668
-	-	-	-	2562	904 L
-	-	F.3313	SUH 330	-	330
-	-	F-35552	SUS 329 J 1	2324	329
58F	X 6 CrNiNb 18 11	F-3524	SUS 347	2338	348
Stainless steels - DUPLEX					
-	-	-	SUS 329J3L	2377	2205
-	-	-	-	2327	2304
-	-	-	SCS 14A	2328	2507
-	-	-	-	-	255
-	-	-	-	-	255
Stainless steels - martensitic					
56A	X 12 Cr 13	F.3401	SUS 410	2302	410; CA-15
-	X 12 CrS 13	-	SUS 416	2380	416
-	X 20 Cr 13	-	SUS 420 J 1	2303	420
-	X 30 Cr 13	-	SUS 420 J 2	2304	420
-	X 40 Cr 14	-	SUS 420 J 2	2304	420
56D	X 40 Cr 14	F.3405	SUS 420 J 2	2304	420
-	-	F-3422	-	-	-
-	-	-	-	-	-
-	X 6 CrNi 13 04	-	SCS 5	2385	CA 6-NM
-	-	-	-	2387	-
56B	-	-	SUS 410J1	-	420
-	X 14 CrS 17	F - 3431	SUS 430 F	2383	430 F
57	X 16 CrNi 16	F - 3427	SUS 431	2321	431
59	X 80 CrSiNi 20	F.320.B	SUH 4	-	HNV 6
-	X 105 CrMo 17	-	SUS 440 C	-	440 C
Stainless steels - hardened					
-	-	-	SCS 630	-	630
-	-	-	SUS 631	2388	631

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
S	Nickel-/Cobalt-alloys							
2.1	900 - 1100	14			1.4718	X 45 CrSi 9 3	Z 45 CS 9	401 S 45
	500 - 750	30			1.4828	X 15 CrNiSi 20 12	Z 15 CNS 20.12	309 S 24
	550 - 800	30			1.4841	X 15 CrNiSi 25 20	Z 15 CNS 25.20	-
	500 - 750	35			1.4845	X 12 CrNi 25 21	Z 12 CN 25.20	310 S 24
	550 - 800	30			1.4864	X 12 NiCrSi 36 16	Z 12 NCS 37.18	NA 17
	950 - 1200	8			1.4871	X 53 CrMnNiN 21 9	Z 52 CMN 21.09	349 S 54
	500 - 750	30			1.4876	X 10 NiCrAlTi 33 20	Z 8 NC 32.21	NA 15 (H)
	500 - 750	40			1.4878	X 12 CrNiTi 18 9	Z 6 CNT 18.12 (B)	321 S 20
	500 - 700	35			2.4360	NiCu30Fe	Nu 30	NA 13
	620 - 850	17			2.4375	NiCu30Al	Nu 30 AT	NA 18
	> 690	40			2.4685	G-NiMo28	-	-
	> 740	42			2.4610	NiMo16Cr16Ti	-	-
	> 760	40			2.4617	G-NiMo30	-	-
	700 - 800	26			2.4630; 2.4951	NiCr20Ti	NC 20 T	HR 5
	800 - 1000	12			2.4631	NiCr20TiAl	-	HR 401; 601
2.2	1200	17			2.4632	NiCr20Co18Ti	-	-
	1180	25			2.4634	NiCo20Cr15MoAlTi	-	-
	< 770	15			2.4662	NiCr13Mo6Ti3	-	HR 53
	900 - 1200				2.4670	-	-	-
	900 - 1200				2.4674	-	-	-
	1270	23			2.6554	-	-	-
	890	50			2.4856	NiCr22Mo9Nb	NC 22 FeDNb	NA 21
2.3	< 1400	25			2.4668	NiCr19FeNbMo	NC 19 FeNb	
S	Pure titanium, Titanium alloys							
1.1	290 - 410	30			3.7025	Ti99.5 / Ti Gr. 1	-	-
1.2	380 - 540	20			3.7035	Ti99.4 / Ti Gr. 2	-	TA 1
	460 - 590	18			3.7055	Ti99.3 / Ti Gr. 3	-	TA 2
	540 - 740	16			3.7065	Ti99.2 / Ti Gr. 4	-	TA 3
	390 - 540	20			3.7235	Ti 2 Pd / Ti Gr.2 Pd	-	-
1.3	> 890	>10			3.7165	TiAl6V482 / Ti Gr. 5	T - A6V	TA 28
	> 1000	9			3.7185	TiAl 4 Mo 4 Sn 2	-	-
K	Cast iron - lamellar graphite							
1.1	100 - 200				0.6010	EN - J1 100 (GG - 10)	Ft 10 D	-
	150 - 250				0.6015	EN - J1 150 (GG - 15)	Ft 15 D	Grade 150
	200 - 300				0.6020	EN - J1 200 (GG - 20)	Ft 20 D	Grade 220
	250 - 350				0.6025	EN - J1 250 (GG - 25)	Ft 25 D	Grade 260
	300 - 400				0.6030	EN - J1 300 (GG - 30)	Ft 30 D	Grade 300
	350 - 450				0.6035	EN - J1 350 (GG - 35)	Ft 35 D	Grade 350
	400 - 500				0.6040	EN - J1 Z (GG - 40)	Ft 40 D	Grade 400
	>170				0.6655	GGL - NiCuCr 15 6 2	L - NUC 15 6 2	L - NUC 15 6 2
	>170	2			0.6660	GGL - NiCr 20 - 2	L - NC 20 2	L - NC 20 2
	>190	1			0.6676	GGL - NiCr 30 - 3	L - NC 30 3	L - NC 30 3
	>170				0.6680	GGL - NiSiCr 30 - 5 - 5	L - NSC 30 5 5	L - NSC 30 5 5
K	Cast iron - nodular graphite							
1.2	370 - 400	14			0.7040	EN (GGG - 400) - 15	FGS 400 - 12	SNG 420 / 12
	420 - 500	7			0.7050	EN (GGG - 500) - 7	FGS 500 - 7	SNG 500 / 7
	550 - 600	3			0.7060	EN (GGG - 600) - 3	FGS 600 - 3	SNG 600 / 3

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Nickel-/Cobalt-alloys					
52	X 45 CrSi 8	-	SUH 1	-	HNV 3
-	-	-	SUH 309	-	309
-	X 16 CrNiSi 25 20	-	SUH 310	-	314; 310
-	X 6 CrNi 26 20	F.331	SUH3300\$ SUS	-	310 S
-	-	-	SUH 330	-	330
-	X 53 CrMnNiN 21 9	-	SUH 35; SUH 36	-	EV 8
-	-	-	NCF 800	-	B 163
-	X 6 CrNiTi 18 11	-	SUS 321	2337	321
-	-	-	-	-	Monel 400
-	-	-	-	-	Monel K - 500
-	-	-	-	-	Hastelloy B
-	-	-	-	-	Hastelloy C - 4
-	-	-	-	-	Hastelloy B - 2
-	-	-	-	-	Nimonic 75
-	-	-	NCF 80 A	-	Nimonic 80 A
-	-	-	-	-	Nimonic 90
-	-	-	-	-	Nimonic 105
-	-	-	-	-	Nimonic 901
-	-	-	-	-	Nimocast 713
-	-	-	-	-	Nimocast PK 24
-	-	-	-	-	Waspaloy
-	-	-	-	-	Inconel 625
-	-	-	-	-	Inconel 718
Pure titanium, Titanium alloys					
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	R56400
-	-	-	-	-	-
Cast iron - lamellar graphite					
-	G 10	-	FC 10	01 10 - 00	A48 - 20 B
-	G 15	FG 15	FC 15	01 15 - 00	A48 - 25 B
-	G 20	FG 20	FC 20	01 200	A48 - 30 B
-	G 25	FG 25	FC 25	01 250	A48 - 40 B
-	G 30	FG 30	FC 30	1 300	A48 - 45 B
-	G 35	FG 35	FC 35	1 350	A48 - 50 B
-	-	-	-	1 400	A48 - 60 B
-	-	-	-	-	A - 436 Type 1
-	-	-	-	-	A - 436 Type 2
-	-	-	-	-	A - 436 Type 3
-	-	-	-	-	A - 436 Type 4
Cast iron - nodular graphite					
-	GS 400 - 12	GGG 40	FCD 40	0717- 02	60 - 40 - 18
-	GS 500 / 7	GGG 50	FCD 50	0727- 02	65 - 45 - 12
-	GS - 600 / 3		FCD 60	0732 - 03	80 - 55 - 06

MATERIALLISTE

Material register

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
K	Cast iron - nodular graphite							
I.2	660 - 700	2			0.7070	EN - GJS - 700 - 2 (GGG - 70)	FGS 700-2	SNG 700/2
	800	2			0.7080	EN - GJS - 800 - 2 (GGG - 80)	FGS 800-2	SNG 800/2
	370 - 480	7			0.7660	GGG - NiCr 20 2	S-NC 20 2	S-NiCr 20 2
	> 390	7			0.7661	GGG - NiCr 20 3	S-NC 20 3	S-NiCr 20 3
	370 - 450	20			0.7670	EN - GJSA - XNi22	S-N 22	S-Ni 22
	440 - 480	25			0.7673	EN - GJSA - XNiMn23 - 4	S-NM 23 4	S-NiMn 23 4
	370 - 480	7			0.7676	EN - GJSA - XNiCr30 - 3	S-NC 30 3	S-NiCr 30 3
	> 370	13			0.7677	GGG - NiCr 30 1	S-NC 30 1	S-NiCr 30 1
	390 - 500	1			0.7680	EN - GJSA - XNiSiCr30 - 5 - 5	S-NSC 30 5 5	S-NiSiCr 30 5 5
	370 - 420	20			0.7683	EN - GJSA - XNi35	S-N 35	S-Ni 35
	370 - 450	7			0.7685	EN - GJSA - XNiCr35 - 3	S-NC 35 3	S-NiCr 35 3
K	Cast iron - vermicular graphite							
I.3	300 - 375	1.5				EN - GJV 300	-	-
	350 - 425	1.5				EN - GJV 350	-	-
	400 - 475	1.0				EN - GJV 400	-	-
	450 - 525	1.0				EN - GJV 450	-	-
	500 - 575	0.5				EN - GJV 500	-	-
K	Malleable cast iron							
2.1	> 350	10			0.8135	EN - GJBM 350 - 10	MN35 - 10	B340 / 12
	> 450	6			0.8145	EN - GJMB 450 - 6	-	P440 / 7
	> 550	4			0.8155	EN - GJMB 550 - 4	MP50 - 5	P510 / 4
	> 650	2			0.8165	EN - GJMB 650 - 2	MP60 - 3	P570 / 3
	> 700	2			0.8170	EN - GJMB 700 - 2	M870 - 2	P690 / 2
	270 - 360	3			0.8035	EN - GJMW - 350 - 4	MB35 - 7	W340 / 3
	300 - 420	4			0.8040	EN - GJMW - 400 - 5	MB40 - 10	W410 / 4
	330 - 480	4			0.8045	EN - GJMW - 450 - 7	-	-
	490 - 570	3			0.8055	EN - GJMW - 550 - 4	-	-
K	Hard casting							
3.1	< 1400		< 45		0.9620	GJH - X 260 NiCr 4 - 2	-	Grade 2 A
	< 1400		< 45		0.9625	GJH - X 330 NiCr 4 - 2	-	Grade 2 B
	< 1400		< 45		0.9630	GJH - X 300 CrNiSi 9 - 5 - 2	-	Grade 2 C
	< 1400		< 45		0.9635	GJH - X 300 CrMo 15 - 3	-	Grade 3 A
	1000	5				GJS - 1000 - 5	-	-
	1200	2				GJS - 1200 - 2	-	-
	1400	1				GJS - 1400 - 1	-	-
H	Hardened steels							
I.1	1250 - 1550	8	< 50		Weldox 1100	-	-	-
I.2	1600 - 1800		< 55		Hardox 500	-	-	-
	1820 - 1900		< 55		Hardox 550	-	-	-
	~ 1850		< 55		1.2713	55 NiCrMoV 6	55 NCDV 7	-
I.3	1995 - 2300		< 60		Armox 600T	-	-	-
	~ 2100		< 60		1.2542	45 WCrV 7	-	BS 1
I.4			< 63		Ferro -Titanit	-	-	-
			< 63		1.2379	X 155 CrVMo12 1	Z 160 CDV 12	BD 2
			< 66		HSSE	-	-	-
			< 66		1.2436	X 210 CrW 12	-	-

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
-	GS 700 / 2	GGG 70	FCD 70	0737 - 01	100 - 70 - 03
-	GS 800 / 2	-	-	-	120 - 90 - 02
-	-	F 43000	-	-	A 439 Type D - 2
-	-	F 43001	-	-	A 439 Type D - 2B
-	-	F 43002	-	-	A 439 Type D - 2C
-	-	F 43003	-	-	A 439 Type D - 2M
-	-	-	-	-	A 439 Type D - 3
-	-	F 43004	-	-	A 439 Type D - 3A
-	-	F 43005	-	-	A 439 Type D - 4
-	-	F 43 006	-	-	A 439 Type D - 5
-	-	-	-	-	A 439 Type D - 5B
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	GTS 35	-	0810	32510
-	-	GTS 45	-	0852	40010
-	-	GTS 55	-	0854	50005
-	-	GTS 65	-	0856	70003
-	-	GTS 70	-	0862; 0864	90001
-	-	GTW 35	FCMW 330	-	MB 350 - 4
-	GMB 40	GTW 40	FCMW 370	-	MB 400 - 5
-	GMB 45	GTW 45	FCMWP 440	-	MB 450 - 7
-	-	GTW 55	-	-	-
-	-	-	-	0512 - 00	A532 I B
-	-	-	-	0513 - 00	A532 I A
-	-	-	-	-	A532 I D
-	-	-	-	-	A532 IIC 15%
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	Weldox 1100
-	-	-	-	-	Hardox 500
-	-	-	-	-	Hardox 550
-	-	F.520.S	SKT 4	-	L 6
-	-	-	-	-	Armox 600T
-	45 WCrV 8 KU	45WCrSi8	-	2710	S 1
-	-	-	-	-	Ferro -Titanit
-	X 155 CrVMo 12 1 KU	-	SKD 11	-	D 2
-	-	-	-	-	HSSE
-	X 215 CrW 12 1 KU	X210CrW12	SKD 2	2312	-

WM code	Rm N/mm²	A5 %	HRC	HB	Mat.-Nr. Mat.-No.	 DIN	 AFNOR	 BS
N	Aluminium unalloyed							
1.1	65 - 150	< 40			3.0225	Al99.5	A5	1B
	40 - 100	< 33			3.0305	Al99.9	A9	-
N	Aluminium wrought alloys - not hardened							
1.1	100 - 125	> 1			3.0505	AlMn0.5Mg0.5	-	N31
	80 - 230	> 2			3.0515	AlMn1	-	N3
	115 - 290	4			3.0525	AlMn1Mg0.5	A - M1G0.5	-
	100 - 205	> 4			3.3315	AlMg1	A - G0.6	N41
	180 - 310	> 3			3.3535	AlMg3	A - G3M	N5
N	Aluminium wrought alloys - hardened							
1.2	150 - 400	> 2			3.1325	AlCuMg1	A - U4G	H14
	180 - 460	> 3			3.1355	AlCuMg2	A - U4G1	2L97
	130 - 360	> 2			3.2315	AlMgSi1	A - SGM0.7	H30
	130 - 270	> 8			3.3206	AlMgSi0.5	-	H9
	120 - 300	> 2			3.3211	AlMg1SiCu	-	H20
	410 - 490	> 3			3.4345	AlZnMgCu0.5	AZ 4 GU / 9051	L86
	180 - 560	> 1			3.4365	AlZnMgCu1.5	AZ 4 GU / 9050 C	L87
N	Aluminium cast alloys Si <5%							
1.3	280 - 300	< 1			3.2134	G - AlSiCu1Mg	-	-
	140 - 300	> 2			3.3241	G - AlMg3Si	-	-
	200	1			3.3292	GD - AlMg9	A - G10S	-
	140 - 210	> 4			3.3541	GD - AlMg3	A - G3T	-
N	Aluminium cast alloys Si <5-12%							
1.4	160 - 200	1			3.2161	G - AlSi8Cu3	-	-
	230 - 360	> 2			3.2373	G - AlSi9Mg	A - S9G	-
	240 - 350	< 3			3.2163	G - AlSi9Cu3	A - S9U3	LM 24
	150 - 340	> 1			3.2381	G - AlSi10Mg	A - S10G	LM 9
	160	1			3.2383	G - AlSi10Mg (Cu)	A - S10GU	LM 9
	150 - 170	5			3.2581	G - AlSi12	A - S13	LM 6
	150 - 290	> 1			3.2583	G - AlSi12 (Cu)	A - S12U	LM 20
N	Aluminum cast alloys Si >12%							
1.5	165 - 370	< 1				G - AlSi 17 Cu 4 Mg	-	-
	180 - 220	< 1				G - AlSi 18 CuNiMg	-	-
	200 - 240	< 1				G - AlSi 21 CuNiMg	-	-
	230 - 300	< 1.5				G - AlSi 25 CuNiMg	-	-
N	Pure copper, low alloyed copper							
2.1	< 600	> 10			2.0240	CuZn15	CuZn15	CZ 102
	< 800	> 10			2.0265	CuZn30	CuZn30	CZ 106
N	Copper-zinc alloys (brass) (long chipping)							
2.2	< 800	> 10			2.0321	CuZn37	CuZn37	CZ 108
	< 800	> 12			2.0335	CuZn36	Ms63	CZ 108
	340 - 480	25			2.0360	CuZn40	Ms60	DCB1
N	Copper-zinc alloys (brass) (short chipping)							
2.2	340 - 570	> 11			2.0401	CuZn39Pb3	Ms58	-
N	Copper-tin alloys (bronze) (long-chipping)							
2.4	< 900	50			2.1016	CuSn4	-	-
	390 - 620	> 15			2.1030	CuSn8P	-	-

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
Aluminium unalloyed					
-	4507	L - 3051	Alx1	-	-
-	-	-	-	-	-
Aluminium wrought alloys - not hardened					
-	-	-	-	-	3105
-	3568	L - 3810	144054	-	-
-	-	-	-	-	-
-	5764	L - 3350	A 2 x 8	144106	-
-	3575	L - 3390	-	-	-
Aluminium wrought alloys - hardened					
-	3579	L - 3120	-	-	-
-	3579	L - 3140	A 3 x 4	-	-
-	3571	L - 3451	-	144212	-
-	3569	L - 3441	A 2 x 5	144103	-
-	-	-	-	-	-
-	811-04	-	-	-	7050
-	811-05	-	-	-	7175
Aluminium cast alloys Si <5%					
-	-	-	-	-	-
-	-	-	-	-	-
-	5080	-	-	-	-
-	3059	-	ADC6	-	-
Aluminium cast alloys Si <5-12%					
-	-	-	-	-	-
-	3051	-	AC4A	-	-
-	5075	-	-	-	-
-	3051	L - 2560	-	4253	-
-	-	-	-	4253	A 360.2
-	3051	-	AC3	4261	A 413.2
-	3048	-	-	4260	A 413.1
Aluminum cast alloys Si >12%					
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Pure copper, low alloyed copper					
-	-	-	C2300	-	C23000
-	-	-	C2600	-	C26000
Copper-zinc alloys (brass) (long chipping)					
-	-	-	C 2700	-	C27200
-	P - CuZn35	-	C 2700	-	C27000
-	-	-	-	-	C28000
Copper-zinc alloys (brass) (short chipping)					
-	-	-	-	-	C38500
Copper-tin alloys (bronze) (long-chipping)					
-	-	-	C 5111	-	C51100
-	-	-	C 5210	-	C52100

WM code	Rm N / mm²	A5 %	HRC	HB	Mat. - Nr. Mat. - No.	 DIN	 AFNOR	 BS
N	Copper-zinc alloys (bronze) (short-chipping)							
2.3	200 - 250	6			2.1097	G - CuSn5ZnPb	Rg5	-
	230 - 320	12			2.1090.01	G - CuSn7ZnPb	Rg7	-
	280	18			2.1086.01	G - CuSn10Zn	Rg10	-
	600 - 650	7			2.0975	G - CuAl10Ni	CuNiAl11	-
N	Copper-Aluminium alloys							
2.5	> 550	40			Ampco 8	-	-	-
	> 750	1			Ampco 21	-	-	-
	> 500	0			Ampco 25	-	-	-
	> 810	15			Ampco 45	-	-	-
	> 1000	8			Ampco M-4	-	-	-
N	Magnesium, wrought alloys							
3.1	> 270	6			3.5612	MgAl 6 Zn	-	-
	> 240	2			3.5912	G - MgAl9Zn1	-	-
N	Synthetics							
4.1					Bakelit	-	-	-
					Pertinax	-	-	-
4.2					PMMA	-	-	-
					POM	-	-	-
					PVC	-	-	-
N	Fibre-reinforced synthetics							
4.3	155 - 365				GFK	Fibreglass		-
	190 - 210				CFK uni.	Carbon fibre		-
	190 - 210				CFK multi.	Carbon fibre		-
					AFK	Aramide fibre		-
					BFK	Boro fibre		-
					MFK	Metal fibre		-
					SFK	Synthetic fibre		-
N	Sandwich							
4.5					P - M - H	Plastic-Metal-Wood		-
					Honeycomb	-		-
					Metal	-		-

 EN	 UNI	 UNE	 JIS	 SIS	 AISI / SAE / ASTM
-	-	-	H 5111	-	C83600
-	-	-	-	-	C93200
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Performance in Cutting Tools

