

Cooling	 
Tolerance	0-0,01
Coating	TiSiN- α

HA

HSC

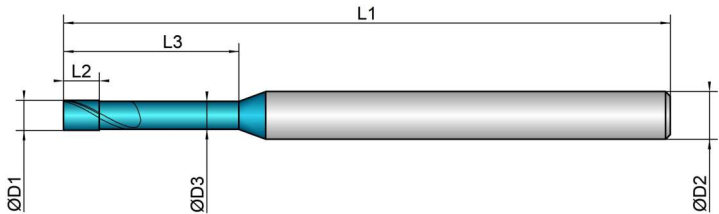




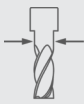
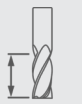
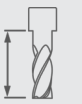
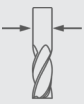


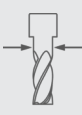


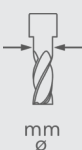
HA K201122

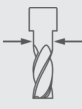
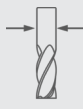


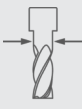
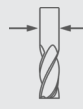
Steel			Hardened steel				Stainless steel (VA)	Castings	Non-ferrous materials				Inconel	Abrasive material		Titanium
< 850 N/mm	< 1100 N/mm	< 1400 N/mm	< 55 HRC	< 60 HRC	< 67 HRC	< 70 HRC			Al	Copper	Mg	Plastics		CFRP / GFRP	Graphite	
		200	150	100	60	45	90			145						

K201122	 mm Ø	 mm Ø	 mm	 mm	 mm	 mm Ø	 #	 °
0,2X0,5	0.2	0.18	0.3	0.5	45.0	4.0	2	30
0,2X1	0.2	0.18	0.3	1.0	45.0	4.0	2	30
0,2X1,5	0.2	0.18	0.3	1.5	45.0	4.0	2	30
0,3X1	0.3	0.28	0.4	1.0	45.0	4.0	2	30
0,3X2	0.3	0.28	0.4	2.0	45.0	4.0	2	30
0,3X3	0.3	0.28	0.4	3.0	45.0	4.0	2	30
0,3X6	0.3	0.28	0.4	6.0	45.0	4.0	2	30
0,3X9	0.3	0.28	0.4	9.0	45.0	4.0	2	30
0,4X2	0.4	0.38	0.6	2.0	45.0	4.0	2	30
0,4X3	0.4	0.38	0.6	3.0	45.0	4.0	2	30
0,4X4	0.4	0.38	0.6	4.0	45.0	4.0	2	30
0,4X5	0.4	0.38	0.6	5.0	45.0	4.0	2	30
0,4X8	0.4	0.38	0.6	8.0	45.0	4.0	2	30
0,4X12	0.4	0.38	0.6	12.0	45.0	4.0	2	30

K201122	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 °
0,5X2	0.5	0.48	0.7	2.0	45.0	4.0	2	30
0,5X4	0.5	0.48	0.7	4.0	45.0	4.0	2	30
0,5X6	0.5	0.48	0.7	6.0	45.0	4.0	2	30
0,5X8	0.5	0.48	0.7	8.0	45.0	4.0	2	30
0,5X10	0.5	0.48	0.7	10.0	50.0	4.0	2	30
0,5X15	0.5	0.48	0.7	15.0	50.0	4.0	2	30
0,6X2	0.6	0.58	0.9	2.0	45.0	4.0	2	30
0,6X4	0.6	0.58	0.9	4.0	45.0	4.0	2	30
0,6X6	0.6	0.58	0.9	6.0	45.0	4.0	2	30
0,6X8	0.6	0.58	0.9	8.0	45.0	4.0	2	30
0,6X10	0.6	0.58	0.9	10.0	45.0	4.0	2	30
0,6X12	0.6	0.58	0.9	12.0	50.0	4.0	2	30
0,6X18	0.6	0.58	0.9	18.0	50.0	4.0	2	30
0,7X2	0.7	0.68	1.0	2.0	45.0	4.0	2	30
0,7X4	0.7	0.68	1.0	4.0	45.0	4.0	2	30
0,7X6	0.7	0.68	1.0	6.0	45.0	4.0	2	30
0,7X8	0.7	0.68	1.0	8.0	45.0	4.0	2	30
0,7X10	0.7	0.68	1.0	10.0	50.0	4.0	2	30
0,8X4	0.8	0.78	1.2	4.0	45.0	4.0	2	30
0,8X6	0.8	0.78	1.2	6.0	45.0	4.0	2	30
0,8X8	0.8	0.78	1.2	8.0	45.0	4.0	2	30
0,8X10	0.8	0.78	1.2	10.0	50.0	4.0	2	30
0,8X12	0.8	0.78	1.2	12.0	50.0	4.0	2	30
0,8X16	0.8	0.78	1.2	16.0	50.0	4.0	2	30
0,8X24	0.8	0.78	1.2	24.0	60.0	4.0	2	30
0,9X4	0.9	0.88	1.3	4.0	45.0	4.0	2	30
0,9X6	0.9	0.88	1.3	6.0	45.0	4.0	2	30
0,9X8	0.9	0.88	1.3	8.0	45.0	4.0	2	30
0,9X10	0.9	0.88	1.3	10.0	45.0	4.0	2	30
0,9X15	0.9	0.88	1.3	15.0	50.0	4.0	2	30

K201122	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 °
1X4	1.0	0.95	1.5	4.0	45.0	4.0	2	30
1X6	1.0	0.95	1.5	6.0	45.0	4.0	2	30
1X8	1.0	0.95	1.5	8.0	45.0	4.0	2	30
1X10	1.0	0.95	1.5	10.0	45.0	4.0	2	30
1X12	1.0	0.95	1.5	12.0	45.0	4.0	2	30
1X14	1.0	0.95	1.5	14.0	45.0	4.0	2	30
1X16	1.0	0.95	1.5	16.0	50.0	4.0	2	30
1X20	1.0	0.95	1.5	20.0	54.0	4.0	2	30
1X25	1.0	0.95	1.5	25.0	70.0	4.0	2	30
1X30	1.0	0.95	1.5	30.0	70.0	4.0	2	30
1,2X6	1.2	1.14	1.8	6.0	45.0	4.0	2	30
1,2X8	1.2	1.14	1.8	8.0	45.0	4.0	2	30
1,2X10	1.2	1.14	1.8	10.0	45.0	4.0	2	30
1,2X12	1.2	1.14	1.8	12.0	45.0	4.0	2	30
1,2X16	1.2	1.14	1.8	16.0	50.0	4.0	2	30
1,2X20	1.2	1.14	1.8	20.0	60.0	4.0	2	30
1,4X6	1.4	1.34	2.1	6.0	45.0	4.0	2	30
1,4X8	1.4	1.34	2.1	8.0	45.0	4.0	2	30
1,4X10	1.4	1.34	2.1	10.0	45.0	4.0	2	30
1,4X12	1.4	1.34	2.1	12.0	45.0	4.0	2	30
1,4X14	1.4	1.34	2.1	14.0	45.0	4.0	2	30
1,4X16	1.4	1.34	2.1	16.0	50.0	4.0	2	30
1,4X22	1.4	1.34	2.1	22.0	54.0	4.0	2	30
1,5X6	1.5	1.44	2.3	6.0	45.0	4.0	2	30
1,5X8	1.5	1.44	2.3	8.0	45.0	4.0	2	30
1,5X10	1.5	1.44	2.3	10.0	45.0	4.0	2	30
1,5X12	1.5	1.44	2.3	12.0	45.0	4.0	2	30
1,5X14	1.5	1.44	2.3	14.0	50.0	4.0	2	30
1,5X16	1.5	1.44	2.3	16.0	50.0	4.0	2	30
1,5X18	1.5	1.44	2.3	18.0	54.0	4.0	2	30

K201122	 mm ø	 mm ø	 mm	 mm	 mm	 mm ø	 #	 °
1,5X20	1.5	1.44	2.3	20.0	54.0	4.0	2	30
1,5X25	1.5	1.44	2.3	25.0	70.0	4.0	2	30
1,5X30	1.5	1.44	2.3	30.0	70.0	4.0	2	30
1,5X35	1.5	1.44	2.3	35.0	70.0	4.0	2	30
1,5X40	1.5	1.44	2.3	40.0	80.0	4.0	2	30
1,5X45	1.5	1.44	2.3	45.0	80.0	4.0	2	30
1,6X6	1.6	1.51	2.4	6.0	45.0	4.0	2	30
1,6X8	1.6	1.51	2.4	8.0	45.0	4.0	2	30
1,6X10	1.6	1.51	2.4	10.0	45.0	4.0	2	30
1,6X12	1.6	1.51	2.4	12.0	45.0	4.0	2	30
1,6X14	1.6	1.51	2.4	14.0	50.0	4.0	2	30
1,6X16	1.6	1.51	2.4	16.0	50.0	4.0	2	30
1,6X18	1.6	1.51	2.4	18.0	54.0	4.0	2	30
1,6X20	1.6	1.51	2.4	20.0	54.0	4.0	2	30
1,6X26	1.6	1.51	2.4	26.0	60.0	4.0	2	30
1,8X6	1.8	1.71	2.7	6.0	45.0	4.0	2	30
1,8X8	1.8	1.71	2.7	8.0	45.0	4.0	2	30
1,8X10	1.8	1.71	2.7	10.0	45.0	4.0	2	30
1,8X12	1.8	1.71	2.7	12.0	45.0	4.0	2	30
1,8X14	1.8	1.71	2.7	14.0	50.0	4.0	2	30
1,8X16	1.8	1.71	2.7	16.0	50.0	4.0	2	30
1,8X18	1.8	1.71	2.7	18.0	54.0	4.0	2	30
1,8X20	1.8	1.71	2.7	20.0	54.0	4.0	2	30
1,8X25	1.8	1.71	2.7	25.0	60.0	4.0	2	30
2X6	2.0	1.91	3.0	6.0	45.0	4.0	2	30
2X8	2.0	1.91	3.0	8.0	45.0	4.0	2	30
2X10	2.0	1.91	3.0	10.0	45.0	4.0	2	30
2X12	2.0	1.91	3.0	12.0	45.0	4.0	2	30
2X14	2.0	1.91	3.0	14.0	50.0	4.0	2	30
2X16	2.0	1.91	3.0	16.0	50.0	4.0	2	30

K201122	D1 mm ø	D3 mm ø	L2 mm	L3 mm	L1 mm	D2 mm ø	z #	 °
2X18	2.0	1.91	3.0	18.0	54.0	4.0	2	30
2X20	2.0	1.91	3.0	20.0	54.0	4.0	2	30
2X25	2.0	1.91	3.0	25.0	60.0	4.0	2	30
2X30	2.0	1.91	3.0	30.0	70.0	4.0	2	30
2X35	2.0	1.91	3.0	35.0	80.0	4.0	2	30
2X40	2.0	1.91	3.0	40.0	90.0	4.0	2	30
2X50	2.0	1.91	3.0	50.0	100.0	4.0	2	30
2X60	2.0	1.91	3.0	60.0	110.0	4.0	2	30
2,5X8	2.5	2.41	3.7	8.0	45.0	4.0	2	30
2,5X10	2.5	2.41	3.7	10.0	45.0	4.0	2	30
2,5X12	2.5	2.41	3.7	12.0	45.0	4.0	2	30
2,5X14	2.5	2.41	3.7	14.0	50.0	4.0	2	30
2,5X16	2.5	2.41	3.7	16.0	50.0	4.0	2	30
2,5X18	2.5	2.41	3.7	18.0	54.0	4.0	2	30
2,5X20	2.5	2.41	3.7	20.0	54.0	4.0	2	30
2,5X25	2.5	2.41	3.7	25.0	60.0	4.0	2	30
2,5X30	2.5	2.41	3.7	30.0	70.0	4.0	2	30
2,5X40	2.5	2.41	3.7	40.0	90.0	4.0	2	30
2,5X50	2.5	2.41	3.7	50.0	100.0	4.0	2	30
3X8	3.0	2.92	4.5	8.0	45.0	4.0	2	30
3X12	3.0	2.92	4.5	12.0	45.0	4.0	2	30
3X16	3.0	2.92	4.5	16.0	50.0	4.0	2	30
3X20	3.0	2.92	4.5	20.0	54.0	4.0	2	30

Kühlung	
Toleranz	0-0,01
Beschichtung	TiSiN- α



Werkstoff / Material	Festigkeit / strength (N/mm ²)	Vc m/min	Ø 0,1 - 0,3		Ø 0,4 - 0,8		Ø 0,9 - 1,2		Ø 1,3 - 1,5		Ø 1,6 - 1,9		Ø 2 - 2,3		Ø 2,4 - 2,7		Ø 2,8 - 3,0			
																				
			ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD	ae= 0,15xD	ae= 0,1xD		
			ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD	ap= L ₂ max	ap= 0,1xD		
			fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)	fz (mm/Z)		
Stahl / Steel	< 850																			
Stahl / Steel	< 1100																			
Stahl / Steel	< 1400	200	0,009		0,014		0,018		0,02		0,022		0,025		0,028		0,03			
Gehärteter Stahl / Hardness Steel	< 55HRC	150	0,009		0,014		0,018		0,02		0,022		0,025		0,028		0,03			
Gehärteter Stahl / Hardness Steel	< 60HRC	100	0,008		0,013		0,017		0,019		0,021		0,024		0,027		0,029			
Gehärteter Stahl / Hardness Steel	< 67HRC	60	0,007		0,012		0,016		0,018		0,02		0,023		0,026		0,028			
Gehärteter Stahl / Hardness Steel	≤ 70HRC	45	0,006		0,011		0,015		0,017		0,019		0,022		0,025		0,027			
INOX	< 700	90	0,009		0,014		0,018		0,02		0,022		0,025		0,028		0,03			
INOX	< 850	85	0,008		0,013		0,017		0,019		0,021		0,024		0,027		0,029			
Guss / Castings																				
Aluminium / Al																				
Kupfer / Cooper		145	0,009		0,014		0,018		0,02		0,022		0,025		0,028		0,03			
Kunststoffe / Plastics																				
Inconel																				
Titan / Titanium																				
Grafit / Graphite																				
GFK / CFK																				

Bitte beachten, hierbei handelt es sich lediglich um Richtwerte! / Caution, these are only guide values!

Hinweis:

Fz Angaben Tabelle ist für kurze Auskraglänge (L3), je länger, dementsprechen Fz prozentual verringern

Fz information at the table is for a short projection length (L3), the longer, accordingly reduce Fz as a percentage