STANDARD CUTTING CONDITIONS

Shoulder milling (VEH, VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C, VRB, VRC, VRD)

ISO	Workpiece material	Hard-ness	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool diameter: DC (mm) 6	8	10	12	16	20	25	Depth of cut *ap* (mm)	Pick feed *Pf* (mm)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.	- 300 HB	80 - 180	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
P	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300 HB	60 - 140	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
P	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	60 - 120	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	40 - 100	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	80 - 200	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
K	Ductile cast irons FCD400, etc. 400-15S, etc.	150 - 250 HB	80 - 200	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x Dc	0.25 x øDc
N	Aluminium alloys Si < 13%	-	200 - 700	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
N	Aluminium alloys Si ≥13%	-	100 - 300	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.25 x øDc
S	Titanium alloys Ti-6Al-4V, etc.	-	40 - 80	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.05 x øDc
S	Heat-resistant alloys Inconel 718, etc.	-	20 - 40	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.10 - 0.17	0.1 - 0.17	0.6 x øDc	0.05 x øDc
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	40 - 80	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.05 x øDc
H	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	20 - 60	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x øDc	0.05 x øDc

Slot milling (VEH, VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C, VRB, VRC, VRD)

ISO	Workpiece material	Hard-ness	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool diameter: DC (mm) 6	8	10	12	16	20	25	Depth of cut *ap* (mm)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.	- 300 HB	80 - 180	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300 HB	60 - 140	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	60 - 120	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	40 - 100	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	80 - 200	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
	Ductile cast irons FCD400, etc. 400-15S, etc.	150 - 250 HB	80 - 200	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.10	0.5 x ø*Dc*
N	Aluminium alloys Si < 13%	-	200 - 700	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
	Aluminium alloys Si ≥13%	-	100 - 300	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
S	Titanium alloys Ti-6Al-4V, etc.	-	40 - 80	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
	Heat-resistant alloys Inconel 718, etc.	-	20 - 40	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.5 x ø*Dc*
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	40 - 80	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.2 x ø*Dc*
	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	20 - 60	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.07 - 0.1	0.2 x ø*Dc*

Shoulder milling (VED / VEE: 6 flutes, VED / VEE: 8, 10 flutes)

ISO	Workpiece material	Hard-ness	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool diameter: DC (mm) 8	10	12	16	20	25	Depth of cut *ap* (mm)	Pick feed *Pf* (mm)
S	Titanium alloys Ti-6Al-4V, etc.	-	60 - 120	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x ø*Dc*	0.02 x ø*Dc*
	Heat-resistant alloys Inconel 718, etc.	-	30 - 60	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x ø*Dc*	0.02 x ø*Dc*
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	80 - 160	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x ø*Dc*	0.02 x ø*Dc*
	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	40 - 90	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x ø*Dc*	0.02 x ø*Dc*

STANDARD CUTTING CONDITIONS

High feed milling (VFX)

ISO	Workpiece material	Hardness	Cutting speed *Vc* (m/min)	ø10		ø12		ø16		ø20		Width of cut *ae* (mm)
				Feed per tooth *fz* (mm/t)	Depth of cut *ap* (mm)	Feed per tooth *fz* (mm/t)	Depth of cut *ap* (mm)	Feed per tooth *fz* (mm/t)	Depth of cut *ap* (mm)	Feed per tooth *fz* (mm/t)	Depth of cut *ap* (mm)	
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.	- 300 HB	100 - 200	0.3 - 0.7	0.5	0.4 - 0.8	0.5	0.5 - 0.9	0.75	0.6 - 1	1	0.6 x ø*Dc*
	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300 HB	80 - 180	0.2 - 0.6	0.5	0.3 - 0.7	0.5	0.4 - 0.8	0.75	0.5 - 0.9	1	0.6 x ø*Dc*
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	80 - 160	0.2 - 0.5	0.4	0.2 - 0.5	0.4	0.3 - 0.6	0.5	0.3 - 0.6	0.75	0.6 x ø*Dc*
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	60 - 100	0.2 - 0.6	0.4	0.2 - 0.6	0.4	0.3 - 0.7	0.5	0.3 - 0.7	0.75	0.6 x ø*Dc*
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	100 - 220	0.3 - 0.7	0.5	0.4 - 0.8	0.75	0.5 - 0.9	0.75	0.6 - 1	1	0.6 x ø*Dc*
	Ductile cast irons FCD400, etc. 400-15S, etc.	150 - 250 HB	100 - 220	0.2 - 0.6	0.5	0.3 - 0.7	0.75	0.4 - 0.8	0.75	0.5 - 0.9	1	0.6 x ø*Dc*
S	Titanium alloys Ti-6Al-4V, etc.	-	40 - 80	0.2 - 0.5	0.4	0.2 - 0.5	0.4	0.2 - 0.6	0.5	0.2 - 0.6	0.5	0.25 x ø*Dc*
	Heat-resistant alloys Inconel 718, etc.	-	20 - 40	0.1 - 0.3	0.3	0.1 - 0.3	0.3	0.1 - 0.3	0.4	0.1 - 0.3	0.4	0.25 x ø*Dc*
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	40 - 80	0.2 - 0.4	0.3	0.2 - 0.4	0.3	0.3 - 0.5	0.4	0.3 - 0.5	0.4	0.45 x ø*Dc*
	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	20 - 60	0.1 - 0.2	0.2	0.1 - 0.2	0.2	0.1 - 0.3	0.3	0.1 - 0.3	0.3	0.25 x ø*Dc*

Please note that the feed per tooth should not exceed the maximum feed per tooth for each product.

STANDARD CUTTING CONDITIONS

Standard cutting conditions: Roughing (VBB-BM / BG / SG, VBD-BG, VBE-BGA)

ISO	Workpiece material	Hard-ness	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool diameter: DC (mm) 6	8	10	12	16	20	25	Depth of cut *ap* (mm)	Pick feed *Pf* (mm)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.	- 300 HB	100 - 200	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300 HB	80 - 180	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	80 - 160	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	60 - 100	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	100 - 220	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
	Ductile cast irons FCD400, etc. 400-15S, etc.	150 - 250 HB	100 - 220	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
N	Aluminium alloys Si < 13%	-	200 - 700	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
	Aluminium alloys Si ≥13%	-	100 - 300	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.4 x øDc
S	Titanium alloys Ti-6Al-4V, etc.	-	40 - 80	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.2 x øDc
	Heat-resistant alloys Inconel 718, etc.	50 - 60 HRC	20 - 40	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.2 x øDc
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	-	40 - 80	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.2 x øDc
	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	20 - 60	0.03 - 0.07	0.04 - 0.08	0.05 - 0.10	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x øDc	0.2 x øDc

Standard cutting conditions: Profiling for semi-finishing and finishing (VBB-BM / BG / SG, VBD-BG, VBE-BGA)

ISO	Workpiece material	Hard-ness	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool diameter: DC (mm) 6	8	10	12	16	20	25	Depth of cut *ap* (mm)	Pick feed *Pf* (mm)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.	- 300 HB	120 - 250	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
P	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300 HB	100 - 220	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
P	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	100 - 200	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	80 - 120	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	120 - 280	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
K	Ductile cast irons FCD400, etc. 400-15S, etc.	150 - 250 HB	120 - 280	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
N	Aluminium alloys Si < 13%	-	300 - 1000	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
N	Aluminium alloys Si ≥13%	-	150 - 400	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x øDc	0.15 x øDc
S	Titanium alloys Ti-6Al-4V, etc.	-	50 - 100	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x øDc	0.1 x øDc
S	Heat-resistant alloys Inconel 718, etc.	50 - 60 HRC	30 - 50	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x øDc	0.1 x øDc
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	-	50 - 100	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x øDc	0.1 x øDc
H	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	30 - 80	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x øDc	0.1 x øDc

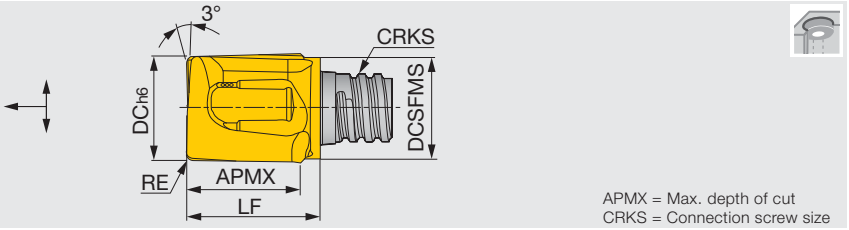
STANDARD CUTTING CONDITIONS

Drilling (VCP, VDP)

ISO	Workpiece material		Hardness	Cutting speed *Vc* (m/min)	Feed: *f* (mm/rev)				
					VDP328	VDP412	VDP513	VDP646	VCP
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.		- 300 HB	40 - 80	0.04 - 0.08	0.05 - 0.10	0.05 - 0.10	0.06 - 0.12	0.06 - 0.12
	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.		- 300 HB	30 - 50	0.04 - 0.08	0.05 - 0.10	0.05 - 0.10	0.06 - 0.12	0.06 - 0.12
	Prehardened steel PX5, NAK80, etc.		30 - 40 HRC	20 - 30	0.04 - 0.08	0.05 - 0.10	0.05 - 0.10	0.06 - 0.12	0.06 - 0.12
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.		- 200 HB	15 - 25	0.04 - 0.08	0.05 - 0.10	0.05 - 0.10	0.06 - 0.12	0.06 - 0.12
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.		150 - 250 HB	60 - 100	0.05 - 0.09	0.07 - 0.12	0.07 - 0.12	0.12 - 0.18	0.12 - 0.18
	Ductile cast irons FCD400, etc. 400-15S, etc.		150 - 250 HB	60 - 100	0.04 - 0.08	0.05 - 0.10	0.05 - 0.10	0.10 - 0.15	0.10 - 0.15
S	Titanium alloys Ti-6Al-4V, etc.		-	15 - 25	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07
	Heat-resistant alloys Inconel 718, etc.		-	10 - 20	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06
H	Hardened steel	SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	15 - 25	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07
		SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	10 - 20	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06

VGC**-02...

TungMeister head for counter boring



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VGC078L08.0R02-02S05	●	2	10°	7.8	7.6	8	0.2	S05	10	KEYV-S05	7
VGC080L08.0R04-02S05	●	2	10°	8	7.6	8	0.4	S05	10	KEYV-S05	7
VGC080L08.0R10-02S05	●	2	10°	8	7.6	8	1	S05	10	KEYV-S05	7
VGC080L08.0R20-02S05	●	2	10°	8	7.6	8	2	S05	10	KEYV-S05	7
VGC098L09.0R03-02S06	●	2	10°	9.8	9.5	9.5	0.3	S06	12.4	KEYV-S06	10
VGC100L09.0R04-02S06	●	2	10°	10	9.5	9.5	0.4	S06	12.4	KEYV-S06	10
VGC100L09.0R10-02S06	●	2	10°	10	9.5	9.5	1	S06	12.4	KEYV-S06	10
VGC100L09.0R20-02S06	●	2	10°	10	9.5	9.5	2	S06	12.4	KEYV-S06	10
VGC117L10.0R03-02S08	●	2	10°	11.7	11.5	10	0.3	S08	14.2	KEYV-S08	15
VGC120L10.0R04-02S08	●	2	10°	12	11.5	10	0.4	S08	14.2	KEYV-S08	15
VGC120L10.0R10-02S08	●	2	10°	12	11.5	10	1	S08	14.2	KEYV-S08	15
VGC120L10.0R20-02S08	●	2	10°	12	11.5	10	2	S08	14.2	KEYV-S08	15
VGC157L15.0R03-02S10	●	2	10°	15.7	15.2	15	0.3	S10	19	KEYV-S10	28
VGC160L15.0R04-02S10	●	2	10°	16	15.2	15	0.4	S10	19	KEYV-S10	28
VGC160L15.0R08-02S10	●	2	10°	16	15.2	15	0.8	S10	19	KEYV-S10	28

• Can drill with step feed
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

STANDARD CUTTING CONDITIONS

Counter boring (VGC)

ISO	Workpiece material		Hardness	Cutting speed *Vc* (m/min)	Feed per tooth *fz*(mm/t)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.		- 300 HB	40 - 80	0.04 - 0.08
P	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.		- 300 HB	30 - 50	0.04 - 0.08
P	Prehardened steel PX5, NAK80, etc.		30 - 40 HRC	20 - 30	0.04 - 0.08
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.		- 200 HB	15 - 25	0.04 - 0.08
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.		150 - 250 HB	60 - 100	0.05 - 0.09
K	Ductile cast irons FCD400, etc. 400-15S, etc.		150 - 250 HB	60 - 100	0.04 - 0.08
S	Titanium alloys Ti-6Al-4V, etc.		-	15 - 25	0.04 - 0.07
S	Heat-resistant alloys Inconel 718, etc.		-	10 - 20	0.03 - 0.06
H	Hardened steel	SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	15 - 25	0.04 - 0.07
H	Hardened steel	SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	10 - 20	0.03 - 0.06

・When drilling, the step feed (woodpeckering feed) operation should be applied with the depth of 0.3 - 0.5 mm per step.
・Apply the same cutting conditions as the VEE type head when conducting shoulder milling or slotting operations.

STANDARD CUTTING CONDITIONS

Chamfering and countersinking (VCA, VCW, VCR, VCP)

ISO	Workpiece material		Hardness	Cutting speed *Vc* (m/min)	Feed *f* (mm/rev)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.		- 300 HB	60 - 100	0.06 - 0.12
P	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.		- 300 HB	50 - 80	0.06 - 0.12
P	Prehardened steel PX5, NAK80, etc.		30 - 40 HRC	40 - 70	0.06 - 0.12
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.		- 200 HB	30 - 50	0.06 - 0.12
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.		150 - 250 HB	80 - 120	0.06 - 0.12
K	Ductile cast irons FC250, FC300, etc. 400-15S, etc.		150 - 250 HB	80 - 120	0.06 - 0.12
N	Aluminium alloys		-	100 - 200	0.08 - 0.15
S	Titanium alloys Ti-6Al-4V, etc.		-	30 - 50	0.05 - 0.1
S	Heat-resistant alloys Inconel 718, etc.		-	20 - 40	0.04 - 0.08
H	Hardened steel	SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc.	40 - 50 HRC	30 - 50	0.05 - 0.1
H	Hardened steel	SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	20 - 40	0.04 - 0.08

TOLERANCE OF TOOL DIAMETER

Basic dimensions (mm)		Permissible dimensional deviations (μm)						
>	≦	e8	e9	h6	h7	h9	h10	z9
6	10	-25 -47	-25 -61	0 -9	0 -15	0 -36	0 -58	+78 +42
10	14	-32 -59	-32 -75	0 -11	0 -18	0 -43	0 -70	+93 +50
14	18	-32 -59	-32 -75	0 -11	0 -18	0 -43	0 -70	+103 +60
18	30	-40 -73	-40 -92	0 -13	0 -21	0 -52	0 -84	-

● JISB0401-2: 1998 (ISO286-2: 1988) extract

STANDARD CUTTING CONDITIONS

Slotting (VST, VTB)

ISO	Workpiece material	Hardness HB	VST type		VTB type	
			Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
P	Low carbon steels S45C, S55C, etc. C45, C55, etc.	- 300	80 - 180	0.05 - 0.15	80 - 180	0.08 - 0.18
	High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300	60 - 120	0.04 - 0.12	60 - 120	0.05 - 0.15
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200	50 - 120	0.04 - 0.12	50 - 120	0.05 - 0.15
K	Grey cast irons FC250, FC300, etc. 250, 300, etc.	150 - 250	100 - 200	0.05 - 0.15	100 - 200	0.08 - 0.18
	Ductile cast irons FCD400, etc. 400-15S, etc.	150 - 250	100 - 200	0.04 - 0.12	100 - 200	0.05 - 0.15
N	Aluminium alloys Si < 13%	-	200 - 600	0.05 - 0.15	200 - 600	0.08 - 0.18
	Aluminium alloys Si ≥13%	-	100 - 300	0.03 - 0.13	100 - 300	0.05 - 0.15
S	Titanium alloys Ti-6Al-4V, etc.	-	40 - 60	0.04 - 0.12	40 - 60	0.05 - 0.15
	Heat-resistant alloys Inconel 718, etc.	-	15 - 35	0.02 - 0.1	15 - 35	0.02 - 0.1

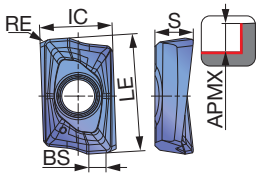
TUNGMEISTER
TUNGALOY

TUNGFORCE REC

INSERTS

AVGT-MJ

AVGT-AJ



P	Steel	☆		★			
M	Stainless		☆	★			
K	Cast iron	★					
N	Non-ferrous				★		
S	Superalloys	☆	★				
H	Hard materials	★					

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated			Carbide	LE	IC	S	BS
			AH120	AH130	AH3135	KS05F				
AVGT060300PBER-MJ	0.0	6			●		8	5	2.7	1.6
AVGT060302PBER-MJ	0.2	6	●	●	●		8	5	2.7	1.5
AVGT060304PBER-MJ	0.4	6	●	●	●		8	5	2.7	1.3
AVGT060308PBER-MJ	0.8	6	●	●	●		8	5	2.6	0.9
AVGT060300PBFR-AJ	0.0	6				●	8	5	2.7	1.6
AVGT060302PBFR-AJ	0.2	6				●	8	5	2.7	1.5
AVGT060304PBFR-AJ	0.4	6				●	8	5	2.7	1.3
AVGT060308PBFR-AJ	0.8	6				●	8	5	2.6	0.9

●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
P	Low carbon steel (S15C / C15E4, SS400 / E275A, etc.)		- 200 HB	First choice	AH3135	230 - 430	0.07 - 0.12
	Carbon steel and alloy steel (S55C / C55, SCM440 / 42CrMo4, etc.)		- 300 HB	First choice	AH3135	150 - 350	0.07 - 0.12
	Prehardend steel (NAK80, PX5, etc.)		30 - 40 HRC	First choice	AH3135	100 - 230	0.07 - 0.12
M	Stainless steel (SUS304 / X5CrNi18-9, SUS316 / X5CrNiMo17-12-3, etc.)		-	First choice	AH3135	150 - 220	0.06 - 0.1
K	Grey cast iron (FC250 / 250, FC300 / 300, etc.)		150 - 250 HB	First choice	AH120	200 - 330	0.07 - 0.12
	Ductile cast iron (FCD400, FCD600 / 600-3, etc.)		150 - 250 HB	First choice	AH120	150 - 240	0.07 - 0.12
N	Aluminium alloys (Si < 13%)		-	First choice	KS05F	650 - 1000	0.07 - 0.12
	Aluminium alloys (Si ≥ 13%)		-	First choice	KS05F	100 - 230	0.04 - 0.12
S	Titanium alloys (Ti-6Al-4V, etc.)		-	First choice	AH130	40 - 90	0.04 - 0.1
	Superalloys (Inconel718, etc.)		-	First choice	AH130	45 - 65	0.04 - 0.09
H	Hardened steel	(SKD61 / X40CrMoV5-1, etc.)	40 - 50 HRC	First choice	AH120	45 - 70	0.04 - 0.08
		(SKD11 / X153CrMoV12, etc.)	50 - 60 HRC		AH120	40 - 65	0.04 - 0.06