STANDARD CUTTING CONDITIONS TXN06 / EXN06

ISO	Workpiece material	Hardness	Priority	Grades	Chip-breaker	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t) Tool dia: DCX (mm) ø32 ~ ø200	Feed when plunging *fz* (mm/t)	ø32, CICT = 2 *n*	ø32, CICT = 2 *Vf*	ø35, CICT = 2 *n*	ø35, CICT = 2 *Vf*	ø40, CICT = 3 *n*	ø40, CICT = 3 *Vf*
P	Carbon steels S45C, S55C etc. C45, C55, etc.	~ 300HB	First choice	AH3035	MJ	100 - 300	0.5 - 1.5	0.15	1,990	3,980	1,820	3,640	1,590	4,770
			Wear resistance	AH8015	MJ				*Vc* = 200 m/min, *fz* = 1.0 mm/t					
	Alloy steels SCM440, SCr415 etc. 42CrMo4, 17Cr3, etc.	~ 300HB	First choice	AH3035	MJ	100 - 300	0.5 - 1.5	0.15	1,990	3,980	1,820	3,640	1,590	4,770
			Wear resistance	AH8015	MJ				*Vc* = 200 m/min, *fz* = 1.0 mm/t					
	Prehardened steels NAK80, PX5, etc.	30 ~ 40HRC	First choice	AH3035	ML	100 - 200	0.5 - 1.0	0.15	1,490	2,380	1,360	2,180	1,190	2,860
									Vc = 150 m/min, *fz* = 0.8 mm/t					
		30 ~ 40HRC	Fracture resistance	AH3035	MJ	100 - 200	0.5 - 1.5	0.15	1,490	2,980	1,360	2,720	1,190	3,570
									Vc = 150 m/min, *fz* = 1.0 mm/t					
		30 ~ 40HRC	Wear resistance	AH8015	ML	100 - 200	0.5 - 1.0	0.15	1,490	2,380	1,360	2,180	1,190	2,860
									Vc = 150 m/min, *fz* = 0.8 mm/t					
M	Stainless steels SUS304, SUS316, etc. X5CrNi18-10, etc. X5CrNiMo17-12-2, etc.	~ 200HB	First choice	AH3035	ML	100 - 150	0.3 - 0.8	0.1	1,190	1,430	1,090	1,310	950	1,710
			Fracture resistance	AH3035	MJ				*Vc* = 120 m/min, *fz* = 0.6 mm/t					
K	Gray cast irons FC250, FC300, etc. GG25, GGG30, etc.	150 ~ 250HB	First choice	AH120	MJ	100 - 300	0.5 - 1.5	0.15	1,990	3,980	1,820	3,640	1,590	4,770
			Wear resistance	AH8015	MJ				*Vc* = 200 m/min, *fz* = 1.0 mm/t					
		150 ~ 250HB	First choice	AH120	MJ	80 - 200	0.5 - 1.5	0.15	1,490	2,980	1,360	2,720	1,190	3,570
			Wear resistance	AH8015	MJ				*Vc* = 150 m/min, *fz* = 1.0 mm/t					
S	Titanium alloy Ti-6Al-4V, etc.	~ 40HRC	First choice	AH130	ML	30 - 60	0.3 - 0.7	0.08	400	400	360	360	320	480
			Fracture resistance	AH130	MJ				*Vc* = 40 m/min, *fz* = 0.5 mm/t					
	Heat-resistance alloy Inconel, Hasteroy, etc.	~ 40HRC	First choice	AH725	ML	20 - 50	0.1 - 0.3	0.05	300	120	270	110	240	140
			Fracture resistance	AH725	MJ				*Vc* = 30 m/min, *fz* = 0.2 mm/t					
H	Hot mold steel SKD61, etc. X40CrMoV5-1, etc.	40 ~ 55HRC	First choice	AH8015	MH	80 - 150	0.1 - 0.5	0.05	1,190	710	1,090	650	950	850
			Low resistance	AH8015	MJ				*Vc* = 120 m/min, *fz* = 0.3mm/t					
	Hot mold steel of D.T.C materials DAC**, DH**, DIEVER, etc	40 ~ 55HRC	First choice	AH8015	MJ	50-100	0.1 - 0.3	0.05	800	320	730	290	640	380
			Fracture resistance	AH8015	MH				*Vc* = 80 m/min, *fz* = 0.2mm/t					
	Cold mold steel SKD11, etc. X153CrMoV12, etc.	55 ~ 65HRC	First choice	AH8005	MH	50 - 70	0.05 - 0.2	0.03	600	120	550	110	480	140
									Vc = 60 m/min, *fz* = 0.1 mm/t					
		55 ~ 65HRC	Fracture resistance	AH8015	MH	50 - 70	0.03 - 0.1	0.03	600	60	550	55	480	70
									Vc = 60 m/min, *fz* = 0.05 mm/t					

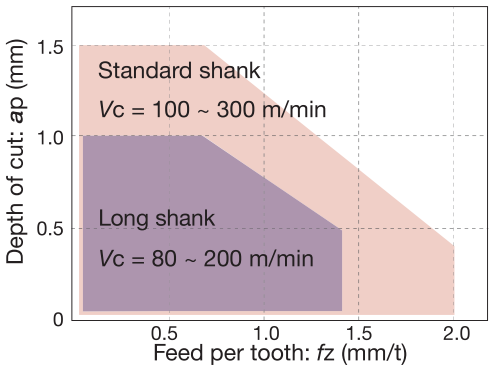
· The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

· Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

Cautionary points in use

The use of a standard or long shank

When using a long shank, please lower the cutting conditions (Vc, fz, ap) to 70% of the maximum conditions for the standard shank.

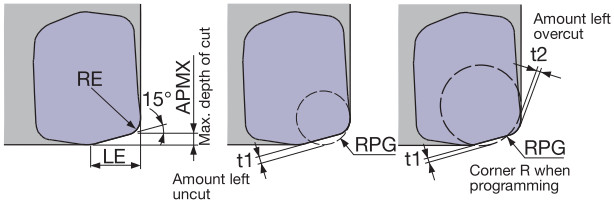


Tool dia.: DCX = ø32 ~ 40 mm
Workpiece: S55C / C55 (200HB)

L/D ratio of overhang
Standard shank: L/D ≤ 3
Long shank: L/D = 4

Tool geometry on programming

When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as R = 3.0 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).



LNMU06-MJ/ML

Max. depth of cut APMX (mm)	Corner radius RE	LE (mm)	Corner R when programming: RPG	Amount left uncut t1 (mm)	Amount left overcut t2 (mm)
1.5	2.0	6.0	2.0	1.0	-
			3.0	0.77	-
			4.0	0.54	0.26

LNGU06-MH

Max. depth of cut APMX (mm)	Corner radius RE	LE (mm)	Corner R when programming: RPG	Amount left uncut t1 (mm)	Amount left overcut t2 (mm)
1.5	2.0	6.0	2.0	0.9	-
			3.0	0.66	-
			4.0	0.41	0.26

Each value in table is calculated theoretically at the maximum condition.