STANDARD CUTTING CONDITIONS

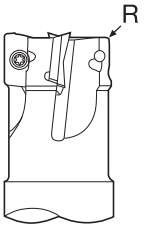
TPO11/EPO11/HPO11 type

ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed: *Vc* (m/min)	Feed per tooth: *fz* (mm/t) MJ	MS	AJ
P	Low carbon steel S15C, etc. C15E4, etc.	~ 200	First choice	AH725	100 - 250	0.1 - 0.2	-	-
		~ 200	Wear resistance	T3130	100 - 250	0.1 - 0.2	-	-
		~ 200	Surface quality	NS740	100 - 250	0.05 - 0.15	-	-
	High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	200 ~ 300	First choice	AH725	100 - 200	0.1 - 0.15	-	-
		200 ~ 300	Wear resistance	T3130	100 - 200	0.1 - 0.15	-	-
		200 ~ 300	Surface quality	NS740	100 - 200	0.05 - 0.12	-	-
	Tool steel SKD11, etc. X153CrMoV12, etc.	150 ~ 300	First choice	AH725	100 - 150	0.1 - 0.15	-	-
		150 ~ 300	Wear resistance	T3130	100 - 150	0.1 - 0.15	-	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	-	AH130	80 - 200	-	0.08 - 0.2	-
K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	First choice	AH120	100 - 250	0.12 - 0.2	-	-
		150 ~ 250	Wear resistance	T1215 T1115	100 - 250	0.12 - 0.2	-	-
	Ductile cast irons FCD450, etc. 450-10S, etc.	150 ~ 250	First choice	AH120	80 - 200	0.12 - 0.2	-	-
		150 ~ 250	Wear resistance	T1215 T1115	80 - 200	0.12 - 0.2	-	-
N	Aluminium alloys Si < 13%	-	-	DS1100	300 - 1000	-	-	0.05 - 0.2
	Aluminium alloys Si ≥ 13%	-	-	DS1100	100 - 200	-	-	0.05 - 0.2
	Copper alloys	-	-	KS05F	200 - 500	-	-	0.05 - 0.2
S	Titanium alloys Ti-6Al-4V, etc.	-	-	AH130	20 - 60	-	0.08 - 0.15	-
	Superalloys Inconel 718, etc.	-	-	AH725	20 - 40	0.08 - 0.13	-	-

CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius RE ≥ 2.0 mm, standard cutter bodies have to be modified “R”. (Only for TPO11, EPO11, TLS11, ELS11, HPO11)

About roughing type TLS11, ELS11
From 2nd row onwards, please use insert with RE = 0.4 or 0.8 mm



Corner radius RE (mm)	The dimension of modifying (mm)
0.4 ~ 1.6	Unnecessary
2.0 ~ 3.2	2

STANDARD CUTTING CONDITIONS

Roughing type TLS11 / ELS11

ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed: *Vc* (m/min)	Feed per tooth: *fz* (mm/t) MJ	MS	AJ
P	Low carbon steel S15C, etc. C15E4, etc.	~ 200	First choice	AH725	100 - 250	0.10 - 0.18	-	-
		~ 200	Wear resistance	T3130	100 - 250	0.10 - 0.18	-	-
	High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	200 ~ 300	First choice	AH725	100 - 200	0.08 - 0.14	-	-
		200 ~ 300	Wear resistance	T3130	100 - 200	0.08 - 0.14	-	-
	Tool steel SKD11, etc. X153CrMoV12, etc.	150 ~ 300	First choice	AH725	100 - 200	0.08 - 0.14	-	-
		150 ~ 300	Wear resistance	T3130	100 - 200	0.08 - 0.14	-	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	-	AH130	100 - 150	-	0.08 - 0.15	-
K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	First choice	AH120	100 - 250	0.10 - 0.18	-	-
		150 ~ 250	Wear resistance	T1215 T1115	100 - 250	0.10 - 0.18	-	-
	Ductile cast irons FCD450, etc. 450-10S, etc.	150 ~ 250	First choice	AH120	80 - 200	0.10 - 0.18	-	-
		150 ~ 250	Wear resistance	T1215 T1115	80 - 200	0.10 - 0.18	-	-
N	Aluminium alloys Si < 13%	-	-	DS1100	200 - 500	-	-	0.05 - 0.18
	Aluminium alloys Si ≥ 13%	-	-	DS1100	100 - 200	-	-	0.05 - 0.18
S	Titanium alloys Ti-6Al-4V, etc.	-	-	AH130	20 - 60	-	0.08 - 0.14	-
	Superalloys Inconel718, etc.	-	-	AH725	20 - 40	0.06 - 0.12	-	-

· To remove excessive chip accumulation use an air blast.
· To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.