TUNGREC
TUNGALOY

STANDARD CUTTING CONDITIONS

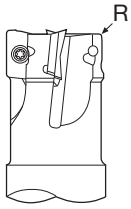
TPO11 / EPO11 / HPO11 type

ISO	Workpiece material		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	AH3225	100 - 250	0.1 - 0.2	-	-
			< 200	For wear resistance	T3225	100 - 250	0.1 - 0.2	-	-
			< 200	Surface quality	NS740	100 - 250	0.05 - 0.15	-	-
	High carbon steel, Alloy steel S45C, SCM440, etc. C45, 42CrMo4, etc.		200 - 300	First choice	AH3225	100 - 200	0.1 - 0.15	-	-
			200 - 300	For wear resistance	T3225	100 - 200	0.1 - 0.15	-	-
			200 - 300	Surface quality	NS740	100 - 200	0.05 - 0.12	-	-
	Tool steel SKD61, etc. X40CrMoV5-1, etc.		150 - 300	First choice	AH3225	100 - 150	0.1 - 0.15	-	-
			150 - 300	For wear resistance	T3225	100 - 150	0.1 - 0.15	-	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.		-	First choice	AH3225	80 - 200	-	0.08 - 0.2	-
			-	For wear resistance	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	For wear resistance	T1215	100 - 250	0.12 - 0.2	-	-
	Ductile cast irons FCD450, etc. 400-15S, etc.		150 - 250	First choice	AH120	80 - 200	0.12 - 0.2	-	-
			150 - 250	For wear resistance	T1215	80 - 200	0.12 - 0.2	-	-
N	Aluminium alloys Si < 13%		-	First choice	DS1100	300 - 1000	-	-	0.05 - 0.2
	Aluminium alloys Si ≥ 13%		-	First choice	DS1100	100 - 200	-	-	0.05 - 0.2
	Copper alloys		-	First choice	KS05F	200 - 500	-	-	0.05 - 0.2
S	Titanium alloys Ti-6Al-4V, etc.		-	First choice	AH130	20 - 60	0.08 - 0.13	-	-
			-	For fracture resistance	AH3225	20 - 60	0.08 - 0.13	-	-
	Superalloys Inconel718, etc.		-	First choice	AH725	20 - 40	0.08 - 0.13	-	-
			-	For fracture resistance	AH130	20 - 40	0.08 - 0.13	-	-
			-	For wear resistance	AH120	20 - 40	0.08 - 0.13	-	-
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50 HRC	First choice	AH725	45 - 70	0.04 - 0.08	-	-
		SKD11, etc. X153CrMoV12, etc.	50- 60 HRC	First choice	AH725	40 - 65	0.04 - 0.06	-	-

CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius RE ≥ 2 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 - 3.2	2

Roughing type TLS11 / ELS11

ISO	Workpiece material	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	AH3225	100 - 250	0.10 - 0.18	-	-
		< 200	For wear resistance	T3225	100 - 250	0.10 - 0.18	-	-
	High carbon steel, Alloy steel S45C, SCM440, etc. C45, 42CrMo4, etc.	200 - 300	First choice	AH3225	100 - 200	0.08 - 0.14	-	-
		200 - 300	For wear resistance	T3225	100 - 200	0.08 - 0.14	-	-
	Tool steel SKD61, etc. X40CrMoV5-1, etc.	150 - 300	First choice	AH3225	100 - 200	0.08 - 0.14	-	-
		150 - 300	For wear resistance	T3225	100 - 200	0.08 - 0.14	-	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	First choice	AH3225	100 - 150	-	0.08 - 0.15	-
		-	For wear resistance	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	For wear resistance	T1215	100 - 250	0.10 - 0.18	-	-
	Ductile cast irons FCD450, etc. 400-15S, etc.	150 - 250	First choice	AH120	80 - 200	0.10 - 0.18	-	-
		150 - 250	For wear resistance	T1215	80 - 200	0.10 - 0.18	-	-
N	Aluminium alloys Si < 13%	-	First choice	DS1100	200 - 500	-	-	0.05 - 0.18
	Aluminium alloys Si ≥ 13%	-	First choice	DS1100	100 - 200	-	-	0.05 - 0.18
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH130	20 - 60	-	0.08 - 0.14	-
		-	For fracture resistance	AH3225	20 - 60	-	0.08 - 0.14	-
	Superalloys Inconel718, etc.	-	First choice	AH725	20 - 40	0.06 - 0.12	-	-
		-	For wear resistance	AH130	20 - 40	0.06 - 0.12	-	-
		-	For wear resistance	AH3225	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.