



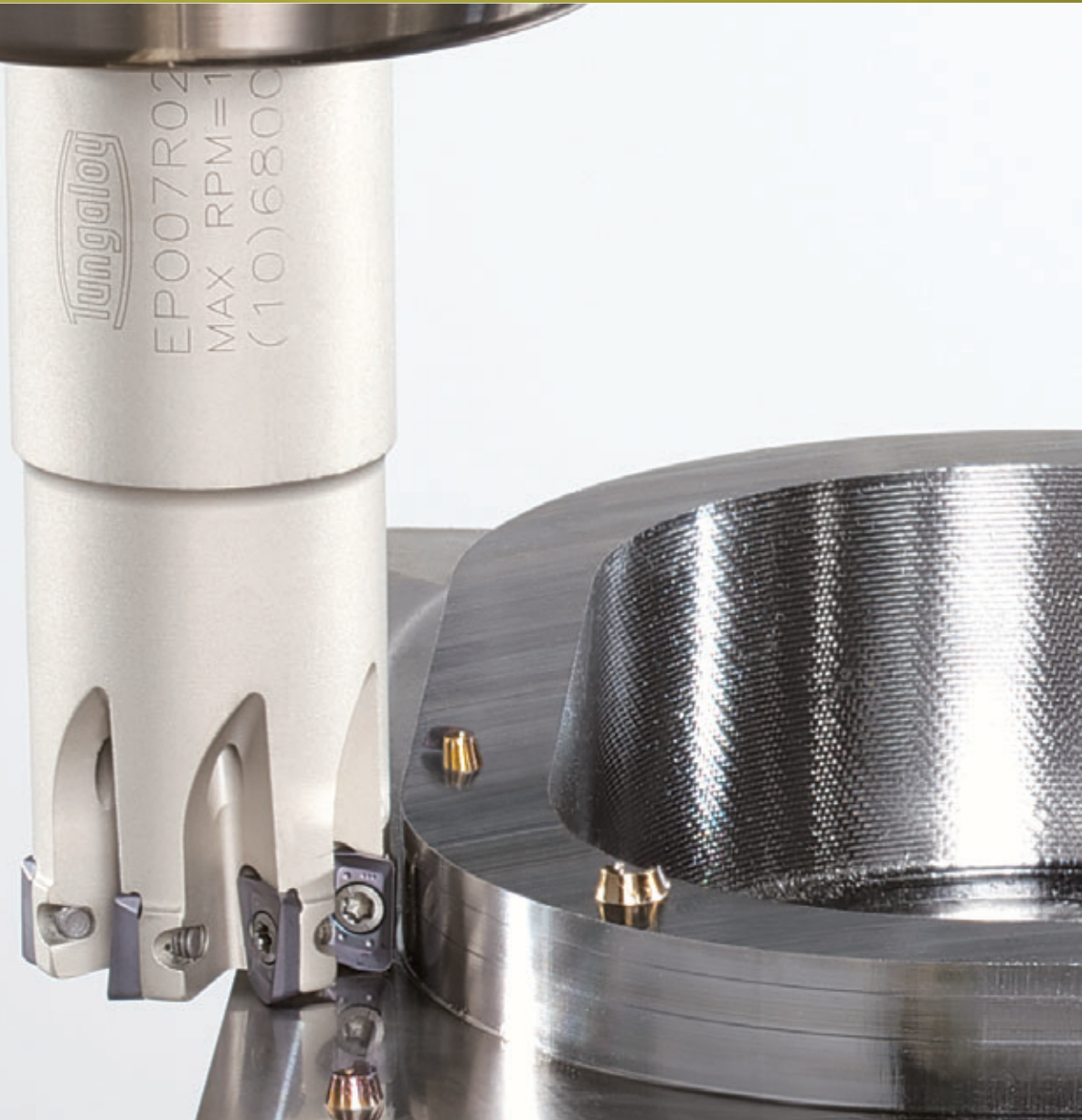
TUNGREC
TUNGALOY



MILLLINE

Tungaloy Report No. 380-US

www.tungaloyamerica.com



Multi-functional
high precision cutter





TUNGREC
TUNGALOY

Highly productive semi-finish
milling cutter with
accurate 90° shoulders

TUNGREC

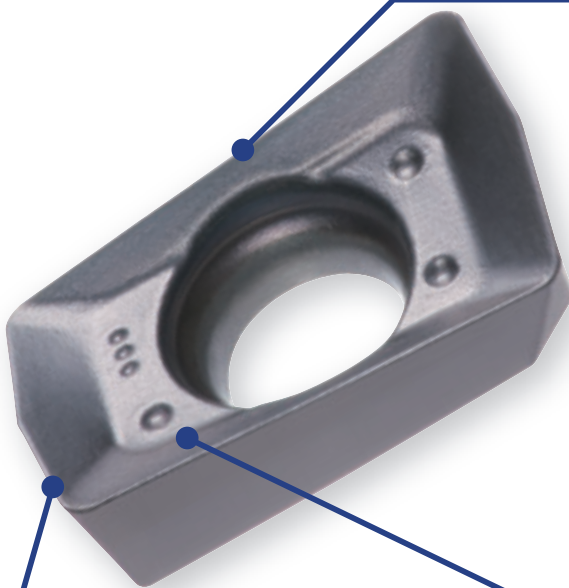
TUNGALOY

Highly productive semi-finish milling cutter with accurate 90° shoulders

Helical cutting edges and high axial rake angles provide free cutting.



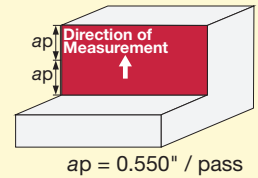
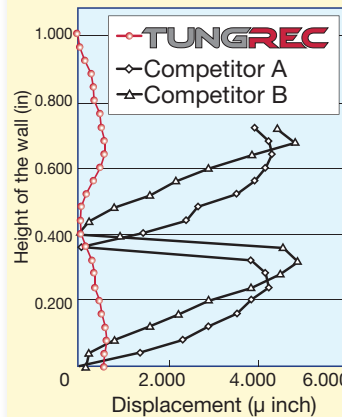
● **High performance inserts**



Helical cutting edges

Excellent wall straightness!

■ **Comparison of straightness**

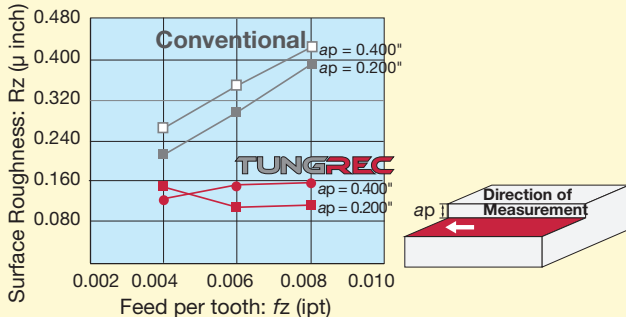


Milling cutter : EPO18R100U0100W02 (ø1.000", t = 2)
 Workpiece : 1055
 Cutting speed: Vc = 500 sfm
 Feed per tooth: fz = 0.004 ipt
 Depth of cut : ap = 0.550" x 2 passes
 Width of cut : ae = 0.200"

Wiper edges

Excellent surface finish!

■ **Comparison of surface roughness**

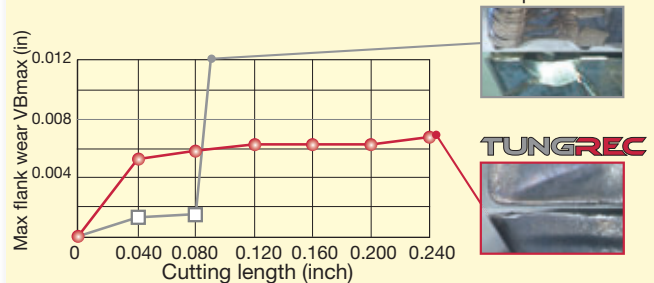


Milling cutter : EPO18R100U0100W02 (ø1.000", t = 2)
 Workpiece : 1015
 Cutting speed: Vc = 500 sfm
 Depth of cut : ap = 0.200" / 0.400"
 Width of cut : ae = 0.800"

Optimized rake angle

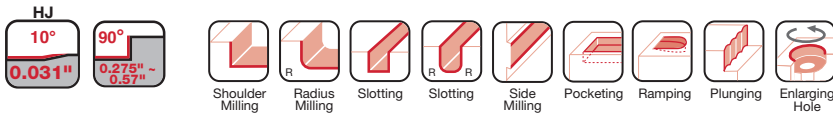
Provides sharpness and reliability!

■ **Comparison of tool life**



Milling cutter : EPO18R100U0100W02 (ø1.000", t = 2 only one insert used)
 Workpiece : 304
 Cutting speed: Vc = 500 sfm
 Feed per tooth: fz = 0.006 ipt
 Depth of cut : ap = 0.200"
 Cutting width : ae = 0.400"

● **High precision shoulder milling cutter**
4 types of chipbreakers for a wide range of applications



● **Chipbreakers**

MJ type
for general machining

P M K S
Steel Stainless Cast Iron Superalloys

MS type
for stainless steel machining

M S
Stainless Superalloys

AJ type
for aluminum machining

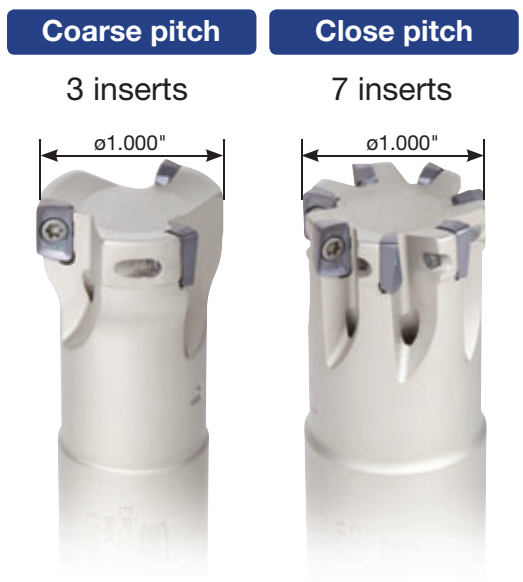
N
Non-ferrous

HJ type
for high feed machining

P M K S
Steel Stainless Cast Iron Superalloys

● **High performance cutter bodies**

Air holes ➔ For improved chip evacuation!
Coarse pitch, close pitch and long shank cutters available!
➔ Choice of optimum cutter body for your application!



■ Max. depth of cut: ap / with MJ chipbreaker

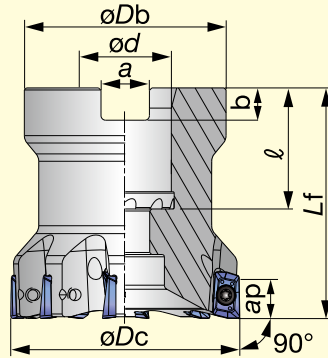
AOMT18
Max. ap = 0.657"

ASMT11
Max. ap = 0.417"

AOMT07
Max. ap = 0.275"

Cutter

Bore type



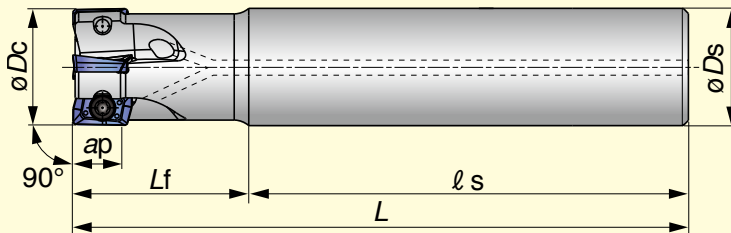
Max. ap:
MJ = 0.275"
AJ = 0.252"
HJ = 0.031"

Parts

Description	Cat. No.
Wrench	T-7DB
Clamping screw	CSTB-2.5L046

Cat. No.	Stock	No. of inserts	Dimensions (in)						Weight (lb)	Air hole	Center bolt (Optional)	Inserts
			* ϕDc	ϕDb	ϕd	ℓ	** L_f	b				
TPO07R200U0075A12	●	12	2.000	1.693	0.750	0.789	1.575	0.197	0.315	0.660	with (C0.375x1.125H)	AO□T0702...

Shank type



Max. ap:
MJ = 0.275"
AJ = 0.252"
HJ = 0.031"

Parts

Descriptions		Parts Cat. No.
Clamping screw	EPO07R050U0050-02	SR-10503833-S
	EPO07R063...-EPO07R100U...	CSTB-2.5L046
Wrench		T-7DB

Cat. No.	Stock	No. of inserts	Dimensions (in)					Weight (lb)	Air hole	Inserts
			* ϕDc	ϕDs	ℓ_s	** L_f	** L			
EPO07R050U0050-02	●	2	0.500	0.500	2.250	0.750	3.000	0.140	with	AO□T0702...
EPO07R063U0063-04	●	4	0.625	0.625	2.563	0.937	3.500	0.250	with	AO□T0702...
EPO07R075U0075-05	●	5	0.750	0.750	2.875	1.125	4.000	0.410	with	AO□T0702...
EPO07R100U0075-03	●	3	1.000	0.750	2.000	1.500	3.500	0.400	with	AO□T0702...
EPO07R100U0100W07	●	7	1.000	1.000	2.281	1.500	3.781	0.680	with	AO□T0702...

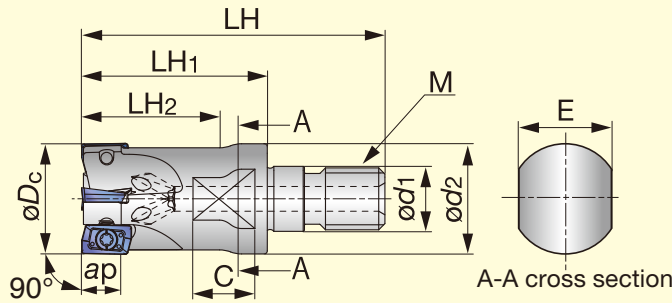
*The ϕDc in the above table shows the diameter when MJ and AJ chipbreakers are used. When HJ chipbreaker is used, the tool diameter is equal to the above shown $\phi Dc + 0.024$ ".

**The L_f and L in the above table show the lengths when MJ chipbreaker is used. When AJ chipbreaker is used, the lengths are equal to $L_f, L + 0.004$ ". When HJ chipbreaker is used, the lengths are equal to $L_f, L + 0.020$ ".

● : Stocked items

Modular type

Max. ap:
 MJ = 0.275"
 AJ = 0.252"
 HJ = 0.031"

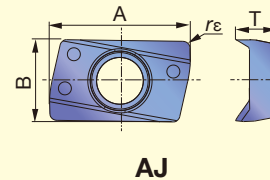
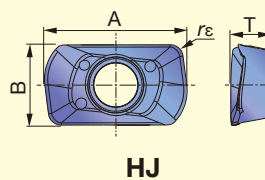
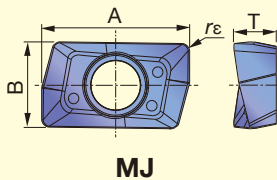


Parts

Descriptions		Parts Cat. No.
Clamping screw	HPO07R012...	SR-10503833-S
	HPO07R016...- HPO07R025...	CSTB-2.5L046
Wrench		T-7DB

Cat. No.	Stock	No. of Inserts	Dimensions: mm (in)									Weight (lb)	Air hole	Applicable Insert
			ϕD_c	LH	LH ₁	LH ₂	C	E	ϕd_1	ϕd_2	M			
New HPO07R012MM06-02	★	2	12 (0.472)	40	25 (0.984)	-	5	7	6.5	9.8 (0.386)	M6	0.030	with AO□T0702...	
HPO07R012MM08-02	●	2	12 (0.472)	42	25 (0.984)	20 (0.787)	8	10	8.5	12.8 (0.504)	M8	0.050	with AO□T0702...	
New HPO07R016MM08-04	★	4	16 (0.630)	42	25 (0.984)	-	10	10	8.5	12.8 (0.504)	M8	0.060	with AO□T0702...	
HPO07R016MM10-04	●	4	16 (0.630)	49	30 (1.181)	20 (0.787)	10	15	10.5	17.8 (0.701)	M10	0.100	with AO□T0702...	
HPO07R020MM10-05	●	5	20 (0.787)	49	30 (1.181)	-	10	15	10.5	17.8 (0.701)	M10	0.130	with AO□T0702...	
HPO07R025MM12-07	●	7	20 (0.787)	57	35 (1.378)	-	10	17	12.5	20.8 (0.819)	M12	0.210	with AO□T0702...	

Inserts



Cat. No.	Accuracy	Honing	Grades			Dimensions (in)			
			Coated		Carbide	A	B	T	r_ϵ
			AH725	AH140	KS15F				
AOMT070202PDPR-MJ	M	with	●	●		0.315	0.185	0.091	0.008
AOMT070204PDPR-MJ	M	with	●	●		0.315	0.185	0.091	0.016
AOMT070208PDPR-MJ	M	with	●	●		0.315	0.185	0.091	0.031
AOMT070216PDPR-MJ	M	with	●	●		0.315	0.185	0.091	0.063
AOMT070208PDPR-HJ	M	with	●	●		0.346	0.193	0.094	0.031
AOGT070204PDFR-AJ	G	without			●	0.319	0.185	0.091	0.016

● : Stocked items
 ★ : Available in 2015

Standard cutting conditions

ISO	Workpiece materials	Hardness HB	Grades	Cutting Speed Vc (sfm)	Feed per tooth: fz (ipt)		
					MJ	HJ	AJ
P	Low carbon steel (1010, 1015 etc.)	- 200	AH725	300 - 660	0.002 - 0.004	0.015 - 0.035	-
	High carbon steels and alloy steel (1045, 4140 etc.)	200 - 300	AH725	300 - 500	0.002 - 0.004	0.015 - 0.035	-
	Tool steel (H13 etc.)	150 - 300	AH725	260 - 400	0.002 - 0.004	0.015 - 0.035	-
M	Stainless steel (304, 316 etc.)	-	AH140	300 - 500	0.002 - 0.004	0.015 - 0.035	-
K	Gray cast iron (No.250B, No.300B etc.)	150 - 250	AH725	330 - 600	0.002 - 0.004	0.015 - 0.035	-
	Ductile cast iron (65-45-12, 80-55-06 etc.)	150 - 250	AH725	260 - 500	0.002 - 0.004	0.015 - 0.035	-
N	Aluminum alloys (Si < 13%)	-	KS15F	1000 - 3300	-	-	0.003 - 0.008
	Aluminum alloys (Si ≥ 13%)	-	KS15F	330 - 660	-	-	0.003 - 0.008
S	Titanium alloys (Ti-6Al-4V etc.)	-	AH725	60 - 160	0.002 - 0.004	0.008 - 0.035	-
	Superalloys (Inconel 718 etc.)	-	AH725	60 - 115	0.002 - 0.003	0.008 - 0.024	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on the cutting edges (aluminum 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.

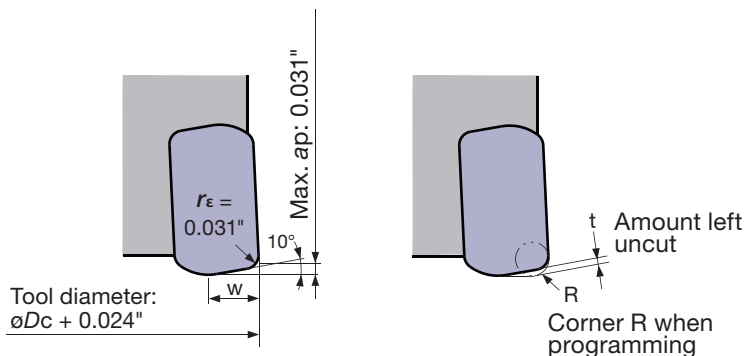
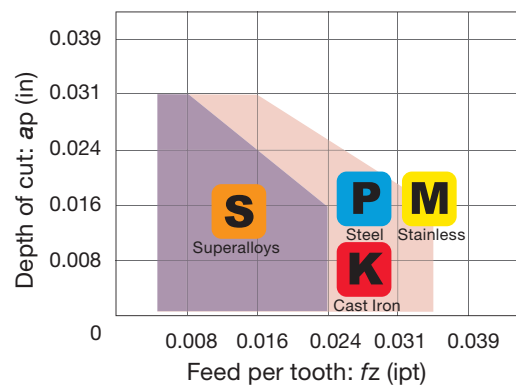
Cautionary points when using HJ inserts

HJ type inserts are designed for high feed machining.

Please note the following when using HJ inserts:

1. The shape of HJ insert differs from that of other inserts (MJ, AJ). However the same insert pocket can be used.
2. When using HJ inserts, all the inserts on the cutter body must be HJ type. Do not use other types of inserts (MJ and AJ types) with HJ inserts on the same cutter body.
3. When using CAD/CAM, please program it as a radius cutter. The table below shows the corner R when programming and the uncut area (t).
4. With HJ inserts, the tool diameter increases by 0.24" over the diameter ϕD_c shown in the table.

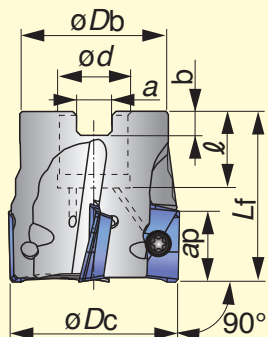
TungRec 07 type HJ inserts Standard conditions



Max. depth of cut max ap (in)	Main cutting edge length W (in)	Corner R when programming	Amount left uncut t (in)
0.031	0.118	R 0.020"	0.016
		R 0.039"	0.012

Cutter

Bore type



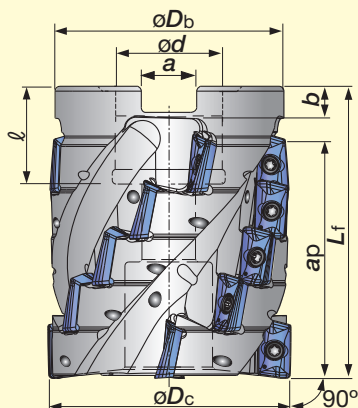
Max. $ap = 0.417''$

Parts

Description	Cat. No.
Wrench	IP-8D

Cat. No.	Stock	No. of inserts	Dimensions (in)							Weight (lb)	Air hole	Center bolt (Option)	Clamping screw	Inserts
			ϕD_c	ϕD_b	ϕd	ℓ	L_f	b	a					
TPS11200RBU	●	7	2.000	1.693	0.750	0.750	1.575	0.197	0.315	0.880	with	C0.375x1.125H	CSPB-2.5	AS□T11T3...
TPS11300RBU	●	10	3.000	2.283	1.000	1.024	1.969	0.236	0.374	2.640	with	C0.500x1.375H	CSPB-2.5	AS□T11T3...
TPS11400RBU	●	11	4.000	3.150	1.500	1.457	2.480	0.394	0.626	5.290	with	TMBA-0.750H	CSPB-2.5	AS□T11T3...

Roughing bore type



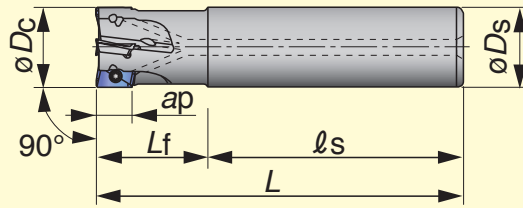
Parts

Description	Cat. No.	
Cutter	TLS11R...	ELS11R...
Clamping screw	CSPB-2.5	
Wrench	IP-8D	
Center bolt	CM10X40H	-

Cat. No.	Stock	No. of eff. edge lines	Dimensions (in)							Weight (lb)	Air hole	No. of inserts	Inserts	
			ϕD_c	ϕD_b	ϕd	ℓ	L_f	b	a					Max. ap
TLS11R200U0075A04	●	4	2.000	1.875	0.750	0.750	2.356	0.197	0.315	1.921	1.330	with	20	AS□T11T3...

Cutter

Shank type



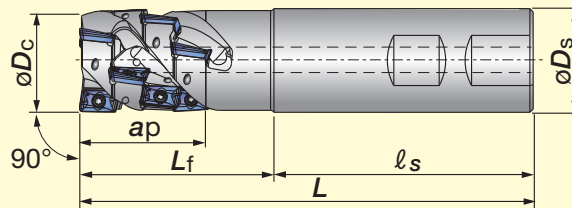
Max. $ap = 0.417''$

Parts

Description	Cat. No.
Wrench	IP-8D

Cat. No.	Stock	No. of inserts	Dimensions (in)					Weight (lb)	Air hole	Clamping screw	Inserts
			ϕD_c	ϕD_s	l_s	L_f	L				
EPS11050RLU	●	1	0.500	0.625	3.750	1.250	5.000	0.350	with	CSPB-2.5	AS□T11T3...
EPS11050RSU	●	1	0.500	0.625	2.362	0.984	3.346	0.240	with	CSPB-2.5S	AS□T11T3...
EPS11062RLU	●	2	0.625	0.625	4.250	1.500	5.750	0.440	with	CSPB-2.5	AS□T11T3...
EPS11062RSU	●	2	0.625	0.625	2.362	0.984	3.346	0.240	with	CSPB-2.5S	AS□T11T3...
EPS11075RLU	●	2	0.750	0.750	5.250	2.000	7.250	0.790	with	CSPB-2.5	AS□T11T3...
EPS11075RSBU	●	3	0.750	0.750	2.362	1.181	3.543	0.370	with	CSPB-2.5S	AS□T11T3...
EPS11100RLU	●	2	1.000	1.000	5.750	2.750	8.500	1.700	with	CSPB-2.5	AS□T11T3...
EPS11100RSBU	●	4	1.000	1.000	2.362	1.378	3.740	0.700	with	CSPB-2.5	AS□T11T3...
EPS11100RSBU-3/4	●	4	1.000	0.750	2.360	1.378	3.738	0.480	with	CSPB-2.5	AS□T11T3...
EPS11125RLU	●	2	1.250	1.250	7.000	3.000	10.000	3.190	with	CSPB-2.5	AS□T11T3...
EPS11125RSBU	●	5	1.250	1.250	2.362	1.378	3.740	1.120	with	CSPB-2.5	AS□T11T3...

Roughing shank type

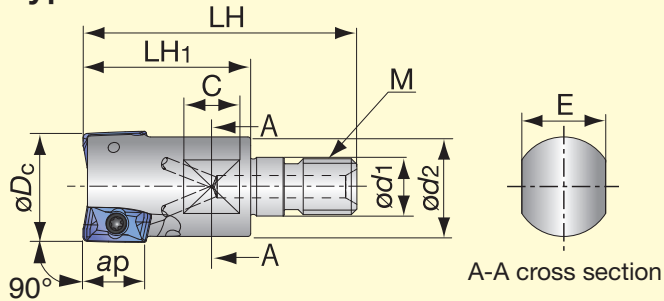


Parts

Description	Cat. No.	
Cutter	TLS11R...	ELS11R...
Clamping screw	CSPB-2.5	
Wrench	IP-8D	
Center bolt	CM10X40H	-

Cat. No.	Stock	No. of eff. edge lines	Dimensions (in)					Weight (lb)	Air hole	No. of inserts	Inserts	
			ϕD_c	ϕD_s	l_s	L_f	L					Max. ap
ELS11R100U0100W02	●	2	1.000	1.000	2.250	1.500	3.750	1.197	0.67	with	6	AS□T11T3...
ELS11R125U0125W03	●	3	1.250	1.250	2.250	2.250	4.500	1.496	1.33	with	12	AS□T11T3...
ELS11R150U0125W03	●	3	1.500	1.250	2.329	2.171	4.500	1.551	1.56	with	12	AS□T11T3...

Modular type



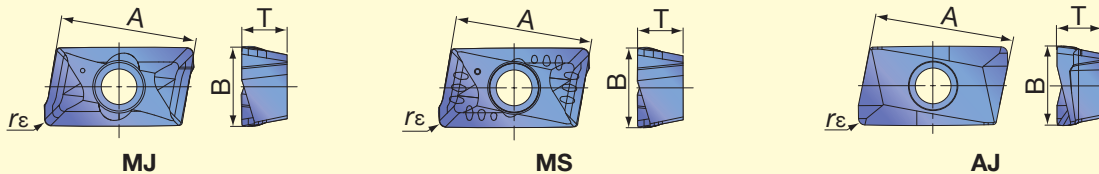
Max. ap = 0.417"

Parts

Descriptions	Parts Cat. No.	
Clamping screw	HPO11R020	HPO11R025, HPO11R032
	CSPB-2.5S	CSPB-2.5
Wrench	IP-8D	

Cat. No.	Stock	No. of Inserts	Dimensions: mm (in)								Weight (lb)	Air hole	Applicable Insert
			øDc	LH	LH1	C	E	ød1	ød2	M			
HPO11R020MM10-02	●	2	20 (0.787)	49	30 (1.181)	10	15	10.5	17.8 (0.701)	M10	0.130	with	AS□T11T3...
HPO11R025MM12-03	●	3	25 (0.984)	57	35 (1.378)	10	17	12.5	20.8 (0.819)	M12	0.210	with	AS□T11T3...
HPO11R032MM16-03	●	3	32 (1.260)	63	40 (1.575)	12	22	17.0	28.8 (1.134)	M16	0.460	with	AS□T11T3...

● Inserts



Cat. No.	Accuracy	Honing	Grades							Dimensions (in)					
			Coated						DLC coated	Cermet	Uncoated	A	B	T	rε
			AH725	AH120	AH130	AH140	T3130	T1115							
ASMT11T304PDPR-MJ	M	with	●	●			●	●		●		0.457	0.264	0.146	0.016
ASMT11T308PDPR-MJ	M	with	●	●			●	●		●		0.457	0.264	0.146	0.031
ASMT11T312PDPR-MJ	M	with	●	●			●	●				0.457	0.264	0.146	0.047
ASMT11T316PDPR-MJ	M	with	●	●			●			●		0.457	0.264	0.146	0.063
ASMT11T320PDPR-MJ	M	with		●								0.457	0.264	0.146	0.079
ASMT11T330PDPR-MJ	M	with		●								0.457	0.264	0.146	0.118
ASMT11T304PDPR-MS	M	with			●	●						0.457	0.264	0.146	0.016
ASGT11T304PDFR-AJ	G	without							●		●	0.457	0.264	0.146	0.016
ASGT11T308PDFR-AJ	G	without							●		●	0.457	0.264	0.146	0.031

Standard cutting conditions

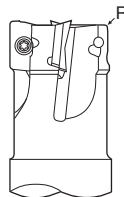
TPS11 / EPS11, HPO11 type

ISO	Workpiece materials	Brinell hardness HB	Priority	Grade	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)		
						MJ	MS	AJ
P	Low carbon steel (1010, 1015 etc.)	- 200	First choice	AH725	330 - 820	0.004 - 0.008	-	-
		- 200	For wear resistance	T3130	330 - 820	0.004 - 0.008	-	-
		- 200	For surface appearance	NS740	330 - 820	0.002 - 0.006	-	-
	High carbon steel and alloy steel (1045, 4140 etc.)	200 - 300	First choice	AH725	330 - 660	0.004 - 0.008	-	-
		200 - 300	For wear resistance	T3130	330 - 660	0.004 - 0.008	-	-
		200 - 300	For surface appearance	NS740	330 - 660	0.002 - 0.005	-	-
Tool steel (H13 etc.)	150 - 300	First choice	AH725	330 - 500	0.003 - 0.006	-	-	
	150 - 300	For wear resistance	T3130	330 - 500	0.003 - 0.006	-	-	
M	Stainless steel (304, 316 etc.)	-	-	AH130	260 - 660	-	0.003 - 0.008	-
K	Gray cast iron (No.250B, No.300B etc.)	150 - 250	First choice	AH120	330 - 820	0.005 - 0.01	-	-
		150 - 250	For wear resistance	T1115	330 - 820	0.005 - 0.01	-	-
	Ductile cast iron (65-45-12, 80-55-06 etc.)	150 - 250	First choice	AH120	260 - 660	0.005 - 0.01	-	-
		150 - 250	For wear resistance	T1115	260 - 660	0.005 - 0.01	-	-
N	Aluminum alloys (Si < 13%)	-	-	DS1100	1000 - 3300	-	-	0.002 - 0.008
	Aluminum alloys (Si ≥ 13%)	-	-	DS1100	330 - 660	-	-	0.002 - 0.008
	Copper alloys	-	-	KS05F	660 - 1650	-	-	0.002 - 0.008
S	Titanium alloys (Ti-6Al-4V etc.)	-	-	AH130	60 - 200	-	0.003 - 0.006	-
	Superalloys (Inconel 718 etc.)	-	-	AH725	60 - 130	0.003 - 0.005	-	-

Cautionary point in modifying cutter bodies

When using inserts with corner radius $r_{\epsilon} \geq 0.79"$, standard cutter bodies have to be modified "R". (Only for TPS11, EPS11, TLS11, ELS11, HPO11)

- From 2nd row onwards, please use insert with $r_{\epsilon} = 0.016"$ or $0.031"$



Corner radius r_{ϵ} (inch)	The dimension of modifying (inch)
0.016 - 0.063	Unnecessary
0.079 - 0.118	0.080

Roughing type TLS11 / ELS11

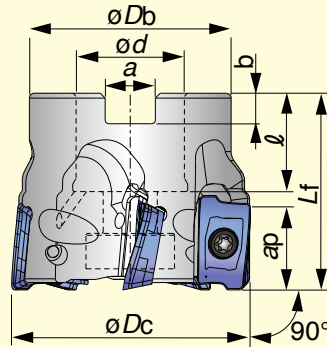
ISO	Workpiece materials	Brinell hardness HB	Priority	Grade	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)		
						MJ	MS	AJ
P	Low carbon steel (1010, 1015 etc.)	- 200	First choice	AH725	330 - 820	0.002 - 0.007	-	-
		- 200	For wear resistance	T3130	330 - 820	0.002 - 0.007	-	-
	High carbon steel and alloy steel (1045, 4140 etc.)	200 - 300	First choice	AH725	330 - 660	0.003 - 0.006	-	-
		200 - 300	For wear resistance	T3130	330 - 660	0.003 - 0.006	-	-
	Tool steel (H13 etc.)	150 - 300	First choice	AH725	330 - 500	0.003 - 0.006	-	-
		150 - 300	For wear resistance	T3130	330 - 500	0.003 - 0.006	-	-
M	Stainless steel (304,316 etc.)	-	-	AH130	330 - 500	-	0.003 - 0.006	-
K	Gray cast iron (No.250B, No.300B etc.)	150 - 250	First choice	AH120	330 - 820	0.004 - 0.007	-	-
		150 - 250	For wear resistance	T1115	330 - 820	0.004 - 0.007	-	-
	Ductile cast iron (65-45-12, 80-55-06 etc.)	150 - 250	First choice	AH120	260 - 660	0.004 - 0.007	-	-
		150 - 250	For wear resistance	T1115	260 - 660	0.004 - 0.007	-	-
N	Aluminum alloys (Si < 13%)	-	-	DS1100	660 - 1650	-	-	0.002 - 0.007
	Aluminum alloys (Si ≥ 13%)	-	-	DS1100	330 - 660	-	-	0.002 - 0.007
S	Titanium alloys (Ti-6Al-4V etc.)	-	-	AH130	60 - 200	0.003 - 0.006	-	-
	Superalloys (Inconel 718 etc.)	-	-	AH725	60 - 130	0.003 - 0.005	-	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on the cutting edges (aluminum 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.

Cutter

Bore type



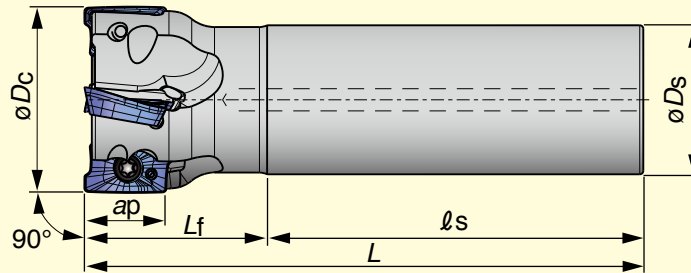
Max. ap = 0.657"

Parts

Description		Cat. No.
Applicable cutter		TPO18R...
Wrench	Torx bit	BT15M
	Grip	H-TBS
Mono block type wrench		-

Cat. No.	Stock	No. of inserts	Dimensions (in)							Weight (lb)	Air hole	Center bolt	Clamping screw	Inserts
			* ϕD_c	ϕD_b	ϕd	l	** L_f	b	a					
TPO18R200U0075A05	●	5	2.000	1.625	0.750	0.750	1.570	0.197	0.315	0.780	with	(C0.375X1.125H)	CSTB-4L093	AO□T1805...
TPO18R250U0075A06	●	6	2.500	2.125	0.750	0.750	1.570	0.197	0.315	1.320	with	(C0.375X1.125H)	CSTB-4L093	AO□T1805...
TPO18R300U0100A07	●	7	3.000	2.250	1.000	1.000	1.750	0.236	0.374	1.890	with	(C0.500X1.375H)	CSTB-4L120	AO□T1805...
TPO18R400U0150A08	●	8	4.000	3.000	1.500	1.060	2.000	0.354	0.630	3.140	without	-	CSTB-4L120	AO□T1805...
TPO18R500U0150A09	●	9	5.000	4.000	1.500	1.060	2.000	0.354	0.630	6.270	without	-	CSTB-4L120	AO□T1805...
TPO18R600U0200A10	●	10	6.000	4.750	2.000	1.060	2.000	0.394	0.748	8.370	without	-	CSTB-4L120	AO□T1805...

Shank type



Max. ap = 0.657"

Parts

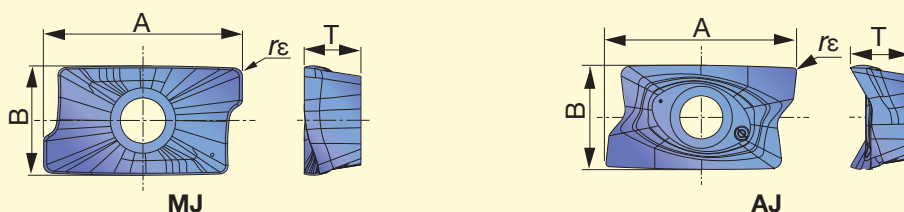
Description		Cat. No.
Applicable cutter		EPO18R...
Wrench	Torx bit	-
	Grip	-
Mono block type wrench		T-15DB

Cat. No.	Stock	No. of inserts	Dimensions (in)					Weight (lb)	Air hole	Clamping Screw	Inserts
			* ϕD_c	ϕD_s	l_s	L_f	L				
EPO18R100U0100W02	●	2	1.000	1.000	2.250	1.750	4.000	0.730	with	CSTB-4L085	AO□T1805...
EPO18R100U0100W02L	●	2	1.000	1.000	2.250	2.750	5.000	0.910	with	CSTB-4L085	AO□T1805...
EPO18R125U0125W03	●	3	1.250	1.250	3.000	1.500	4.500	1.320	with	CSTB-4L093	AO□T1805...
EPO18R125U0125W03L	●	3	1.250	1.250	2.250	4.250	6.500	1.880	with	CSTB-4L093	AO□T1805...
EPO18R150U0125W03L	●	3	1.500	1.250	2.250	4.250	6.500	2.420	with	CSTB-4L093	AO□T1805...
EPO18R150U0125W04	●	4	1.500	1.250	2.250	2.250	4.500	1.460	with	CSTB-4L093	AO□T1805...
EPO18R200U0125W05	●	5	2.000	1.250	2.250	2.250	4.500	1.680	with	CSTB-4L093	AO□T1805...

* The ϕD_c in the above table shows the diameter when MJ chipbreaker is used.
When AJ chipbreaker is used, the diameter is equal to the above shown $\phi D_c + 0.080$ ".

● : Stocked items

● Inserts



Cat. No.	Accuracy	Honing	Grades			Dimensions (in)			
			Coated		Carbide	A	B	T	r ϵ
			AH725	AH140	KS15F				
AOMT180508PDPR-MJ	M	with	●	●		0.768	0.421	0.220	0.031
AOMT180516PDPR-MJ	M	with	●	●		0.768	0.421	0.220	0.063
AOMT180524PDPR-MJ	M	with	●	●		0.768	0.421	0.220	0.094
AOMT180532PDPR-MJ	M	with	●	●		0.768	0.421	0.220	0.126
AOGT180504PDFR-AJ	G	without			●	0.780	0.425	0.240	0.016
AOGT180508PDFR-AJ	G	without			●	0.780	0.425	0.240	0.031

● : Stocked items

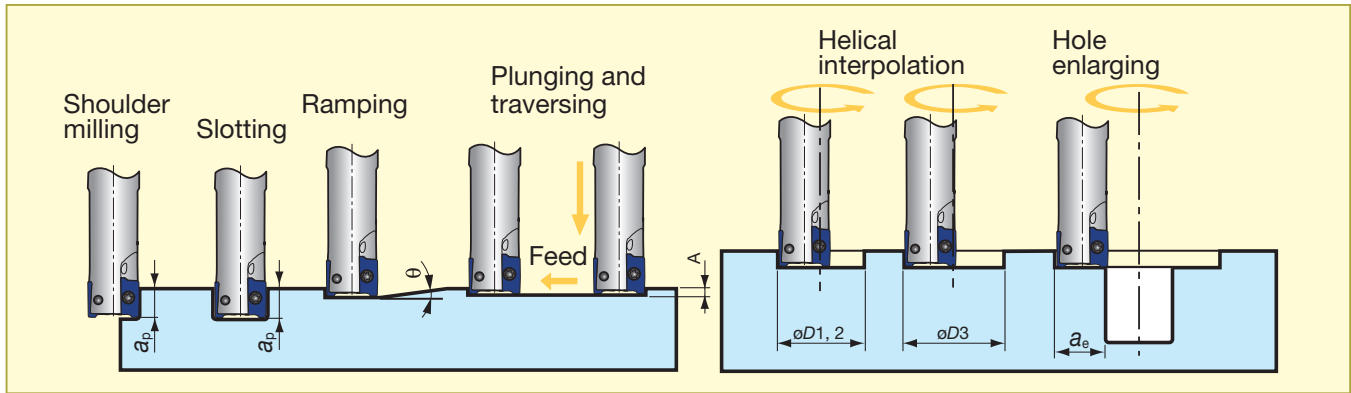
● Standard cutting conditions

ISO	Workpiece materials	Brinell hardness HB	Grade	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)	
					MJ	AJ
P	Low carbon steel (1010, 1015 etc.)	- 200	AH725	330 - 820	0.003 - 0.010	-
	High carbon steel and alloy steel (1045, 4140 etc.)	200 - 300	AH725	330 - 750	0.003 - 0.008	-
	Tool steel (H13 etc.)	150 - 300	AH725	330 - 600	0.003 - 0.008	-
M	Stainless steel (304,316 etc.)	-	AH140	330 - 660	0.003 - 0.008	-
K	Gray cast iron (No.250B, No.300B etc.)	150 - 250	AH725	330 - 820	0.003 - 0.010	-
	Ductile cast iron (65-45-12, 80-55-06 etc.)	150 - 250	AH725	260 - 660	0.003 - 0.010	-
N	Aluminum alloys (Si < 13%)	-	KS15F	1000 - 3300	-	0.002 - 0.010
	Aluminum alloys (Si ≥ 13%)	-	KS15F	330 - 660	-	0.002 - 0.010
S	Titanium alloys (Ti-6Al-4V etc.)	-	AH725	60 - 200	0.003 - 0.007	-
	Superalloys (Inconel 718 etc.)	-	AH725	60 - 130	0.003 - 0.006	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on the cutting edges (aluminum 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.

Machining applications



Cat. No.	Tool- ϕ ϕD_c (in)	Chip-breaker	Max. depth of cut a_p (in)	Max. ramping angle θ	Max. plunging A (in)	Min. machining $\phi D1$ (in)	Max. machining $\phi D2$ (in)	*Max. machining $\phi D3$ (in)	Max. cutting width in enlarging a_e (in)
EPO07R050U0050-02	0.500	MJ, AJ	0.276	7.5°	0.020	0.750	0.960	0.862	0.480
	0.524	HJ	0.031	4.5°	0.030	0.786	1.008	-	0.406
EPO07R063U0063-04	0.625	MJ, AJ	0.276	5°	0.020	0.938	1.210	1.112	0.610
	0.649	HJ	0.031	4°	0.030	0.974	1.258	-	0.531
EPO07R075U0075-05	0.750	MJ, AJ	0.276	3.5°	0.020	1.125	1.460	1.362	0.730
	0.774	HJ	0.031	2.5°	0.030	1.161	1.508	-	0.656
EPO07R100U...	1.000	MJ, AJ	0.276	2.4°	0.020	1.500	1.960	1.862	0.980
	1.024	HJ	0.031	2°	0.030	1.536	2.008	-	0.906
EPS11050...	0.500	MJ, MS, AJ	0.417	6°	0.020	0.590	0.910	0.882	0.480
EPS11062...	0.625	MJ, MS, AJ	0.417	5°	0.020	0.790	1.220	1.332	0.610
EPS11075...	0.750	MJ, MS, AJ	0.417	3°	0.020	1.100	1.530	1.382	0.730
EPS11100...	1.000	MJ, MS, AJ	0.417	2°	0.020	1.500	1.930	1.882	0.980
EPS11125...	1.250	MJ, MS, AJ	0.417	1.5°	0.020	2.050	2.480	2.382	1.230
EPO18R100U...	1.000	MJ, AJ	0.657	5.5°	0.039	1.272	1.921	1.764	0.961
EPO18R125U...	1.250	MJ, AJ	0.657	3.5°	0.039	1.772	2.421	2.264	1.211
EPO18R150U...	1.500	MJ, AJ	0.657	2.7°	0.039	2.272	2.921	2.764	1.461
T/EPO18R200U...	2.000	MJ, AJ	0.657	1.9°	0.039	3.272	3.921	3.764	1.961
TPO07R200U0075A12	2.000	MJ, AJ	0.276	0.9°	0.020	3.000	3.960	3.862	1.980
	2.024	HJ	0.031	0.6°	0.030	3.036	4.008	-	1.906
TPS11200RBU	2.000	MJ, MS, AJ	0.417	0.7°	0.020	3.460	3.900	3.882	1.950
TPS11300RBU	3.000	MJ, MS, AJ	0.417	0.4°	0.020	5.830	6.260	5.882	3.130
TPS11400RBU	4.000	MJ, MS, AJ	0.417	0.3°	0.020	7.400	7.830	7.882	3.920
TPO18R250U0075A06	2.500	MJ, AJ	0.657	1.4°	0.039	4.272	4.921	4.764	2.461
TPO18R300U0100A07	3.000	MJ, AJ	0.657	1.1°	0.039	5.272	5.921	5.764	2.961
TPO18R400U0150A08	4.000	MJ, AJ	0.657	0.8°	0.039	7.272	7.921	7.764	3.961
TPO18R500U0150A09	5.000	MJ, AJ	0.657	0.6°	0.039	9.272	9.921	9.764	4.961
TPO18R600U0200A10	6.000	MJ, AJ	0.657	0.5°	0.039	11.272	11.921	11.764	5.961

*Flat bottom hole

Notes: Corner r_ϵ for dimensions of $\phi D1$, $\phi D2$, and $\phi D3$: $r_\epsilon = 0.016''$ for EPO07 / EPS11 and $r_\epsilon = 0.031''$ for EPO18.

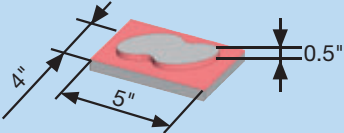
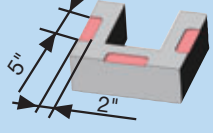
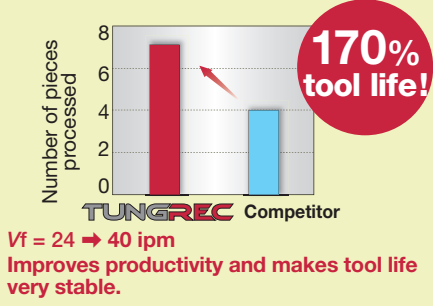
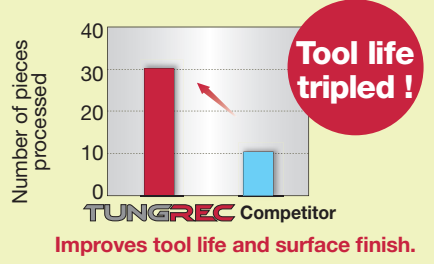
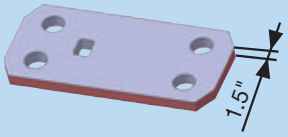
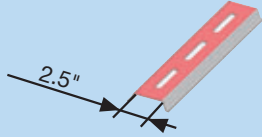
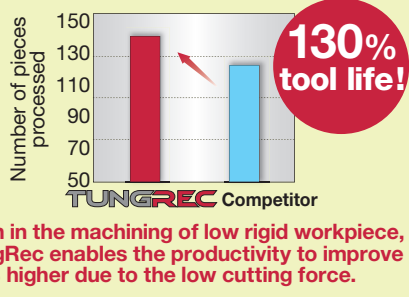
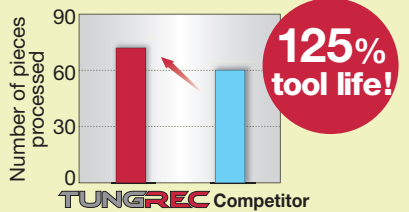
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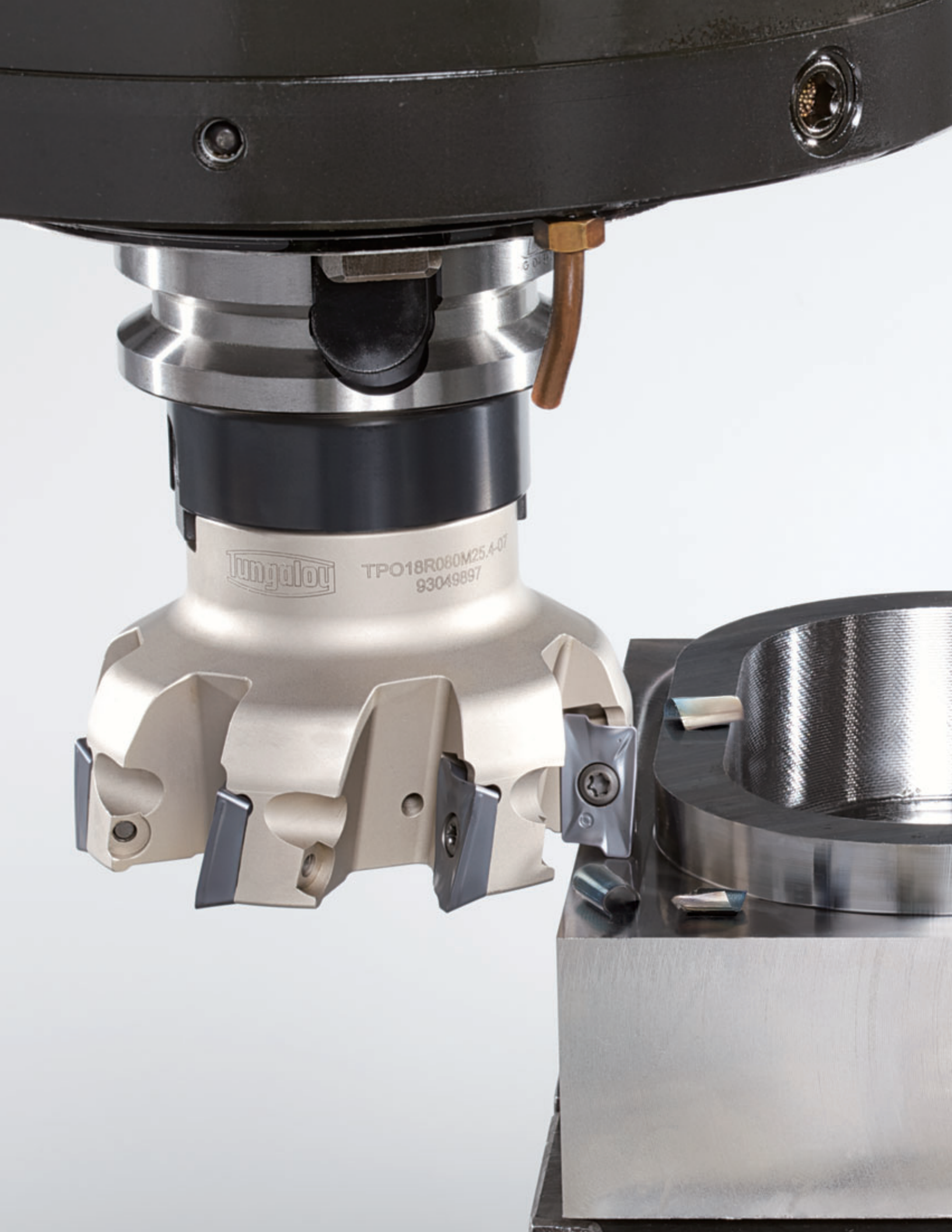
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NM2X35



Practical examples

Workpiece type		Machine parts	Compressor parts
Cutter		TPO07R200U0075A12 (ø2.000", t = 12)	EPS11125RSBU (ø1.250", t = 5)
Insert		AOMT070208PDPR-MJ	ASMT11T304PDPR-MJ
Grade		AH725	NS740
Workpiece material		4140	Structural steel
			
Cutting conditions	Cutting speed: V_c (sfm)	430	500
	Feed per tooth: f_z (ipt)	0.004	0.005
	Feed speed: V_f (ipm)	40	40
	Depth of cut: a_p (in)	0.120	0.200
	Width of cut: a_e (in)	~ 1.500	0.600
	Method of machining	Shoulder milling	Shoulder milling
	Coolant	Dry	Dry
Machine	Vertical MC, BT40	Vertical MC, BT50	
Results			
Workpiece type		Machine parts	Transportation rail
Cutter		TLS11R200U0075A04	TPO18R200U0075A05 (ø2.000", t = 5)
Insert		ASMT11T308PDPR-MJ	AOMT180516PDPR-MJ
Grade		AH725	AH725
Workpiece material		Low carbon steel	1020
			
Cutting conditions	Cutting speed: V_c (sfm)	500	720
	Feed per tooth: f_z (ipt)	0.007	0.006
	Feed speed: V_f (ipm)	26	42
	Depth of cut: a_p (in)	1.5	0.240
	Width of cut: a_e (in)	0.2	0.750
	Method of machining	Shoulder milling	Face milling
	Coolant	Dry	Dry
Machine	Vertical MC, BT50	Vertical MC, BT50	
Results			



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Tungaloy-NTK America Inc.

United States

3726 N Ventura Drive, Arlington Heights, IL 60004, U.S.A.

Inside Sales: +1-888-554-8394

Technical Support: +1-888-554-8391

Fax: +1-888-554-8392

www.tungaloy.com/us

Canada

432 Elgin St. Unit 3, Brantford, Ontario N3S 7P7, Canada

Phone: +1-519-758-5779 Fax: +1-519-758-5791

www.tungaloy.com/ca

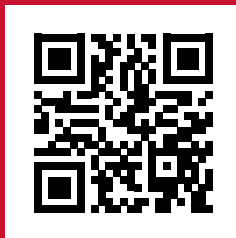
Mexico

C Los Arellano 113, Parque Industrial Siglo XXI

Aguascalientes, AGS, Mexico 20290

Phone:+52-449-929-5410 Fax:+52-449-929-5411

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