

Milling cutter

EPS & TPS

High precision 90° milling cutter



New milling grades!

High Precision 90° milling cutter

Features

High precision and general purpose are the main characteristics of Tungaloy's latest innovative development. The new and modern EPS & TPS generation of milling cutters covers a multitude of different applications. The endmills, of which some

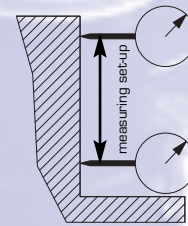
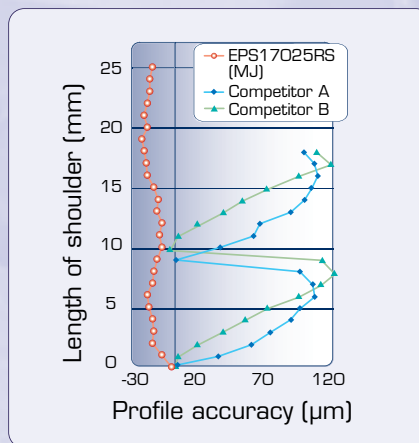
are equipped with air hole, are best suited for square shoulder and slotting operations at only low cutting forces. The exact positioning of the insert combined with a positive chipbreaker and a two-step rake angle enable the machining of a high pre-

cision 90° shoulder without any steps in the profile. Further finishing operations with a solid carbide milling cutter thus become unnecessary.

Benefits

- Square shoulder milling without step effect
- 90° shoulder, with high precision profile accuracy
- Positive rake angle for low cutting forces and excellent chip control
- EPS endmills with air hole

90° Square Shoulder



Cutter: EPS17025RS (ø 25, t = 2)
 Insert: ASMT170508PDPR-MJ
 Grade: AH120
 Work material: C55
 Cutting speed: $V_c = 150$ m/min
 Feed per tooth: $f_t = 0.1$ mm
 Axial cutting depth: $a_p = 2 \times 14$ mm
 Cutting width: $a_e = 5$ mm
 Coolant: without

Grade

AH120	AH130 NEW	AH140	T1015
Coated fine grain carbide for milling of steels, alloy steels and cast irons The TiAlN-PVD coating provides for application in medium to high cutting speed operations.	New (TiAl)N coated grade for general milling of stainless steels Excellent adhesion and improved hardness Extraordinary toughness Well balanced wear resistance and fracture toughness	High toughness for medium finishing and roughing of stainless steels at low cutting speeds	MT-CVD coated grade for general milling operations of cast irons at medium cutting speeds High wearresistance and toughness
T3130 NEW	NS740	KS05F	
New MT-CVD coated grade for general milling operations of carbon steels and alloy steels at medium cutting speeds Improved balance between wear resistance and toughness	Uncoated Cermet with extreme wear-resistance and well balanced toughness For universal application in milling operations of steel and cast iron materials at medium cutting speeds Best surface quality	Highly wear resistant, uncoated ultra-fine grain carbide for high cutting speeds	

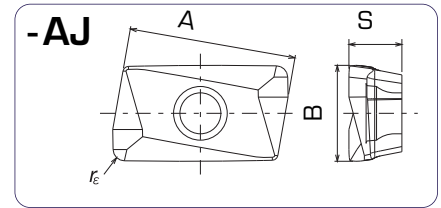
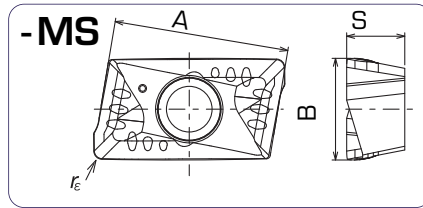
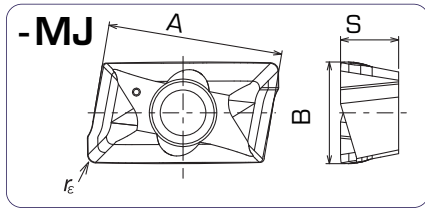
Chipbreaker

-MJ
 optimal performance for steel and cast iron materials
 - stable cutting edge
 - excellent chip control

-MS
 first choice for stainless steels
 - soft cutting
 - minimum edge built-up

-AJ
 first choice for machining of aluminium alloys
 - extremely sharp cutting edges

Specifications: Inserts

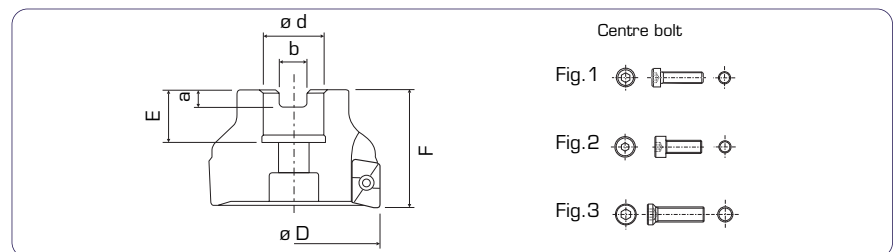


● Standard stock in Europe

Item code	Grade							Accuracy	Honing	Dimensions (mm)			
	NEW PVD		CVD NEW		Cermet	Carbide	A			B	S	r_{ϵ}	
	AH120	AH130	AH140	T1015	T3130	NS740	KS05F						
ASMT11T304PDPR-MJ	●	●		●	●	●		M	with	11.6	6.7	3.7	0.4
ASMT11T304PDPR-MS		●	●										0.8
ASGT11T304PDFR-AJ							●	G	without				1.2
ASMT11T308PDPR-MJ	●	●		●	●	●		M	with				1.6
ASGT11T308PDFR-AJ							●	G	without	2.0			
ASMT11T312PDPR-MJ	●	●			●			M	with	3.0			
ASMT11T316PDPR-MJ	●	●		●	●	●				0.4			
ASMT11T320PDPR-MJ	●	●								0.8			
ASMT11T330PDPR-MJ	●	●		●	●	●				1.2			
ASMT170504PDPR-MJ	●	●		●	●	●		M	with	16.9	9.8	5.6	0.4
ASGT170504PDFR-AJ							●	G	without				0.8
ASMT170508PDPR-MJ	●	●		●	●	●		M	with				1.2
ASMT170508PDPR-MS		●	●										1.6
ASGT170508PDFR-AJ							●	G	without	2.0			
ASMT170512PDPR-MJ	●	●			●			M	with	3.0			
ASMT170516PDPR-MJ	●	●		●	●	●				0.4			
ASMT170520PDPR-MJ	●	●								0.8			
ASMT170530PDPR-MJ	●	●		●	●	●				1.2			
ASMT170532PDPR-MJ*	●	●		●	●	●				1.6			
										2.0			
										3.0			
										3.2			

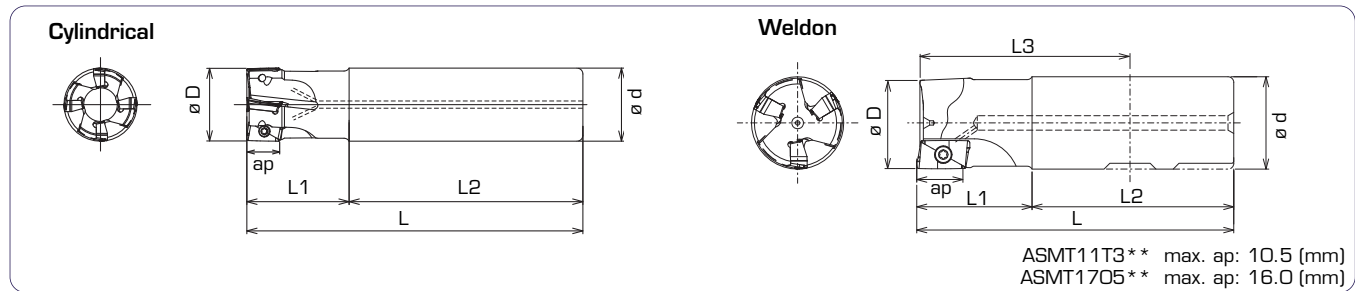
*Note: Inserts with corner radius r_{ϵ} 3.2 are not recommended for spiral interpolation.

Specifications: TPS 11/17 Milling cutter



Item code	Stock	No. of inserts	Dimensions (mm)						Inserts	Replacement parts			
			$\varnothing D$	$\varnothing d$	F	E	a	b		Clamping screw	Wrench	Centre bolt	
TPS11040RB-E	●	6	40	16	40	19	5.6	8.4	AS*T11T3**PD*R**	CSPB-2.5	IP-8D	CM8X30	Fig. 1
TPS11050RB-E	●	7	50	22		20	6.3	10.4				CM10X30	Fig. 2
TPS11063RB-E	●	8	63	45	19	5.6	8.4	FSHM8-30				Fig. 3	
TPS17040RB-E	●	4	40	16	40	19	5.6	8.4	AS*T1705**PD*R**	CSPB-4S	IP-15D	CM10X30	Fig. 2
TPS17050RB-E	●	5	50	22		20	6.3	10.4					
TPS17063RB-E	●	6	63	45									

Specifications: EPS 11/17 Endmill

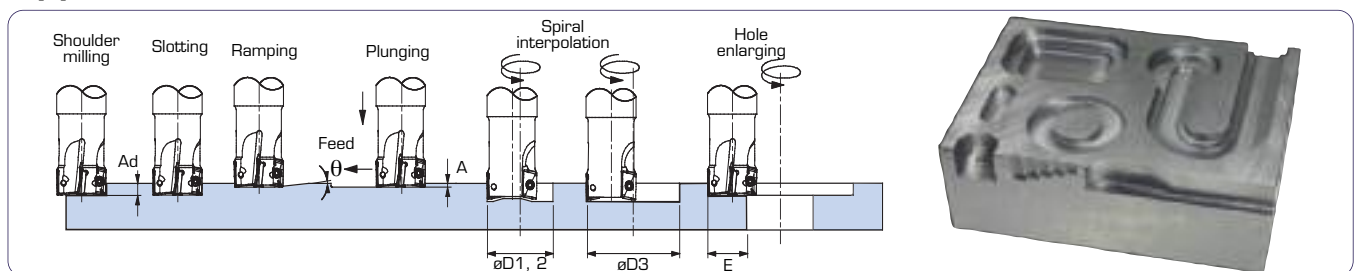


Item code	Stock	No. of inserts	Dimensions (mm)							Inserts	Replacement parts	
			ø D	L	L1	L2	L3	ø d	Clamping screw		Wrench	
EPS11012RS	●	1	12							AS*T11T3**PD*R**	CSPB-2.5S	IP-8D
EPS11016RS	●	2	16	85	25	60	-	16				
EPS11018RS	●		18									
EPS11020RS	●	3	20	100	30	70	-	20				
EPS11020RSB	●		21									
EPS11021RSB	●		25	115	35		-	25				
EPS11025RS	●	4	26									
EPS11025RSB	●		32	120	40		-	32				
EPS11026RSB	●	5	33			80						
EPS11032RS	●		25	115	35		-	25				
EPS11032RSB	●		26									
EPS11033RSB	●	3	32	120	40		-	32				
EPS17025RS	●		25	115	35		-	25				
EPS17026RS	●	2	26									
EPS17032RS	●		32	120	40		-	32				
EPS17032RSB	●	3	33									
EPS17033RSB	●		AS*T1705**PD*R**	CSPB-4S	IP-15D							
EPS11012RL	●	1	12	125	30	95		16	AS*T11T3**PD*R**	CSPB-2.5S	IP-8D	
EPS11016RL	●	2	16	145	40	105	-	16				
EPS11018RL	●		18									
EPS11020RL	●		20	185	50	135	-	20				
EPS11021RL	●		21									
EPS11025RL	●		25	220	70	150	-	25				
EPS11026RL	●		26									
EPS11032RL	●		32	255	80	175	-	32				
EPS11033RL	●		33									
EPS17025RL	●	2	25	220	70	150	-	25				
EPS17026RL	●		26									
EPS17032RL	●		32	255	80	175	-	32				
AS*T1705**PD*R**	CSPB-4S	IP-15D										
EPS11012RS-E	●	1	12	80	25	55	56	16	AS*T11T3**PD*R**	CSPB-2.5S	IP-8D	
EPS11016RS-E	●	2	16	85								
EPS11020RSB-E	●	3	20	90	30	60	65	20				
EPS11025RSB-E	●	4	25	95	35		63	25				
EPS11032RSB-E	●	5	32	110	40	70	74	32				
EPS17025RS-E	●	2	25	95	35	60	63	25				
EPS17032RSB-E	●	3	32	110	40	70	74	32				
AS*T1705**PD*R**	CSPB-4S	IP-15D										

Cutting conditions

Work materials	Grade	Chip-breaker	Cutting-parameter	Tool diameter (mm)		
				ø 12	ø 16 - ø 21	ø 25 - ø 63
Low alloy steels St42, C45E etc. < 250HB	NS740	-MJ	V _c (m/min) ft (mm/t)	80 - 100 0.05 - 0.08	100 - 120 0.05 - 0.12	100 - 150 0.05 - 0.15
	AH120	-MJ	V _c (m/min) ft (mm/t)	80 - 100 0.05 - 0.10	100 - 150 0.12 - 0.20	100 - 150 0.12 - 0.20
Alloy steels 42CrMo4, 16MnCr5 etc. < 300HB	NS740	-MJ	V _c (m/min) ft (mm/t)	80 - 100 0.05 - 0.08	80 - 100 0.05 - 0.08	80 - 120 0.05 - 0.10
	NEW T3130	-MJ	V _c (m/min) ft (mm/t)	80 - 100 0.05 - 0.10	80 - 120 0.10 - 0.15	100 - 200 0.10 - 0.20
Die steels X96CrMoV12 etc. < 300HB	NEW T3130	-MJ	V _c (m/min) ft (mm/t)	80 - 100 0.05 - 0.10	80 - 120 0.10 - 0.15	100 - 150 0.12 - 0.20
	NEW AH130	-MJ -MS	V _c (m/min)	80 - 120	100 - 180	100 - 230
-MJ: ft (mm/t)			0.05 - 0.12	0.12 - 0.18	0.12 - 0.23	
-MS: ft (mm/t)			0.05 - 0.10	0.12 - 0.15	0.12 - 0.20	
Stainless steels X8CrNiS18-9 etc. < 250HB	AH140	-MS	V _c (m/min) ft (mm/t)	80 - 100 0.05 - 0.10	100 - 150 0.12 - 0.15	100 - 200 0.12 - 0.20
	Cast irons GG25 etc.	T1015	-MJ	V _c (m/min) ft (mm/t)	80 - 100 0.08 - 0.12	100 - 150 0.12 - 0.20
Aluminium alloy Si < 12 %				KS05F	-AJ	V _c (m/min) ft (mm/t)
	Aluminium alloy Si > 12 %	KS05F	-AJ			V _c (m/min) ft (mm/t)
Copper alloy				KS05F	-AJ	V _c (m/min) ft (mm/t)

Applications

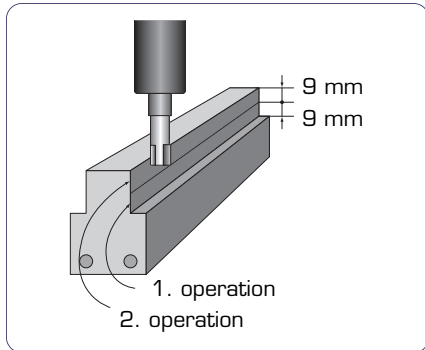


Item code	Tool ø (mm)	Max. cutting depth Ad (mm)	Max. ramping angle (θ)	Max. plunging A (mm)	Min. machining øD1 (mm)	Max. machining øD2 (mm)	* Max. machining øD3 (mm)	Max. cutting width for enlarging E (mm)
EPS11012R**	12	11.0	6°	0.5	15	23	21 - 23	11.5
EPS11016R**	16		5°		20	31	29 - 31	15.5
EPS11018R**	18	10.9	4°		26	35	33 - 34	17.5
EPS11020R***	20	10.8	3°		28	39	37 - 39	19.5
EPS11021R***	21		30		41	39 - 41	20.5	
EPS11025R***	25	10.8	2°		38	49	47 - 49	24.5
EPS11026R***	26		40		51	49 - 51	25.5	
EPS11032R***	32	10.7	1° 30'		52	63	61 - 63	31.5
EPS11033R***	33				54	65	63 - 65	32.5
EPS17025R**	25	16.3	5°		1.0	32	48	46 - 48
EPS17026R**	26			34		51	49 - 51	25.0
EPS17032R***	32	16.2	3° 30'	46		62	60 - 62	31.0
EPS17033R***	33			48		65	63 - 65	32.0
TPS11040RB-E	40	10.6	1°	0.5	68	79	77 - 79	39.5
TPS11050RB-E	50		0° 42'		88	99	97 - 99	49.5
TPS11063RB-E	63		0° 30'		114	125	123 - 125	62.5
TPS17040RB-E	40	16.2	2° 30'	1.0	62	78	76 - 78	39.0
TPS17050RB-E	50	16.1	1° 30'		82	98	96 - 98	49.0
TPS17063RB-E	63	16.0	1°		108	124	122 - 124	62.0

* Plain bore hole bottom



Practical example



Square shoulder milling
Milling cutter: EPS17032RSB
(ϕ 32, $t = 3$)
Inserts: ASMT170508PDPR-MJ
Grade: AH120
Work material: X155CrVMo12-1
(1.2379)
Cutting speed: $V_c = 140$ m/min
Table feed: $V_f = 502$ mm/min
Feed per tooth: $f_t = 0.12$ mm
Axial cutting depth: $a_p = 2 \times 9$ mm
Cutting width: $a_e = 5.0$ mm

Result:
Due to the excellent 90° profile accuracy, a final finishing operation with a solid carbide endmill was unnecessary. Thus operation time was drastically reduced.

Tungaloy Europe GmbH

Tungaloy Europe GmbH
Elisabeth-Selbert-Str. 3
D - 40764 Langenfeld
Tel. +49 (0 21 73) 9 04 20 - 0
Fax +49 (0 21 73) 9 04 20 - 18
e-mail: info@tungaloy.de
www.tungaloy-eu.com

Tungaloy France S.a.r.l.

6, Avenue des Andes
F - 91952 COURTABOEUF CEDEX
Tel. +33 (01) 64 86 43 00
Fax +33 (01) 69 07 78 17
e-mail: info@tungaloy.fr
www.tungaloy-eu.com

Tungaloy Italia S.p.A.

Via E. Andolfato, 10
I - 20126 MILANO
Tel. +39 02 25 20 12 - 1
Fax +39 02 25 20 12 - 65
e-mail: info@tungaloy.it
www.tungaloy-eu.com

Tungaloy Central Europe s.r.o.

4D Center Building B 10F
Kodanska 46
CZ - 10100 Praha 10
Tel. +420 - 2 72 65 22 18
Fax +420 - 2 34 06 42 70
e-mail: info@tungaloy.cz
www.tungaloy-eu.com

Distributed by:



ISO 9001 certified
QC00J0056
18/10/1996
Tungaloy Corporation

ISO 14001 certified
EC97J1123
26/11/1997
Production Division,
Tungaloy Corporation