

MILLLINE Shoulder milling cutter

TUNGQUAD

TPD / EPD / ELD type

**Extended version
with roughing type**

Small diameter cutters that deliver highly productive solutions



Ideal solution for milling small parts on small machine !



Features

● Super high density cutters

Small diameter cutter delivers very high productivity levels !

■ Comparison of number of teeth

Tool diameter ϕD_c (mm)	$\phi 25$	$\phi 32$	$\phi 40$
TUNGQUAD	5	6	8
Conventional	4	5	6
Competitor	3	4	5

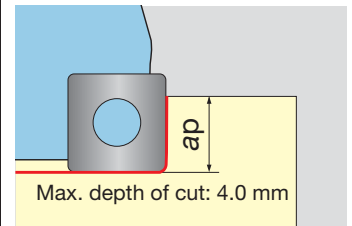


- Air hole**
Improves chip evacuation
- Ni-plated cutter bodies**
Tough surface prevents scratching

● High performance with economical inserts

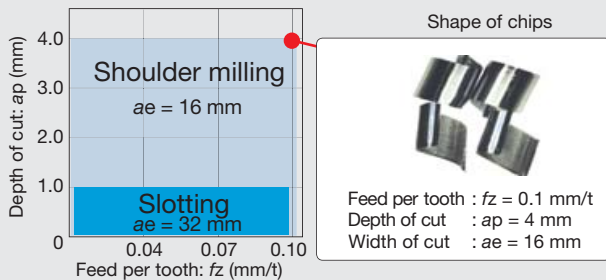
Four edged positive insert !

Chipbreakers	Work material	Shape	Features	Cross-sections of the cutting edge (Outline figure)
MJ	P Steel M Stainless K Cast Iron		Well balanced sharpness and strength	
AJ	N Non-ferrous		Sharp edge and lapped surface	



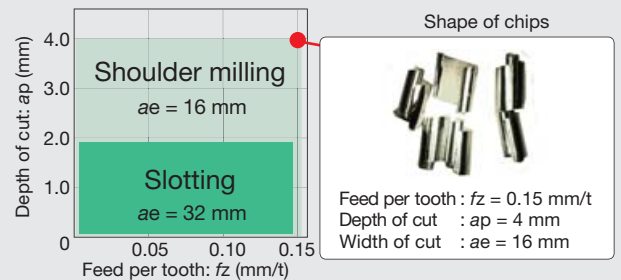
Cutting performance

Application Range for Steel, S55C (C55E)



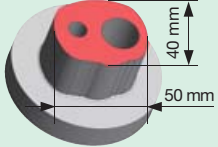
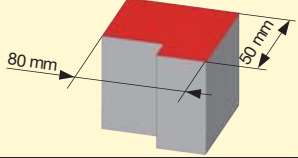
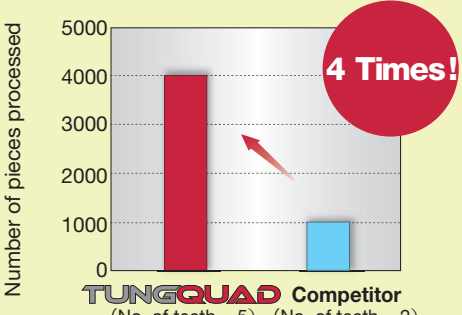
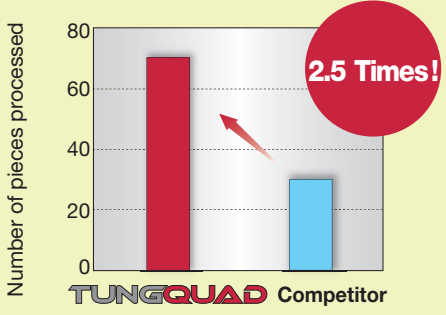
Cutter : TPD05R032M16.0E06 ($\phi 32$ mm)
Insert : SDMT050204PN-MJ
Grade : AH725
Cutting speed : $V_c = 180$ m/min
Cutting fluid : Dry cutting
Machine : Vertical M/C, BT30

Application Range for Aluminium, A7020 (EN AW-7020)



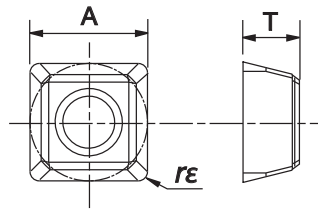
Cutter : TPD05R032M16.0E06 ($\phi 32$ mm)
Insert : SDHT050204FN-AJ
Grade : TH10
Cutting speed : $V_c = 400$ m/min
Cutting fluid : Dry cutting
Machine : Vertical M/C, BT30

Practical examples

Work piece type		Compressor parts	Machine parts
Toolholder		EPD05R025M20.0W05	EPD05R040M32.0W08
Insert		SDHT050204FN-AJ	SDMT050204PN-MJ
Grade		TH10	AH140
Work material		Aluminium alloys ADC12	Stainless steels SUS304 (X5CrNi18-10)
			
Cutting conditions	Cutting speed : V_c (m/min)	314	150
	Feed per tooth: f_z (mm/t)	0.08	0.06
	Depth of cut : a_p (mm)	1	3.5
	Width of cut : a_e (mm)	25	2
	Coolant	Water soluble	Dry
Results		 <p>4 Times!</p> <p>Productivity is Doubled ! (Feed speed $V_f = 700$ mm/min \rightarrow 1500 mm/min)</p>	 <p>2.5 Times!</p> <p>No chipping on the edge. Stable machining.</p>



Inserts



■ Insert

Cat. No.	Accuracy	Honing	Stock			Dimensions (mm)			Cutter
			Coated grades		Carbide	A	T	rE	
			AH725	AH140	TH10				
SDMT050204PN-MJ	M	with	●	●		5.09	2.38	0.4	TPD05..., EPD05... ELD05...
SDHT050204FN-AJ	H	without			●	5.09	2.39	0.4	

Standard cutting conditions

■ Bore, shank type

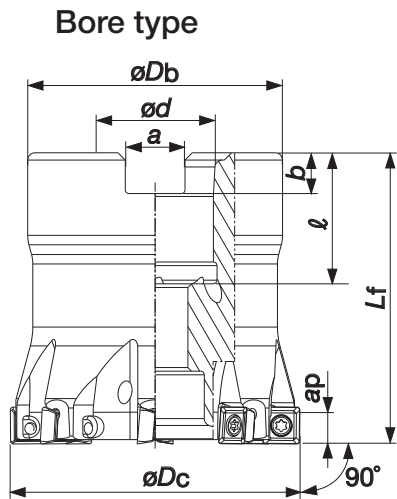
Work material	Brinell hardness HB	Grades	Cutting Speed Vc (m/min)	Feed per tooth fz (mm/t)
Low carbon steels S15C / C15E4 etc.	~ 200	AH725	230 - 320	0.04 - 0.10
High carbon steels S45C / C45 etc.	200 ~ 300		150 - 230	
Alloyed steels SCM440 / 42CrMo4 etc.	150 ~ 300		110 - 130	
Tool steels SKD11 / X153CrMoV12 etc.	~ 300			
Stainless steels SUS304 / X5CrNi18-9 etc.	-	AH140	100 - 200	0.03 - 0.09
Grey cast irons FC250 / 250 etc.	150 ~ 250	AH725	200 - 300	0.05 - 0.12
Ductile cast irons FCD400 / 450-10S etc.			160 - 240	0.05 - 0.12
Aluminium alloys (Si < 13%)	-	TH10	350 - 500	0.05 - 0.15
Aluminium alloys (Si ≥ 13%)	-		100 - 200	

* For deep and wide cutting, set the Vc and fz to the lower recommended limits and check the vibration and spindle load of the machine.

■ Roughing type

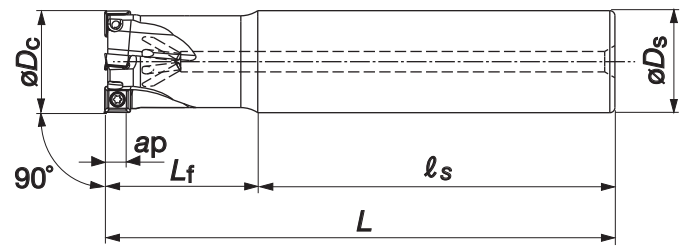
Work material	Brinell hardness HB	Grades	Cutting Speed Vc (m/min)	Feed per tooth fz (mm/t)
Low carbon steels S15C / C15E4 etc.	~ 200	AH725	100 - 250	0.04 - 0.10
High carbon steels S45C / C45 etc.	200 ~ 300		100 - 200	
Alloyed steels SCM440 / 42CrMo4 etc.	150 ~ 300		100 - 130	
Tool steels SKD11 / X153CrMoV12 etc.	~ 300			
Stainless steels SUS304 / X5CrNi18-9 etc.	-	AH140	100 - 150	0.03 - 0.09
Grey cast irons FC250 / 250 etc.	150 ~ 250	AH725	100 - 250	0.05 - 0.12
Ductile cast irons FCD400 / 450-10S etc.			80 - 200	0.05 - 0.12
Aluminium alloys (Si < 13%)	-	TH10	200 - 500	0.05 - 0.15
Aluminium alloys (Si ≥ 13%)	-		100 - 200	

Cutters

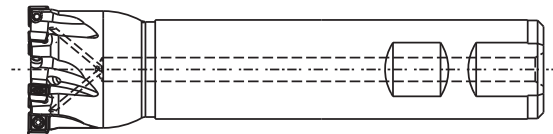


Shank type

straight



weldon



Descriptions	Parts Cat. No.
Clamping screw	CSPB-2L043
Wrench	IP-6DB

■ Bore type

Cat. No.	Stock	No. of Inserts	Dimensions (mm)							Weight (kg)	Air hole	Cutter mounting screw	Inserts
			ϕDc	ϕDb	ϕd	ℓ	L_f	b	a				
TPD05R032M16.0E06	●	6	32	30	16	20	32	5.6	8.4	0.1	with	CM8x30H	SDMT050204PN-MJ
TPD05R040M22.0E08	●	8	40	38	22	22	40	6.3	10.4	0.2	with	CM10x30H	SDHT050204FN-AJ

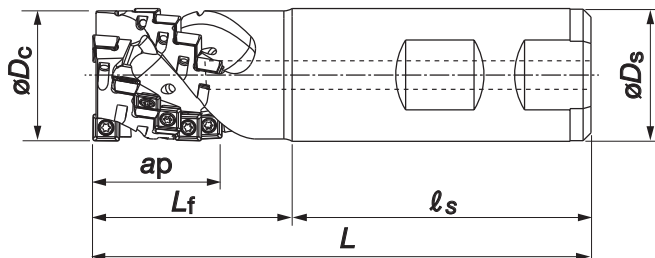
Max. $ap = 4$ mm

■ Shank type

Cat. No.	Stock	No. of Inserts	Dimensions (mm)					Weight (kg)	Air hole	Shank type	Inserts
			ϕDc	ϕDs	ℓ_s	L_f	L				
EPD05R012M12.0-02	●	2	12	12	62	18	80	0.1	with	straight	SDMT050204PN-MJ SDHT050204FN-AJ
EPD05R016M16.0-03	●	3	16	16	90	20	110	0.2	with	straight	
EPD05R020M20.0W04	●	4	20	20	80	25	105	0.2	with	weldon	
EPD05R025M20.0W05	●	5	25	20	90	25	115	0.3	with	weldon	
EPD05R032M25.0W06	●	6	32	25	98	32	130	0.5	with	weldon	
EPD05R040M32.0W08	●	8	40	32	100	40	140	0.8	with	weldon	

Max. $ap = 4$ mm

NEW Roughing type



■ Roughing type

Cat. No.	Stock	No. of eff. edge lines	Dimensions (mm)						Weight (kg)	Air hole	Inserts
			ϕDc	ϕDs	ℓ_s	L_f	L	ap			
NEW ELD05R020M20.0W02	●	2/10	20	20	53	32	85	20.3	0.2	with	SDMT050204PN-MJ
NEW ELD05R025M25.0W03	●	3/18	25	25	59	36	95	24.2	0.3	with	SDHT050204FN-AJ

● : Stocked items



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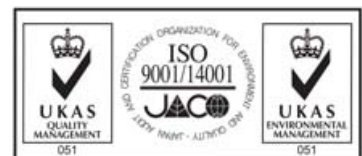
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