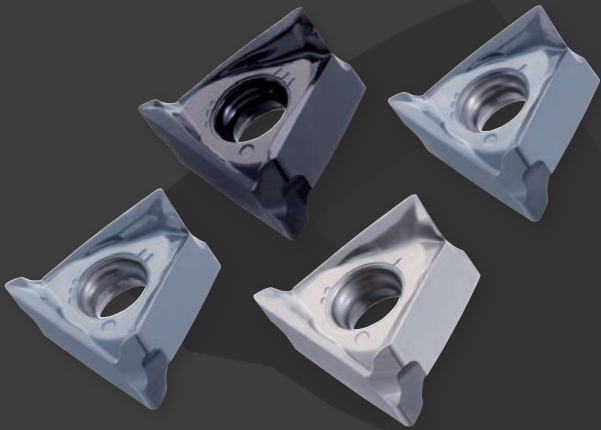




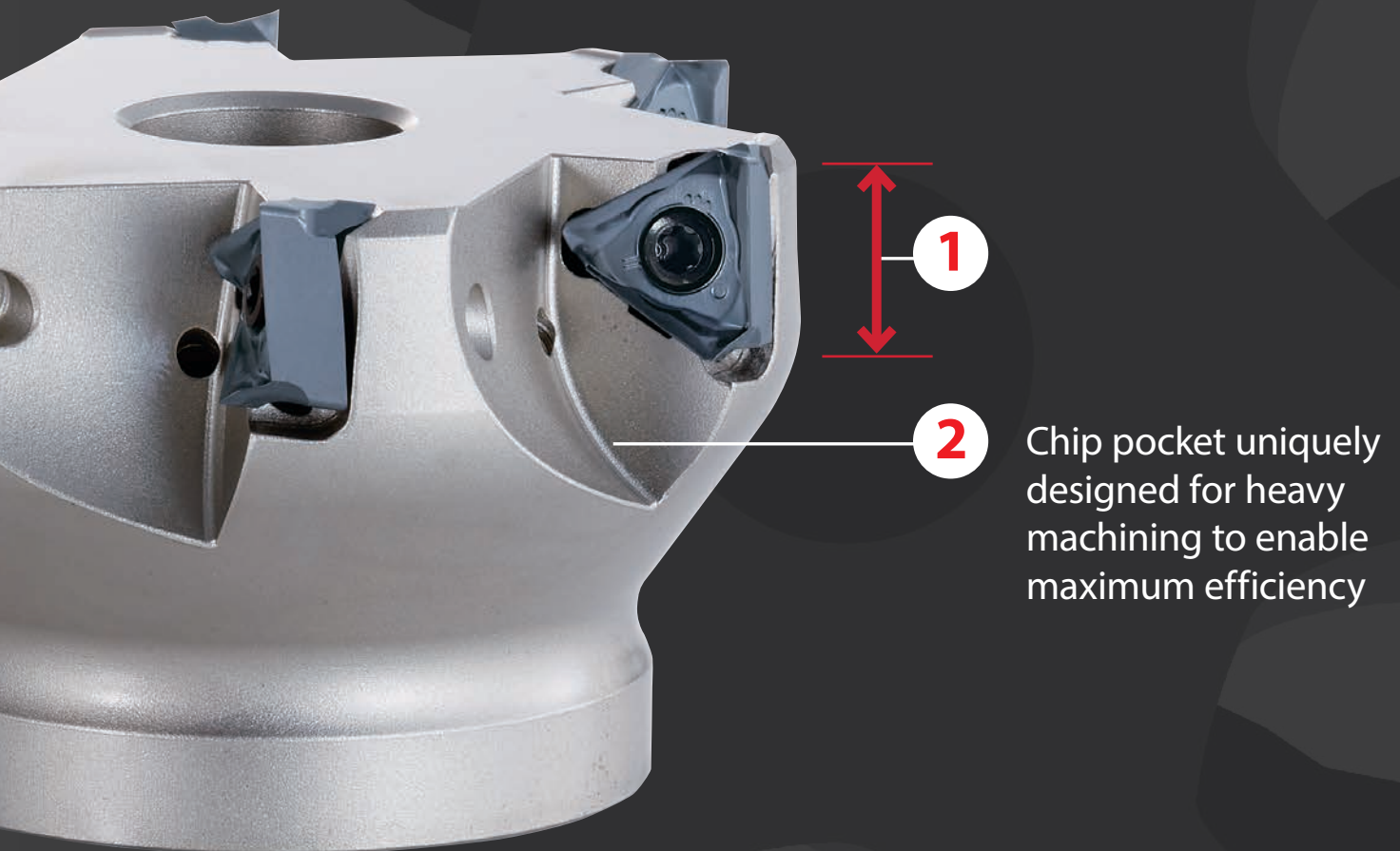
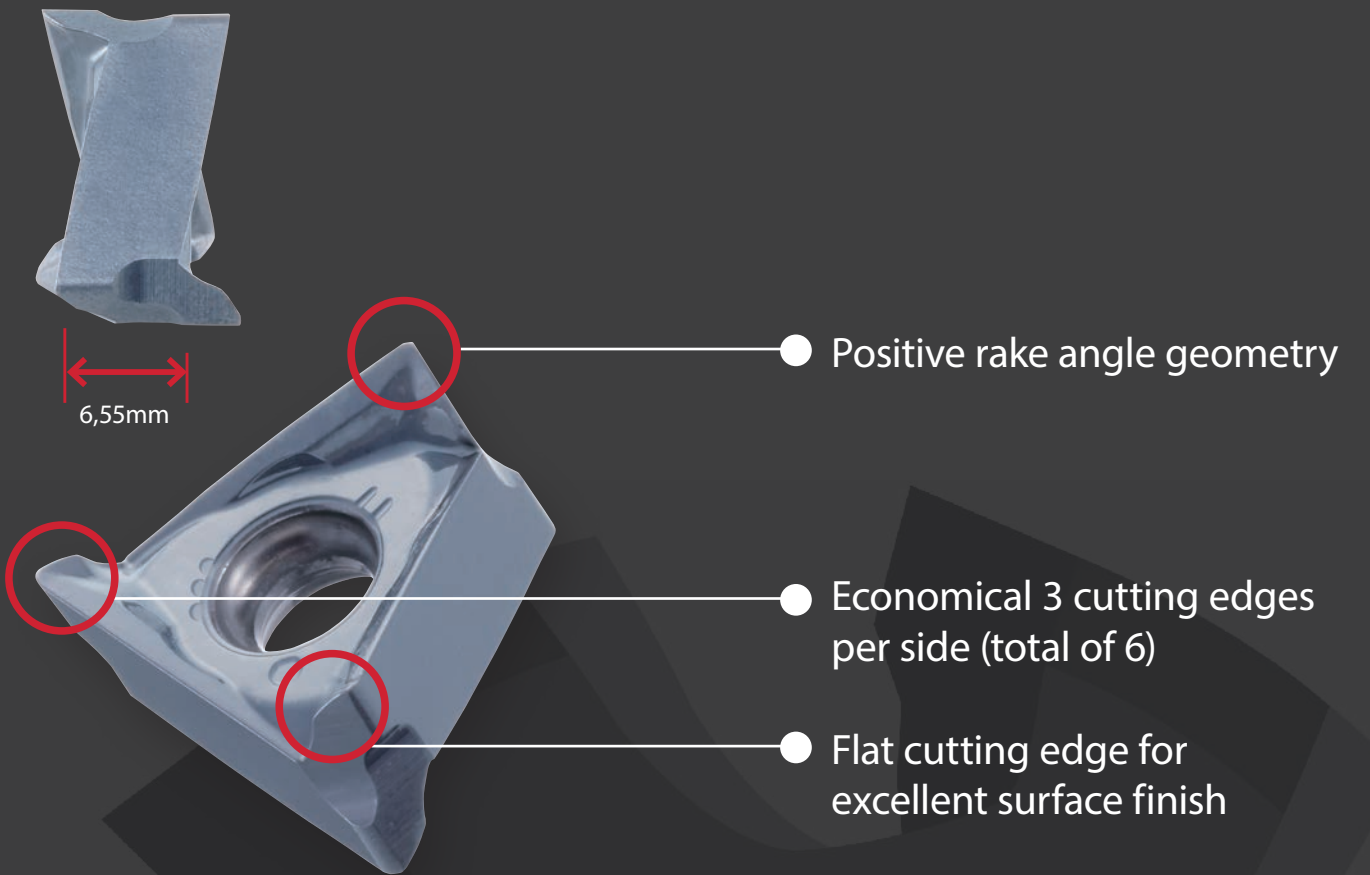
6-corner shoulder cutter series

PSTW

Volume 2



KEY FEATURES: PHOENIX PSTW



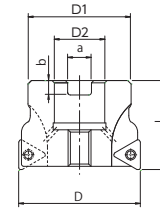
PSTW BORE

Milling | Indexables

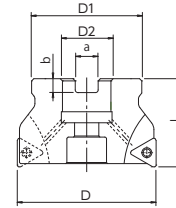


- 90° shoulder cutter
- Double sided 6 corners inserts
- Bore type
- 50 - 125 mm

Type 1



Type 2



EDP	Designation	Z	D	D1	D2	L	a	b	Type	Specification	Price
7803100	PSTW12R050M22-3	3	50	45	22	40	10,4	6,3	1	With coolant hole	
7803101	PSTW12R050M22-4	4	50	45	22	40	10,4	6,3	1	With coolant hole	
7803102	PSTW12R063M22-3	3	63	50	22	40	10,4	6,3	2	With coolant hole	
7803103	PSTW12R063M22-5	5	63	50	22	40	10,4	6,3	2	With coolant hole	
7803110	PSTW12R080M27-5	5	80	60	27	50	12,4	7	2	With coolant hole	
7803111	PSTW12R080M27-6	6	80	60	27	50	12,4	7	2	With coolant hole	
7803112	PSTW12R100M32-5	5	100	70	32	50	14,4	8	2	With coolant hole	
7803113	PSTW12R100M32-7	7	100	70	32	50	14,4	8	2	With coolant hole	
7803114	PSTW12R125M40-7	7	125	90	40	63	16,4	9	2	With coolant hole	
7803115	PSTW12R125M40-9	9	125	90	40	63	16,4	9	2	With coolant hole	

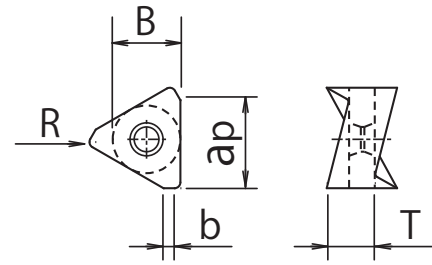
Accessories & spare parts

Applicable cutter	Clamping screw		Power screw		Wrench	
Ø 50~125	7808129	FS40511 (Torx 15)			7808208	T15-D (Torx 15)
Ø 50			7808151	PS1031 (M10X31)		



PSTW INSERTS

Milling | Indexables



- 90° shoulder cutter
- Double sided 6 corners inserts

EDP	Designation	Z	B	T	R	b	ap max	Grade	P		M		K		N		S		H		Price	
									dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖		
7811087	TNHU120608ER-NM	6	10,8	6,55	0,8	1,25	12	CK010														
7827088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XC3020	⊖				⊖	⊖								
7828088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XP3025		⊖			⊖	⊖								
7825089	TNKH120608ER-GL	6	10,8	6,55	0,8	1,5	12	XC3030	⊖				⊖	⊖								
7825088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XC3030	⊖				⊖	⊖								
7814089	TNKH120608ER-GL	6	10,8	6,55	0,8	1,5	12	XP3035	⊖	⊖			⊖	⊖								
7814094	TNKH120612ER-GM	6	10,8	6,55	1,2	1,0	12	XP3035	⊖	⊖			⊖	⊖								
7814095	TNKH120616ER-GM	6	10,8	6,55	1,6	0,75	12	XP3035	⊖	⊖			⊖	⊖								
7814096	TNKH120620ER-GM	6	10,8	6,55	2,0	0,60	12	XP3035	⊖	⊖			⊖	⊖								
7814088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XP3035	⊖	⊖			⊖	⊖								
7813088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XP2040	⊖	⊖			⊖	⊖				⊖	⊖			
7813094	TNKH120612ER-GM	6	10,8	6,55	1,2	1,0	12	XP2040	⊖	⊖			⊖	⊖				⊖	⊖			
7813095	TNKH120616ER-GM	6	10,8	6,55	1,6	0,75	12	XP2040	⊖	⊖			⊖	⊖				⊖	⊖			
7813096	TNKH120620ER-GM	6	10,8	6,55	2,0	0,60	12	XP2040	⊖	⊖			⊖	⊖				⊖	⊖			
7813089	TNKH120608ER-GL	6	10,8	6,55	0,8	1,5	12	XP2040	⊖	⊖			⊖	⊖				⊖	⊖			
7812088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XC1015					⊖	⊖								
7812090	TNKH120608ER-GR	6	10,8	6,55	0,8	1,5	12	XC1015					⊖	⊖								
7821088	TNKH120608ER-GM	6	10,8	6,55	0,8	1,5	12	XP1020					⊖	⊖								
7821090	TNKH120608ER-GR	6	10,8	6,55	0,8	1,5	12	XP1020					⊖	⊖								
7816091	TNKH120608ER-SM	6	10,8	6,55	0,8	1,5	12	XC5040				⊖						⊖				

Cutting conditions

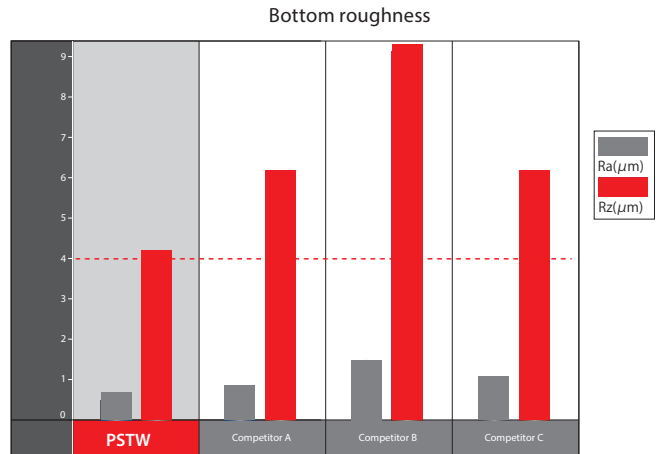
	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	180 (100~250)	0,15 (0,05~0,25)	3
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100~250)	0,15 (0,05~0,25)	3
	Die Steel (SKD11-SKD61)	~280HB	150 (80~200)	0,12 (0,05~0,2)	3
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (80~200)	0,1 (0,05~0,18)	2
	Stainless Steel (Wet) (SUS304,SUS420)	~250HB	80 (60~120)	0,1 (0,05~0,18)	2
K	Cast Iron (FC250)	~350N/mm ²	200 (100~350)	0,2 (0,1~0,3)	3
	Ductile Cast Iron (FCD400)	~800N/mm ²	180 (100~270)	0,15 (0,05~0,25)	3
S	Superalloy (Wet) (Inconel®718)	-	35 (25~60)	0,08 (0,05~0,15)	1
	Titanium Alloy (Ti-Al-4V)	-	40 (30~120)	0,08 (0,05~0,15)	1,5
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (50~150)	0,1 (0,08~0,2)	1,5
	Steel for Die Casting (DAC55-DH31)	43~48HRC	80 (40~120)	0,08 (0,06~0,15)	1
	Hardened Steel (SKD11)	50~55HRC	60 (40~90)	0,06 (0,05~0,1)	0,5

PHOENIX PSTW

Milling | Indexables

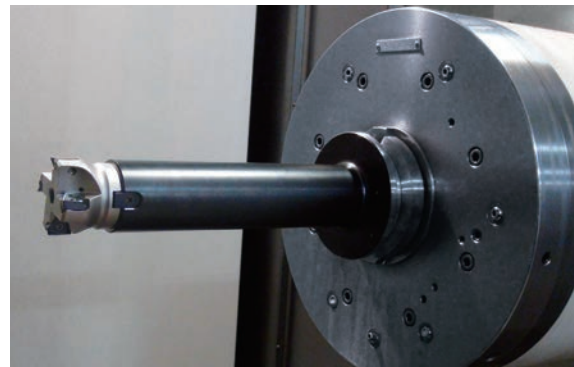
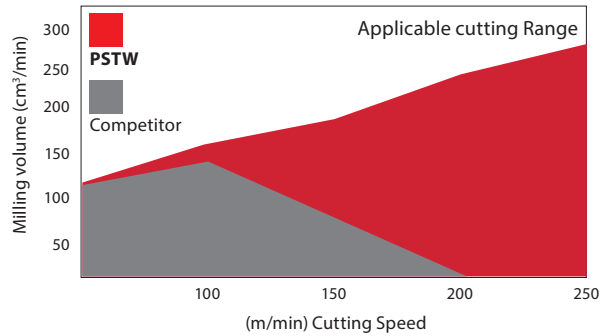
Excellent surface roughness

Tool	PSTW12R050M22-4 (Ø 50 x 4 flutes)
Insert Grade	TNKG120608ER-GM (XP3035)
Work Material	S50C
Cutting Speed	200m/min (1,274min ⁻¹)
Feed	510mm/min (0.1mm/t)
Depth of cut	ap=0.2mm ae=32mm
Coolant	Air Blow
Machine	Horizontal Machining Center



High efficiency even in long overhang length applications

Tool	PSTW12R050M22-4 (Ø 50 x 4 flutes)	(Ø 50 x 5 flutes) Competitor's Single Sided Insert Cutter
Insert grade	TNKG120608ER-GM (XP3035)	Coated Carbide Insert
Work Material	S50C	
Cutting Method	Slot Milling	
Depth of cut	ap=3mm ae=50mm	
Overhang length	190mm(3.8D)	
Coolant	Air Blow	
Machine	Horizontal Machining Center	



Insert variation based on application

Chipbreaker	NM	GL	GM	GR	SM
	Aluminium Alloy & Non-Ferrous metal	Low-resistance machining	Multi-purpose machining & General steel milling	Intermittent machining & Cast iron machining	Superalloy & Difficult-to-machine material
Application					



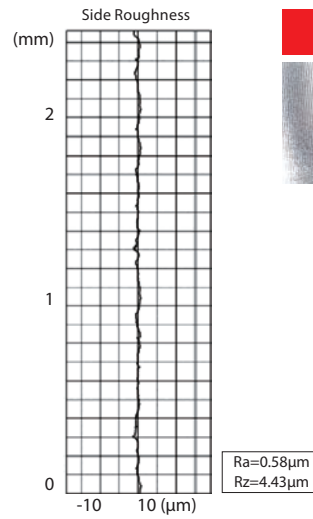
PROCESSING DATA

Milling | Indexables

High-precision machining of press mold slide surface

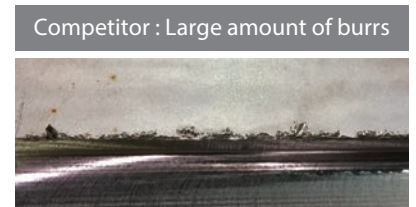
Tool	PSTW12R050M22-4 (Ø50 x 4 flutes)
Insert Grade	TNKU120608ER-GR (XP1020)
Work Material	FCD500
Cutting Speed	300m/min (1,910min ⁻¹)
Feed	1,700mm/min (0.2mm/t)
Depth of Cut	ap=0.5mm ae=0.3mm
Overhang Length	240mm
Coolant	Air Blow
Machine	Double Column Machining Center

The PSTW was able to achieve excellent surface precision during side finishing, satisfying the required run-out accuracy of under 10µm.



High efficiency machining of SUS304 (Stainless steel)

Tool	PSTW12R050M22-4 (Ø50 x 4 flutes)	Competitor's Single Sided Insert Cutter (Ø50 x 5 flutes)
Insert Grade	TNKU120608ER-GL (XP2040)	Coated Carbide Insert
Work Material	SUS304	
Cutting Speed	150m/min(955min ⁻¹)	
Feed	700mm/min(0.18mm/t)	700mm/min(0.15mm/t)
Depth of Cut	ap=5mm ae=35mm	ap=3mm ae=35mm
Coolant	Water Soluble	
Machine	Double Column Machining Center	

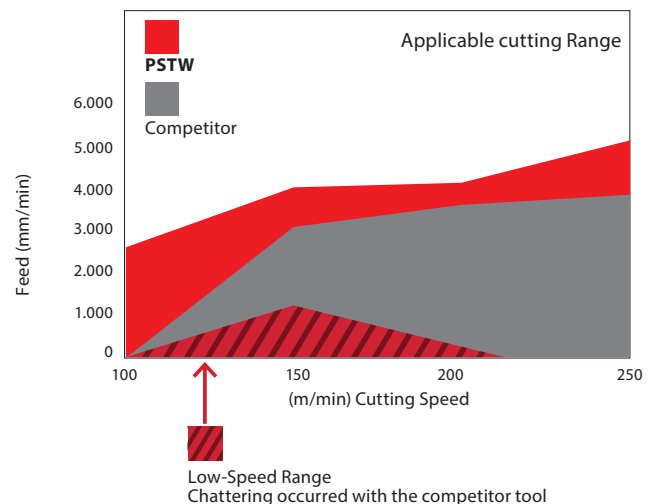


With the increase of depth of cut (ap), the competitor tool exhibited chattering and burrs, which hindered further efficiency improvement. Whereas the PSTW, even with one less corner, was able to increase machining efficiency by 67%, allowing high productivity.

Highly efficient stable processing of long overhang length of 300 mm (5D)

Tool	PSTW12R063M22-5 (Ø63 x 5 flutes)	Competitor's Double Sided Insert Cutter (Ø63 x 4 flutes)
Insert Grade	TNKU120608ER-GM (XC3030)	Coated Carbide Insert
Work Material	FC250	
Depth of Cut	ap=2mm ae=44mm	
Overhang Length	300mm (5D)	
Coolant	Air Blow	
Machine	Horizontal Machining Center	

In this test, the PSTW achieved higher efficiency versus the competitor tool in the processing of long overhang length of L/D=5. Furthermore, due to the lack of sharpness in the cutting edge, the competitor tool had poor contact with the workpiece in the low-speed machining range, resulting in chattering (lined area on graph). With an ultra sharp cutting edge, the PSTW was able to achieve stable performance even in the low-speed cutting range.



Milling | Indexables

Processing Data

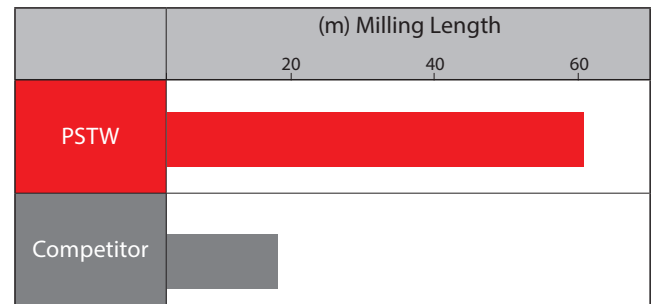
PROCESSING DATA

Milling | Indexables

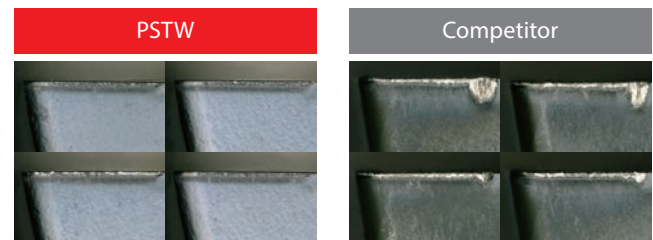
Rough milling of construction machinery control valve

Tool	PSTW12R063M22-5 (Ø63 x 5 flutes)	Competitor's Double Sided Insert Cutter (Ø63x 5 flutes)
Insert Grade	TNKU120608ER-GR (XP1020)	Coated Carbide Insert
Work Material	FCD500	
Cutting Speed	180m/min(910min ⁻¹)	
Feed	1,000mm/min(0.22mm/t)	
Depth of Cut	ap=3mm ae=45mm	
Coolant	Air Blow	
Machine	Horizontal Machining Center	

The PSTW demonstrated much greater wear resistance versus the competitor tool. In particular, it was able to effectively suppress wear progress of the cutting edge and achieved 3.5 times the durability versus the competitor.



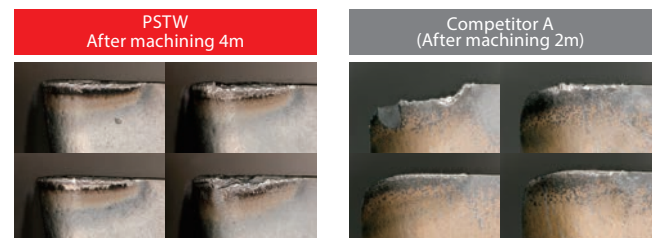
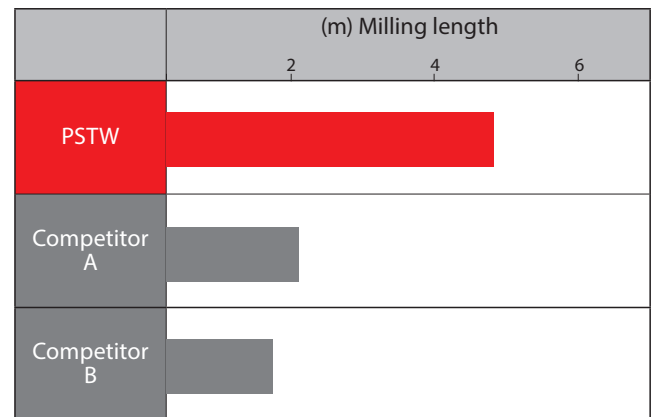
After machining 17m



Long tool life in Ti-6Al-4V

Tool	PSTW12R050M22-4 (Ø50 x 4 flutes)	Competitor's Double Sided Insert Cutter A,B (Ø50x 4 flutes)
Insert Grade	TNKU120608ER-SM (XC5040)	Coated Carbide Insert
Work Material	Ti-6Al-4V	
Cutting Speed	40m/min(255min ⁻¹)	
Feed	82mm/min(0.08mm/t)	
Depth of Cut	ap=1.5mm ae=20mm	
Coolant	Air Blow	
Machine	Horizontal Machining Center	

The PSTW (XC5040) was able to suppress wear resistance to prolong durability whereas the competitor equivalent product (double sided triangle insert) exhibited early wear and chipping.





shaping your dreams

OSG EUROPE LOGISTICS

Avenue Lavoisier 1
B-1300 Z.I. Wavre - Nord - Belgium
Tel: +32 10 23 05 07
Fax: +32 10 23 05 51
info@osgeurope.com

OSG BELUX

Avenue Lavoisier 1
B-1300 Z.I. Wavre - Nord - Belgium
Tel: +32 10 23 05 11
Fax: +32 10 23 05 31
info@osg-belgium.com

OSG FRANCE

Parc Icade, Paris Nord 2
Immeuble "Le Rimbaud"
22 Avenue des Nations
CS66191 - 93420 Villepinte - France
Tel: +33 1 49 90 10 10
Fax: +33 1 49 90 10 15
sales@osg-france.com

OSG NETHERLANDS

Bedrijfsweg 5 - 3481 MG Harmelen
Tel: +31 348 44 2764
Fax: +31 348 44 2144
info@osg-nl.com

OSG UK

Shelton house, 5 Bentalls
Pipps Hill Ind Est, Basildon Essex SS14 3BY
Tel: +44 845 305 1066
Fax: +44 845 305 1067
sales@osg-uk.com

SLOVAKIA

Branch office of OSG Europe Logistics s.a.
Tel (SK) +421 2 4329 1295
Tel (BE) +32 10 23 05 07
Fax (BE) +32 10 23 05 51
sales-osgsvk@osgeurope.com

OSG POLAND Sp. z.o.o.

Spółdzielcza 57
05-07 Halinów - Poland
Tel: +22 760 82 71
Fax: +22 760 82 71
osg@osg-poland.com

OSG GERMANY

Karl-Ehmann-Str. 25
D - 73037 Göppingen - Germany
Tel: +49 7161 6064 - 0
Fax: +49 7161 6064 - 444
info@osg-germany.de

OSG SCANDINAVIA

(For Scandinavian countries)
Langebjergvaenget 16
4000 Roskilde - Denmark
Tel: +45 46 75 65 55
Fax: +45 46 75 67 00
osg@osg-scandinavia.com

SWEDEN

Branch office of OSG SCANDINAVIA
Abrahams Gränd 8
295 35 Bromölla - Sweden
Tel: +46 40 41 22 55
Fax: +46 40 41 32 55
osg@osg-scandinavia.com

OSG IBERICA

Bekolarra 4
E - 01010 Vitoria-Gasteiz - Spain
Tel: +34 945 242 400
Fax: +34 945 228 883
osg.iberica@osg-ib.com

RUSSIA

Butlerova street, 17B, office 5069
117342 Moscow - Russia
Tel: +7 (495) 150 41 54
info@osg-russia.com

OSG TURKEY

Rami Kişla Cad.No:56 Eyüp
Istanbul 34056 - Turkey
Tel:+90 212 565 24 00
Fax: +90 212 565 44 00
info@osg-turkey.com

ROMSAN INTERNATIONAL CO. SRL

Reprezentant Exclusiv OSG
23-25, Nerva Traian Street
031044 Bucuresti - România
Tel: +40 021 322 07 47
Fax: +40 021 321 56 00
romsan.int@romsan.ro

AUSTRIA

Branch office of OSG GERMANY
Messestraße 11
A-6850 Dornbirn
Tel: +49 7161 6064-0
Fax: +49 7161 6064-444
info@osg-germany.de

OSG ITALIA

Via Cirenaiica n. 52 int. 61/63
I - 10142 Torino - Italy
Tel: +39 0117705211
Fax: +39 0117071402
info@osg-italia.it

WEXO PRÄZISIONSWERKZEUGE GmbH

Siemensstraße 13
D-61352 Bad Homburg
Tel: (06172) 10 62 06
Fax: (06172) 10 62 13
verkauf@wexo.com

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