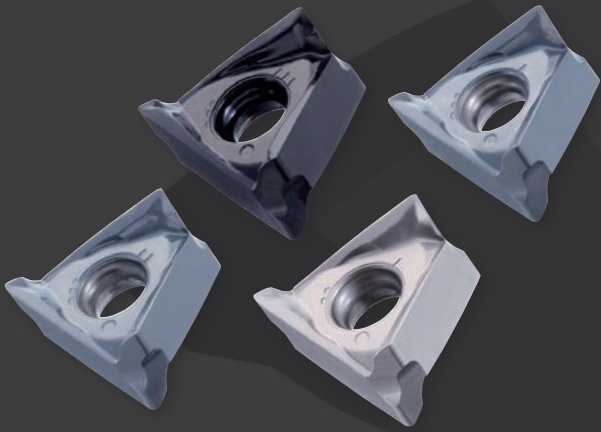




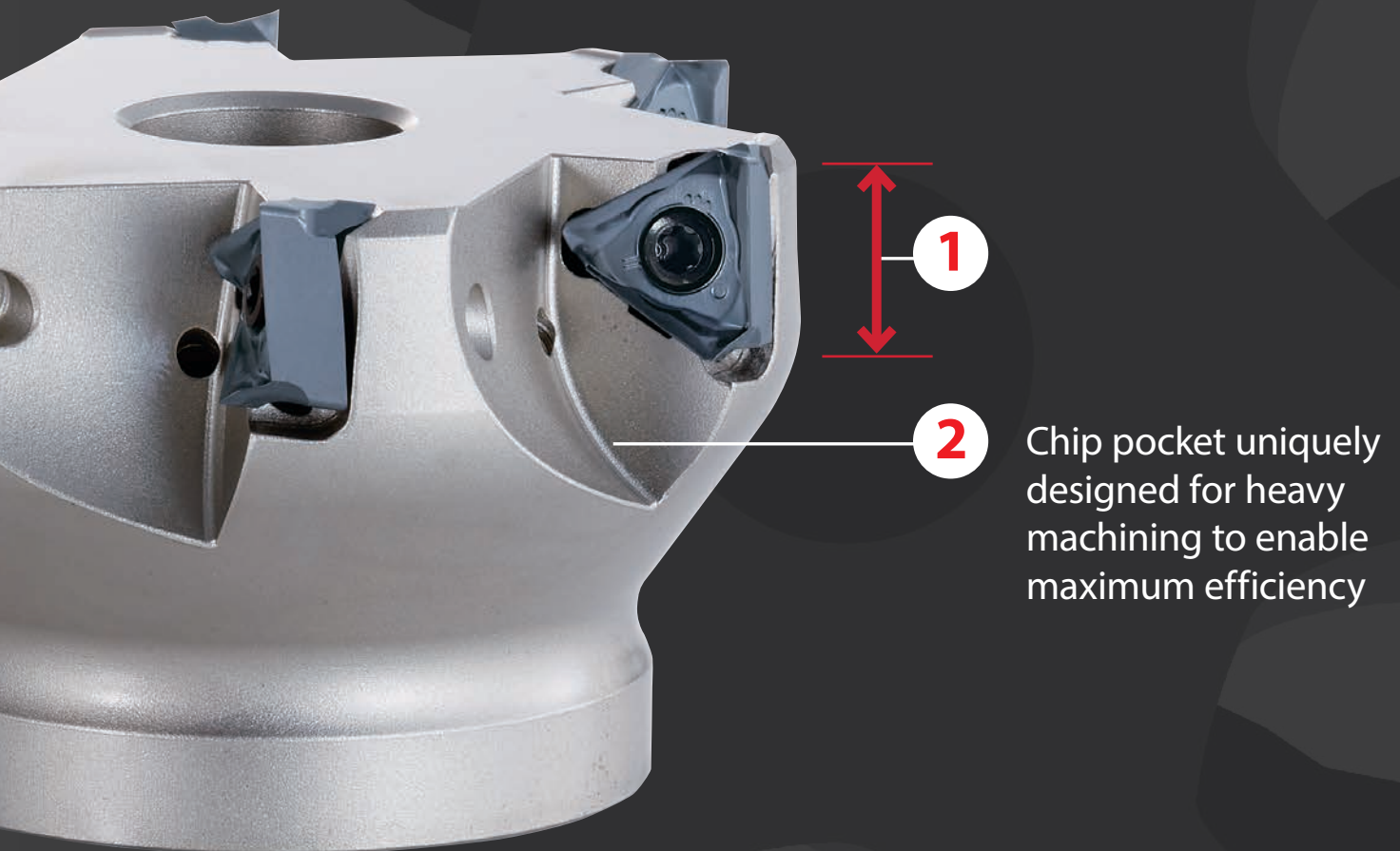
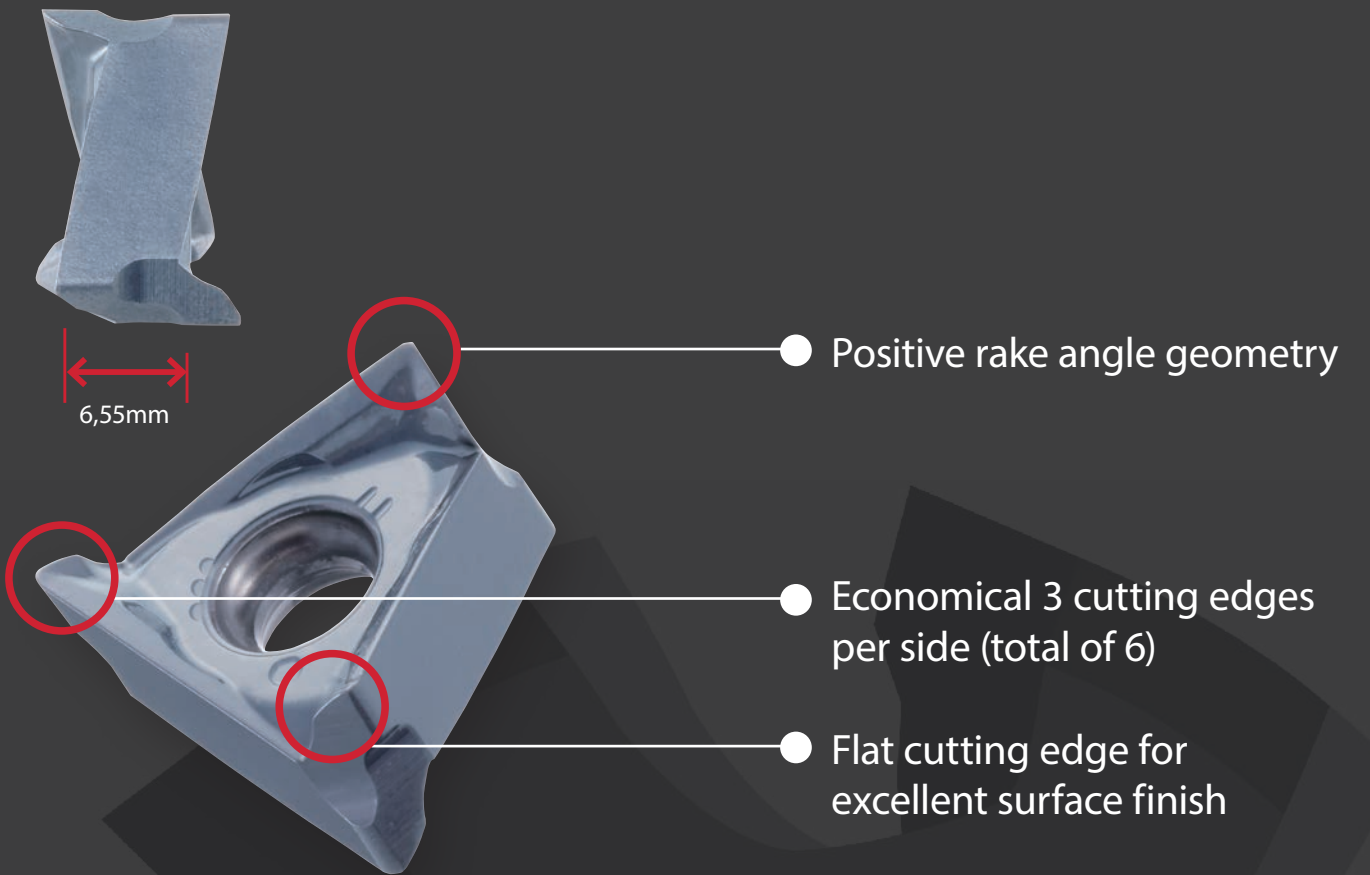
6-corner shoulder cutter series

# PHOENIX

PSTW



# KEY FEATURES: PHOENIX PSTW



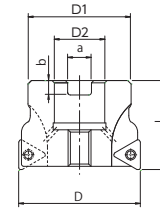
# PSTW BORE

Milling | Indexables

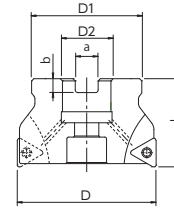


- 90° shoulder cutter
- Double sided 6 corners inserts
- Bore type
- 50 - 125 mm

Type 1



Type 2



EDP	Designation	Z	D	D1	D2	L	a	b	Type	Specification
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	Without coolant hole
7803103	PSTW12R063M22-5	5	63	50	22	40	10,4	6,3	2	Without coolant hole
7803110	PSTW12R080M27-5	5	80	60	27	50	12,4	7	2	Without coolant hole
7803111	PSTW12R080M27-6	6	80	60	27	50	12,4	7	2	Without coolant hole
7803112	PSTW12R100M32-5	5	100	70	32	50	14,4	8	2	Without coolant hole
7803113	PSTW12R100M32-7	7	100	70	32	50	14,4	8	2	Without coolant hole
7803114	PSTW12R125M40-7	7	125	90	40	63	16,4	9	2	Without coolant hole
7803115	PSTW12R125M40-9	9	125	90	40	63	16,4	9	2	Without coolant hole

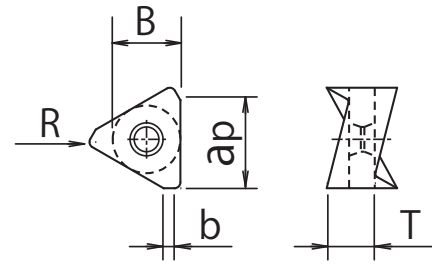
## Accessories & spare parts

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		
									dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖	
7814088	TN KU120608ER-GM	6	10,8	6,55	0,8	1,5	12	XP3035	●	●	○	○	○	○							
7825088	TN KU120608ER-GM	6	10,8	6,55	0,8	1,5	12	XC3030	●	●	○	○	○	○							
7813089	TN KU120608ER-GL	6	10,8	6,55	0,8	1,5	12	XP2040	○	○	○	○	○	○							
7816091	TN KU120608ER-SM	6	10,8	6,55	0,8	1,5	12	XC5040			○	○	○	○							
7812090	TN KU120608ER-GR	6	10,8	6,55	0,8	1,5	12	XC1015					○	○							
7821090	TN KU120608ER-GR	6	10,8	6,55	0,8	1,5	12	XP1020					○	○							

## 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 (SS400-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 <sup>2</sup>	200 (100~350)	0,2 (0,1~0,3)	3
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	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

Milling | Indexables

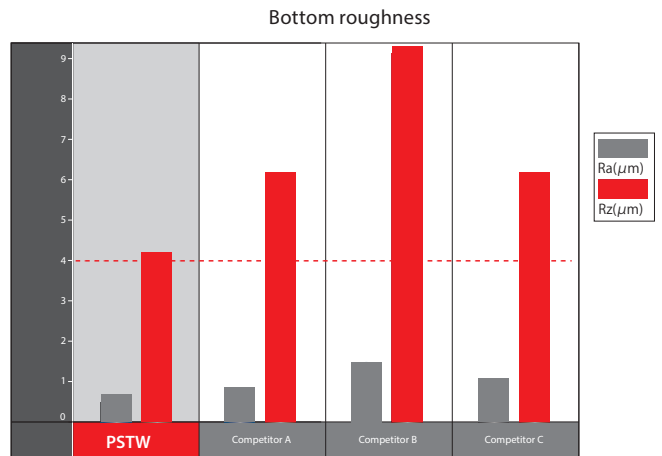
Inserts

# PHOENIX PSTW

Milling | Indexables

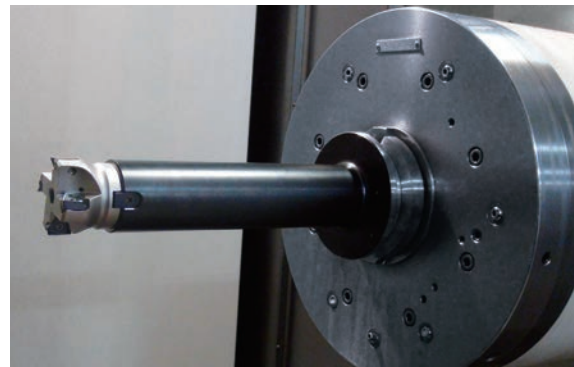
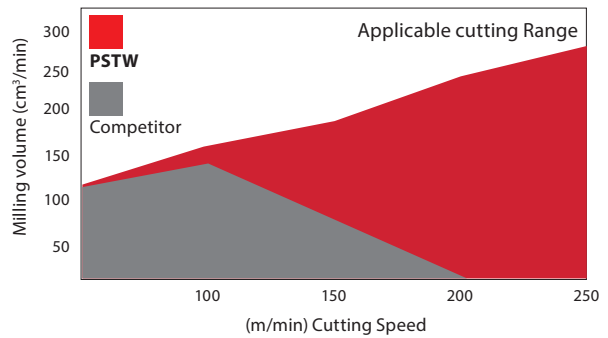
## Excellent surface roughness

Tool	PSTW12R050M22-4 (Ø 50 x 4 flutes)
Insert Grade	TN KU120608ER-GM (XP3035)
Work Material	S50C
Cutting Speed	200m/min (1,274min <sup>-1</sup> )
Feed	510mm/min (0.1mm/t)
Depth of cut	a <sub>p</sub> =0.2mm a <sub>e</sub> =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	TN KU120608ER-GM (XP3035)	Coated Carbide Insert
Work Material	S50C	
Cutting Method	Slot Milling	
Depth of cut	a <sub>p</sub> =3mm a <sub>e</sub> =50mm	
Overhang length	190mm(3.8D)	
Coolant	Air Blow	
Machine	Horizontal Machining Center	



## Insert variation based on application

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



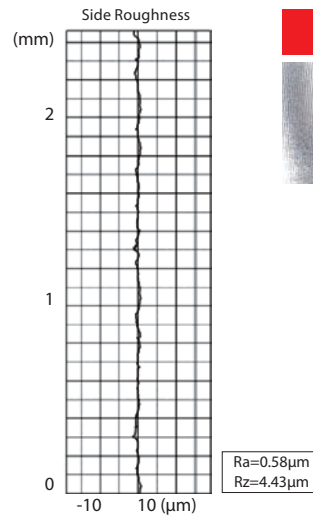
# PROCESSING DATA

Milling | Indexables

## High-precision machining of press mold slide surface

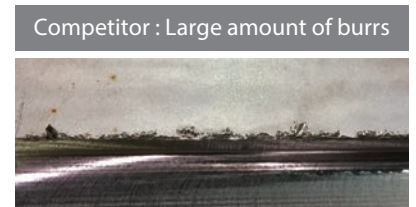
Tool	PSTW12R050M22-4 (Ø50 x 4 flutes)
Insert Grade	TNKU120608ER-GR (XP1020)
Work Material	FCD500
Cutting Speed	300m/min (1,910min <sup>-1</sup> )
Feed	1,700mm/min (0.2mm/t)
Depth of Cut	ap=0.5mm ae=0.3mm
Overhang Length	240mm
Coolant	Air Blow
Machine	Double Column Machining Center

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 <sup>-1</sup> )	
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	

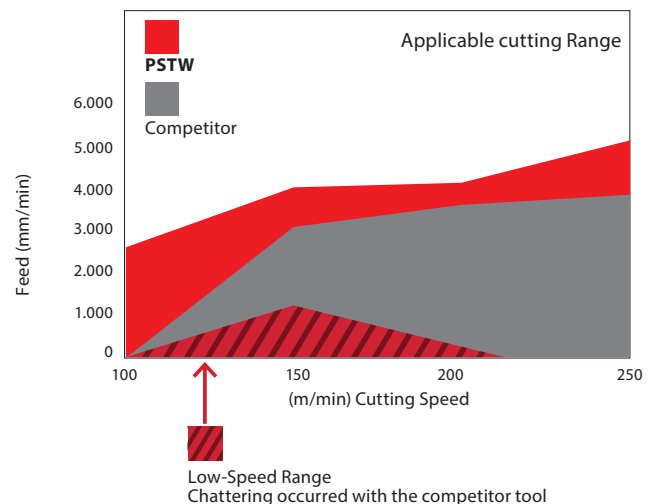


With the increase of depth of cut (ap), the competitor tool exhibited chattering and burrs, which hindered further efficiency improvement. Whereas the PSTW, even with one less corner, was able to increase machining efficiency by 67%, allowing high productivity.

## 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

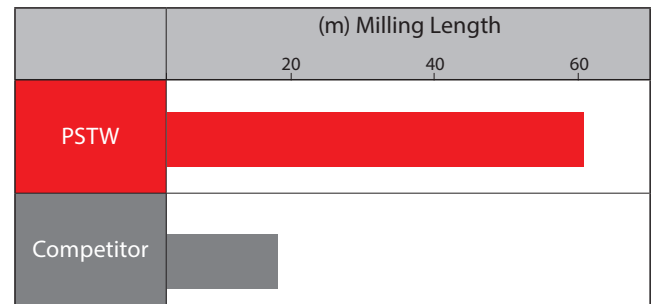
# PROCESSING DATA

Milling | Indexables

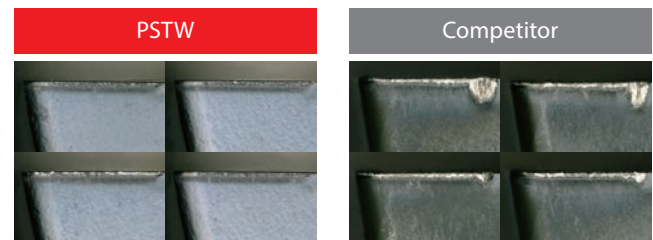
## Rough milling of construction machinery control valve

Tool	<b>PSTW12R063M22-5</b> (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 <sup>-1</sup> )	
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.



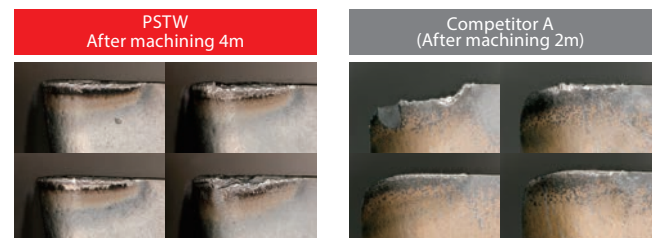
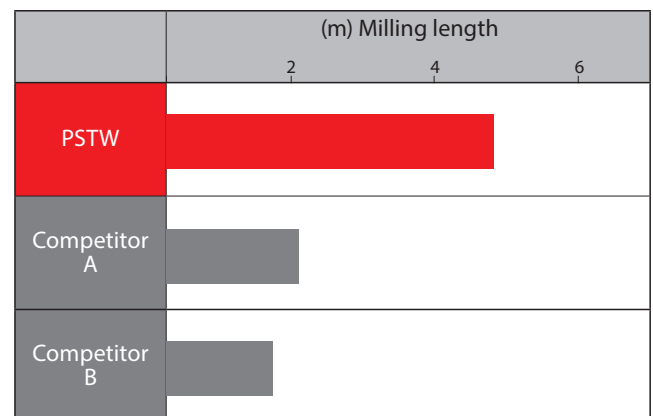
After machining 17m



## Long tool life in Ti-6Al-4V

Tool	<b>PSTW12R050M22-4</b> (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 <sup>-1</sup> )	
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*

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