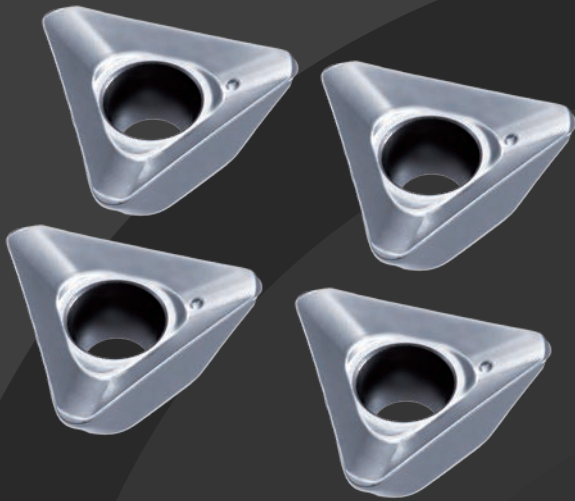




Centering and Chamfering Cutter

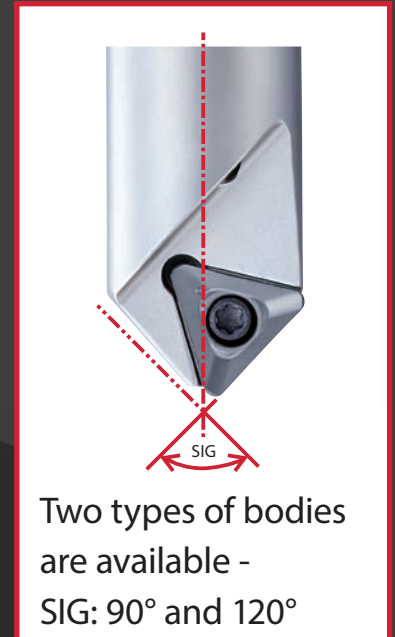
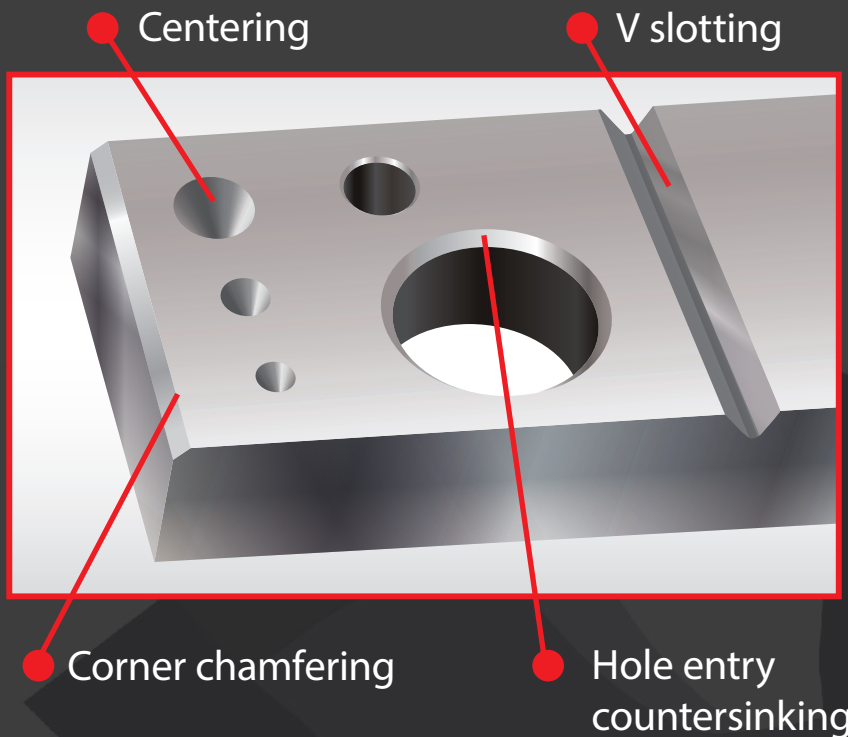
PLDS

Volume 1



KEY FEATURES: PLDS

Centering, countersinking and V slotting can be performed with a single tool



Economical 3-corner insert with both chipping resistance and sharpness

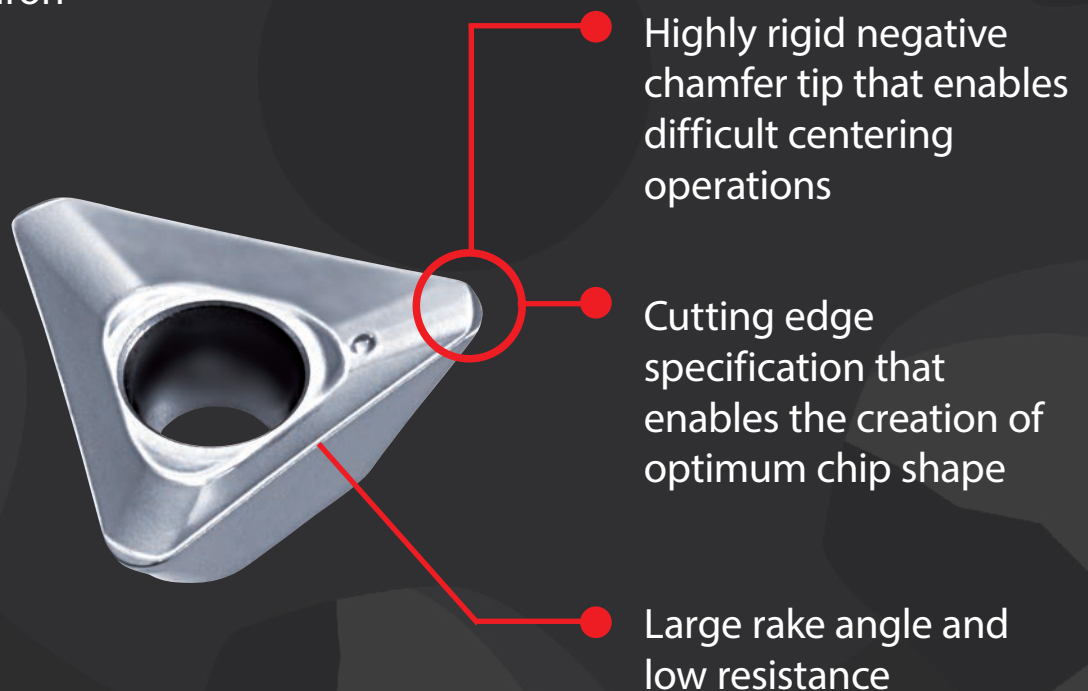
High-strength insert grades that can be selected according to the work material

For Steel and cast Iron

XP9020

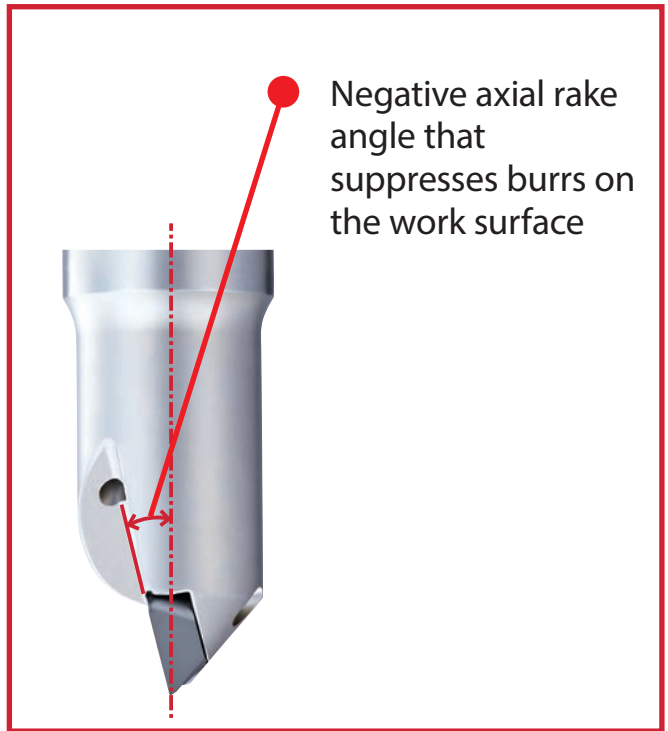
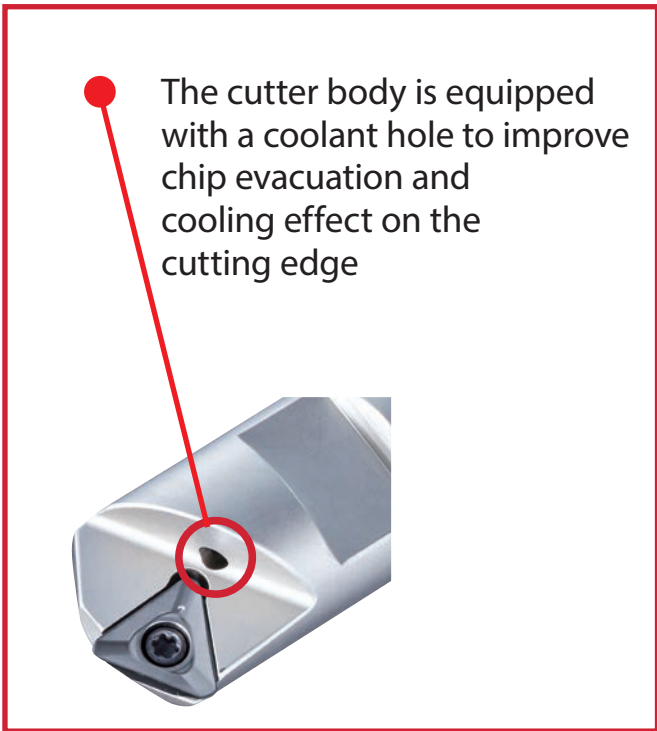
For Stainless Steel
and heat resistant
alloys

XP2040



PHOENIX CENTERING AND CHAMFERING CUTTER

Optimal body design that enables long tool life and excellent machining surface



Machine Tips

Countersinking takes place after drilling!

For centering, make the centering diameter smaller than the drill diameter

Centering Drilling Countersinking

Inappropriate centering diameter relative to the drill diameter

Bottom tip shape

Center remnants

Center remnants may occur at the bottom of the hole due to the shape of the insert, which may adversely affect the drilling process.

Centering that also serves as countersinking

When the centering diameter becomes larger than the drill diameter, the shoulder of the drill will collide with the workpiece, which may cause chipping on the cutting edge.

CUTTING CONDITIONS

Centering and Chamfering | Indexables | Cutting conditions

PLDS

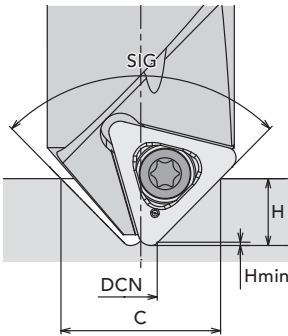
Centering and Chamfering Cutter

	Work Material	Tensile Strength / Hardness	Vc (m/min) Cutting Speed	(min ⁻¹) S	(mm/rev) Feed Rate	
					Centering	Countersinking (Side Feed)
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	80 (60~120)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	80 (60~120)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Die Steel (SKD11-SKD61)	~280HB	80 (60~120)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
M	Stainless Steel (Coolant) (SUS304-SUS420)	~250HB	80 (60~120)	1.500 ~ 2.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
K	Cast Iron (FC250)	~350N/mm ²	100 (60~140)	1.500 ~ 3.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Ductile Cast Iron (FCD400)	~800N/mm ²	100 (60~140)	1.500 ~ 3.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
N	Aluminium Alloys	~13%Si	150 (100~200)	2.500 ~ 5.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
S	Heat Resistant Alloys (Wet) (Inconel 718)	–	35 (25~60)	600 ~ 1.500	0,04 (0,03 ~ 0,06)	0,08 (0,05 ~ 0,12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	–	40 (30~100)	700 ~ 2.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
H	Pre-hardened Steel (NAK80)	40~43HRC	80 (60~100)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Steel for Die Casting (DAC-MAGIC, DH31)	43~48HRC	60 (50~80)	1.200 ~ 2.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)

1. The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting condition.
2. Inserts should be attached to the holder tightly in a very neat condition.
3. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.
4. For the feed of V slotting, use 80% of the countersinking (side feed) shown in the above table.

Centering and Chamfering | Indexables

Standard centering depth (H)



SIG = 90°
 Hmin = 0,25
 DCN = Ø 2,5 (minimum machined hole diameter)

$$H = (C - DCN) / 2 + Hmin$$

H = Centering depth
 C = Countersink diameter

Example: When SIG=90°C=φ10 (Countersink diameter)
 The value of H will be 4 mm instead of 5 mm.

SIG = 120°
 Hmin = 0,1
 DCN = Ø 2,4 (minimum machined hole diameter)

$$H = (C - DCN) / 3,46 + Hmin$$

H = Centering depth
 C = Countersink diameter

Cutting conditions

CUTTING DATA

Centering and Chamfering | Indexables

SUS304 90° Centering

Tool	PLDS11R002SS16-90
Insert Grade	TPKT110308ER-DM (XP2040)
Work Material	SUS304
Cutting Speed	63m/min (2.000min ⁻¹)
Feed	80mm/min (0.04mm/rev)
Processing depth	4mm Ø 10 Countersink diameter
Coolant	Water-Soluble (Internal)
Machine	Horizontal Machining Center

	Number of holes			
	100	200	300	400
PLDS	Still Running			
Competitor A	Chipping			
Competitor B	Chipping			

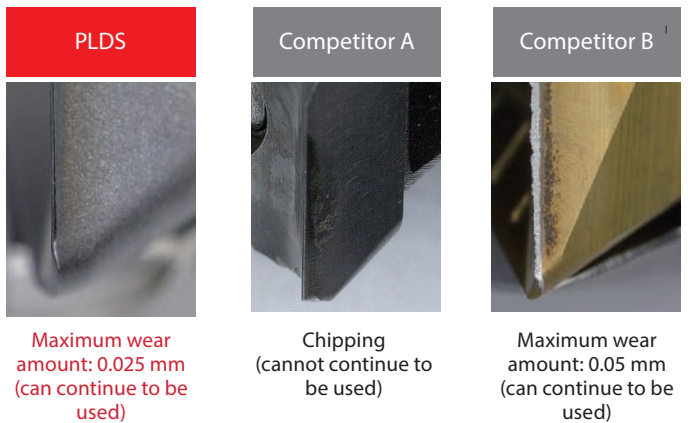
The PLDS exhibits good wear condition and can continue to be used even after machining more than twice the number of holes as the competitor products.



S50C 90° Centering

Tool	PLDS11R002SS16-90
Insert Grade	TPKT110308ER-DM (XP9020)
Work Material	S50C
Cutting Speed	94m/min (3.000min ⁻¹)
Feed	180mm/min (0.06mm/rev)
Processing depth	4mm Ø 10 Countersink diameter
Number of holes	700 Holes
Coolant	Water-Soluble (Internal)
Machine	Horizontal Machining Center

Wear comparison after machining 700 holes



The PLDS exhibits minimal wear even after machining 700 holes and is in a state where it can continue to be used.

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shaping your dreams

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