

PLUNGERS

ISCAR introduces a new unique family of plunging tools for deep cavities, and high shoulders. The new tool system is very effective and economical for deep machining of slots, and straight or sloped walls which require very large tool overhangs. The loads on the machine, tool and workpiece are mainly axial - avoiding bending moments.

Tools

PLC - A multi-functional tool for plunging operations and for regular light milling (semi-finishing). The PLC tools are equipped with standard HELIQUAD inserts SDMT 12T3 PDR-HQ with maximum width of cut: $a_p = 11$ mm.

PL - Endmill cutter for central cut "A" type cutters are recommended for deep cavities. They are equipped with whistle-notch clamping flats.

PLH - Trepanning configuration.

PL and PLH cutters are equipped with the new PLMT 13-5-TR insert with four cutting edges. The strong, double-sided insert with a roof-type slope can be screw-clamped from either side in any of the seats on the cutter. Use of the tangential position of the insert's long cutting edge on the face of the cutter provides more strength and secure clamping of the insert in the pocket. The insert can also be clamped in the peripheral position using the short cutting edge. The rake face of the insert is designed with large rake angles to improve and ease chip flow.

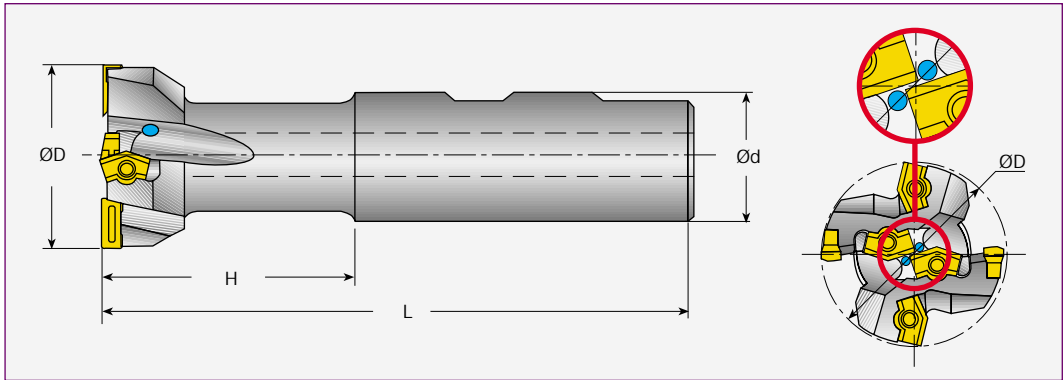
The PLH type mounted on BT, CAT or INT adaptors will be available upon request only.

This new family of tools can provide material reductions of machining costs in the die and mold and turbine blade industries, etc. Moreover, only a few tools are required for the machining of various complicate shapes and cavities.








PLUNGERS

Center Cutting Plungers



PL

Designation	D	Z _{eff}	Z	d	H	L		
PL D40-H090-W32-13	40	1	2	32	90	150		0.68
PL D50-H100-W32-13	50	2	6	32	100	160		0.87
PL D63-H120-W40-13	63	2	6	40	120	190		1.30



Insert

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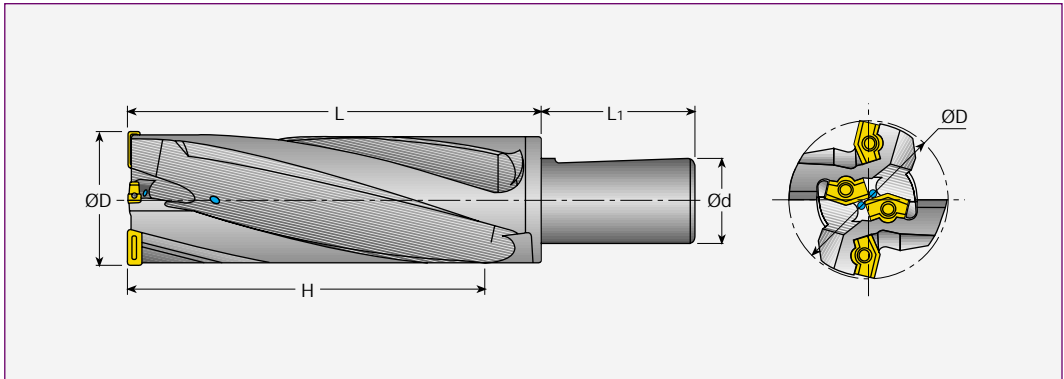


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PLUNGERS

Center Cutting Plungers



PL-A

Designation	D	Z _{eff}	Z	d	H	L	L ₁		 Kg
PL D40-H100-A-WN32-13	40	1	2	32	100	120	58		
PL D50-H140-A-WN32-13	50	2	4	32	140	160	58		
PL D63-H140-A-WN40-13	63	2	6	40	140	160	58		



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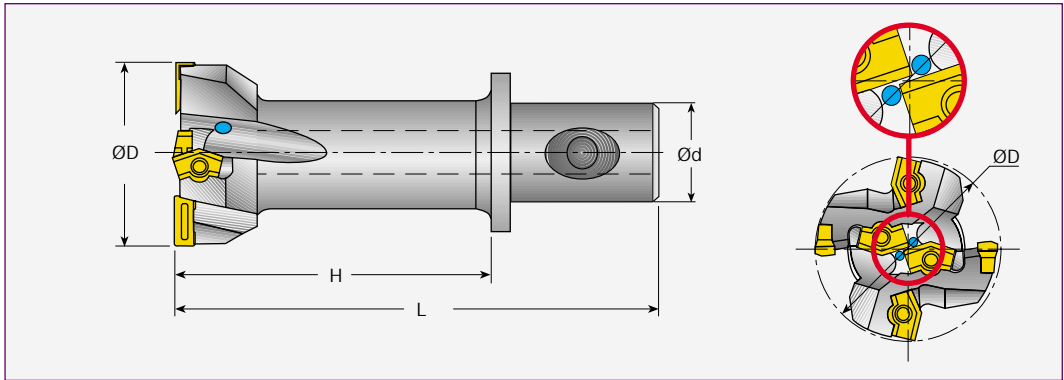
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PLUNGERS

Center Cutting Plungers with CLICKFIT Adaptation



PL-CF4

Designation	D	Z _{eff}	Z	H	L	d		 Kg
PL D40-H090-CF4-13	40	1	2	90	140	CF4		0.55
PL D50-H100-CF4-13	50	2	6	100	150	CF4		0.69



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Adapters

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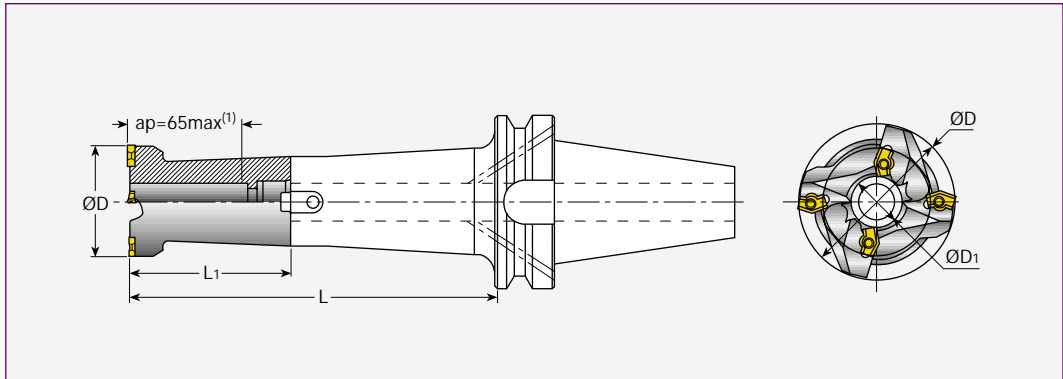


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Trepanning Plungers



PLH

Head	Adapter ⁽²⁾	D	D ₁	Z _{eff}	Z	L ₁	L	
PLH D75-27-13	PA 27-L152-BT50	75	24	2	4	110	262	
	PA 27-L152-INT50	75	24	2	4	110	262	
	PA 27-L152-CAT50	75	24	2	4	110	262	

(1) Max depth of cut per level - 65mm (ap)

(2) Available upon request only.



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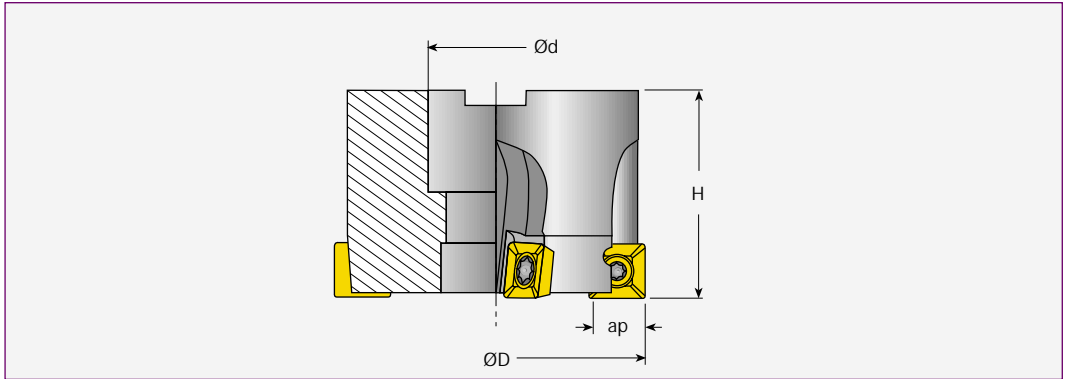
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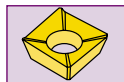
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Side Plunging Milling Cutters Using HELIQUAD Inserts



PLC

Designation	D	Z	d	H	ap	Style	 Kg
PLC D52-22-12	52	4	22	40	11	A	0.69
PLC D65-27-12	65	5	27	50	11	A	0.72



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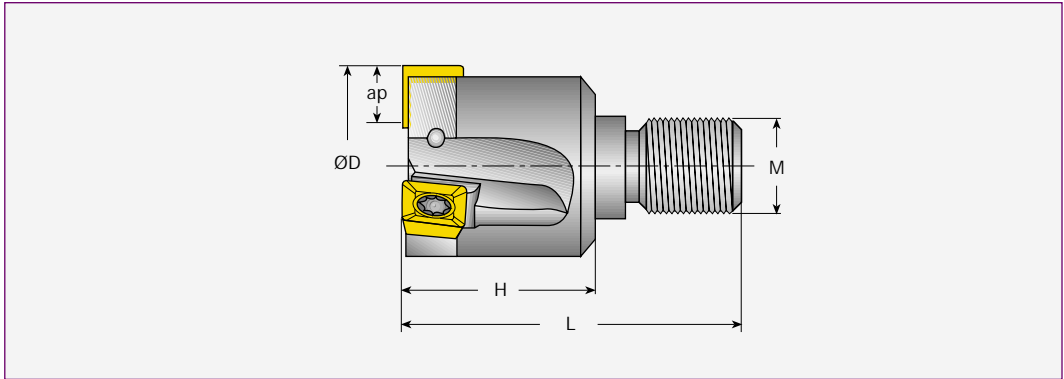


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PLUNGERS

Side Plunging Milling Cutters
Using HELIQUAD Inserts and FLEXFIT Adaptation



PLC-M

Designation	D	Z	M	H	ap	L	 Kg
PLC D40-M16-12	40	3	16	44	11	69	0.39



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Shanks

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Recommended pattern for the use of PL...- type plunger tools.

- 1) First hole - drilling mode, see sketch 1.
- 2) Second and following overlapping by a pitch of $0.5d < A < 0.8d$, see sketch 1.
- 3) For overlap between pass 1 and 2, see sketch 2.

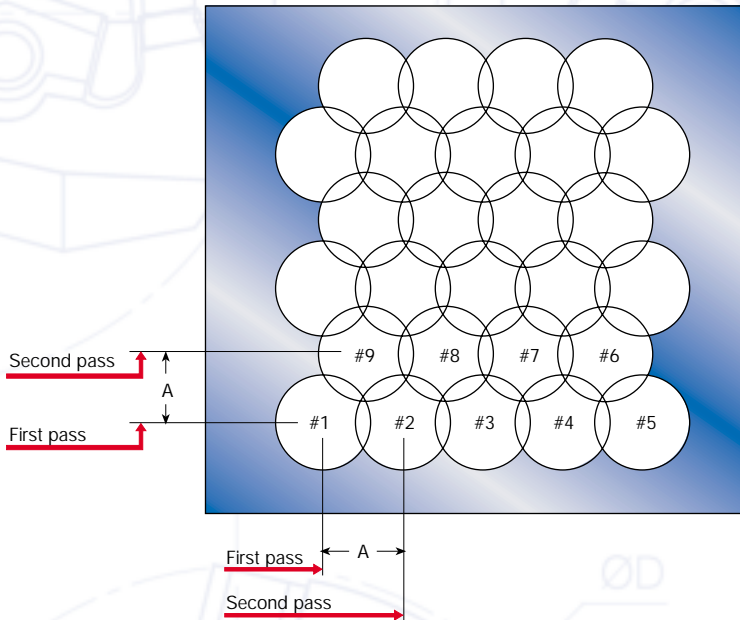
Cutting conditions:

For alloy steel SAE 4340, P20, using carbide grade IC 328

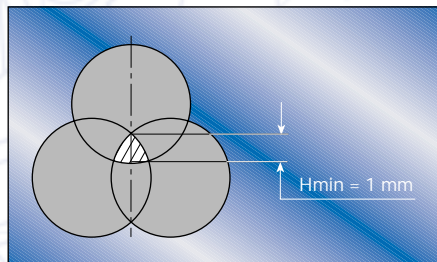
$V_c = 100 \text{ m/min}$

$f_z = 0.1 - 0.12 \text{ mm/flute}$

Sketch 1



Sketch 2



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Recommended pattern for the PLC...- type plungers.

- 1) Maximum width AP for each pass should not exceed 11 mm, see sketches #3 through #5.
- 2) Total width of penetration should not exceed $A < 0.7D$, see sketch #5.
- 3) AP for additional lateral side steps also have an 11 mm maximum, see sketch #6.

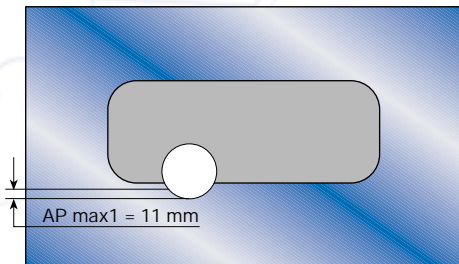
Cutting conditions:

For alloy steel SAE 4340, P20. 30 to 32 Rc, using carbide grade IC 328

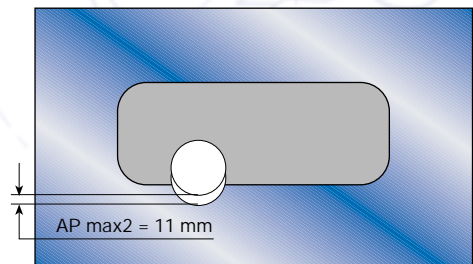
$V_c = 150$ m/min

$f_z = 0.12 - 0.15$ mm/tooth

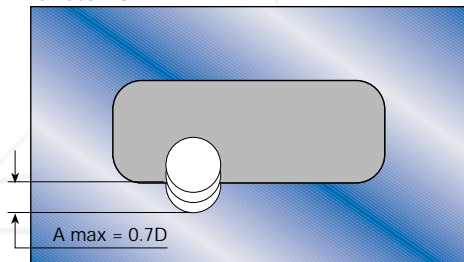
Sketch 3



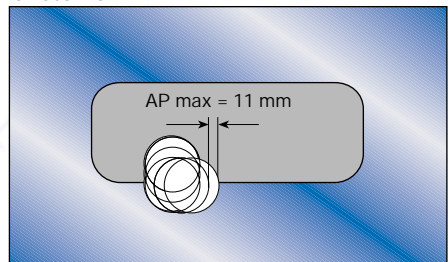
Sketch 4



Sketch 5

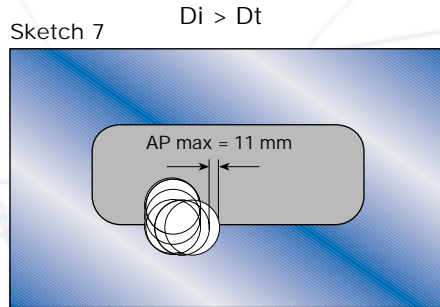


Sketch 6

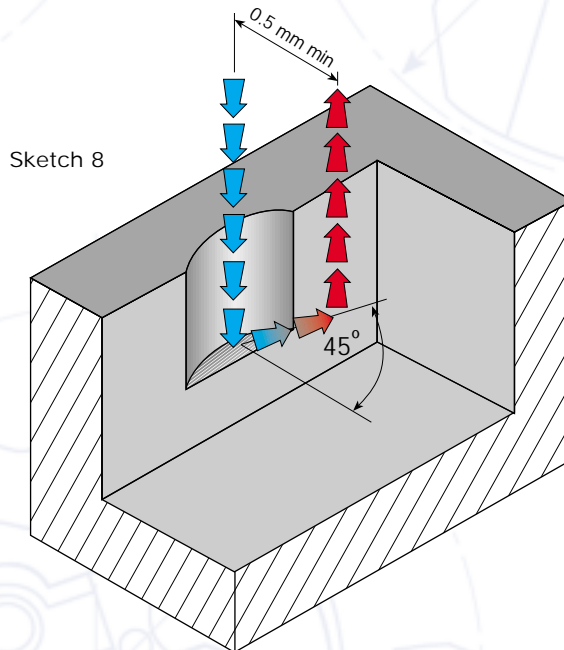


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When plunging starts from a predrilled hole, the initial diameter of the hole D_i should be larger than the plunger diameter D_t .



Please note: After each axial plunge stroke, move 45° from the horizontal a distance of at least 0.5 mm. Only after this move may you move up and away for a rapid exit. See sketch 8.



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The PLH...- type (trepanning) plungers have a hollow center. This requires for a specific pattern so that the column that remains after each plunge is removed completely and smoothly.

The coordinates in table 1 produce the pattern shown in sketch 9 this provides the optimal results for the PLH D75-27-13 type plunger (outer diameter of 75 mm, inner diameter of 24 mm).

Sketch 9

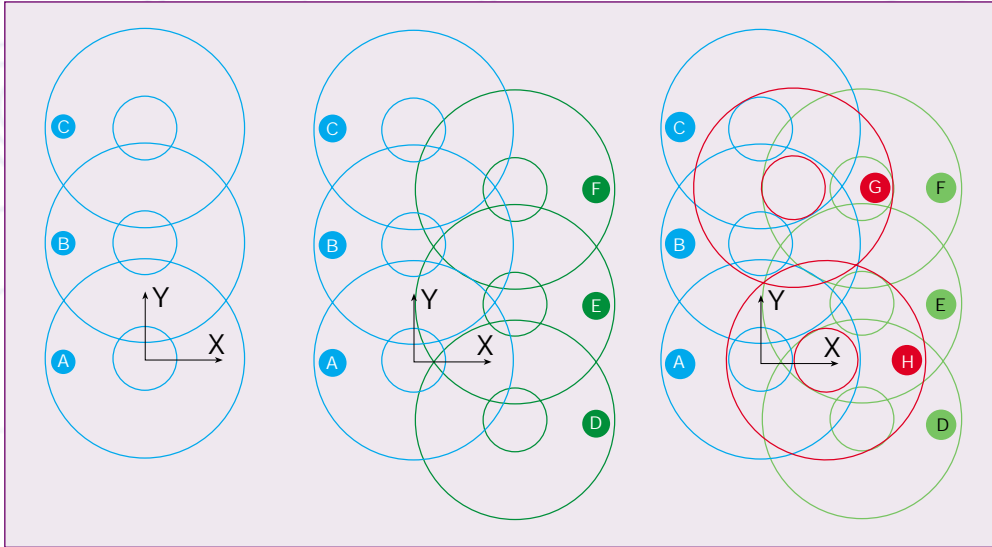


Table 1

Hole	X	Y
A	0.0000	0.0000
B	0.0000	43,300
C	0.0000	86,601
D	37,125	-21,650
E	37,125	21,650
F	37,125	64,951
G	24,750	0.0000
H	12,375	64,951