

# KTMP.CNC.TOOLING



## MURATA WIEDEMANN TOOLING

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Belgium

ОФИЦИАЛЬНЫЙ ДИЛЕР В РОССИИ  
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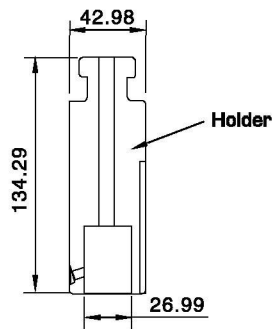


[www.ktmptooling.com](http://www.ktmptooling.com)

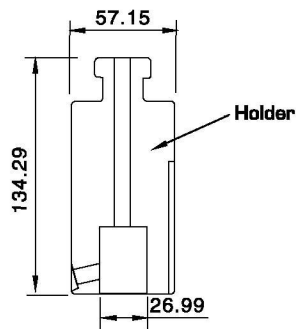
[www.obint.ru](http://www.obint.ru)

## 114 HOLDER FOR C3 MACHINE

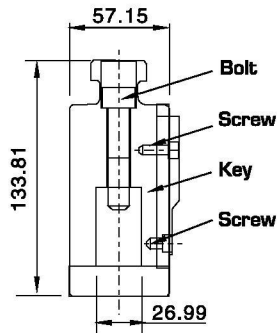
XA STA.	Code	Price
Punch holder		



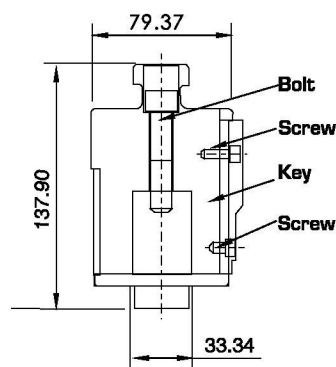
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Punch holder		



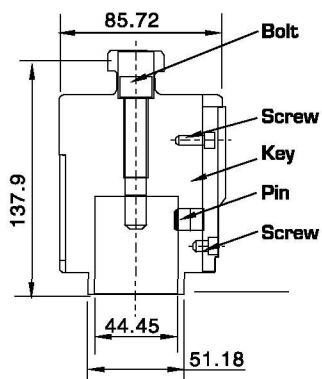
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Punch holder		



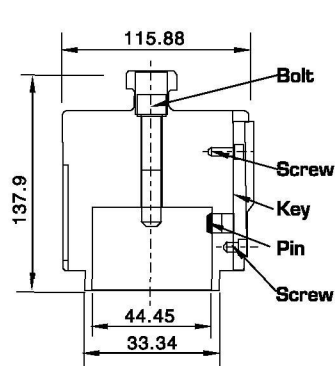
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Punch holder		



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Punch holder		

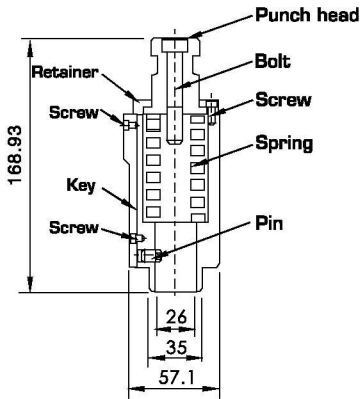


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Punch holder		

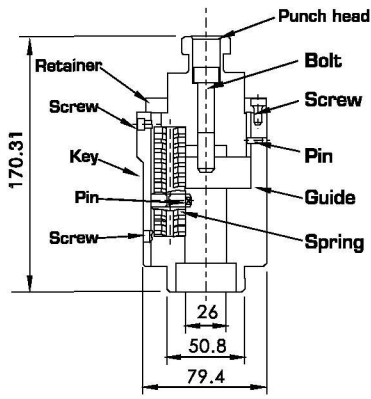


## VULCAN HOLDER

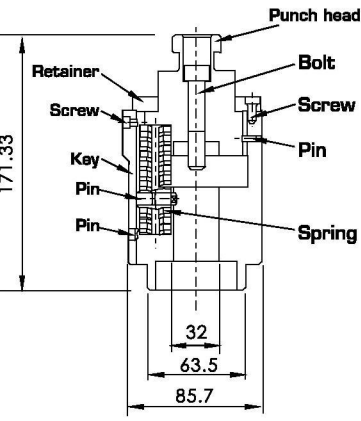
A,B STA.	Code	Price
Punch holder		



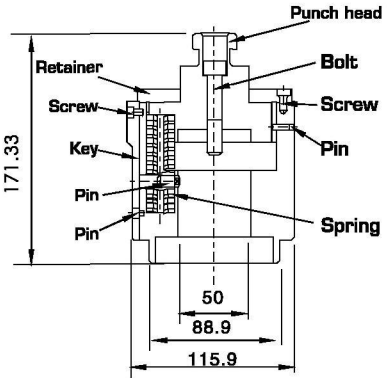
C STA.	Code	Price
Punch holder		



D STA.	Code	Price
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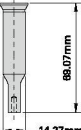
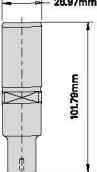
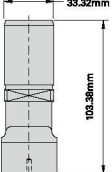
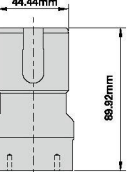
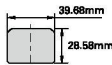
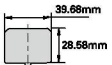
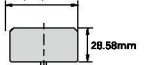
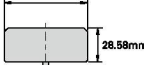
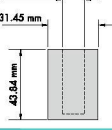
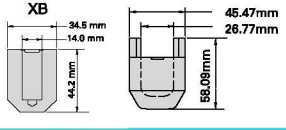
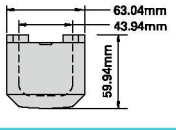
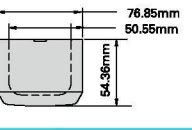
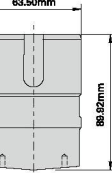
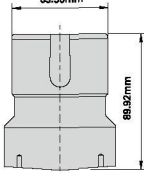
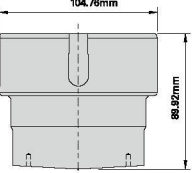
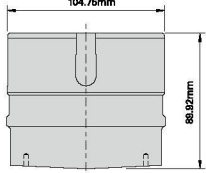
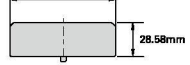


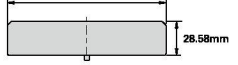
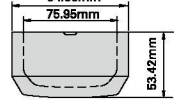
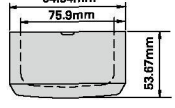
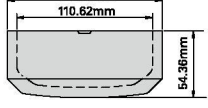
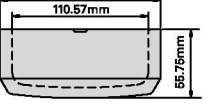


E/F STA.	Code	Price
Punch holder		

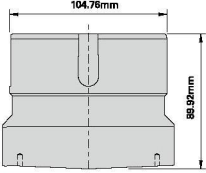
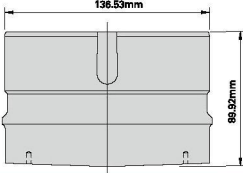
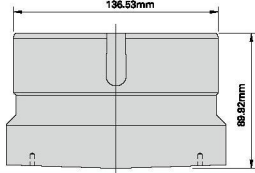
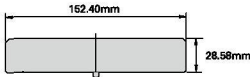
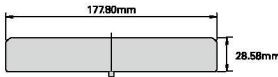
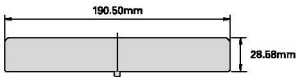
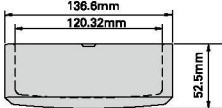
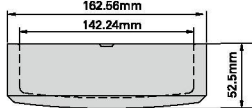




# 114 SERIES STANDARD STYLE

	A STA. ~12.7mm	B STA. ~25.4mm	C STA. 25.4-38.1mm	D STA. 38.1-50.8mm
PUNCH				
	<ul style="list-style-type: none"> <li>Round</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Round(Oct.)</li> <li>Shape</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Shape</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> <li>Shape</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>
DIE				
	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>
STRIPPER				
	<ul style="list-style-type: none"> <li>STD.</li> </ul>	<ul style="list-style-type: none"> <li>Std.</li> <li>RE</li> <li>XB</li> </ul>	<ul style="list-style-type: none"> <li>STD.</li> <li>RE</li> </ul>	<ul style="list-style-type: none"> <li>STD.</li> <li>RE</li> </ul>
	E STA. 50.8-63.5mm	F STA. 63.5-76.2mm	G STA. 76.2-88.9mm	G STA. 88.9-104.8mm
PUNCH				
	<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> <li>Shape</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> <li>Shape</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> <li>Shape</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> <li>Shape</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>
DIE				
	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>Shape</li> <li>Positive</li> <li>S/F</li> <li>S/O</li> </ul>
STRIPPER				
	<ul style="list-style-type: none"> <li>STD.</li> <li>RE</li> </ul>	<ul style="list-style-type: none"> <li>STD.</li> <li>RE</li> </ul>	<ul style="list-style-type: none"> <li>STD.</li> <li>RE</li> </ul>	<ul style="list-style-type: none"> <li>STD.</li> <li>RE</li> </ul>

## 114 SERIES STANDARD STYLE

	J Sta. 104.8 - 120.65mm	K Sta. 120.65 - 139.7mm	L Sta. 139.7 - 152.4mm
PUNCH			
	Round Flat Rooftop Concave Shape Flat Rooftop Concave	Round Flat Rooftop Concave Shape Flat Rooftop Concave	Round Flat Rooftop Concave Shape Flat Rooftop Concave
DIE			
	Round Std. S/O H/Y Shape STD. S/F S/O H/Y	Round Std. S/O H/Y Shape STD. S/F S/O H/Y	Round Std. S/O H/Y Shape STD. S/F S/O H/Y
STRIPPER			
	STD. RE	STD. RE	

### Die types



Setp types  
round die Std.



Straight+Positive  
shape die Std.

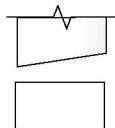


S/O types

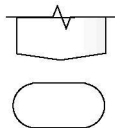


S/F types

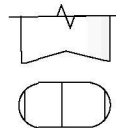
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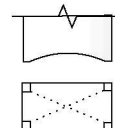
Whisper



Rooftop

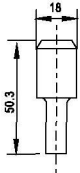

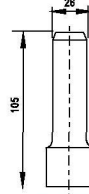


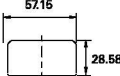
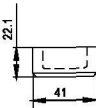
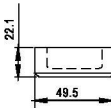
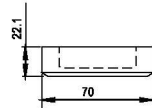
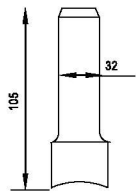
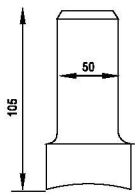
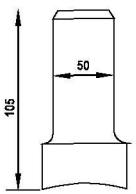
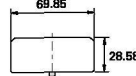
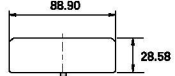
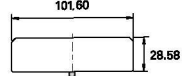
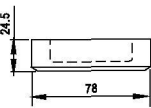
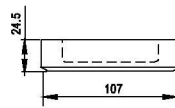
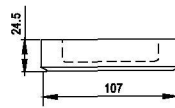


Inverted rooftop



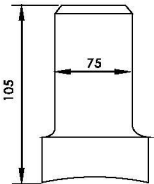
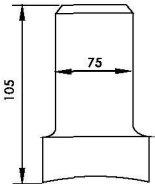
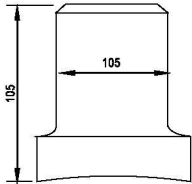
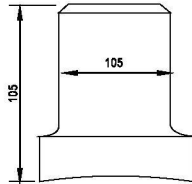
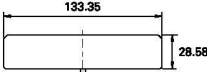
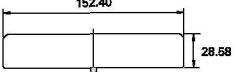
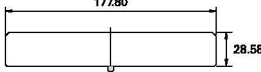
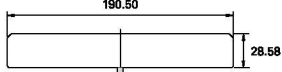

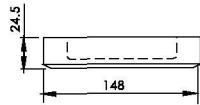

concave rooftop

## VULCAN SERIES STANDARD STYLE

	AB Sta. ~25.4mm				B Sta. ~25.4mm				C Sta. 25.4 - 38.1mm			
PUNCH												
	<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>				<ul style="list-style-type: none"> <li>Shape</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Flat</li> <li>Rooftop</li> <li>Concave</li> </ul>			
DIE												
	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>H/Y</li> </ul>				<ul style="list-style-type: none"> <li>Shape</li> <li>STD.</li> <li>S/F</li> <li>S/O</li> <li>H/Y</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>H/Y</li> </ul>			
STRIPPER												
	<ul style="list-style-type: none"> <li>Round</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Shape</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Shape</li> </ul>			
PUNCH	D Sta. 38.1 - 50.8mm				E Sta. 50.8 - 63.5mm				F Sta. 63.5 - 76.2mm			
												
DIE												
	<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>H/Y</li> </ul>				<ul style="list-style-type: none"> <li>Shape</li> <li>STD.</li> <li>S/F</li> <li>S/O</li> <li>H/Y</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Std.</li> <li>S/O</li> <li>H/Y</li> </ul>			
STRIPPER												
	<ul style="list-style-type: none"> <li>Round</li> <li>Shape</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Shape</li> </ul>				<ul style="list-style-type: none"> <li>Round</li> <li>Shape</li> </ul>			



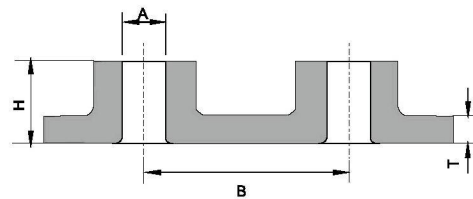
## VULCAN SERIES STANDARD STYLE

	H Sta.88.9 - 104.8mm	J Sta. 104.8 - 120.65mm	K Sta.120.65 - 139.7mm	L Sta.139.7 - 152.4mm
PUNCH				
	Round Flat Rooftop Concave	Round Flat Rooftop Concave	Round Flat Rooftop Concave	Round Flat Rooftop Concave
DIE				
	Round Std. S/O H/Y	Round Std. S/O H/Y	Round Std. S/O H/Y	Round Std. S/O H/Y
STRIPPER				
	Round Shape	Round Shape	Round Shape	

### Die clearance (Recommended: mm)

Material \ Thickness	0.8	1.0	1.5	2.0	2.5	3.0	3.2	3.5	4.0	4.5	5.0	5.5	6.0
Alumium(AL)	0.12	0.15	0.23	0.3	0.38	0.45	0.5	0.6	0.7	0.8	1.0	1.1	1.2
Mild steel(MS)	0.15	0.2	0.3	0.4	0.5	0.7	0.75	0.85	1.0	1.1	1.25	1.35	1.5
Stainless steel(SS)	0.2	0.25	0.38	0.55	0.65	0.9	0.95	1.05	1.2	1.35			

## EXTRUSION



Machine: \_\_\_\_\_ A: \_\_\_\_\_  
 Material: \_\_\_\_\_ B: \_\_\_\_\_  
 H: \_\_\_\_\_ T: \_\_\_\_\_

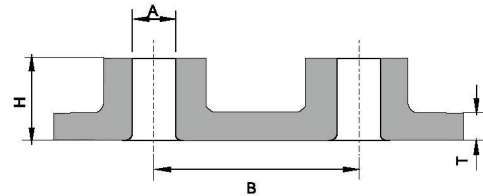
- 1 Replaceable insert design on extrusion
- 2 Max.thickness: 2mm for mild steel or AL.  
1mm for stainless.
- 3 forming height Max.H: over 3 x thread pitch  
need prepunch.
- 4 Two typess: Form up and Form down.
- 5 Please fill in the above form.

### ● Prepunch size(Mild steel,Aluminum)

Unit: mm

Thickness		0.8		1.0		1.2		1.6(AL 1.5)		2.0		2.3	
	φA	PP	H	PP	H	PP	H	PP	H	PP	H	PP	H
M2.6	2.21	1.3	1.5	1.3	1.8	1.3	2.0	1.6	2.2				
M3	2.57	1.3	1.7	1.3	2.0	1.6	2.0	1.6	2.4				
M4	3.40	2.0	1.8	2.0	2.0	2.0	2.2	2.3	2.5	2.3	2.5	2.5	3.2
M5	4.30			2.3	2.3	2.3	2.5	2.8	2.8	2.8	3.2	3.0	3.5
M6	5.10					3.0	2.6	3.0	3.1	3.8	3.2	3.8	3.4

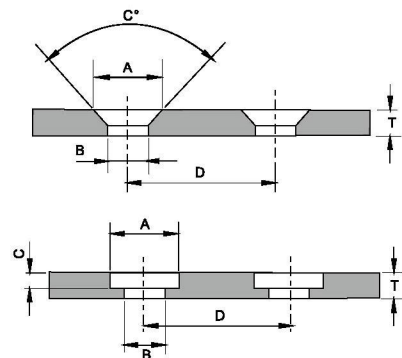
## EXTRUSION



Machine: \_\_\_\_\_ A: \_\_\_\_\_  
 Material: \_\_\_\_\_ B: \_\_\_\_\_  
 H: \_\_\_\_\_ T: \_\_\_\_\_

- 1 Replaceable insert design on extrusion
- 2 Max.thickness: 2mm for mild steel or AL  
1mm for stainless
- 3 Max.H $\geq$ 2T
- 4 Need prepunch
- 5 Give tool enough time to strip
- 6 Two typess: Form up and Form down

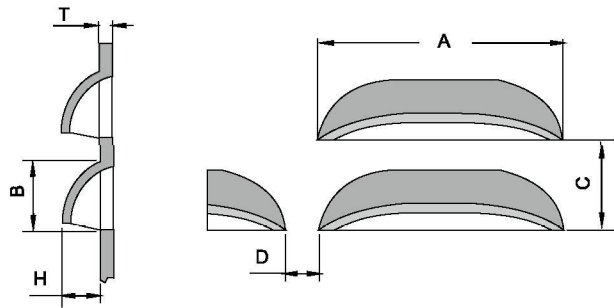
## COUNTERSINK



Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_  
 Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_  
 C: \_\_\_\_\_

- 1 Need prepunch
- 2 Change hole size to get different depth
- 3 Two types:form down and form up
- 4 Min.thickness: T $\geq$ 1.0mm

## CLOSE LOUVER

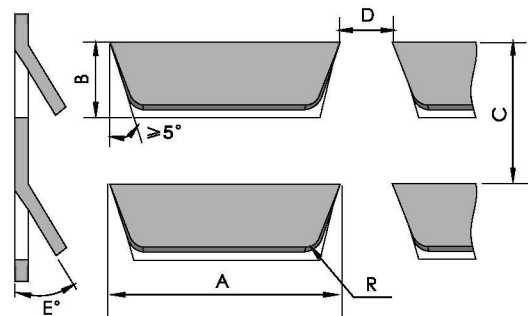


Machine: \_\_\_\_\_ Material: \_\_\_\_\_

A: \_\_\_\_\_ B: \_\_\_\_\_ C: \_\_\_\_\_ D: \_\_\_\_\_ H: \_\_\_\_\_ T: \_\_\_\_\_

- 1 Tooling is made for specific thickness
- 2 Give tool enough time to strip
- 3 Adjust length without shim, replaceable insert
- 4 Only form up

## OPEN LOUVER

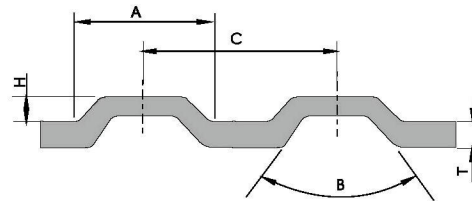


Machine: \_\_\_\_\_ Material: \_\_\_\_\_

A: \_\_\_\_\_ B: \_\_\_\_\_ C: \_\_\_\_\_ D: \_\_\_\_\_ E: \_\_\_\_\_ R: \_\_\_\_\_

- 1 Tooling is made for specific thickness
- 2 Give tool enough time to strip
- 3 Adjust length without shim, replaceable insert
- 4 Only form up

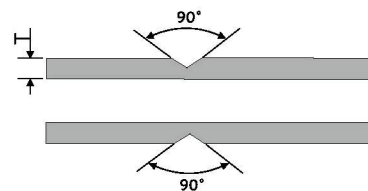
## EMBOSS



Machine: \_\_\_\_\_ A: \_\_\_\_\_  
 Material: \_\_\_\_\_ B: \_\_\_\_\_ H: \_\_\_\_\_  
 C: \_\_\_\_\_ T: \_\_\_\_\_

- 1 Two types: Form up and Form down
- 2 Escape clamp or punching hole
- 3 Give tool enough time to strip
- 4 Option: round or shape
- 5 Please fill in the above form

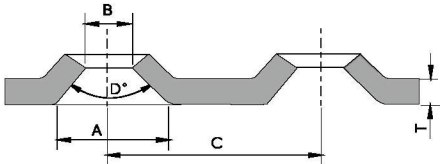
## CENTERPOINT



Machine: \_\_\_\_\_  
 Material: \_\_\_\_\_ T: \_\_\_\_\_

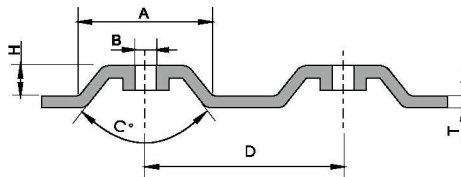
- 1 Forbid punching empty
- 2 Two types: Form up and Form down
- 3 Angle: 90 degree, Max. thickness: 6.0mm
- 4 Please fill in the above form

## EMBOSS COUNTERSINK/EMBOSS EXTRUSION



Machine: \_\_\_\_\_ A: \_\_\_\_\_ B: \_\_\_\_\_  
Material: \_\_\_\_\_ C: \_\_\_\_\_ T: \_\_\_\_\_

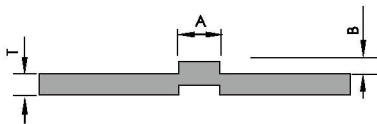
- 1 Need prepunch
- 2 Option: pierce and form in one hit
- 3 Two types: Form up and form down



Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ H: \_\_\_\_\_  
C: \_\_\_\_\_ T: \_\_\_\_\_

- 1 Complete emboss and extrusion on one hit.
- 2 Give tool enough time to strip
- 3 Only form up.
- 4 Please fill in the above form.

## HALF SHEAR/RIB TOOL



Machine: \_\_\_\_\_ A: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_

- 1 Max. B size : 0.6 X thickness.
- 2 Two types: Form up and Form down.
- 3 Give tool enough time to strip.
- 4 Please fill in the above form

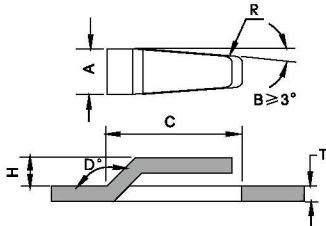


Machine: \_\_\_\_\_ A: \_\_\_\_\_ H: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_

- 1 Two types: Specific length & nibbling
- 2 Form up and Form down  
Increment of ribbing rib should be 0.5~2.0mm
- 3 For Max. thickness: 2.7mm mild steel or AL,  
2.3mm Stainless steel



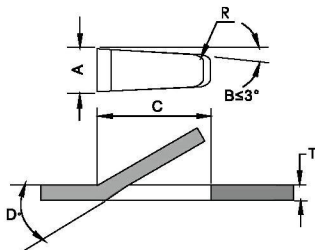
## LANCE AND FORM



Machine: \_\_\_\_\_ A: \_\_\_\_\_ C: \_\_\_\_\_ R: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ D: \_\_\_\_\_ H: \_\_\_\_\_



- 1 Tooling is made for specific thickness
- 2 Give tool enough time to strip
- 3 Two types: form down and form up

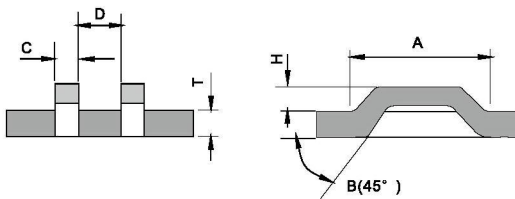


Machine: \_\_\_\_\_ A: \_\_\_\_\_ C: \_\_\_\_\_ R: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ D: \_\_\_\_\_ T: \_\_\_\_\_



- 1 Tooling is made for specific thickness
- 2 Height in 90 degree tool should be over 2T

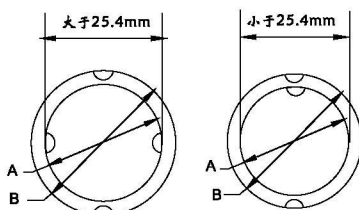
## BRIDGE/KNOCKOUT



Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ H: \_\_\_\_\_  
C: \_\_\_\_\_ T: \_\_\_\_\_



- 1 Design single or double bridge,
- 2 Two types: form down and form up
- 3 Bridge width (C)  $\geq 2XT$  and  $\geq 1.8mm$

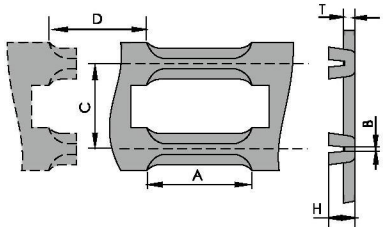


Machine: \_\_\_\_\_ A: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_



- 1 Forbid punch empty
- 2 Control shear depth with tool height
- 3 Design single EKO, double EKO, triple EKO

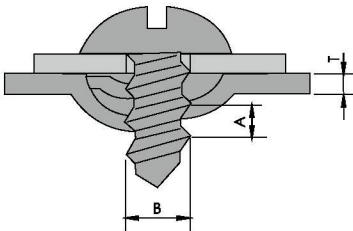
## CARD GUIDE/THREAD FORM



Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ H: \_\_\_\_\_  
C: \_\_\_\_\_ T: \_\_\_\_\_



- 1 Tooling is made for specific thickness
- 2 Adjust length without shim, replaceable insert
- 3 Form height  $H \leq 2T$

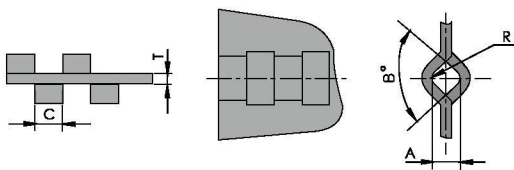


Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_  
C: \_\_\_\_\_



- 1 Two types: form down and form up
- 2 Sheetmetal range: 0.5mm~1.2mm
- 3 Please fill the left form
- 4 Consult our sales desk if not clear

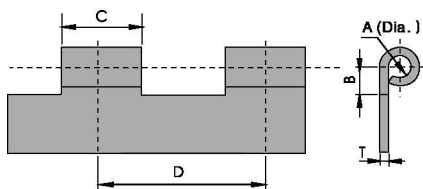
## THREAD LOOP/HINGLE



Machine: \_\_\_\_\_ A: \_\_\_\_\_ R: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_  
C: \_\_\_\_\_



- 1 Angle "B" standard 90°
- 2 Please fill in the above form
- 3 Consult our sales desk if not clear

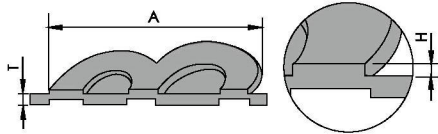


Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ T: \_\_\_\_\_  
C: \_\_\_\_\_

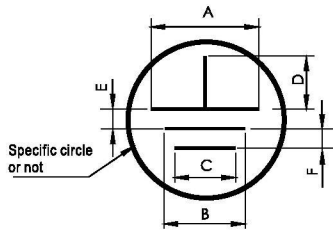


- 1 Tooling is made for specific sheetmetal thickness
- 2 Need prepunch
- 3 First for curling, second for forming
- 4 Only form up
- 5  $T \leq 2T$  (Mild steel),  $\leq 1.5\text{mm}$  (Stainless steel)

## STAMPING



Machine: \_\_\_\_\_ A: \_\_\_\_\_  
Material: \_\_\_\_\_ H: \_\_\_\_\_  
T: \_\_\_\_\_



Machine: \_\_\_\_\_ A: \_\_\_\_\_ D: \_\_\_\_\_ G (width): \_\_\_\_\_  
Material: \_\_\_\_\_ B: \_\_\_\_\_ E: \_\_\_\_\_ H (depth): \_\_\_\_\_  
C: \_\_\_\_\_ F: \_\_\_\_\_

- 1 Forbid punch empty
- 2 Form up or form down.
- 3 Make other symbol besides ground symbol.
- 4 Dash tool can make various symbol in auto index station.
- 5 Please fill in the above form.

## SHAPE CLASSES

Code: RO	Code: RE	Code: OB	Code: SQ	Code: SD	Code: DD
Name: Round	Name: Rectangle	Name: Oblong	Name: Square	Name: Single D	Name: Double D
size: A	size: B/A	size: B/A	size: A	size: B/A	size: B/A
Code: QD	Code: ET	Code: HX	Code: OT	Code: A0	Code: A1
Name: Quad D	Name: Equi. triangle	Name: Hexagon	Name: Octagon	Name: Diamond	Name: Diamond
size: B/A	size: A	size: A	size: A	size: B/A	size: B/A/R
Code: A2	Code: A3	Code: A4	Code: A5	Code: A6	Code: A7)
Name: Diamond	Name: Diamond	Name: Cable connector	Name: Eix edge	Name: Eight edge	Name: Triangle
size: B/A/C	size: B/A/C/R	size: B/A/C/R	size: B/A/C	size: C/B/A/D	size: B/A
Code: A8	Code: A9	Code: B0	Code: B1	Code: B2	Code: B3
Name: Tri. with R	Name: Right Tri.	Name: Double R	Name: Tri-R	Name: Quad-R	Name: Ellipse
size: A/B/R	size: B/A	size: B/A/C/D/R	size: B/A/C/D/E	size: B/A/D/E/F/G	size: B/A/C/R
Code: B4	Code: B5	Code: C0	Code: C1	Code: C2	Code: C3
Name: Football	Name: Keyhole	Name: Keyway	Name: Double keyway	Name: Quad keyway	Name: keyway
size: A/B	size: A/B/C	size: C/B/A	size: C/B/A	size: C/B/A	size: C/B/A

■ Standard shape: RE, OB, SQ, SD, DD, QD, EX, HX, OT.

## SHAPE CLASSES

Code: C4	Code: C5	Code: C6	Code: C7	Code: D0	Code: D1
Name: Double-keyway	Name: Quad-keyway	Name: Keyway	Name: Micro-joint	Name: Triangle with R	Name: One way radius
size: C/B/A	size: C/B/A	size: C/B/A/D	Size: B/A	size: A/B/C/R	size: B/A/R
Code: D2	Code: D3	Code: D4	Code: D5	Code: E0	Code: E1
Name: Four way radius	Name: Four way	Name: H with radius	Name: H shape	Name: Four Radius	Name: Banana
size: A/R	size: A/B/C/D/E/F	size: D/C/B/A	size: D/C/A/B	size: A/B/C/D/E	size: A/C/D/R
Code: E2	Code: E3	Code: E4	Code: E5	Code: E6	Code: E7
Name: Banana	Name: Connector	Name: Connector	Name: Connector	Name: Keyhole	Name: Keyhole
size: B/C/A	size: D/B/C/A/R	size: D/B/A/C/F/R	size: D/B/C/A/R	size: C/A/B	size: C/A/B
Code: E8	Code: F0	Code: F1	Code: F2	Code: F3	Code: F4
Name: Keyhole	Name: Keyhole	Name: Keyhole	Name: Keyhole	Name: Keyhole	Name: T shape
size: C/A/B	size: C/A/B	size: C/A/B	size: C/A/B	size: B/C/A	size: D/C/B/A
Code: F5	Code: F6	Code: F7	Code: F8		
Name: T shape	Name: Cross	Name: Cross	Name: Cross		
size: D/C/A/B	size: C/B/D/A	size: B/A/D	size: B/A/C/D/R		