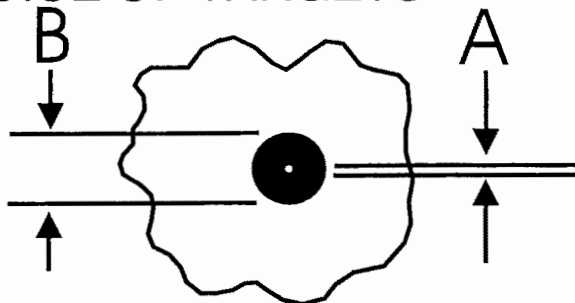


Chapter 4 Target Specifications For The Spartanics Model-83 Punch Press

In order for the press to position and punch material, precision sensors determine the position of drilled, etched, imaged, or a printed target on a sheet of material. The rated accuracy is up to $\pm .0005"$ (.012mm). The following specifications will help ensure accurate punching.

CHOICE OF TARGETS

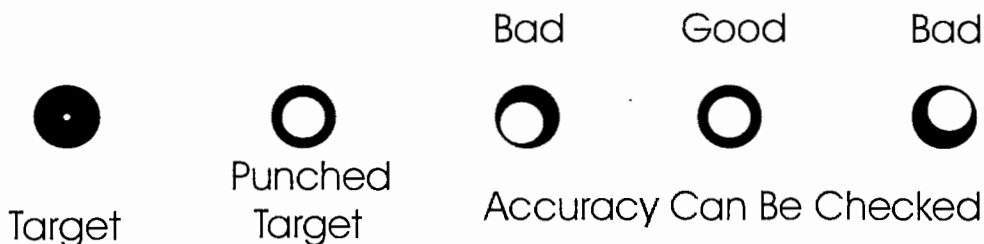
1. Donut: The best type of target is a dark-colored donut on a light background. "A" and "B" dimensions in the illustration are shown in the table.



Type of Material	Dimension	
	A	B
PC Boards, Panels, Name Plates, etc.	.025" - .040" (.63 mm - 1.0 mm)	.125" (3 mm) Min.‡
Vinyl, Mylar, or Flex Circuits	.020" - .030" (.50 mm - .75 mm)†	.125" (3 mm) Min.‡
Photographic Film (Silver)	.020 - .035" (.50 mm - .90 mm)†	.125" (.3 mm.) Min.‡
Diazo Film	.030" - .040" (.75 mm - 1.0 mm)†	.125" (.3 mm) Min.‡

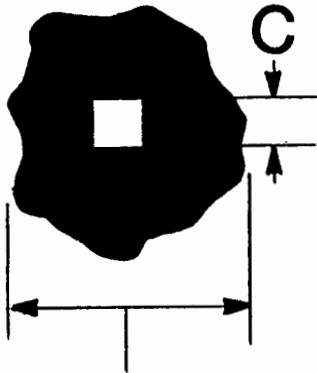
† = The dimension can be smaller for clearer and thinner material; eg film, flex circuits.

‡ = If the outside diameter of the donut is .005" (13 mm) - .010 (26 mm) larger than the punch diameter, accuracy can be easily checked to a tolerance of .001 (.0125 mm) without magnification. Accuracy of .0005" (.012 mm) is obtainable with the proper targets.



CHOICE OF TARGETS (cont.)

2. **Square:** A square-type target will not work as well as a donut-type but it will still work well if the target is placed squarely under the punch. If the target is slightly rotated, the punch may not punch the target accurately.

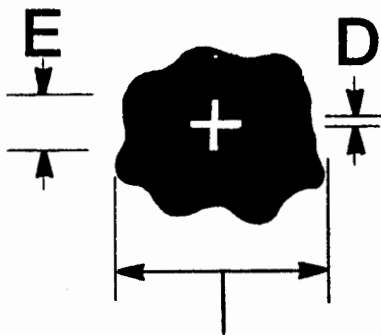


See Note 3 Below

Type of Material	Dimension	
	C	
PC Boards, Panels, Nameplates, etc.	.030"-.040" (.63mm-1.0mm)	
Vinyl, Mylar, or Flex Circuits	.020"-.030" ^{**} (.50mm-.75mm)	
Photographic Film (Silver)	.020"-.035" ^{**} (.50mm-.90mm)	
Diazo Film	.030"-.040" ^{**} (.75mm-1.0mm)	

* See Note 1 on page 1.

3. **Cross:** A cross-type target will not work as well as a donut-type but it will still work well if the target is placed squarely under the punch. If the target is slightly rotated, the punch may not punch the target accurately.



See Note 3 Below

Type of Material	Dimension	
	D	E
PC Boards, Panels, Nameplates, etc.	.010"-.015" ^{**} (.25mm-.38mm)	.100" (2.5mm) Min. For All Types Of Material
Vinyl, Mylar, or Flex Circuits	.010"-.015" ^{**} (.25mm-.38mm)	
Silver Type Film (Cross type target won't work for Diazo film.)	.020"-.035" (.50mm-.90mm)	

*See Note 1 on page 1.

Note 3

An uninterrupted background of approximately 1/8" (3.2mm) diameter around the target is desirable. A smaller diameter may be used but then it is more important for the punch press operator to position the target carefully.

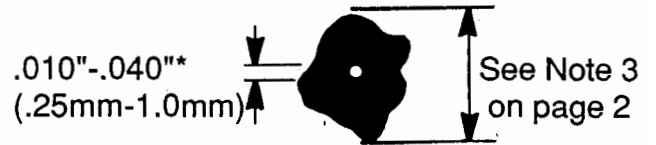
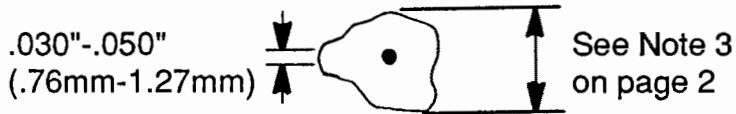
CHOICE OF TARGETS (cont.)

Using Holes or Dots as Targets on PC Boards

When using holes or dots as targets on PC boards, consider the following specifications:

Dot:

Hole or Etched Dot:



See Note 1 on page 1.

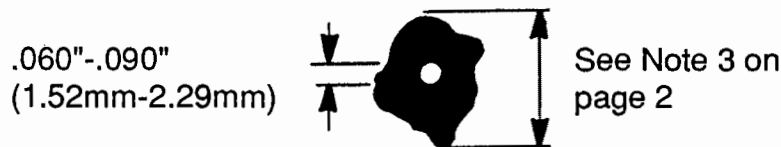
See Note 1 on page 1.

Sometimes it is not possible to generate dots as small as the ones listed above. If this is the case, larger dots can be used if they meet the following specifications:

Large Dark Dot:



Large Light Dot:



Other Marks For Targets

Spartanics does not recommend using the following marks as targets but the marks will work if they are very carefully placed under the punch.



What to Avoid When Making Artwork

Never use the following mark as a target. It won't work.



Choice of Sensor Heads

Refer to the following table when ordering sensor heads.

Type of Material	Spartanics #
Nameplates, Flex and Silver Film	37-200
Printed Circuit Boards	38-200
Diazo and Silver Films	83-2000