



IMPROVE EFFICIENCY WITH SPECIAL SHAPES (Quad Radius, Inside/Outside Radius & Banana Tool) USING YOUR AUTO INDEX STATION

THE PROBLEM:

Fabricators are always looking for ways to improve manufacturing efficiency in today's cost conscious environment. Some processes are more obvious than others. One of the most inefficient, frequently overlooked fabrication techniques is nibbling large holes with a small punch. To illustrate, the parts shown at right were nibbled using a smaller diameter round punch. While nibbling works, this type of processing causes the following problems:

- Punching debris that scores and burrs turret bores
- Increased galling on punches
- Increased production time for parts (many hits)
- Increased machine maintenance (side loading)
- Excessive tool wear that leads to more frequent maintenance and replacement
- Wear and tear on the machine
- Scalloped edges

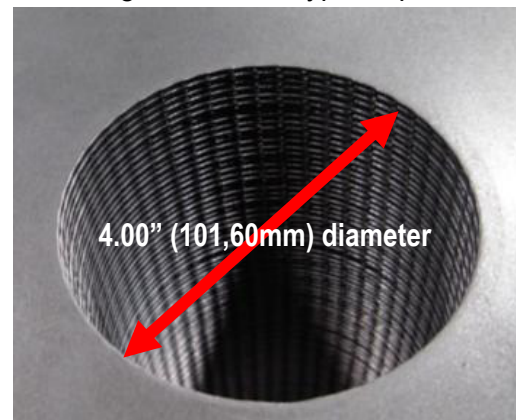
There is a better, more efficient way.

THE MATE SOLUTION:

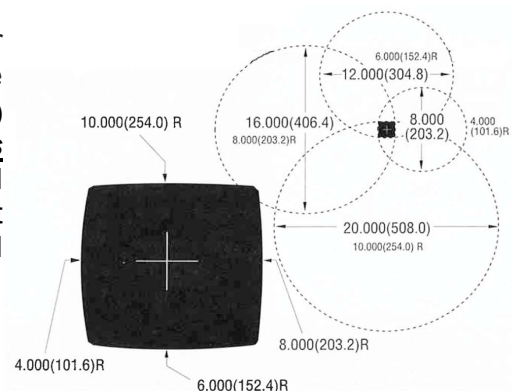
Most turret presses include an **auto-index station** that rotates a punch and die to any designated angle dictated by the machine program. Mate offers a wide range of **special shapes** that can be used in the auto index station to improve manufacturing efficiency and product quality. This Solutions Bulletin looks at three high value shapes: **Quad Radius**, **Inside/Outside Radius** and **Banana Tool**.

QUAD RADIUS:

Using a punch and die with an arc for a much larger circle, your auto index station can create a smooth edged, round hole limited only by your sheet size. The **Quad Radius tool** (right) produces large holes with smoother edges and with **far fewer hits** than using a round nibbling punch. In effect, the Quad Radius tool puts an 8, 12, 16 and 20-inch punch into a single 2-inch station. It will create even larger holes, but as hole size exceeds a tool radius, scalloping begins to appear.



Nibbled with 0.25" (6,35mm) punch, took 178 HITS each! Using a Quad Radius with a tool radius 2.00" (50,80mm) and programmable radius of 1.5086" (38,32mm) would take **JUST 16 HITS!**



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Fully Guided tooling is recommended because the positive guiding action gives the punch the support it needs for nibbling and the stripper clamps the sheet securely to prevent lateral movement. You can order any custom radius you wish.

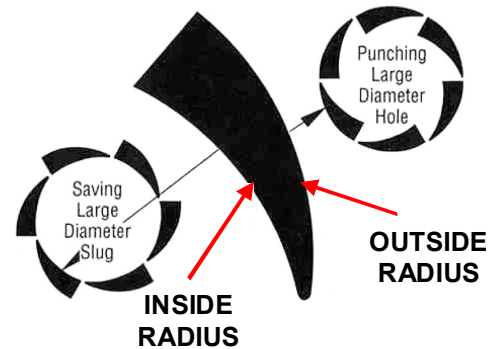
INSIDE/OUTSIDE RADIUS:

This **Inside/Outside Radius tool** is for use in Auto Index Stations. The inside radius must be larger than outside radius. This tool can be programmed to punch holes with slugs or parts retained in the sheet, yet can be separated easily off the press.

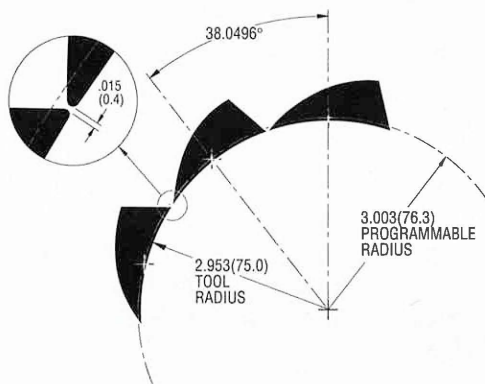
The tool's large radii result in slugs with smoother edges, produced with far fewer hits than using an ordinary radius punch for nibbling holes. This one tool punches slugs of any size practical for its configuration. The smoothest edges occur when the radius coincides with the radius punched.

With an Inside/Outside Radius tool, you do not have to stop the machine to remove the slug for an oversize opening, or remove the blank if saving the slug. By using small, precise tabs, the machine does not need to be stopped to remove a slug for an oversize hole. The precise tab is created by leaving a .015"(.40mm) gap between hits. Once the sheet is removed from the machine, you can still break away the tabs and slugs.

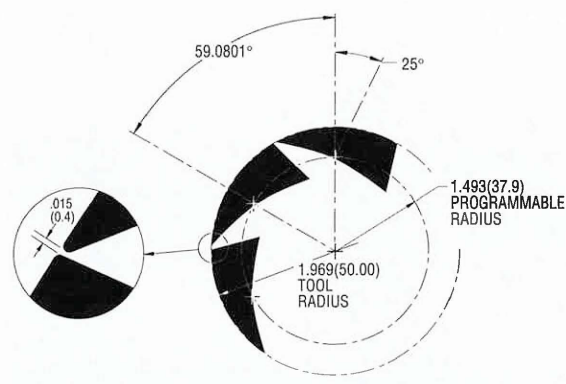
I/O Radius Tool cuts both inside and outside radii



SAVING LARGE DIAMETER SLUG



PUNCHING LARGE DIAMETER HOLE



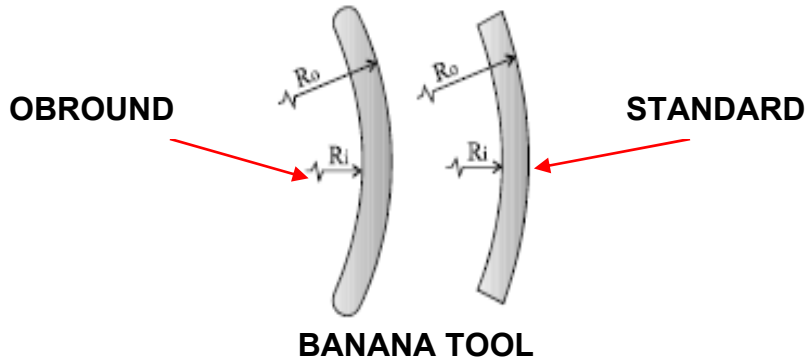
CENTERLINE LAYOUT

Mate provides a centerline layout drawing for each tool to aid in programming, examples above.

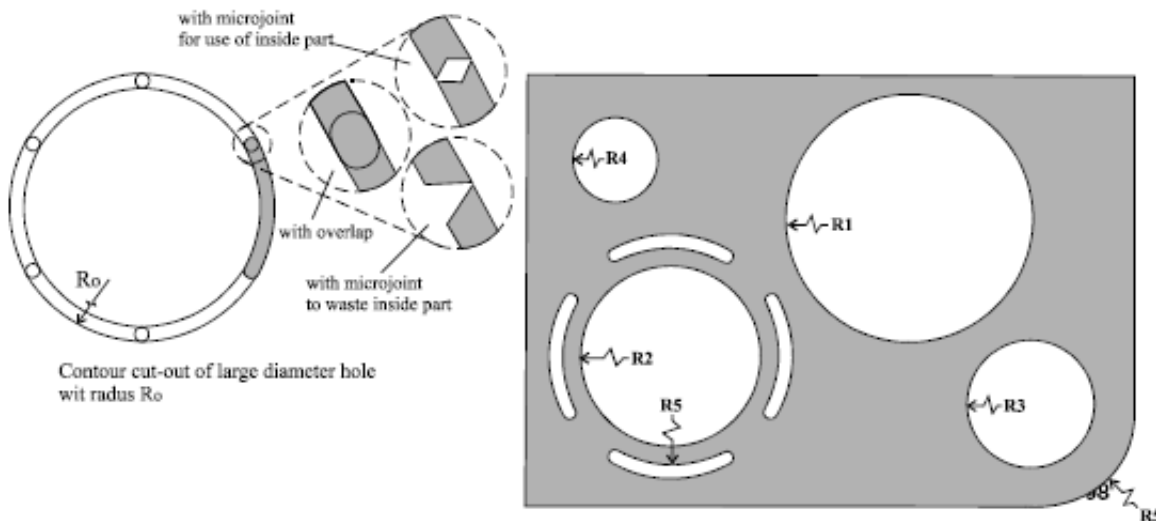
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BANANA TOOLS:



Similar to Inside/Outside Radius tool, Banana Tools allow fabricators to use the inner part to nest smaller parts. "Obround" banana tools may be more effective in thicker material because, unlike the inside/outside radius tool, there is no sharp point that could break.



POTENTIAL INDUSTRIES THAT COULD USE THESE TOOLS:

- Aerospace
- Appliances
- Automotive
- Electronic Enclosures
- Food Service Equipment/Refrigeration
- Heavy/Agricultural Equipment
- HVAC (Heating/Ventilation/Air Conditioning)
- Many More!

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AVAILABLE TOOLING STYLES:

- Thick Turret
- Thin Turret
- Trumpf Style
- Murata Wiedemann
- Salvagnini

STATION SIZES:

- Any Auto Index Station

MATERIAL RESTRICTIONS:

- None

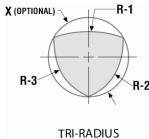
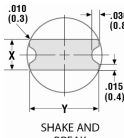
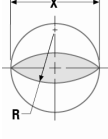
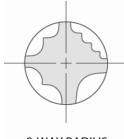
MATERIAL THICKNESS LIMITATIONS:

- None

TONNAGE RESTRICTIONS:

- None known

OTHER MATE SPECIAL SHAPES TO USE IN AN AUTO INDEX STATION TO IMPROVE EFFICIENCY:

SPECIAL SHAPE	DESCRIPTION/POSSIBLE USE
Tri-Radius: 	Punch 3 different size large openings with a single tool.
Shake-and-Break: 	Use to create micro joints on long edges to keep a skeleton rigid during processing, yet easy to separate off the machine.
Football (sometimes referred to as <i>Lenticular</i>): 	Punch 2 different size large openings with a single tool OR punch a large opening and leave scrap connected with 3 micro joints to be removed later.
9-Way Radius Tool: 	Provides nine popular external radii from 0.50"(12,00mm) to .063"(1,50mm) Use for prototyping or short production runs.