

USE STRENGTHENING RIBS TO COMBINE STRUCTURAL RIGIDITY AND MINIMUM MATERIAL THICKNESS

THE PROBLEM:

Fabricators are often invited by companies to bid on jobs to manufacture components. While you'd like to think that the fact that your company produces high quality parts would be reason enough to select your firm for the job, competitive pricing remains a key selection criterion. So let's say that you do everything correct: you design for manufacture, eliminate secondary operations and more, but the price is still too high. One of the few remaining variables is the material, and using the minimum material thickness is a way to reduce the cost of a component. This is acceptable if the component doesn't require much structural



THE MATE SOLUTION:

A common way to add strength to a sheet metal part is to add strengthening ribs. As the material is deformed, the effective material thickness increases, strengthening the material. Two ways to add strengthening ribs are with Mate's Rollerball™ tool and a beaded emboss tool.

Mate Rollerball™

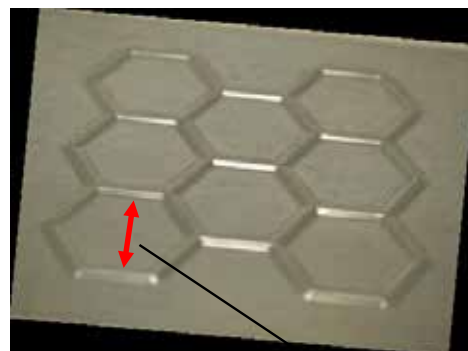
Mate's Rollerball tool allows fabricators to reduce sheet metal thickness without compromising the strength and rigidity of the product. Designed to take advantage of extended programming capabilities of punch presses capable of operating in the X and Y axis with the ram down, Rollerball forms the sheet metal by "pinching" the material between two ball bearings in the upper assembly and a single ball bearing in the lower assembly. Doing so creates the stiffening rib that can be used to strengthen the sheet metal. The shape of the form is the result of programs created in the punch press programming system.

Beaded Emboss

Embossing operations are commonly used in sheet metal and vary in purpose and function; one such function is to add strengthening ribs. A common way to add strength to a sheet metal part is to introduce a bend or beaded emboss. As the material is deformed, the effective material thickness increases and the material becomes stronger.

How a Mate Customer Used a Beaded Emboss Tool for Improved Strength

A manufacturer of electrical enclosures and cable management systems wanted to use the minimum material thickness in order



1.96" (50mm)

SOLUTION BULLETIN

to reduce the cost of the component in their Trumpf machine. The component was part of a walkway used in a cable management system and needed to be strong enough to be walked on without deformation.

Presented with the challenging task of combining structural strength with minimum material thickness, Mate's Applications Specialists looked to one of the strongest natural shapes: a hexagon. The solution from Mate combines the natural strength of the hexagon with the functionality of a beading tool, into a non-spring loaded custom beaded emboss tool.

Measuring 1.97" (50mm) across the flats, the hexagonal shape exceeds the design parameters for some Size 2 spring loaded tools, but the shallow height of 0.040" (1mm) and the gentle angle of 60 degrees made this situation an ideal application.

The upper assembly is a two-piece construction that includes the upper inverted die and a combined shank and alignment ring. The lower tool is a simple die with the profile of the emboss machined on the surface. As the sheet moves, it is stripped from the form on the lower tool.

One of the challenges was to ensure that subsequent cycles of the tool did not crush the previous forms. Knowing that these forms would be used close together, Mate included a relief at the corner of each form to prevent the previous form being crushed. The resultant form was strong, aesthetically pleasing and provided good traction.

AVAILABLE TOOLING STYLES AND STATION SIZES:

- Mate Rollerball tool
 - Thick Turret, Trumpf Style, Murata Wiedemann and Thin Turret
- Mate Beaded Emboss tool
 - All tooling styles and station sizes

MATERIAL AND OTHER RESTRICTIONS:

- Contact your Mate Applications Specialist
- **VIDEO**
- See a video of Mate's Rollerball tool at mate.com:
 - <http://www.mate.com/en/products-and-parts/fabrication-solutions/rollerball/>

