

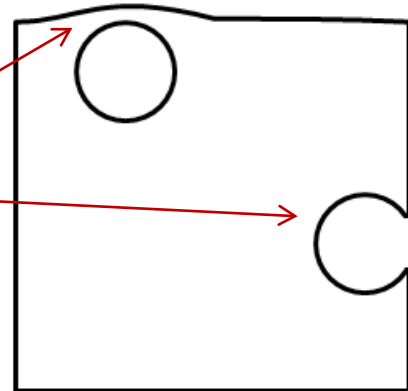
# Die Cutting Design Guidelines

## TECHNICAL BULLETIN 106

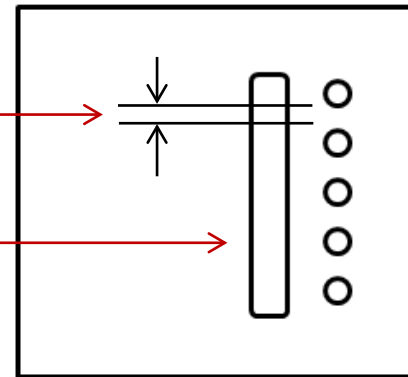
When designing new die cut parts, it is important to keep in mind the impact that your design has on the manufacturing process for those parts. Simple part dimensions can change the method in which a part can be cut, ultimately impacting the cost of the part. We have put together this Design Guide to provide you with a model for best practices.

### Holes

Locate holes at least two material thicknesses from the edge of the part in order to avoid tearing or bulging during fabrication and handling



Use at least two material thicknesses between holes or other similar design features



Consider using an oblong hole to replace a series of holes when possible

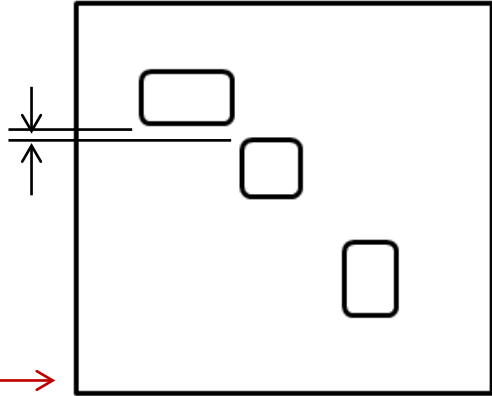
Standard size round punches increase by 0.015" increments. Using standard sized punches will lower cost.

## Corners & Slots

Use at least two material thicknesses between slots or similar design features

Standard size square punches increase by 0.015" increments. Using standard sized punches will lower tooling cost.

Straight exterior edges and square corners enables "common ruling" on the die, which increases yield and lower cost.

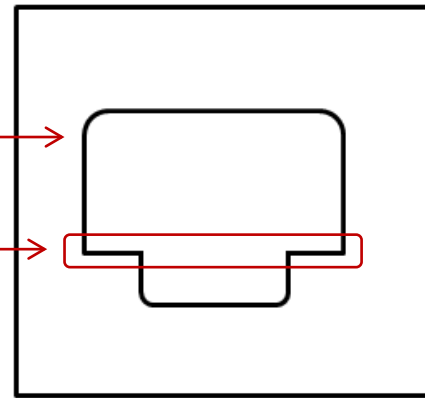


## Odd Shapes

Odd shapes can be made by bending steel rule to the desired shape. Minimum specified radius should be 0.031"

When possible, avoid square internal corner which promote material cracking and splitting.

A radius of 1mm or less creates a corner in a steel ruled die which is stronger than a square corner.



## Tolerances

Most die tools are made via CNC router, and the tolerances of the tool are quite accurate, generally +/-0.010". However, due to the elastomeric nature of many MAST Technologies' materials, die-cut tolerances must be greater than the tolerance of the die tool. For example, MR21 Cavity Resonance Absorbers can elongate more than 15% during cutting which can cause "hour-glassing" or distortion of the sidewall of the part. This distortion generally does not affect the fit of the part, but when measured, is shown out of tolerance. Please contact a MAST Technical Representative to determine the most suitable tolerance for your application and material thickness.

MAST Technologies' standard tolerance for materials <0.080" is +/-0.015"

MAST Technologies' standard tolerance for materials >0.080" is +/-0.020"

## Alternate Type of Cutting

If the complexity of the designed part or these rules cannot be followed due to design sensitivity, MAST Technologies has alternate methods for cutting. Generally, the cost per part will be slightly higher with these methods, but there will be little or no tooling cost.

**CNC Knife Cutting-** CNC knife cutting machines utilize a series of tools which can cut, crease, or perforate a variety of different types of materials with great accuracy. Typically digital drawing files (.dwg, .dxf, and others) can be loaded directly into the machine's software, reducing or eliminating any "set-up" fees.

**Water-Jet Cutting-** Water-jet cutting machines utilize a very high pressure jet of water which is driven by a CNC controller. Water-jet cutting allows for the most versatile part dimensions of any cutting methods.