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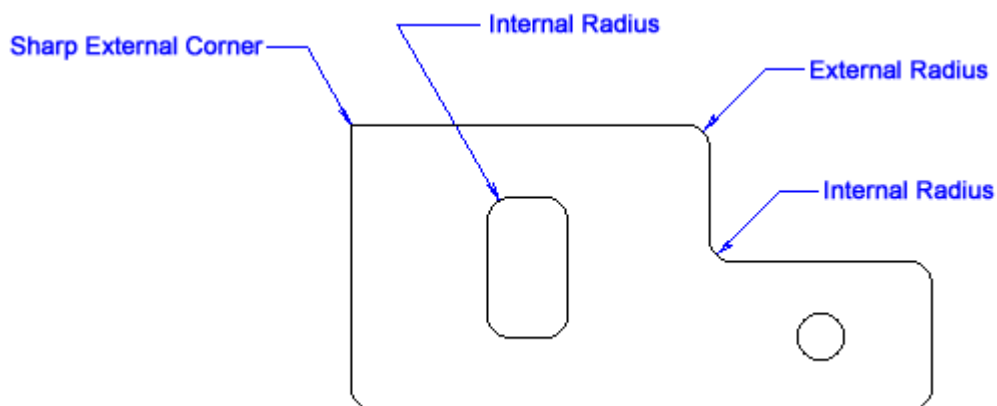
Design Guide For Stampings

Very intricate and complex products can be produced using a stamping die. This is because of the advances in die design and builds technology. Products can be cut, formed, drawn, twisted, coined, extruded, welded, tapped and even assembled in the die by employing a variety of technologies. Economically, stamping competes with many other processes, such as, chemical etching, laser cutting, screw machining and die casting, even for short runs.

The following design guidelines are recommendations and are intended to make engineers aware of how their decisions affect the stamping process. If a feature must be incorporated despite any of these general guidelines, it is recommended that the engineer work with the supplier's engineers to mitigate the unfavorable effects of the characteristic. Usually, a solution can be fashioned that improves capability and reliability of the stamping process, while reducing the cost of the die and parts.

Avoid Sharp Corners

Internal corners should be filleted with a radius that is equal to at least one material thickness. Sharp external corners can be attained in a stamping die only by making 2 separate cuts. This most often produces a burr as the material at the intersection flows away from the cutting forces on the 2nd cut.



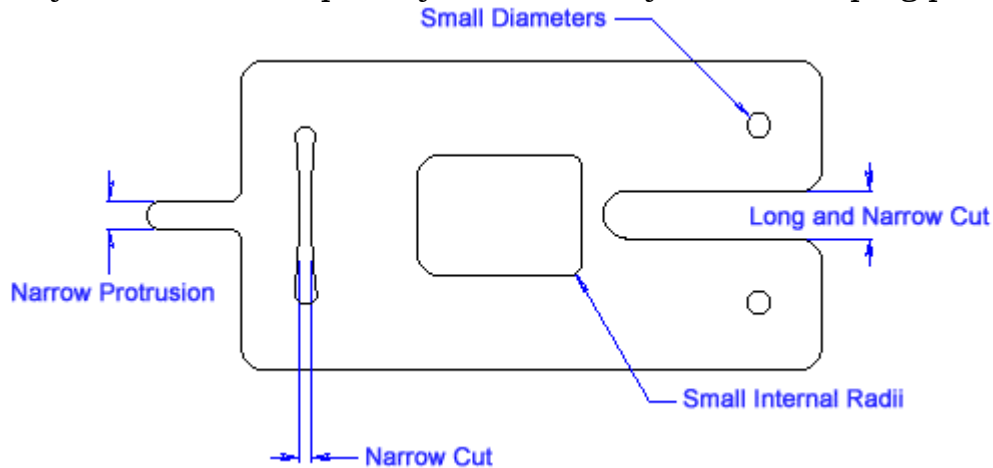


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Avoid Relatively Small

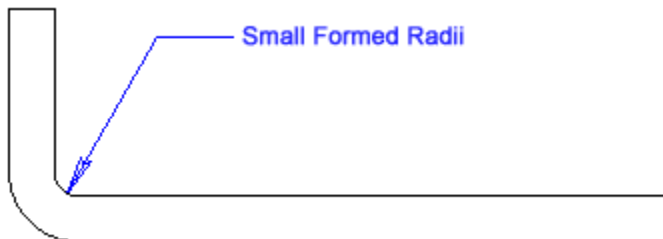
Features

Small features relative to the material thickness can cause high stresses in stamping components. Although specialized methods exist to produce features with dimensions equal to or less than one material thickness, they decrease the capability and reliability of the stamping process.



Avoid Small Bend Radii

The smallest permissible bend radius is dependent upon the material type and temper. If too small of a radius is used, the material on the outside of the bend will crack. Normally a bend radius equal to the material thickness is adequate. However, with extra hard or spring tempered copper-based material and full hard stainless steels, the bend radius should be increased to 1 1/2 to 2 times the material thickness.





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Avoid Severe Transitions on Cylindrical Parts

As a cylindrical part transitions from one diameter to another, the material must stretch. This is a result of the difference in the amount of material required for each diameter. As shown in the diagram below, this stretching must occur over a gradual transition in order to avoid tearing. It is best to utilize a transition angle no more than 45° on a medium tempered material (soft tempered material allows more, hard tempered less).

