RES MANUFACTURING COMPANY

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KEY METAL FORMING DESIGN GUIDELINES

Holes: Minimum hole diameter should be equal to or greater than 1.2 times the material thickness.

Edge to Holes: The distance between hole and edge should be a minimum of two stock thicknesses.

Hole to Form: Spacing is normally 2.5 times the material thickness plus the bend radius.

Slot to Form: Spacing for long slots should be at least four times the material thickness plus the bend radius.

Notches & Tabs: Should not be narrower than 1.5 times the material thickness.

Form to Hole: Spacing should be great enough so that hole distortion does not occur.

L-Shaped Parts: Should include a bend relief notch to avoid cracking or fracture.

Grain Direction: Constraints are particularly important in harder stock. The line of sharp V-bend should not be parallel with the grain direction, otherwise cracking or fracture is likely to occur.

Burrs: Burrs are a result of the normal stamping process. Burrs on the outside of a bend may create fractures. Burr height will range up to 10% of material thickness. Burrs can be removed utilizing a number of different processes.

Shapes: Round is the easiest to draw, followed by square with adequate corner radii. Irregular shapes and those that combine two basic shapes into one are much more difficult and costly to produce.

Corners: Should be as generous as possible to facilitate manufacturing. Normally, the punch and die radius should be a minimum of four times the material thickness.

Squareness: Normal variation on formed 90-degree bends is usually within plus or minus 1 degree.

Feature Distortion: Distortion is more likely to occur when various design features like holes or slots are too close to an edge, form, or each other. This is more apparent in drawn parts, which undergo much more deformation than formed parts.

Flatness: Should not be over-specified. Requiring flatness of less than .003in./in. may require a secondary operation at added expense.

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