

## Shearing Overview

A process for cutting sheet metal to size out of a larger stock such as roll stock. Shears are used as the preliminary step in preparing stock for stamping processes, or smaller blanks for CNC presses.

Material thickness ranges from 0.125 mm to 6.35 mm (0.005 to 0.250 in). The dimensional tolerance ranges from  $\pm 0.125$  mm to  $\pm 1.5$  mm ( $\pm 0.005$  to  $\pm 0.060$  in).

The shearing process produces a shear edge burr, which can be minimized to less than 10% of the material thickness. The burr is a function of clearance between the punch and the die (which is nominally designed to be the material thickness), and the sharpness of the punch and the die.

## Blanking Overview

Cutting up a large sheet of stock into smaller pieces suitable for the next operation in stamping, such as drawing and forming. Often this is combined with piercing.

Blanking can be as simple as a cookie cutter type die to produce prototype parts, or high speed dies that run at 1000+ strokes per minute, running coil stock which has been slit to a specified width.

For production parts, the final configuration of the drawn or formed shape needs to be established before the blank die can be built—since the blank size and the slit width size needs to be established precisely.

Corners should have a minimum radius of 0.5 x material thickness or 0.4 mm (0.016in) whichever is greater. Sharper corners can be produced but at a greater die maintenance costs and more burrs.

Slots or tabs widths should be greater than 1.5 X stock thickness.

The length can be a maximum of 5 times slot/tab width.

These rules can be violated at an increased tooling cost-- width as low as 1 X thickness and length as high as 7 X thickness can be achieved.

On cutoffs, avoid full radiuses across the width of stock. A square cut-off is best. If a radius is necessary, then an angle-blended radius is best.