

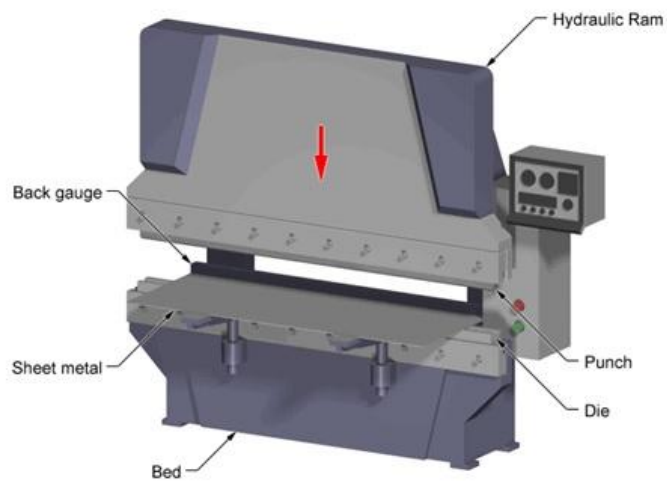


AGS-TECH Inc., Tel: 505-550-6501 and 505-565-5102, Fax: 505-814-5778,

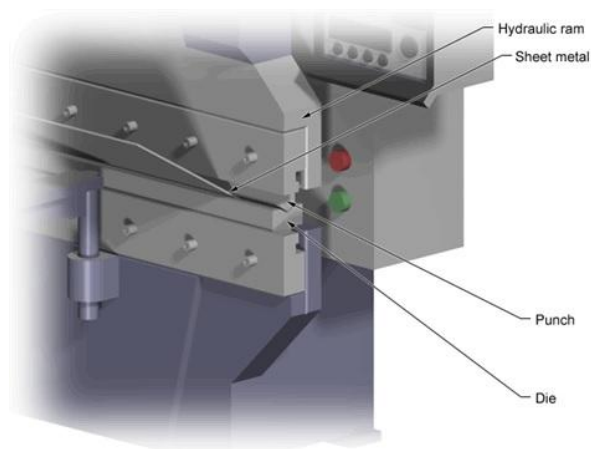
Email: [sales@agstech.net](mailto:sales@agstech.net), Web: <http://www.agstech.net>

## SHEET METAL FORMING OPERATIONS:

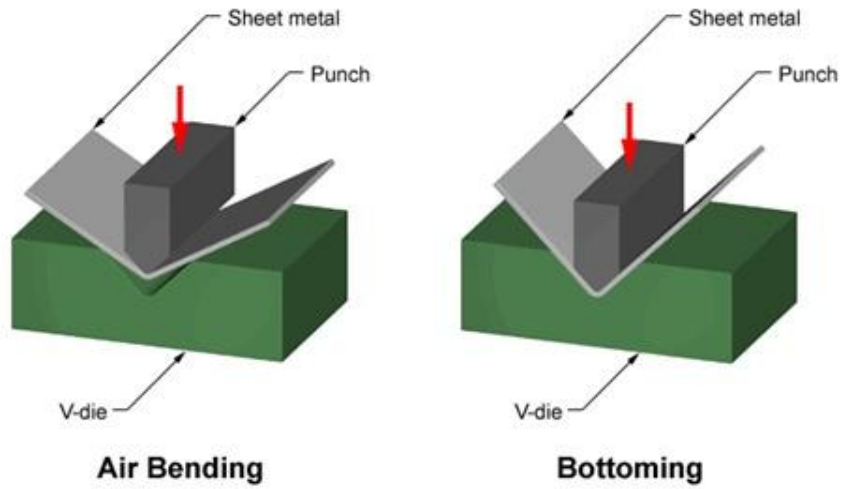
### Press Brake (Open)



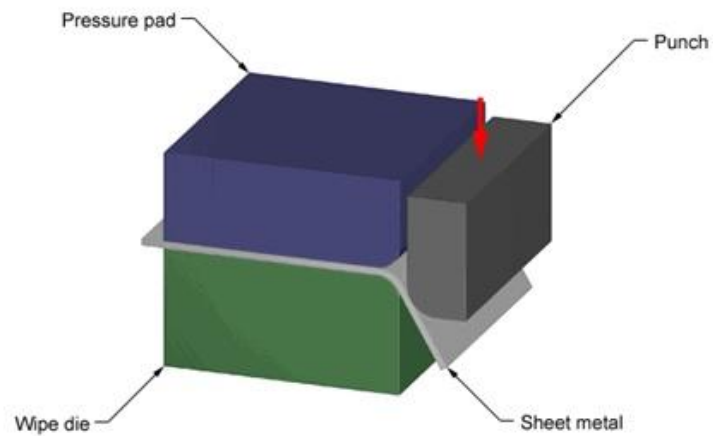
### Press Brake (Closed)



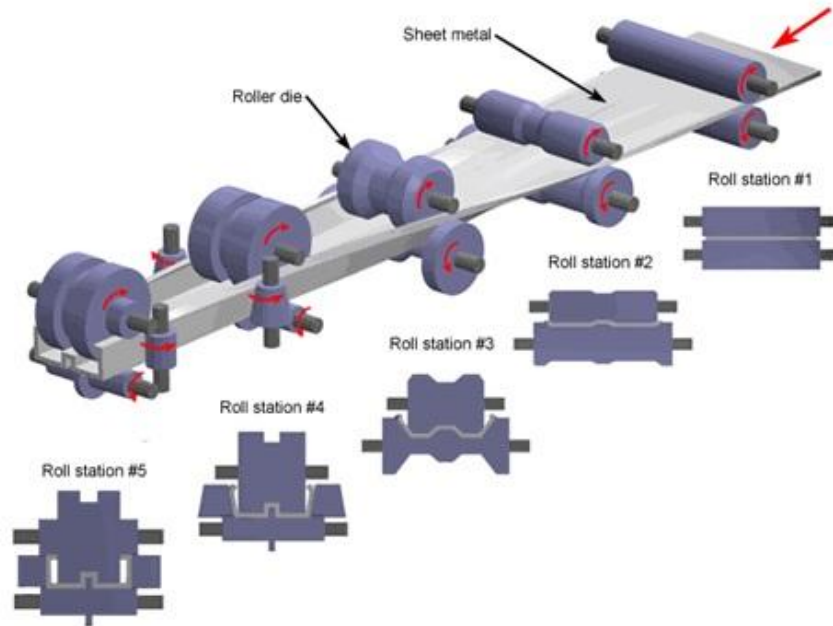
## V Bending



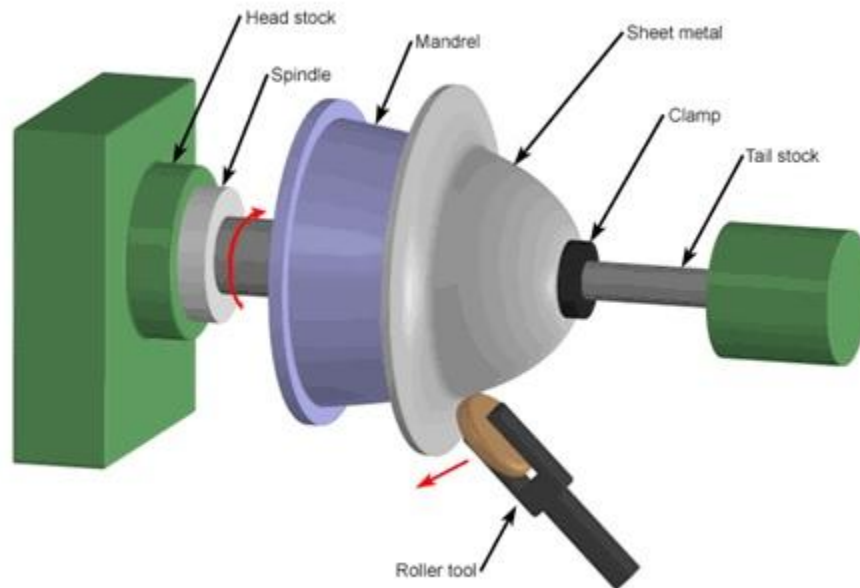
## Wipe Bending



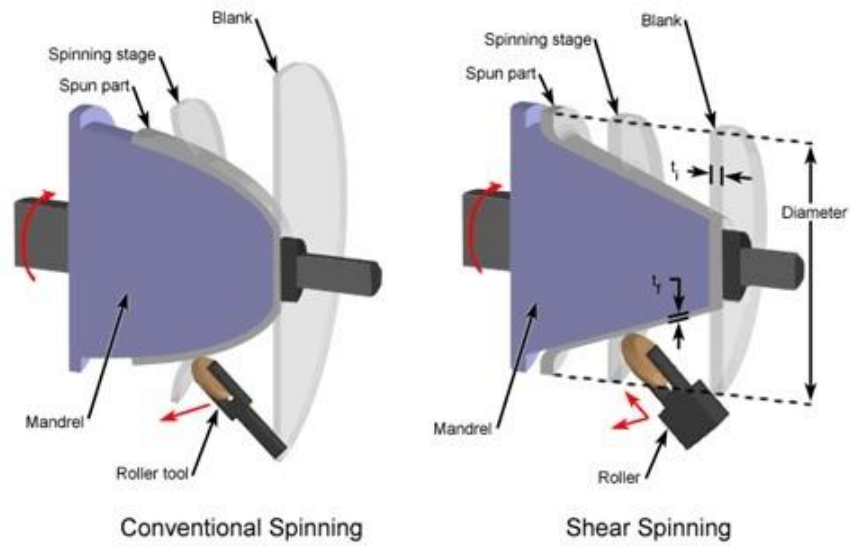
## Roll Forming



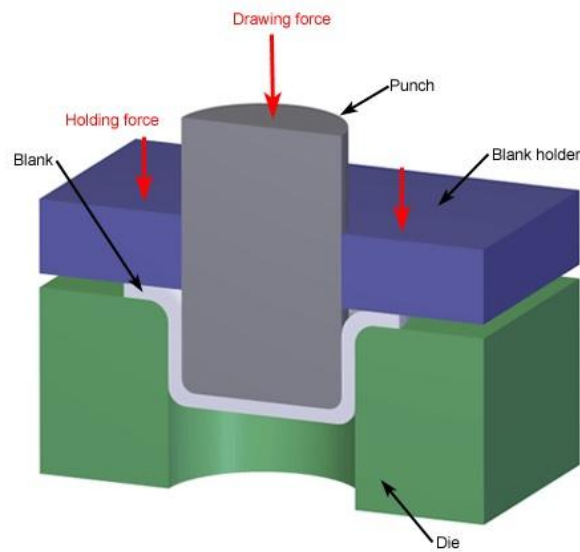
## Spinning Lathe

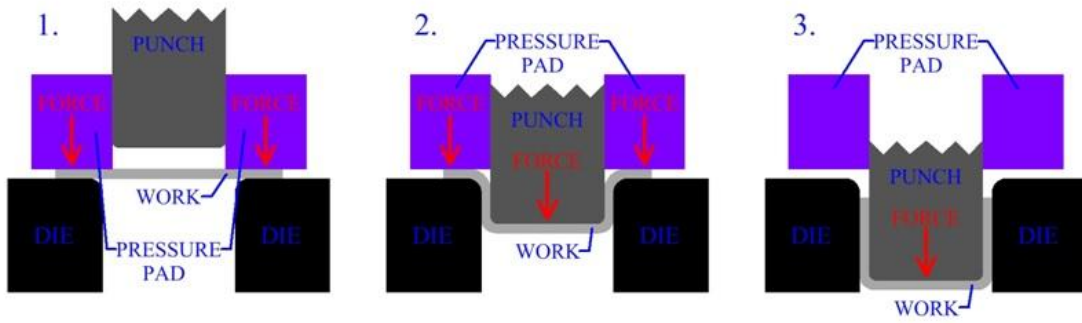
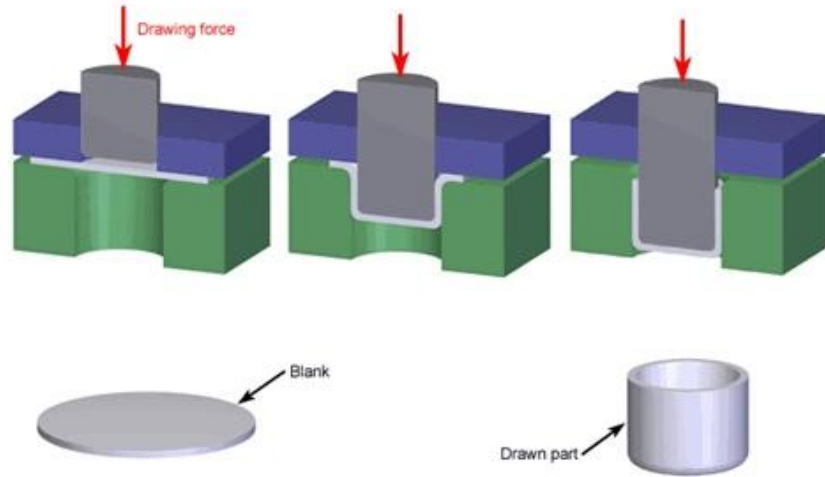


## Conventional Spinning vs. Shear Spinning

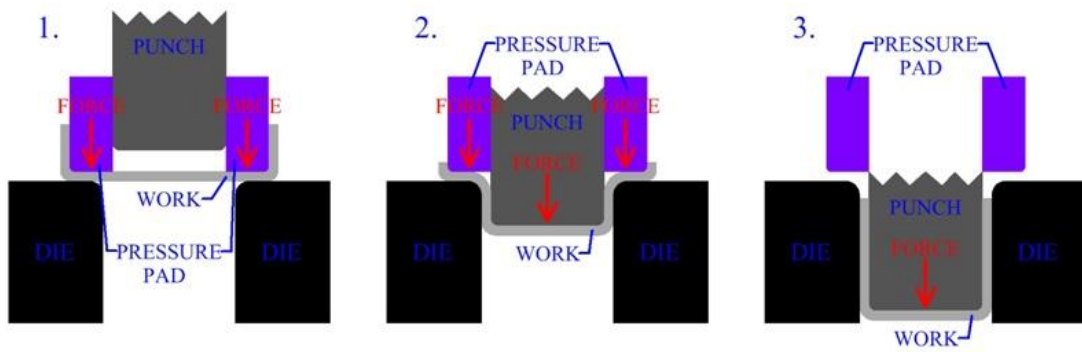


## Deep Drawing

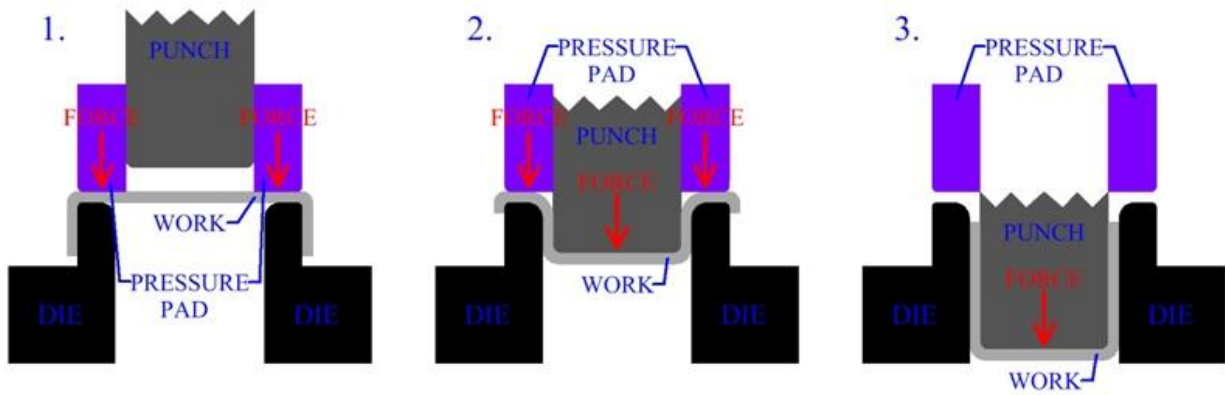




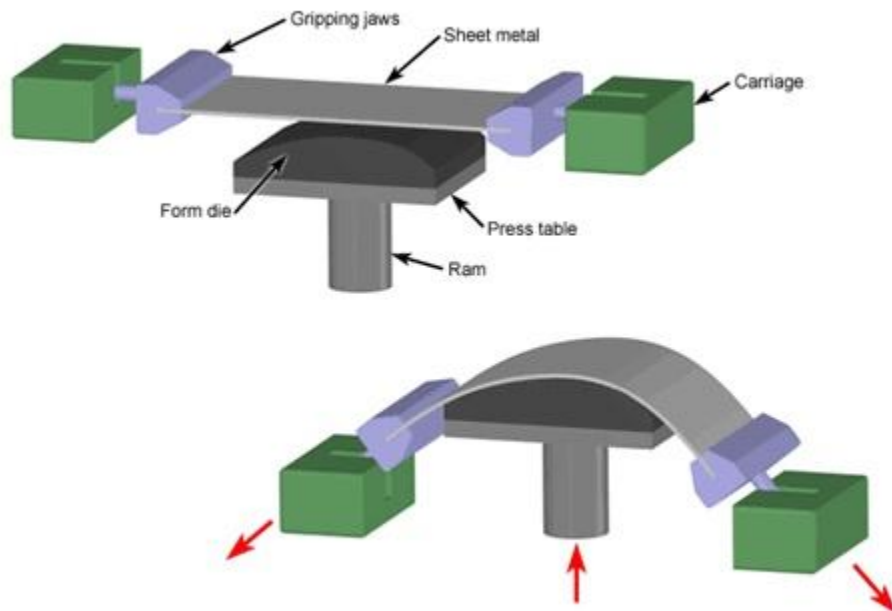
**Redrawing of Sheet Metal**



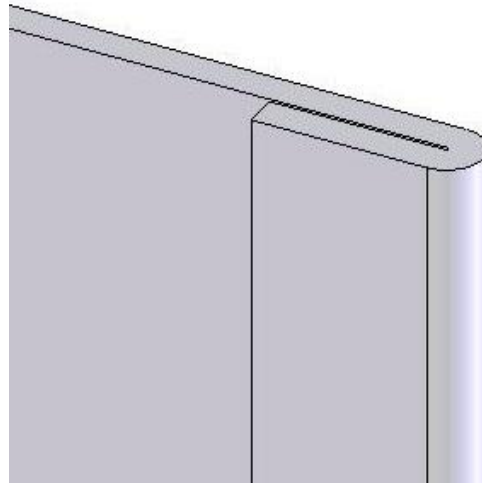
## Reverse Redrawing of Sheet Metal



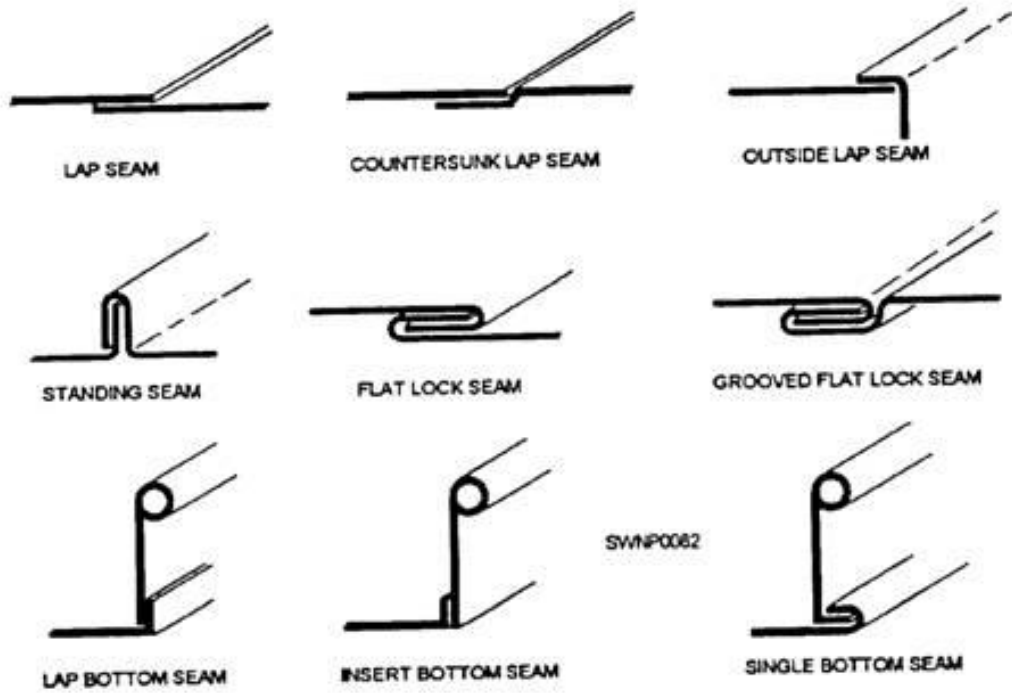
## Stretch Forming



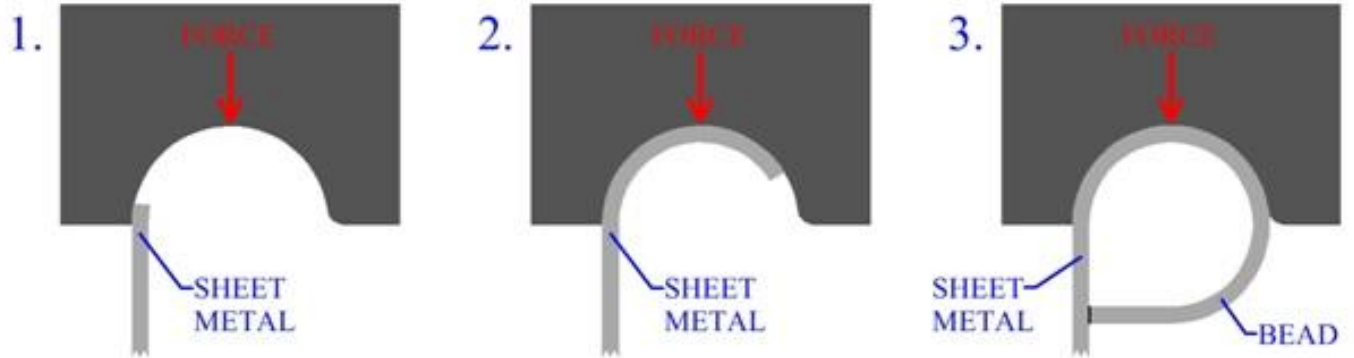
## Hemming



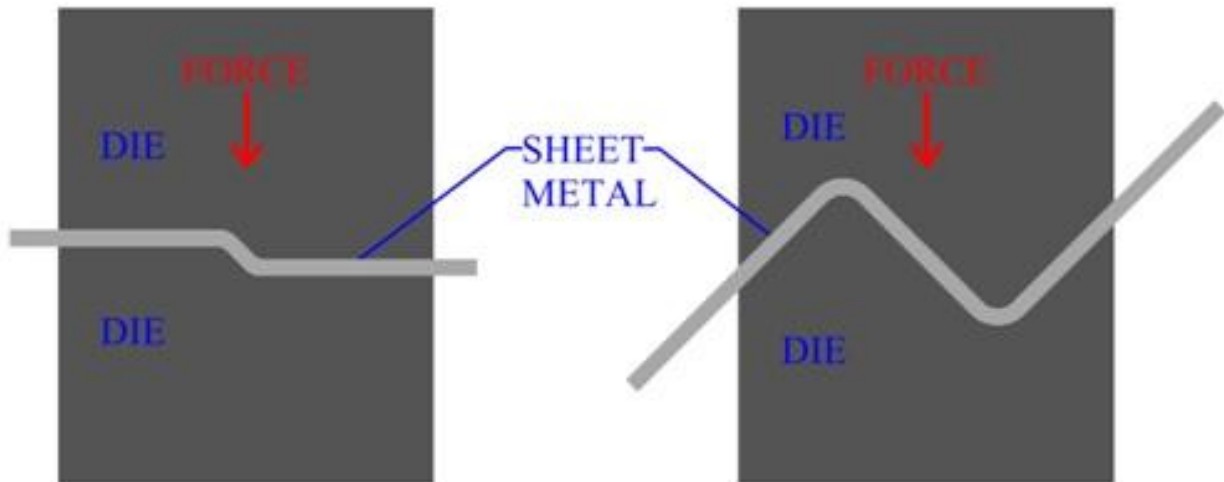
## Seaming



## Beading

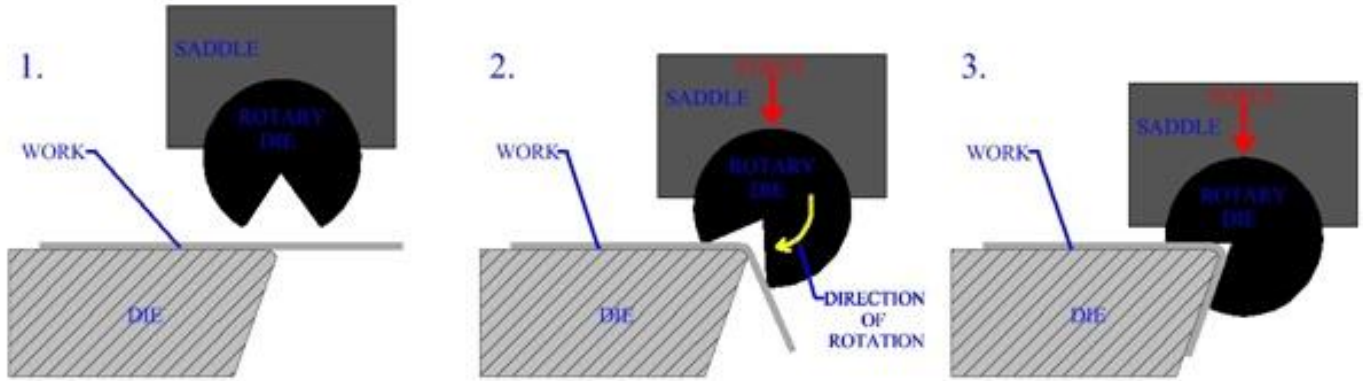


## Offset Bending

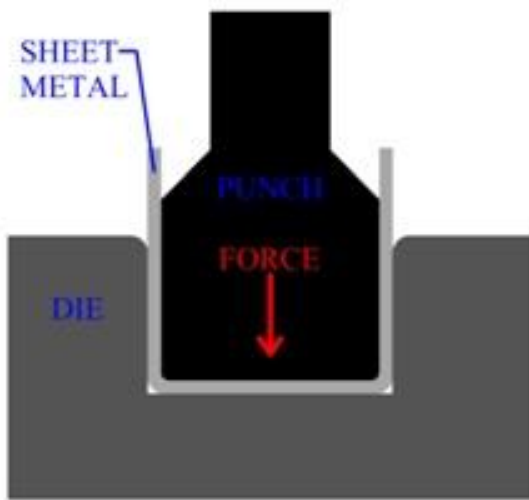




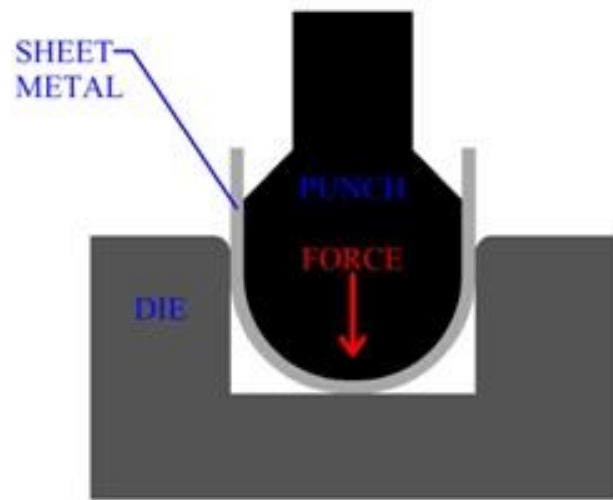
## Rotary Bending



## Channel Bending and U-Bending

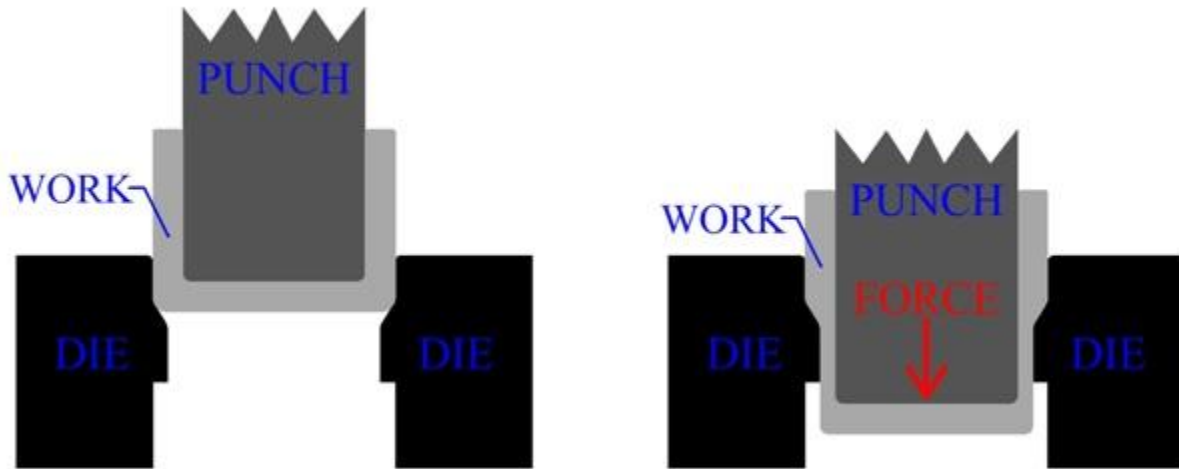


CHANNEL BENDING

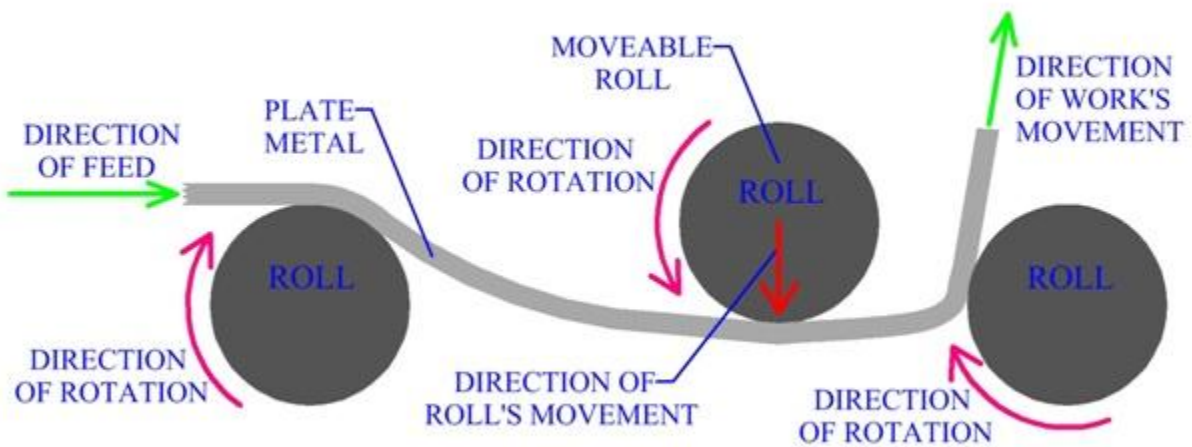


U BENDING

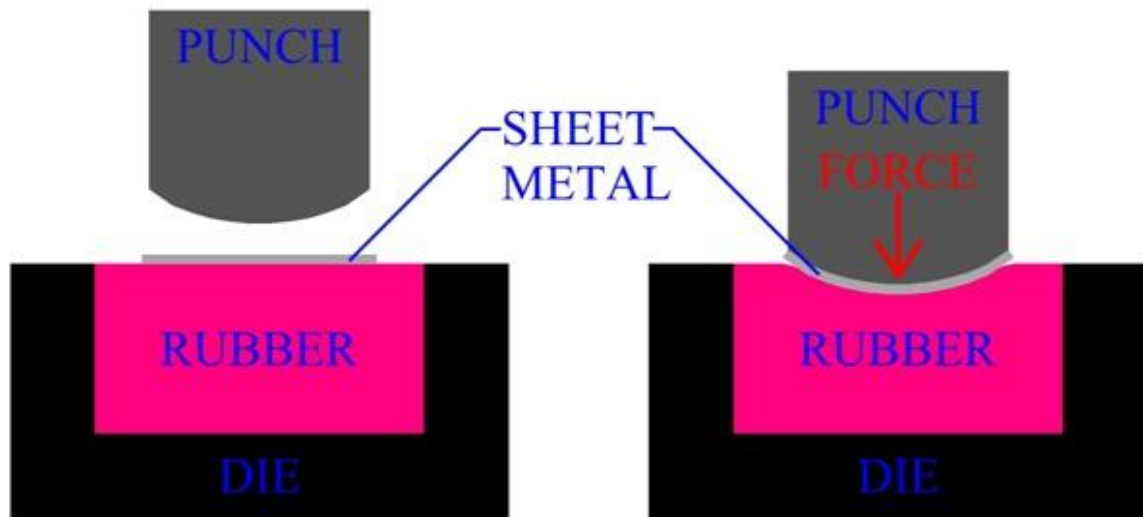
## Sheet Metal Ironing



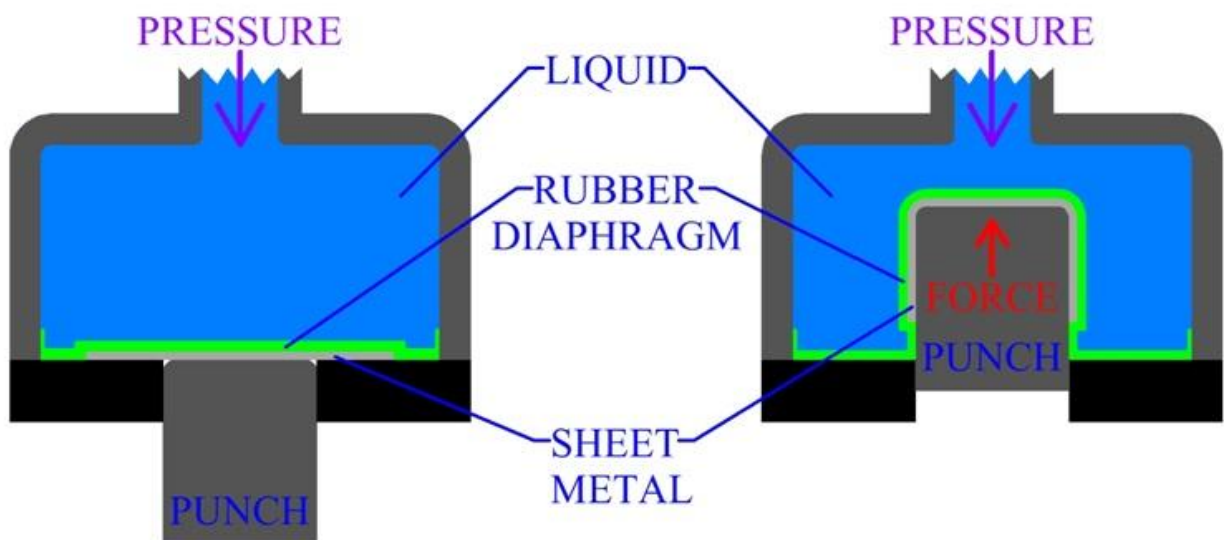
## Roll Bending



## Rubber Forming

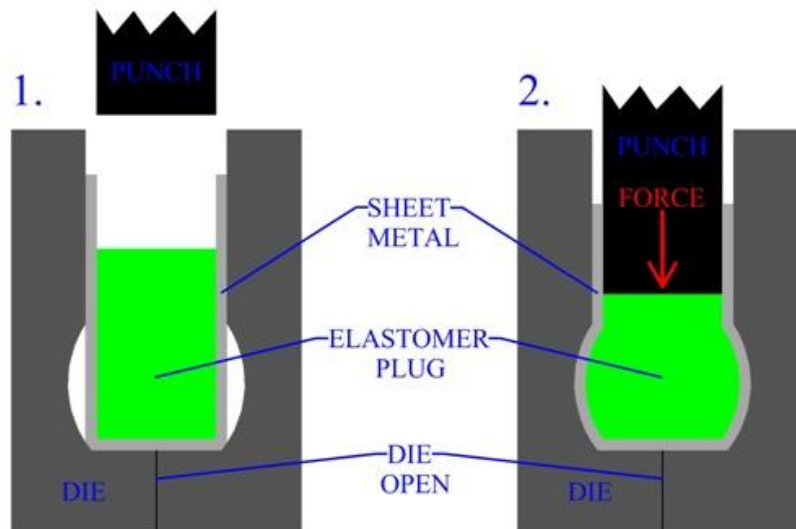


## Hydroforming

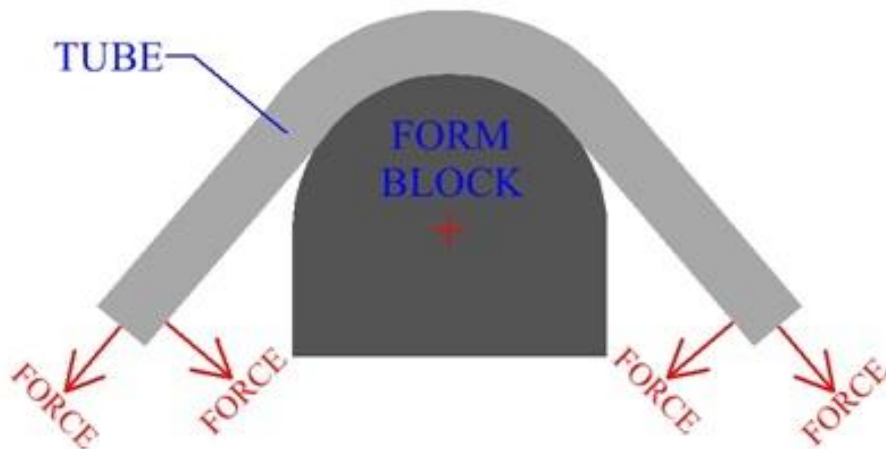


## METAL TUBE BENDING PROCESSES:

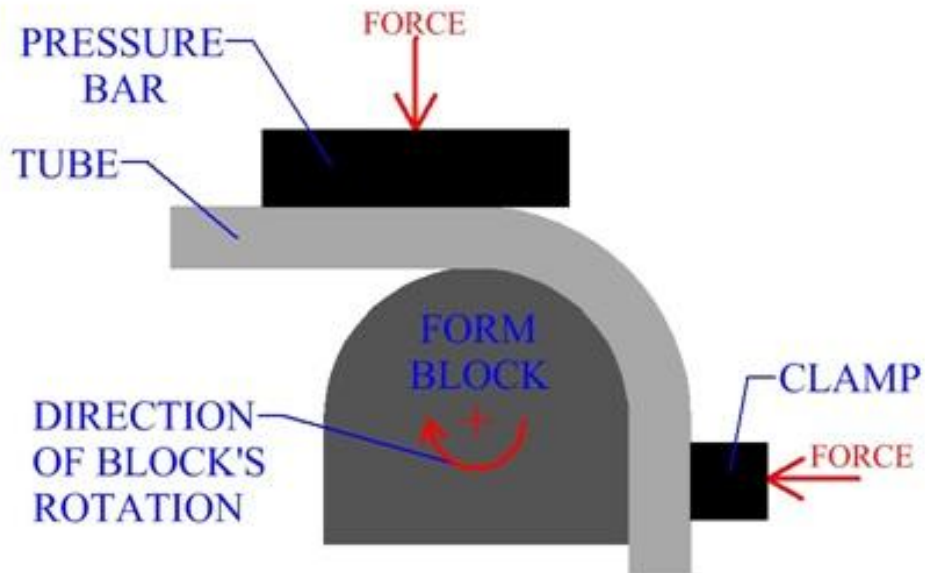
### Tube Bulging



### Tube Stretch Bending

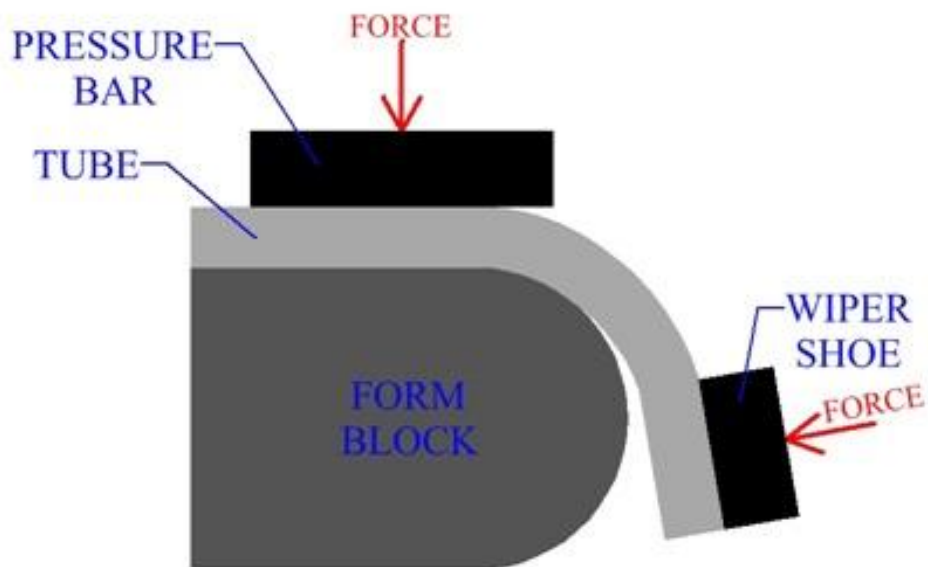


### Tube Draw Bending

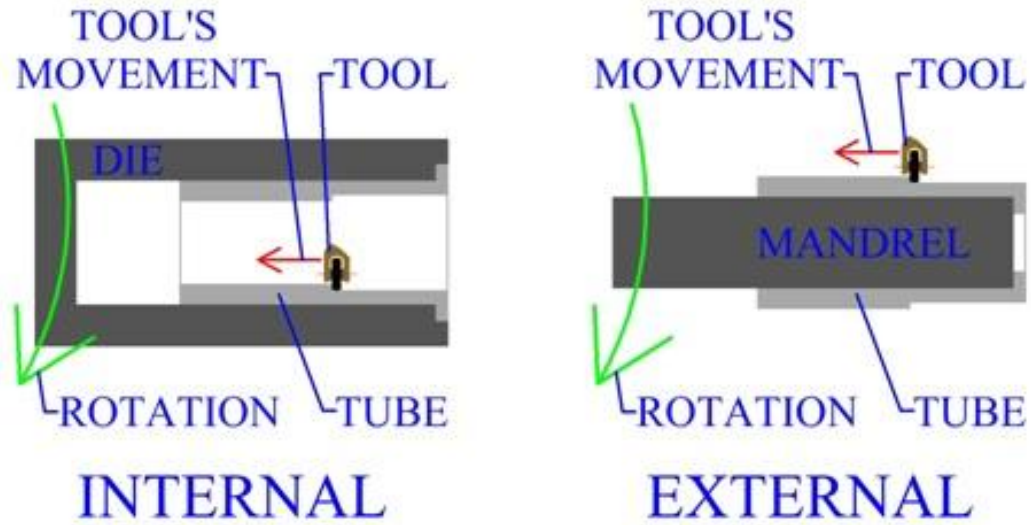


### Tube Compression Bending

## COMPRESSION BENDING

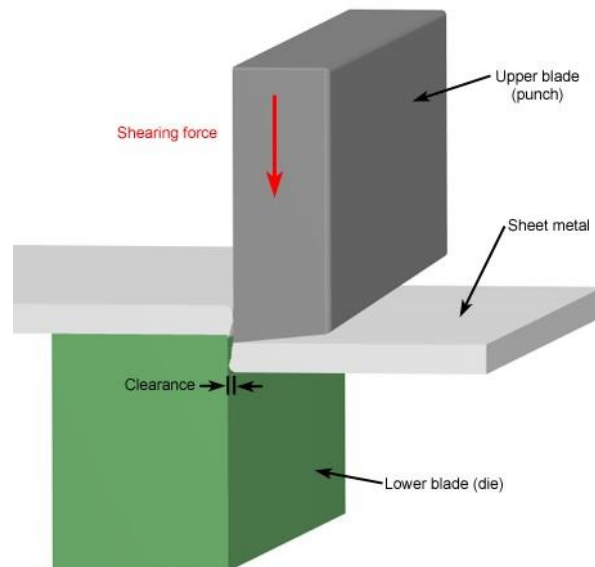


## Tube Spinning

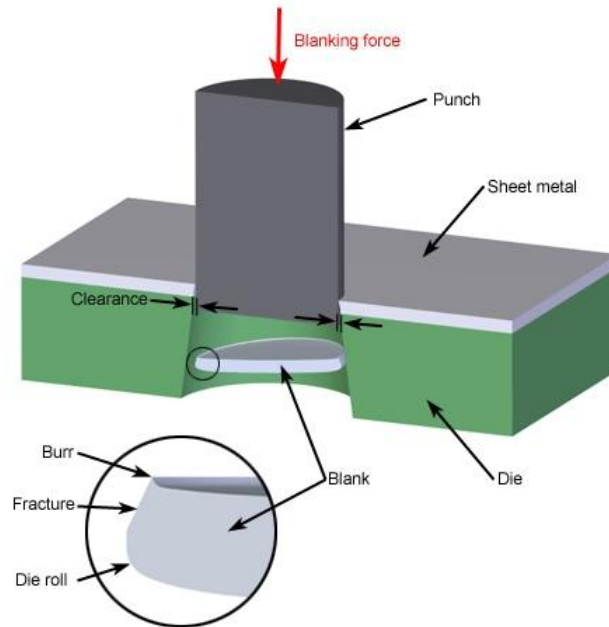


## SHEET METAL CUTTING OPERATIONS:

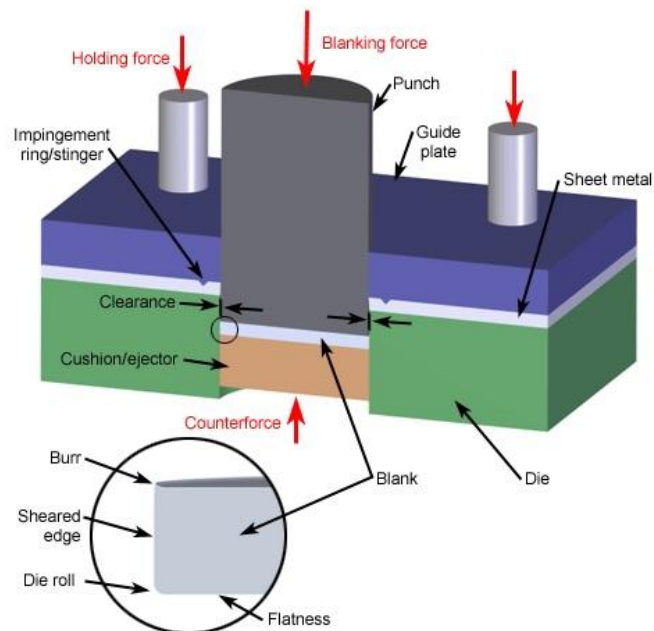
### Shearing



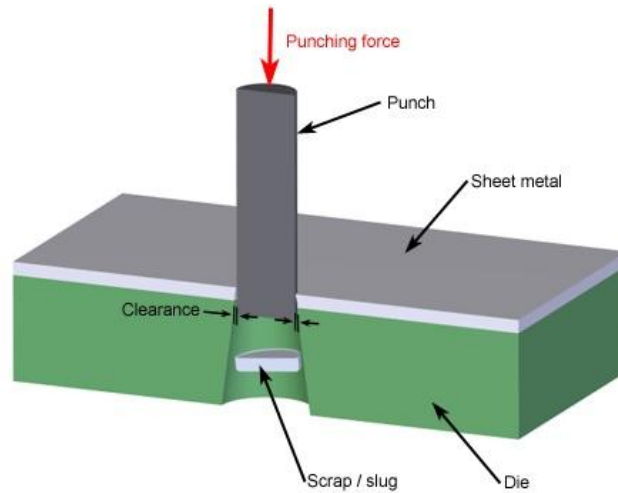
## Blanking



## Fine Blanking



## Punching



A typical punching operation is one in which a cylindrical punch tool pierces the sheet metal, forming a single hole. However, a variety of operations are possible to form different features. These operations include the following:

- Piercing - The typical punching operation, in which a cylindrical punch pierces a hole into the sheet.

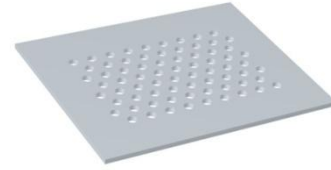


- Slotting - A punching operation that forms rectangular holes in the sheet. Sometimes described as piercing despite the different shape.





- Perforating - Punching a close arrangement of a large number of holes in a single operation.



- Notching - Punching the edge of a sheet, forming a notch in the shape of a portion of the punch.



- Nibbling - Punching a series of small overlapping slits or holes along a path to cutout a larger contoured shape. This eliminates the need for a custom punch and die but will require secondary operations to improve the accuracy and finish of the feature.



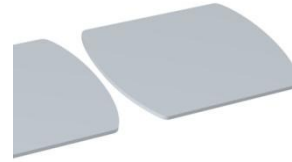
- Lancing - Creating a partial cut in the sheet, so that no material is removed. The material is left attached to be bent and form a shape, such as a tab, vent, or louver.



- Slitting - Cutting straight lines in the sheet. No scrap material is produced.



- Parting - Separating a part from the remaining sheet, by punching away the material between parts.



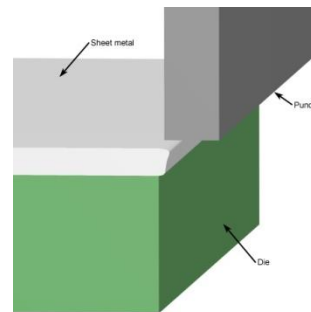
- Cutoff - Separating a part from the remaining sheet, without producing any scrap. The punch will produce a cut line that may be straight, angled, or curved.



- Trimming - Punching away excess material from the perimeter of a part, such as trimming the flange from a drawn cup.



- Shaving - Shearing away minimal material from the edges of a feature or part, using a small die clearance. Used to improve accuracy or finish. Tolerances of  $\pm 0.001$  inches are possible.



- Dinking - A specialized form of piercing used for punching soft metals. A hollow punch, called a dinking die, with beveled, sharpened edges presses the sheet into a block of wood or soft metal.

