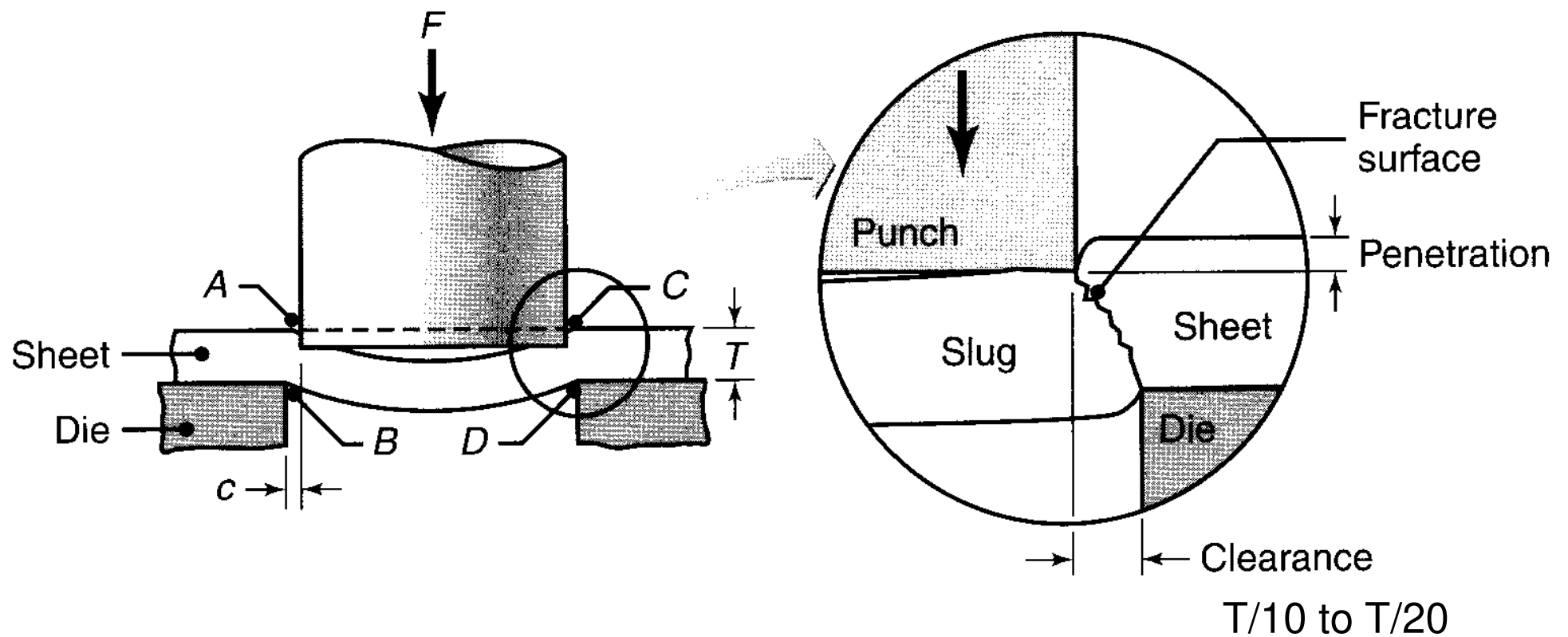


Sheet Metal Forming

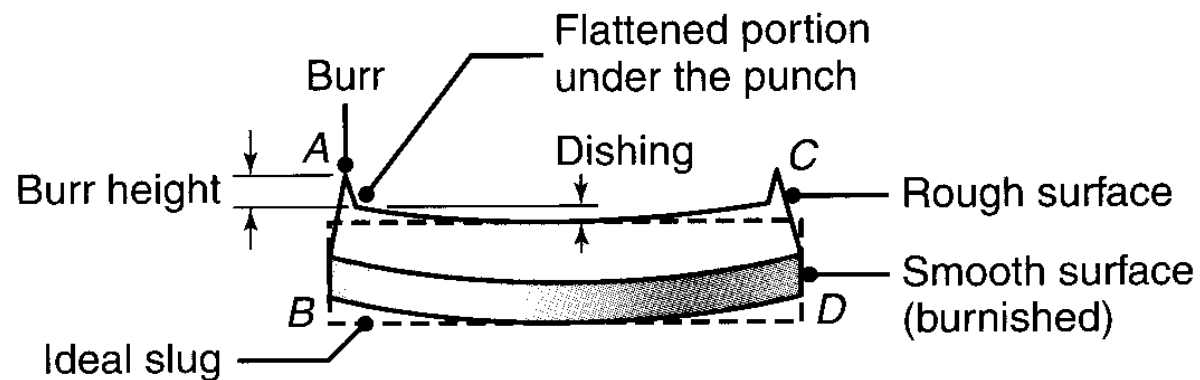
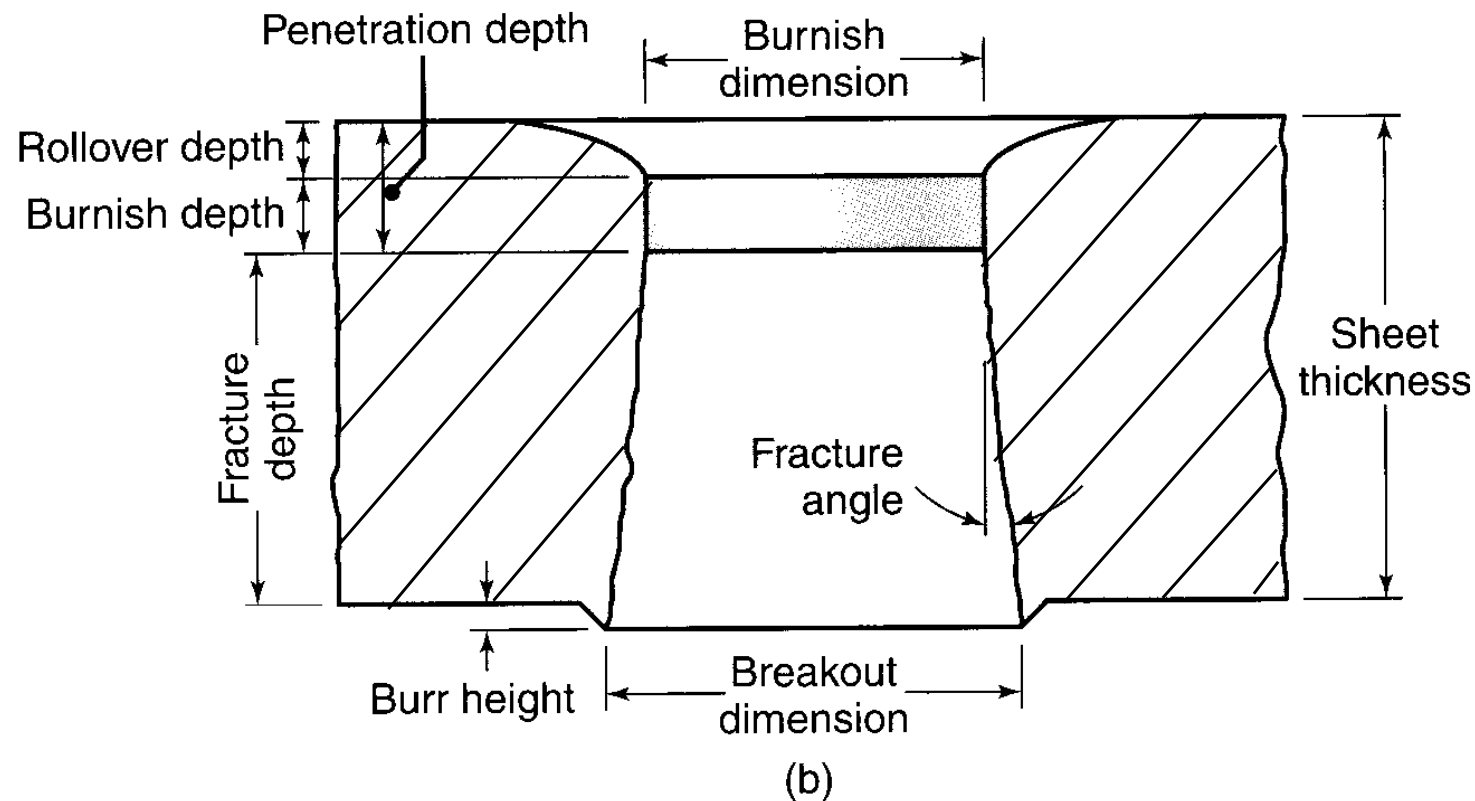
Shearing, spinning etc.

Shearing – material separation

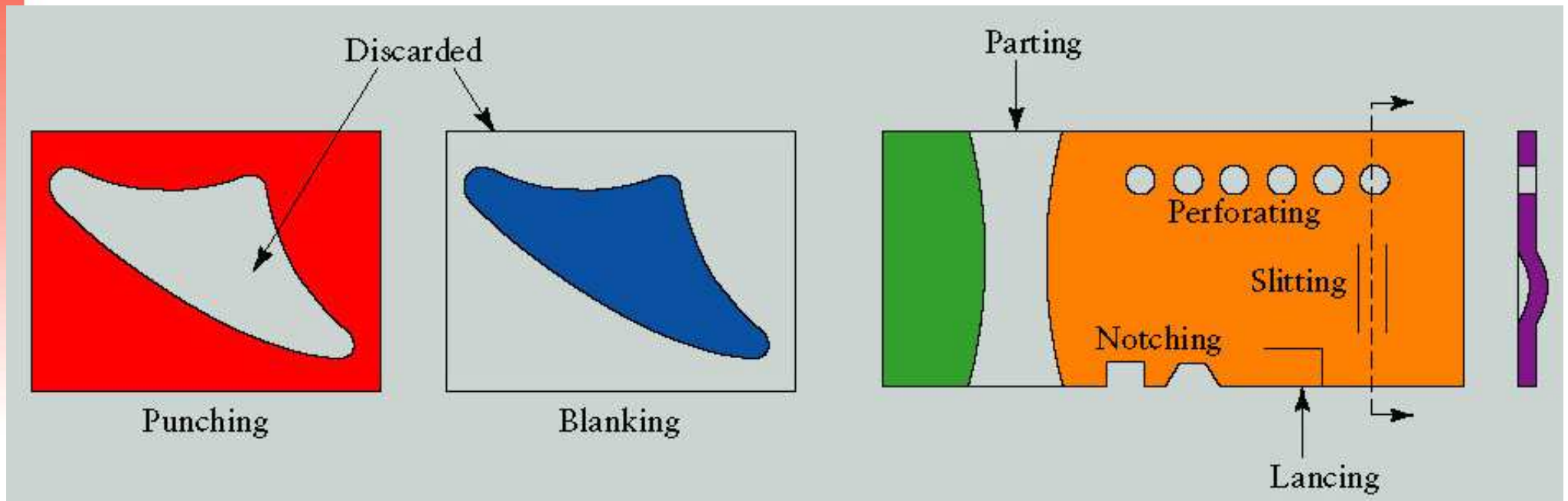


The hole is defined by the punch, the slug by the die !

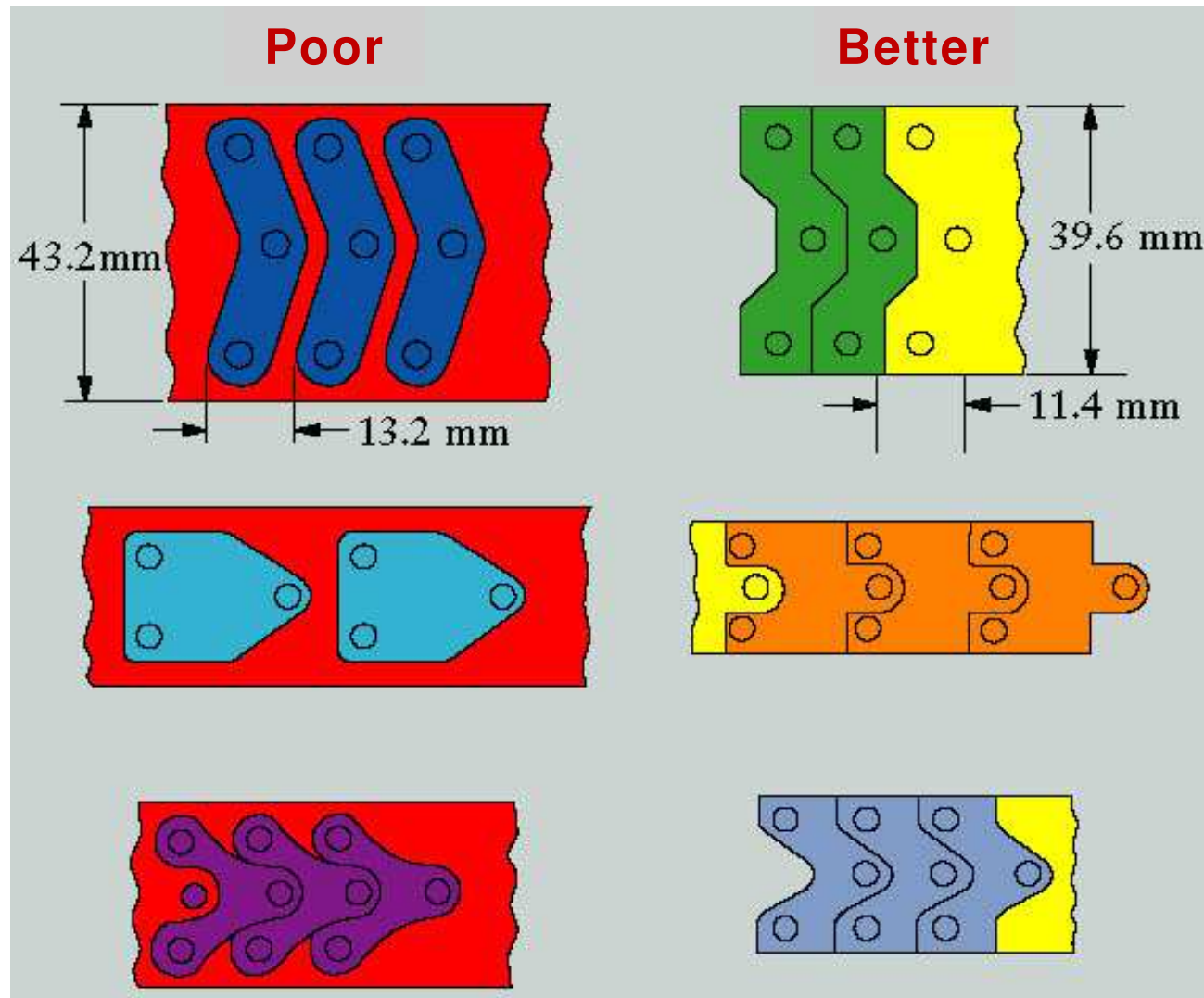
Shearing – punching and blanking



Shearing – punching, blanking etc.

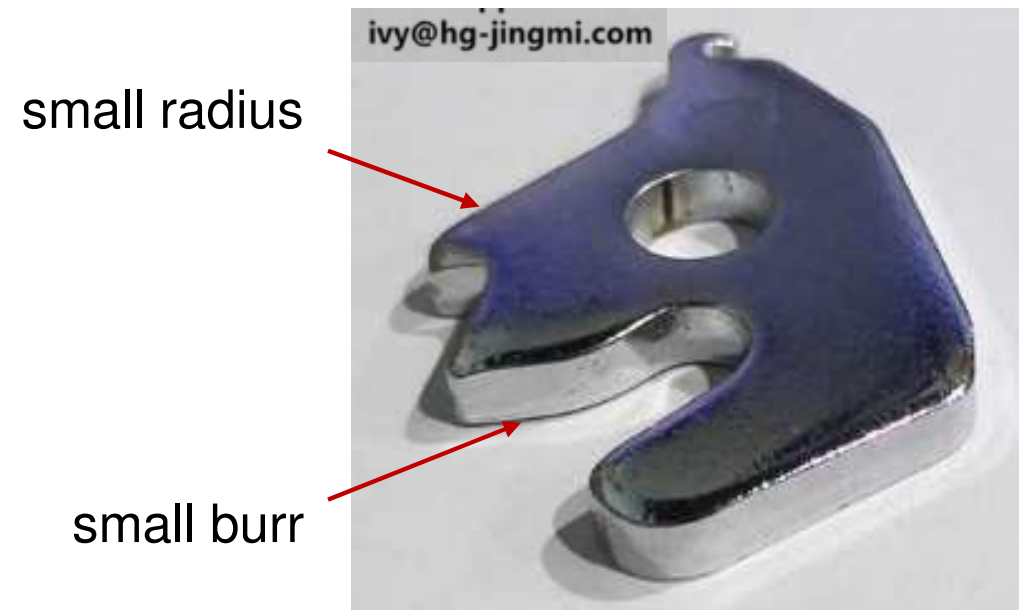
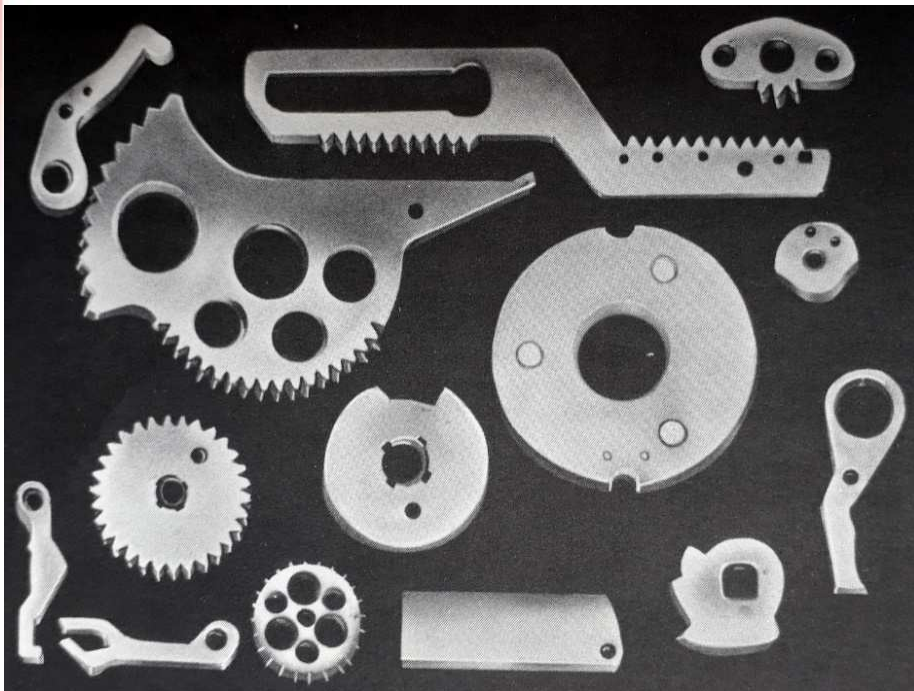
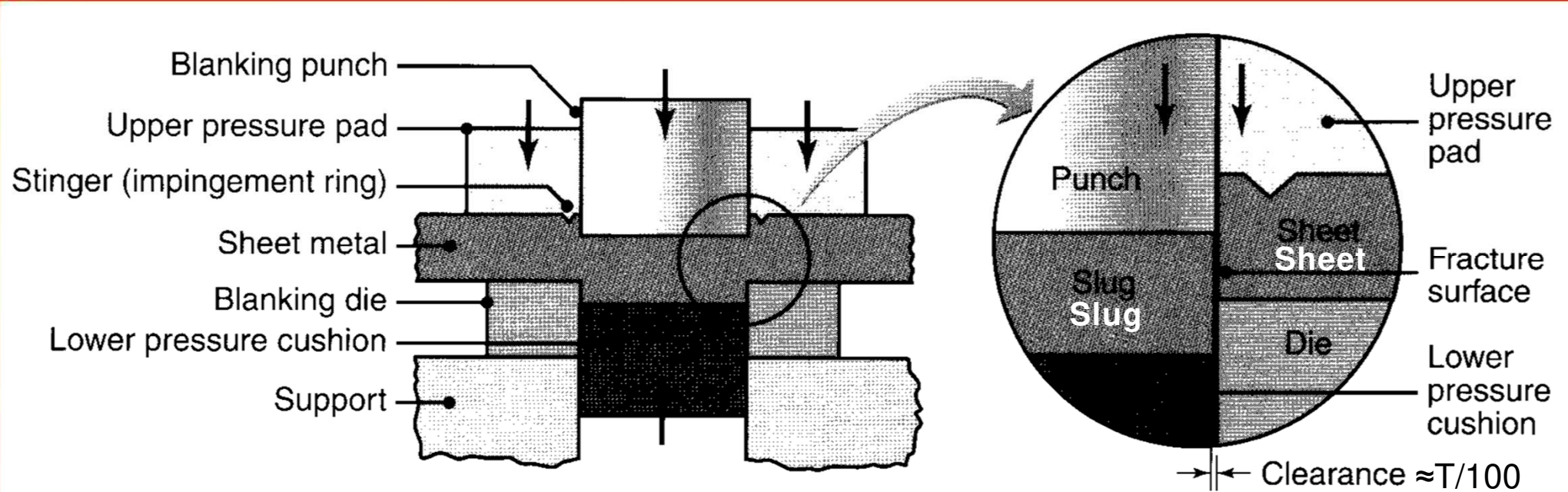


Efficient nesting of blanks



Optimal material utilization in blanking

Shearing – fine blanking



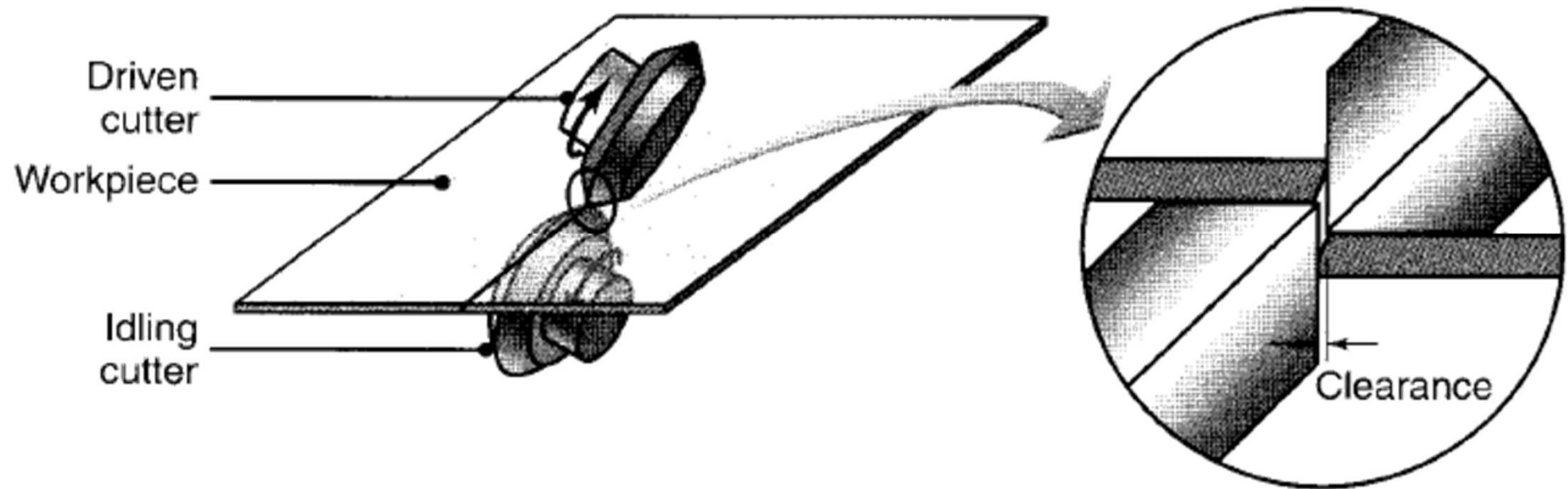
Shearing – fine blanking



The best quality houses are able to provide fine-blanking tolerances of $\pm 13 \mu\text{m}$.



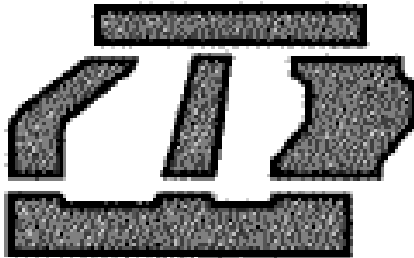
Shearing – Slitting with rotary knives



Cutting of strips from sheets or coils.

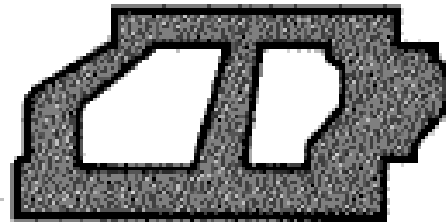
Shearing – Tailor welded blanks

Blanking;
laser cutting



1.

Laser welding



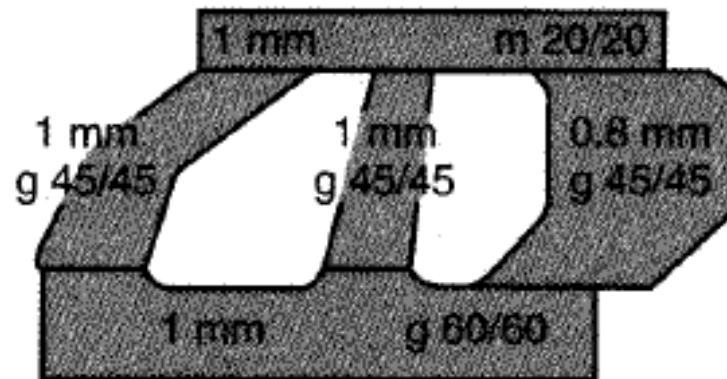
2.

Stamping

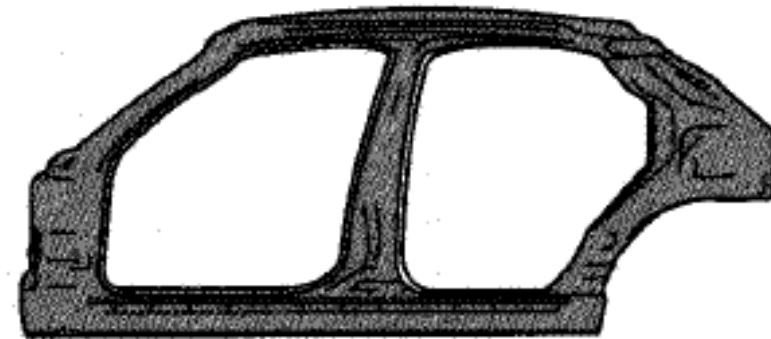


3.

Production of an outer side panel of a car body.

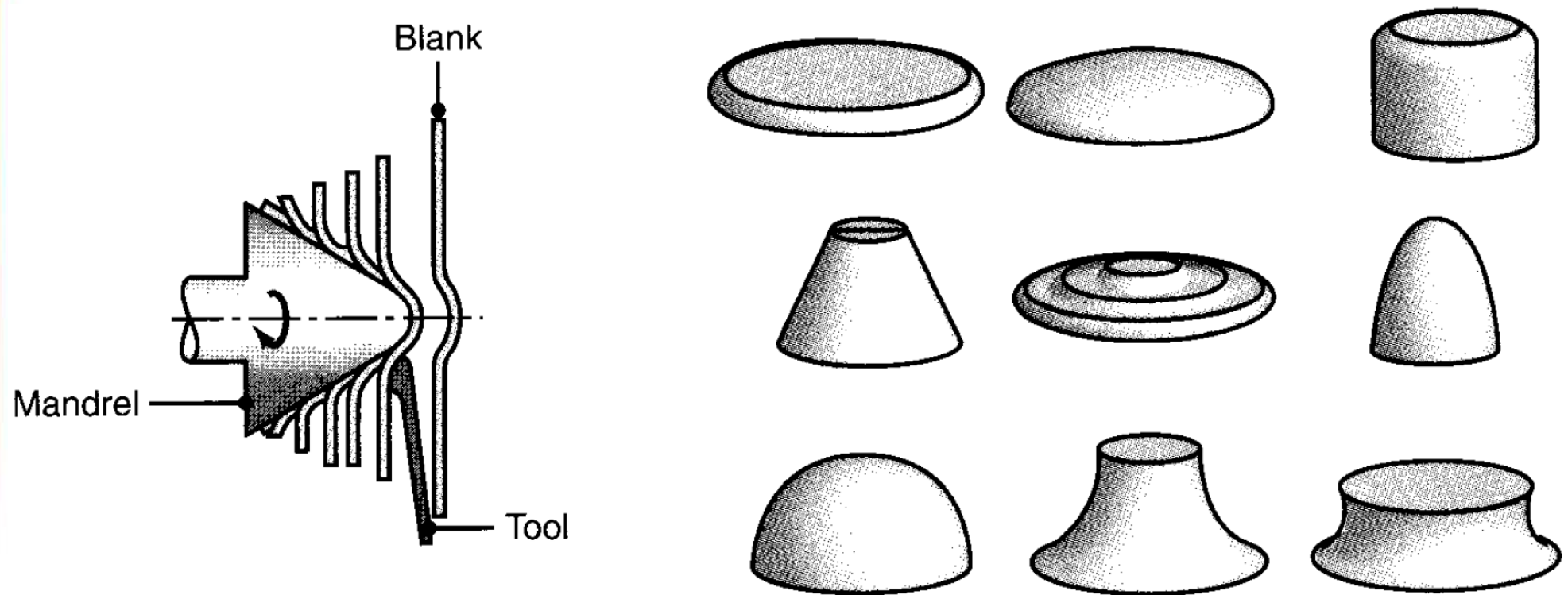


(b)



(c)

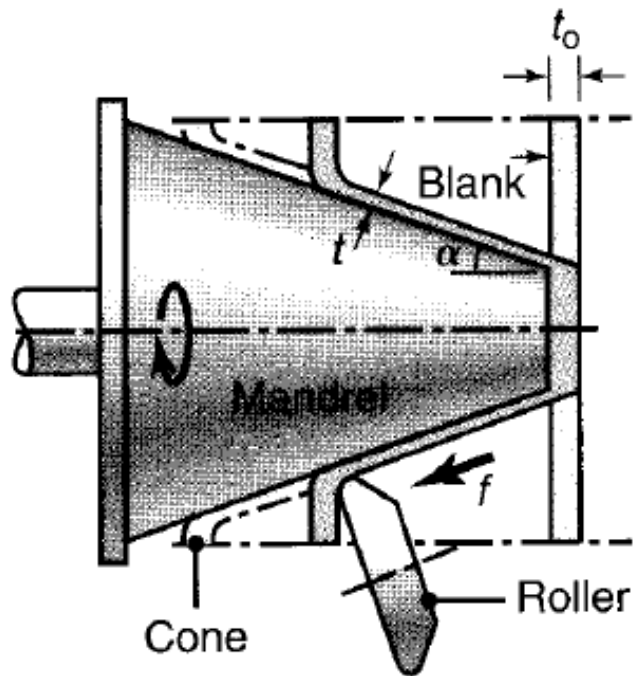
Spinning



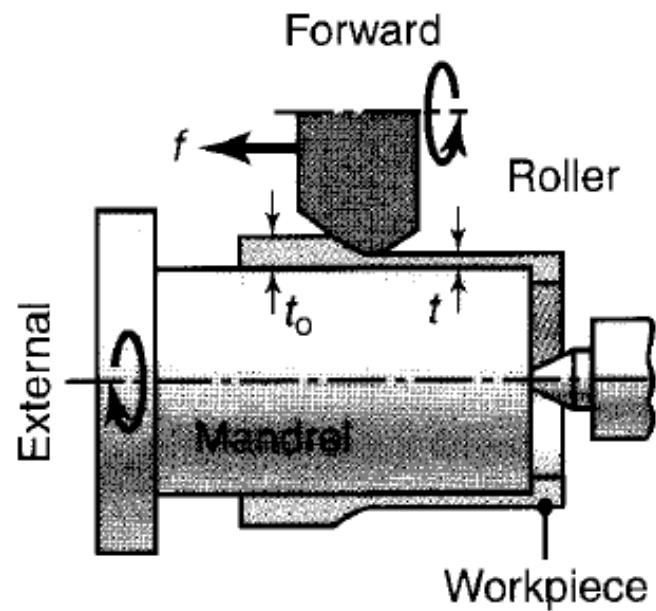
The wall thickness is about constant !

Spinning

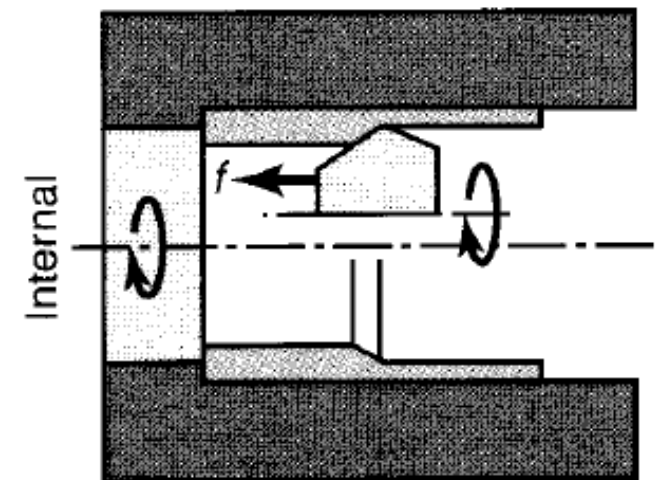
Shear-spinning



Tube-spinning

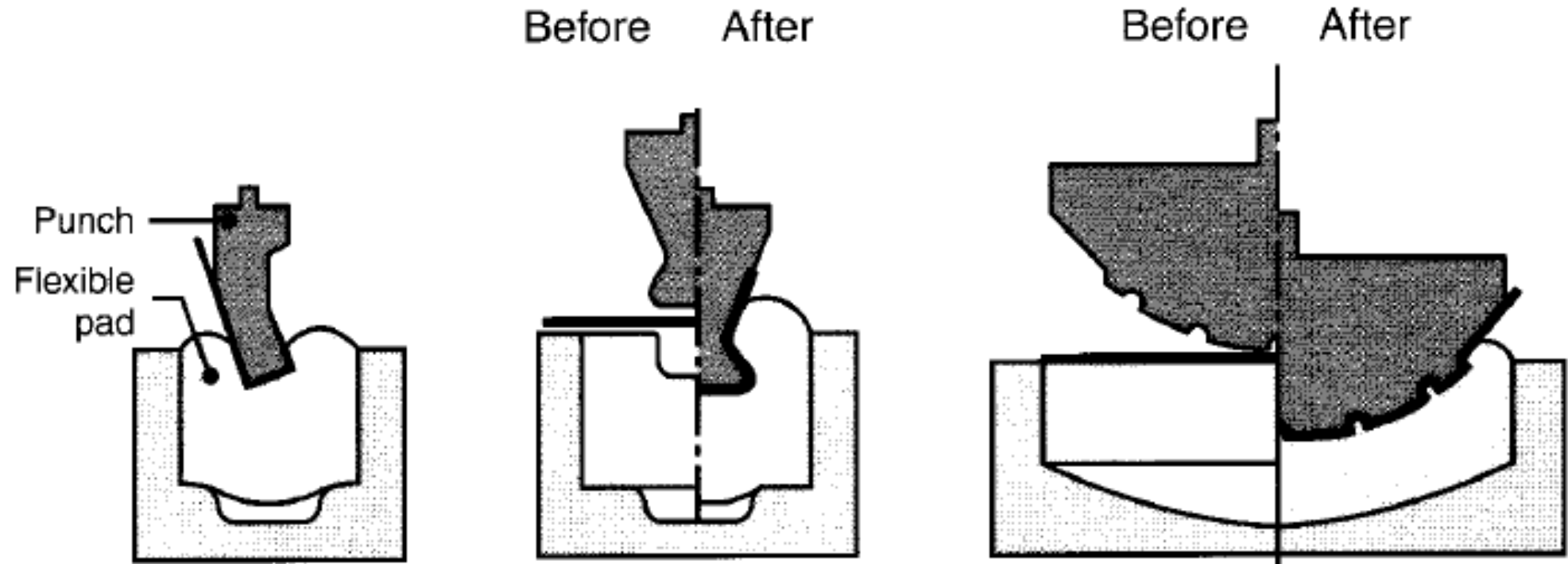


Backward



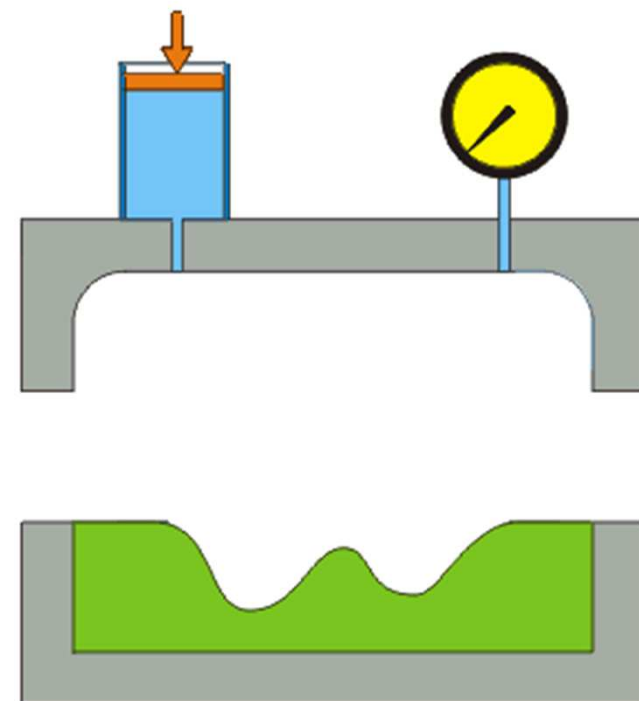
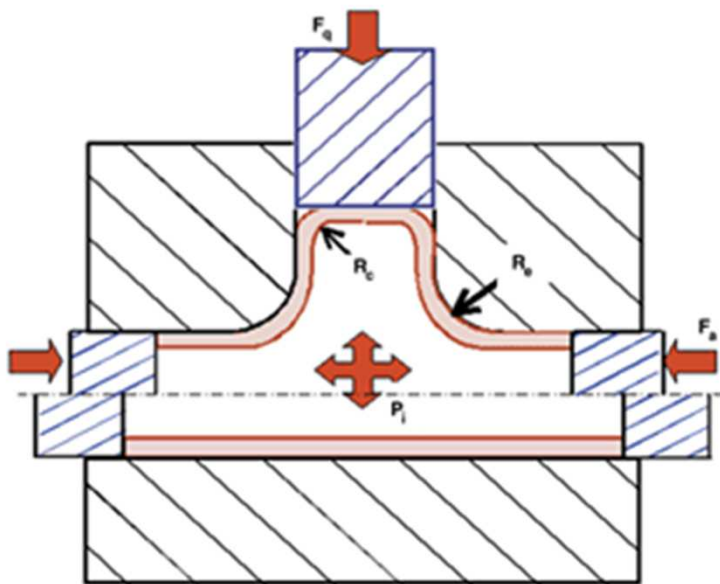
The wall thickness is reduced !

Rubber forming



The outer surface of the sheet is protected from damage or scratches: no contact with a hard metal surface during forming.

Hydroforming



Thank you for your attention!