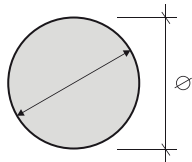


COMPUTE TONNAGE FOR PUNCHING

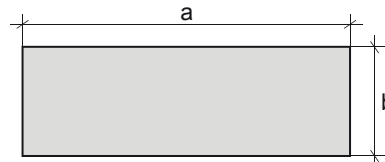
$$\text{Ton} = P \times E \times D$$

Ton = Required tons for punching
P= Perimeter of the hole to be done
E= Material thickness
D= Material hardness in Kg/mm²

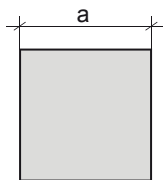
(P) PERIMETER OF MOST COMMONLY USED HOLES



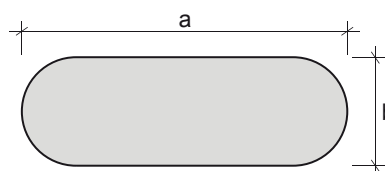
$$P = \pi \times \text{Ø}$$
$$\pi = 3,1416$$



$$P = 2 \times a + 2 \times b$$



$$P = 4 \times a$$



$$P = (\pi \times b) + 2 \times (a - b)$$

(D) MATERIAL HARDNESS IN Kg/mm² (N/mm²)

Aluminum	30 Kg/mm ² (300 N/mm ²)
Brass	25 Kg/mm ² (250 N/mm ²)
Copper	22 Kg/mm ² (220 N/mm ²)
Mild steel	45 Kg/mm ² (450 N/mm ²)
Stainless steel	85 Kg/mm ² (850 N/mm ²)

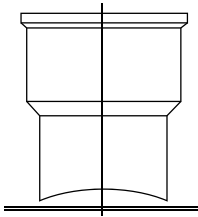
Approximate average values

EXAMPLE

Ø = Punch 18 mm
E = 10 mm
D = Mild steel 45 Kg/mm²

$P = \pi \times \text{Ø}$
 $P = 3,1416 \times 18$
 $P = 56,54 \text{ mm}$
 $\text{Ton} = P \times E \times D / 1000$
 $\text{Ton} = 56,54 \times 10 \times 45 / 1000$
 $\text{Ton} = 25,44 \text{ tons}$

IMPORTANT



- In case the machine tonnage does not allow making the hole, there is the possibility of buying sloped cut punches. Resistance of material while punching is much lower.
- The diameter of the hole to be made must be always bigger than the material thickness to avoid any possible breakages. E.g.: With a 10mm punch we cannot punch a 15mm thickness sheet, on the other hand we could punch 10mm metal sheet with a 15mm diam.