

Compute tonnage for punching

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

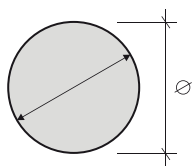
Ton = Required tons for punching

P= Perimeter of the hole to be done

E= Material thickness

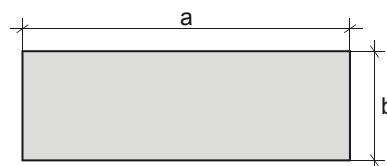
D= Material hardness in Kg/mm²

(P) Perimeter of most commonly used holes

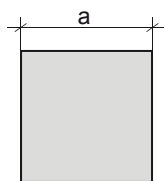


$$P = \pi \times \varnothing$$

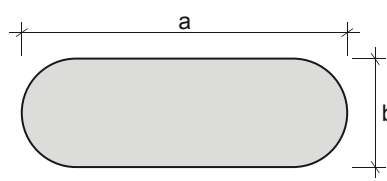
$$\pi = 3,1416$$



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



$$P = 4 \times a$$



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

(D) Material hardness

Aluminio	30 Kg/mm ² (300 N/mm ²)
Latón	25 Kg/mm ² (250 N/mm ²)
Cobre	22 Kg/mm ² (220 N/mm ²)
Hierro	45 Kg/mm ² (450 N/mm ²)
Inox	65 Kg/mm ² (850 N/mm ²)

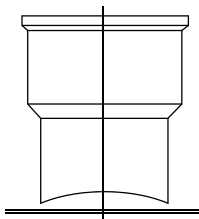
Approximate average values

Example

$\varnothing = \text{Punch } 18 \text{ m}$
 $E = 10 \text{ mm}$
 $D = \text{Mild steel } 45 \text{ Kg/mm}^2$

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

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.