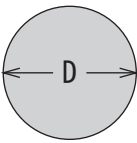
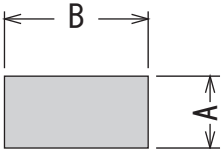


TECHNICAL INFORMATION

CALCULATE PUNCHING FORCE (TONNAGE)

Tonnage capacity is different depending on machines.
Use the calculation formula below to prevent from over tonnage.

$$\text{Tonnage (ton)} = \frac{\text{Circumference (mm)} \times \text{Material thickness (mm)} \times \text{Shear resistance (kg/mm}^2\text{)}}{1000}$$

Circumference	
Round	Shaped
Diameter x 3.14	(Length dimension + Width dimension) x 2
	
Circumference = D x 3.14	Circumference = (A + B) x 2

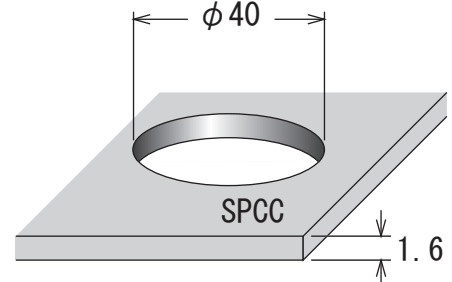
Shear resistance by material

Material	Shear resistance (kg/mm ²)
Mild Steel	26~35
SS400	33~42
Stainless Steel	52~56
Aluminum	7~16
Copper	18~30
Brass	22~40

<Calculation example>

The tonnage when piercing Φ40 to Mild Steel T=1.6mm.

$$\frac{40 \times 3.14}{\text{Circumference}} \times \frac{1.6}{\text{Material thickness}} \times \frac{35}{\text{Shear resistance}} \div 1000 = 7 \text{ (ton)}$$



CALCULATE TONNAGE WITH SHEAR

Tonnage with shear = tonnage without shear x shear coefficient

- If height of shear is lower than sheet thickness.

Shear coefficient = 0.5

- If the height of shear is higher than sheet thickness

Shear coefficient = $1 - 0.5 \times \frac{\text{height of shear}}{\text{sheet thickness}}$

