



$$\sigma = \frac{mg}{A} = \frac{mg}{TW}$$

$$A = (2 \times 10^{-3} \text{ m}) (3 \times 10^{-2} \text{ m})$$

$$A = 6 \times 10^{-5} \text{ m}^2$$

$$mg = (100 \text{ kg}) (10 \text{ m/s}^2) = 1000 \text{ N} = 1 \times 10^3 \text{ N}$$

$\sigma > Y \Rightarrow$ plastic deformation

$$\frac{mg}{TW} > Y$$

$$\sigma = \frac{1 \times 10^3 \text{ N}}{6 \times 10^{-5} \text{ m}^2} = \frac{1}{6} \times 10^8 \text{ Pa}$$

$$= \frac{1}{6} \times 10^2 \text{ MPa}$$

$$= \frac{100}{6} \text{ MPa}$$

$$\approx 17 \text{ MPa}$$

$$\underline{17 \text{ MPa} < 40 \text{ MPa}}$$

plastic deformation
not expected