

Learner Resource 3 Breaking stress

- Carefully cut a strip of aluminium foil that is about 1.0 cm wide and 15 cm long.
- Use a test strip clamp (for example SciChem catalogue number XPS130010) to secure both ends of the strip.
- Secure one end to a clamp rod and hang a 100 g holder from its bottom end: see Figure 3.
- Use a micrometer screw gauge to measure the average thickness d of the strip. Also record the absolute uncertainty.
- Use a plastic ruler to measure the average width of the strip. Also record the absolutely uncertainty.
- Carefully add 100 g slotted masses until the strip snaps.
- Record the mass M when the strip snapped.
- Calculate the breaking force F for the strip using $F = Mg$.
- Calculate the cross-sectional area A of the strip. Include the percentage uncertainty in A .
- Determine the breaking stress for material (aluminium) of the foil. Include the percentage uncertainty.

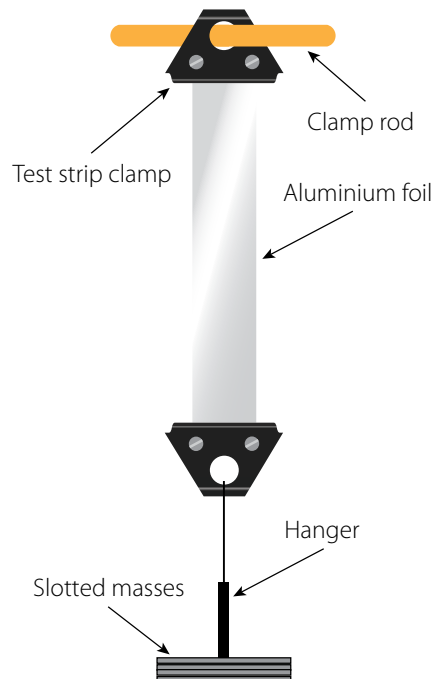


Figure 3

Drawing conclusions:

- The breaking stress for aluminium is about 90 MPa according to one data book.

What is the percentage difference between your value and this value?

How reliable is your experimental value for the breaking stress?

