NEATH PORT TALBOT COLLEGE
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School of Maths & Science
Science Practical

To find the breaking stress of glass

◆ **Aim**

To determine the breaking stress of a glass fibre.

◆ **Introduction**

You will produce a long, thin glass fibre from a piece of glass rod. You will then load the fibre until it breaks. From measurements of the diameter of the fibre and the load required to break it you will calculate the breaking stress.

◆ **Safety**

Control Measures
- You are reminded of the need of good laboratory practice in order to maintain a safe working environment.
- Wear safety goggles and lab coats.

Hazards

General Hazard	Make sure that the retort stand is securely fastened to the bench using a G – clamp. Make sure that the loads are added slowly and at arms length.
	Place mats on the floor to catch the masses when the fibre breaks.
	Take care – the fibre becomes very hot and should be allowed to cool completely before handling.
	Do not handle broken glass, call your tutor or laboratory technician.

◆ **Apparatus Required**

Bunsen burner; heat proof mats; tongs; retort stand and clamp; G – clamp; masses and holders; micrometer; 20cm piece of soda glass.

◆ **Procedure**

1. Your tutor will show you how to produce a long glass fibre. Watch carefully!

2. The rod will be heated in the Bunsen Burner flame and when it is sufficiently heated it will be drawn into a long fibre.

3. Care must be taken to allow the fibre to cool completely before the next stage.

4. When cool, suspend the glass fibre vertically from a retort stand and clamp. Load the fibre until it breaks. Record the breaking load.
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5. Measure carefully the diameter of the thread where it is fractured.
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6. Calculate the breaking stress of the glass from:

$$\text{Breaking stress} = \frac{\text{Load to fracture}}{\text{Cross sectional area}}$$

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