Materials

1 Bulk Properties of solids

Hooke's law - Force is directly proportional to extension, provided the proportionality limit has not been reached

1.1 Spring constant

1.1.1 Series

$$Spring\; constant = \frac{Spring\; constant\; of\; one\; spring}{Number\; of\; springs}$$

1.1.2 Parallel

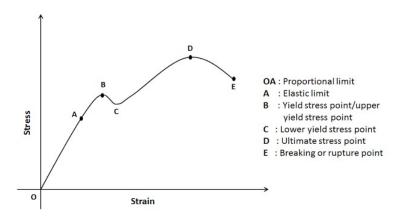
Spring constant=Spring constant of one spring \times Number of springs

1.2 Material properties

Brittle material - Snap Ductile material - Stretch

Plastic Behaviour - The behaviour of a material after it has reached it's elastic limit

1.3 Stress strain graph of a metal wire



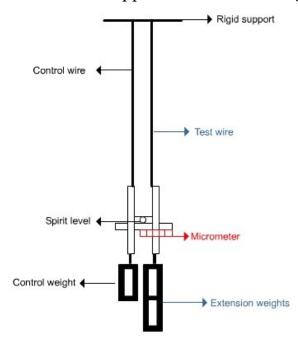
2 The Young Modulus

The **gradient**of a stress strain graph is the Young Modulus

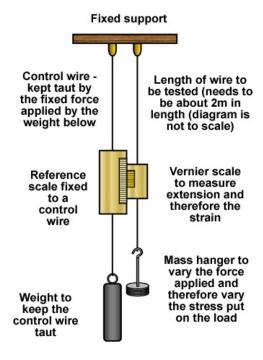
Units of Young Modulus: Nm⁻² or Pa

Stiff Material - High Young Modulus Flexible Material - Low Young Modulus

2.1 Searle's apparatus for measuring Young's Modulus

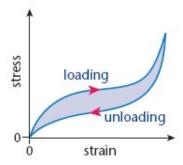


2.2 Vernier apparatus for measuring Young's Modulus

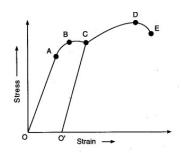


3 Stress Strain Graphs

3.1 Rubber



3.2 Metal



3.3 Polythene

