**STIFFNESS - BENDING AND TORSION**

Bench-mounting apparatus enabling a variety of investigations into material stiffness

**KEY FEATURES**

- Compact, bench-mounting frame that holds parts for different experiments in stiffness of materials
- Allows investigations into stiffness in bending of beams of different materials and cross-section
- Easy to use precision parts and instruments for accurate, repeatable and reliable results
- Simple, rugged, long-lasting and trouble-free parts
- Gives clear, straightforward and effective demonstrations of beam behaviour
- The standard TE16 kit includes test beams of different materials and cross-section
- Optional additional kits (TE16a and TE16b) available for experiments with different beam fixings (cantilever and encastre) and torsional stiffness experiments
**DESCRIPTION**

A compact, bench-mounting frame that holds different parts for investigations into stiffness of materials. The standard TE16 includes parts for tests in bending of beams of different materials and cross-section. Optional additional kits allow investigations into different beam fixings and torsional stiffness.

The main part is a rigid metal frame. Supplied as standard are two adjustable knife edges that work as simple supports for test beams. A linear scale on the back panel of the frame allows accurate positioning of the knife edges. The kit also includes weights, a magnetic dial gauge and a set of different beams. Also included in the standard TE16 kit is a vernier gauge for students to accurately measure dimensions of the specimens they test.

Students add different loads to the beams using weights on a hanger. The dial gauge indicator on the back panel accurately measures beam deflection.

The Additional Experimentation Kit (TE16a), available as an optional extra, enables further investigations into a simple cantilever, a propped cantilever and an encastre beam.

The Additional Torsion Testing Kit (TE16b) is also available as an optional extra. It allows torsion tests on solid rods of different materials and a tube.

**STANDARD FEATURES**

- Supplied with comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

**RECOMMENDED ANCILLARIES**

- Additional Experimentation Kit (TE16a)
- Additional Torsion Testing Kit (TE16b)

**OPERATING CONDITIONS**

**OPERATING ENVIRONMENT:**

Laboratory

**STORAGE TEMPERATURE RANGE:**

-25°C to +55°C (when packed for transport)

**OPERATING TEMPERATURE RANGE:**

+5°C to +40°C

**OPERATING RELATIVE HUMIDITY RANGE:**

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

**EXPERIMENTS**

**STANDARD TE16 KIT**

- Investigation of the stiffness in bending of different materials of the same cross-section (Young’s modulus/stiffness)
- Investigation of the stiffness of a single material with different cross-section geometries (second moment of area, or I value)

**WHEN USED WITH THE OPTIONAL TE16A:**

- Experiments to find the deflected shape of a beam and bending of a beam clamped at one end (a cantilever).
- Comparison of a simply supported beam, a cantilever and an encastre beam.

**WHEN USED WITH THE OPTIONAL TE16B:**

- Experiments to find the relationship between angular deflection and the dimensional and material properties of rods and tubes (torsional stiffness).

**SPECIFICATION**

**TE16**

**DIMENSIONS:** 500 mm x 250 mm x 350 mm, packed volume 0.08 m³

**WEIGHT:** Approximately: 12 kg (including weights and beams), packed: 16 kg

**BENCH SPACE NEEDED:** Solid, level bench space of approximately 500 mm x 500 mm

**WEIGHTS:** 6 x 0.5 N

**TEST BEAMS (COMMON CROSS-SECTION):** Brass, steel, aluminium, wood, acrylic and polyethylene (PETG)

**ALUMINIUM TEST BEAM CROSS-SECTIONS:** Square, rectangular and hollow

**TE16A**

**NETT WEIGHT:** 1.66 kg

**PACKED VOLUME AND WEIGHT:** Less than 0.001 m³ and approximately 2.5 kg.

**PARTS:**

- Two encastre fixings
- Two knife edge hangers
- Weight hanger

**TE16B**

**NETT WEIGHT:** 2.4 kg

**PACKED VOLUME AND WEIGHT:** Less than 0.001 m³ and approximately 3.5 kg.

**PARTS:**

- Two chuck assemblies
- Weight hanger and weights
- Three specimens – One brass tube and brass and steel rods