



STIFFNESS - BENDING AND TORSION

TE16

Compact, benchtop apparatus enabling a variety of investigations into material stiffness including Young's modulus.



KEY FEATURES

- 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



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DESCRIPTION

A compact, benchtop 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
- ISO9001 certified manufacturer

LEARNING OUTCOMES

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 encastred 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).

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



ADDITIONAL EXPERIMENTATION KIT (TE16A)



ADDITIONAL TORSION TESTING KIT (TE16B)

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SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

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