



Features

- Elastic deformation of statically determinate or indeterminate beams under bending load¹
- Elastic torsion of round bars under torque¹
- Influence of material, cross-section, and clamping length on deformation

Bending and torsion are typical loads to which components are subjected. The resultant stresses and deformations can lead to the failure of the component. A number of different factors play a role in this, including the material, the cross-section of the bar, the clamping length, and the method of bearing support.

Tesca Deformation of Bars under Bending or Torsion investigates the influence of these factors on the deformation of a bar under bending load or torque. A set of test bars has been assembled so as to permit direct comparison of measurement results. The bar under investigation is fixed to two movable support blocks and loaded down by a weight. A dial gauge records the resulting deformation. The support blocks include clamping chucks to hold the torsion bars and bearings for the bars in the bend test. The bearings offer a range of clamping options, enabling statically

determinate or indeterminate bearing supports to be investigated.

The torque is applied by a device mounted on a support block. The point of load application to generate the bending moment is adjustable.

The various elements of the experiment are clearly laid-out and housed securely in a storage system. The complete test set-up is arranged on the frame.

The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

Specifications

- Elastic deformation of bars under bending or torsion
- Bending tests with statically determinate and indeterminate systems
- Torsion tests with a statically determinate system
- Supports in the bending test may be clamped or free
- 2 adjustable blocks with clamping chuck for torsion tests and supports for bending tests
- Set of weights to generate the bending or torque
- Dial gauge with bracket
- Storage system to house the components

Note: Specifications are subject to change.

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Technical Specifications:

- 17 bars for bending tests
 - Material: aluminum, steel, brass, copper
 - Height with LxW 510x20mm: $h=3...10\text{mm}$
 - Width with LxH 510x5mm: $w=10...30\text{mm}$
 - Length with W x H 20 x 4 mm : $l=210...510\text{mm}$
 - LxWxH: 20x4x510mm (aluminum, steel, brass, copper)
 - LxWxH: 10x10x510mm (aluminium)
- 22 torsion bars
 - Material: aluminium, steel, brass, copper
 - Length with $d=10\text{mm}$: 50...640mm (aluminium)
 - DxL: 10x50mm/10x340mm (aluminium, steel, copper, brass)
 - Diameter with $L=50/340\text{mm}$: $d=5...12\text{mm}$ (steel)
- Dial gauge: 0...10mm, graduations: 0,01mm
- Tape measure, graduations: 0,01m
- Weights
 - 1x 1N (hanger)
 - 1x 1N, 1x 4N, 1x 5N, 1x 9N
- 22 torsion bars
- 1 dial gauge with bracket, 1 tape measure
- 1 set of weights including hanger
- 2 hexagon socket wrenches
- 1 storage system
- 1 set of instructional material

Experiments:

- Bending tests
 - Determination of the modulus of elasticity
 - Statically determinate systems
- Beam mounted on 2 supports; cantilever beam
 - Statically indeterminate systems
- Dual-span beam
 - Deformation of a beam dependent on Material
- Geometry (section width, height, and length)
- Type of support and length of the span
 - Formulation of proportional relationships for the deformation Torsion experiments
 - Determination of the shear modulus of various materials
 - The angle of twist dependent on
- Clamping length
- Bar diameter
 - Formulation of proportional relationships for the angle of twist

Scope of Delivery:

- 1 frame
- 2 bearing blocks
- 1 device to generate the torque
- 17 bars for bending test

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