



Features

- Elastic deformation of curved-axis beams
- Circular, semi-circular, and quadrant beams

In construction engineering, a distinction is made between beams and arches. An arch is a statically indeterminate supported structure with a curved axis and two fixed support bearings or clamp fixings. The support bearings of an arch (such as a double-articulated arch) absorb forces vertically and horizontally. The ends of the arch in the bearings do not move. This produces the static arching effect of the system. In mechanical engineering, crane hooks and chain links are typical examples of a curved beam. Tesca Deformation of Curved-Axis Beams includes three different beams, borne on statically determinate supports: a circular beam,

a semi-circular beam, and a quadrant beam. The beam under test is loaded with a set of weights. Dial gauges record its horizontal and vertical deformations. All three beams have the same cross-section and so the same 2nd moment of area. This enables test results to be directly compared.

Semi-circular and circular beams are fixed to a bearing on the pillar. The quadrant beam is clamped into a bearing block.

The various elements of the experiment are clearly laid-out and housed securely in a storage system. The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

Specifications

- Elastic deformation of curved-axis beams under load
- 3 different beams with the same cross-section: circular beam, semi-circular beam, quadrant beam
- Bearing block to fix the quadrant beam
- Pillar with bearing to support the circular or semi-circular beam
- 1 set of weights to place the beam under load
- 3 dial gauges to record the horizontal and vertical deformation
- Storage system to house the components

Technical Specifications

- Curved-axis beam
 - Radius: approx. 150mm
 - Cross-section WxH: 20x5mm
 - Material: steel, galvanized
- Dial gauges
- Measuring range: 0...20mm, graduations: 0,01mm
- Weights
 - 1x 1N (hanger)
 - 2x 2N

Note: Specifications are subject to change.

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- 1x 5N
- 1x 10N
- 4x 20N

Experiments

- Bending behavior of a curved-axis beam
 - Circular beam
 - Semi-circular beam
 - Quadrant beam
- Application of the principle of virtual forces (the force method) to calculate the deformation
- 2nd moment of area
- Comparison of calculated and measured deformations

Scope of Delivery

- 1 base plate with pillar
- 3 beams
- 3 dial gauges
- 1 set of weights
- 2 hexagon socket wrenches
- 1 storage system with foam inlay
- 1 set of instructional material

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