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Manufacturer & Exporter · Ambala, Haryana, India

PRODUCT DATA SHEET
Catalogue reference for product evaluation

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Deformation of Frame | FortiTestX-42

Category: Strength of Materials · **Order Code:** FORTITESTX-42 · **Country of Origin:** India

Product Overview

The Deformation of Frame FortiTestX-42 is a structural mechanics laboratory unit for investigating frame deformation under load using U-shaped and S-shaped steel frames (600 x 600 mm, 20 x 10 mm cross-section). This deformation of frame apparatus supports statically determinate and indeterminate configurations via a roller bearing on the free end, with two dial gauges recording deflection at 0.01 mm resolution across a 0 to 20 mm range. Two weight sets with movable hooks apply loads at adjustable positions, and analytical methods including first-order elasticity theory, superposition, and virtual work are covered in full. Four optional frame variants extend the unit to portal, redundant, and unsymmetrical frame geometries.

View this product online: https://scienticoindia.com/product/deformation-of-frame-fortitestx-42/



Request a model-specific quotation
Include quantity and delivery country.

Technical Specifications

Deformation of Frame FortiTestX-42, Technical Specifications

Parameter	Detail
Model Reference	FortiTestX-42
Category	Strength of Materials and Structures
Frame Material	Steel
Frame Edge Length	600 mm
Frame Cross-Section	20 x 10 mm
U-Shaped Frame Dimensions	600 x 600 mm
S-Shaped Frame Dimensions	600 x 600 mm
Frames Included	2 (U-shaped and S-shaped)
Support Configuration	Statically determinate (free end) or indeterminate (roller bearing)
Clamping	1 long clamping pillar, 1 short clamping pillar
Load Application	2 sets of weights with movable hooks, adjustable to any load application point
Dial Gauge Measuring Range	0 to 20 mm
Dial Gauge Graduation	0.01 mm
Dial Gauges Included	2

Parameter	Detail
Storage	Dedicated component storage system
Instruction Manual	Included

Technical Data

Steel Frames

Parameter	Value
Material	Steel
Edge Length	600 mm
Cross-Section	20 x 10 mm
U-Shaped Frame	600 x 600 mm
S-Shaped Frame	600 x 600 mm

Dial Gauges

Parameter	Value
Measuring Range	0 to 20 mm
Graduation	0.01 mm

Weight Sets

Weight	Quantity
0.5 N hanger weights	2
1 N weights	8
5 N weights	4

Key Features

Key Features

- Frame Geometry: two steel frames, U-shaped and S-shaped, each 600 x 600 mm, 20 x 10 mm cross-section
- Support Configuration: this deformation of frame apparatus switches between statically determinate and indeterminate by adding a roller bearing to the free end
- Clamping System: 1 long and 1 short clamping pillar for secure frame mounting
- Load Application: 2 weight sets with movable hooks, adjustable to any load application point along the frame
- Deformation Measurement: 2 dial gauges, 0 to 20 mm range, 0.01 mm graduation
- Weight Set Included: 2x 0.5 N hangers, 8x 1 N, 4x 5 N
- Analytical Methods Covered: first-order elasticity theory, principle of superposition, principle of virtual work
- S-Shaped Frame: demonstrates applicability of analytical methods to non-standard frame geometries
- Storage and Frame: all components organised in dedicated storage system within a self-contained experimental frame
- Optional Variants: FX-42A portal with overhanging ends, FX-42B redundant square frame, FX-42C unsymmetrical portal, FX-42D square portal frame

Experiments

- Relationship between load application and deformation on the frame
- Differences between statically determinate and statically indeterminate frames
- Familiarisation with first-order elasticity theory for statically determinate and indeterminate systems
- Application of the principle of superposition
- Application of the principle of virtual work on statically determinate and statically indeterminate frames

- Determination of a deformation by the principle of virtual forces
- Determination of a load by the principle of virtual displacement
- Comparison of calculated and measured deformations

Construction and Design

The Deformation of Frame FortiTestX-42 is built around two steel frames, each with a 600 x 600 mm plan dimension and a 20 x 10 mm rectangular cross-section. The U-shaped frame replicates standard portal construction geometry as used in hall structures. One end is clamped using a long or short clamping pillar; the opposite end is left free for statically determinate experiments or fitted with a roller bearing for statically indeterminate analysis. The S-shaped frame is included to demonstrate that the same analytical methods apply to non-standard frame geometries. Two sets of weights with movable hooks load the frame at any chosen application point. Two dial gauges with a 0 to 20 mm range and 0.01 mm graduation record the deformations of this deformation of frame unit under load. Bending moment characteristics are derived using first-order elasticity theory, superposition, and virtual work principles. The differential equation of the bent line, constructed from characteristic curves and an integrals chart, yields displacements and support forces at the roller bearing. All components are housed in an integrated storage system within the experimental frame.

Scope of Delivery

- 1 experimental unit
- 1 instruction manual
- 2 sets of weights
- 2 dial gauges
- 1 thread
- 2 frames

Optional Accessories

- FX-42A: Portal with overhanging ends
- FX-42B: Redundant square frame
- FX-42C: Unsymmetrical portal
- FX-42D: Square portal frame

Ordering & Delivery

- Send the product name, quantity, delivery country and destination with your enquiry.
- Production schedule, freight, payment terms and export documents are confirmed in the written quotation.

Frequently Asked Questions

Q1: Can the Deformation of Frame FortiTestX-42 be configured for both statically determinate and indeterminate conditions?
Yes. The free end of the U-shaped frame can be left unconstrained for statically determinate experiments, or fitted with a roller bearing to create a statically indeterminate condition.

Q2: What frame geometries are included with this deformation of frame apparatus?
Two frames are included: a U-shaped frame (600 x 600 mm) for standard portal frame experiments and an S-shaped frame (600 x 600 mm) for demonstrating method applicability to non-standard geometries.

Q3: What analytical methods does the FortiTestX-42 support?
The unit supports first-order elasticity theory, the principle of superposition, and the principle of virtual work, including determination of deformations by virtual forces and loads by virtual displacement.

Q4: What is the resolution of the dial gauges?
The dial gauges have a graduation of 0.01 mm and a measuring range of 0 to 20 mm.

Q5: Are additional frame configurations available?
Yes. Four optional frame variants are available: FX-42A (portal with overhanging ends), FX-42B (redundant square frame), FX-42C (unsymmetrical portal), and FX-42D (square portal frame).

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