

The experiment bending stress in a beam allows the experimental investigation of the internal stresses of a simply supported beam placed into four-point bending.

This experiment has the following properties:

- ▶ T section beam fitted with five strain gauges to measure the strain at various points on the section
- ▶ Load cell assembly to apply any load up to 500N via a load application bracket, evenly distributing the load over two points
- ▶ Adjustable simple supports

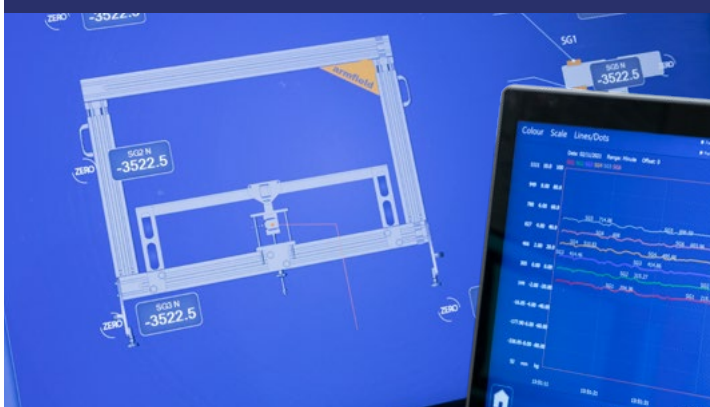
EXPERIMENT FOR DETERMINING THE BENDING STRESSES AND STRAINS WITHIN A T-BEAM

SOFTWARE SUPPLIED AS STANDARD



SV100 Bench mounted frame
(sold separately)

armBUS software



T beam section with attached strain gauges



Description

The beam used in this experiment has five strain gauges fitted at the mid span location at various points on its section. Each strain gauge has a corresponding perpendicular strain gauge which is used to eliminate the effect of thermal expansion from the strain measurement.

The T beam rests on two simple supports with a central slot to accommodate the web of the T beam. The simple supports are fixed to the Universal Frame bottom beam using thumb screws which allow the user to adjust the position of the supports and change the working length of the beam.

Point loads are applied to the beam through a load application bracket. The load application bracket takes the applied load from the load cell assembly and equally divides it between two point loads equi-distant from the load cell, placing the beam into four-point bending.

The load cell is operated by applying a deflection to the beam using the load handle at the base of the load cell. The load cell then measures the load invoked by the applied deflection.

Requirements

Scale

SV
100

SV
HMI

1Ph

PC

USB



Electrical supply: 110/120V, 60Hz or 220/240V, 50Hz
PC with a USB port, running Windows 7 or above

Essential accessories/equipment

- ▶ SV100: Bench Mounted Frame
- ▶ SV101: Structures Interface Unit

Technical specification

- ▶ 1 x T Beam fitted with Strain Gauges
- ▶ Material: BS EN 755-2, EN AW-6082 T6
- ▶ Yield Stress = 260 Mpa
- ▶ Young's Modulus = 70 Gpa
- ▶ Beam Length = 900mm
- ▶ Flange depth (d1) = 6.35mm
- ▶ Beam width / breadth (b1) = 38.1mm
- ▶ Web depth (d2) = 38.1 mm – 6.35mm = 31.75mm
- ▶ Web width / breadth (b2) = 6.35mm
- ▶ Distance between point loads = 100mm
- ▶ 2 x Simple Supports
- ▶ 1 x Load Cell Assembly
- ▶ Force range: 0 – 500N
- ▶ 1 x Load Application Bracket
- ▶ 1 x Detent Pin
- ▶ Universal Frame Mounting Hardware

Overall dimensions

Length	1.176m
Width	0.392m
Height	0.922m

Packed and crated shipping specifications

Volume	0.1m ³
Gross weight	25 kg

Experimental content

- ▶ Bending Equation
- ▶ Neutral Axis
- ▶ Working with Stress and Strains and their conversion
- ▶ Second Moment of Area

Features / benefits

- ▶ Allows custom specimen usage
- ▶ Span can be adjusted
- ▶ Supplied with Armfield structures software as standard

Related laws

- ▶ Bending Stress
- ▶ Strain
- ▶ Strain Gauges
- ▶ Bending Equation
- ▶ Neutral Axis
- ▶ Second Moment of Area

Graphing detail



Related products

Forces and Moments

- ▶ SV300: Combined Shear Force & Bending Moment
- ▶ SV301: Shear Force in a Beam
- ▶ SV302: Bending Moments in a Beam
- ▶ SV303: Deflection of Beams and Cantilevers
- ▶ SV304: Equilibrium of Forces
- ▶ SV305: Suspension Cable

Operational conditions

- ▶ Storage temperature: -10°C to +70°C
- ▶ Operating temperature range: +10°C to +50°C
- ▶ Operating relative humidity range: 0 to 95%, non condensing

Ordering codes

- ▶ **SV306:** Bending Stress in a Beam
- ▶ **SV100:** Bench Mounted Frame (Sold separately)
- ▶ **SV101:** Structures Interface Unit (Sold separately)

Armfield standard warranty applies with this product

Knowledge base

- > 28 years expertise in research & development technology
- > 50 years providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company



Products CE certified

armfield.co.uk

Aftercare

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