

The experiment Combined Shear Force & Bending Moment in a Beam allows the experimental investigation of the internal shear force and bending moment of a simply supported beam under different point loads.

This experiment has the following properties:

- ▶ Split beam allows the internal shear force and bending moment at the split to be measured
- ▶ Up to 3kg of point loads can be applied to the beam across three movable weight hangers
- ▶ Adjustable simple supports

ALLOWS THE EXPERIMENTAL INVESTIGATION OF THE INTERNAL SHEAR FORCE AND BENDING MOMENT OF A SIMPLY SUPPORTED BEAM UNDER DIFFERENT POINT LOADS
SOFTWARE SUPPLIED AS STANDARD



SV100 Bench mounted frame (sold separately)

armBUS software



High quality materials



UK office - email: sales@armfield.co.uk tel: +44 (0) 1425 478781 (for ROW)
 USA office - email: info@armfield.inc tel: +1 (609) 208-2800 (USA only)

Issue: 1
 URL: <http://www.armfield.co.uk/structures>

Applications

ME CE IP

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Description

The beam used in this experiment has been split into two sections and then re-joined to allow the shear force and bending moment to be measured at the point the beam has been split. The connection of the two sections of beam allow it to be adjusted so that the sections are parallel and level, using the supplied level, while allowing the beam to deflect under load.

The split beam rests on two simple supports, one at each end. Each beam section rests on a roller that is free to rotate allowing the beam to move as it deflects. The simple supports are fixed laterally through slots in two universal frame mounts allowing the position of the simple support to be adjusted.

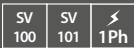
The side plate of each support can be used as a pointer against the tape measure fixed to each beam section, allowing the position of the supports relative to the split to be recorded.

Point loads are applied to the beam through three extended weight hangers and three 1000g slotted weight hangers. The extended weight hangers can be moved along the length of the beam allowing many different loading conditions to be explored.

Like the simple supports, the extended weight hangers have a pointer that may be used against the tape measure fixed to each beam section, allowing the position of the supports relative to the split to be recorded.

Requirements

Scale



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

- ▶ Long Split Beam: 550mm
- ▶ Short Split Beam: 350mm
- ▶ Beam Total Length: 900mm
- ▶ Bending Moment Force Offset: 87.9 mm
- ▶ Measurement Type at Beam Split: Shear Force & Bending Moment
- ▶ Instrument Level Sensitivity: 60 seconds per 2mm division
- ▶ 2 x Universal Frame Mounts
- ▶ 2 x Sliding Simple Supports
- ▶ 3 x 1000g Weight Hangers
- ▶ 3 x Extended Weight Hangers 24g
- ▶ 1 x Instrument Level
- ▶ 1 x 300mm Steel Rule
- ▶ 2 x Detent Pins
- ▶ Split Beam Connecting Hardware
- ▶ 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

- ▶ Determine the internal shear force and bending moment within a simply supported beam with multiple point loads to be measured and compared to those obtained through hand calculations
- ▶ Variation in bending moment for variation in load, load position and load arrangement
- ▶ Comparison of experimental with theoretical values of shear force and bending moment
- ▶ Influence lines

Features / benefits

- ▶ Allows experimentation of both Bending and Shear in the same experiment
- ▶ Split beam allows the internal shear force and bending moment at the split to be measured
- ▶ Up to 3kg of point loads can be applied to the beam across three movable weight hangers
- ▶ Adjustable simple supports
- ▶ Unrestricted load position
- ▶ Visually realistic 'cut' beam
- ▶ Supplied with both a short and long split beam
- ▶ Supplied with Armfield structures software as standard
- ▶ Supplied with comprehensive manual and experimentation

Related laws

- ▶ Shear force
- ▶ Bending moment
- ▶ Strain
- ▶ Stress
- ▶ Young's modulus
- ▶ Shear force diagram
- ▶ Bending moment diagrams
- ▶ Verification of equilibrium of vertical forces and moments

Related products

Forces and Moments

- ▶ 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
- ▶ SV306: Bending Stress in a Beam

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

- ▶ SV300: Combined Shear Force & Bending Moment
- ▶ 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

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Aftercare

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