SV SERIES

Forces & Moments

Equilibrium of Forces – SV304

The experiment equilibrium of forces allows the experimental investigation of non-concurrent forces creating equilibrium in a system.

ALLOWS THE EXPERIMENTAL INVESTIGATION OF NON-CONCURRENT FORCES CREATING EQUILIBRIUM IN A SYSTEM

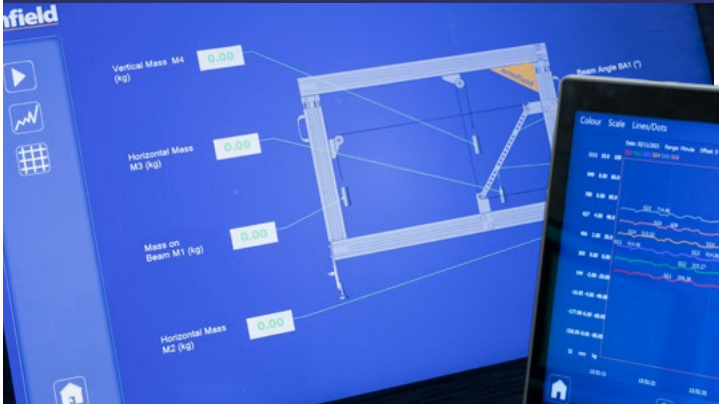
SOFTWARE SUPPLIED AS STANDARD

This experiment has the following properties:

- Up to 1500g of reaction weights to measure the vertical and horizontal reaction forces at each end of the beam
- Ladder type beam with multiple locations to add additional weight up to a total beam weight of 470g
- Ability to show non-concurrent equilibrium in a system using an equilibrium beam
- Adjustable simple supports allowing the angle of the ladder beam to be adjusted

SV100 Bench mounted frame (sold separately)

armBUS software



Masses run over pulley assemblies

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

Applications: ME CE IP

Description

The beam used in this experiment has equidistant holes along its length for the carabiner and weight hanger to be positioned at any suitable position, allowing a range of set ups.

The beam uses two roller assemblies that fit within the beam supports allowing the beam to freely move as the reaction loads are applied and equilibrium is reached.

The equilibrium beam rests within the slots on two simple supports through rollers, connected to each end of the beam. These slots allow for the rollers to move freely horizontally and vertically a small amount whilst keeping them secured within the supports.

These supports can be positioned anywhere along the face of the Universal Frame. This allows many angles and positions of the Equilibrium Beam to be achieved and the equivalent reaction force required to achieve equilibrium to be measured.

Reaction loads at each end of the beam are applied through three sliding pulley brackets, adjustable cords and 500g slotted weight hangers. The points at which the cords connect to the beam can be adjusted to simulate different lengths of beam and theoretical support positions.

An additional load can be applied to the beam to increase the total weight of the beam. The weight hanger can also be moved along the length of the beam (using a carabiner) having the effect of moving the position of the beams centre of gravity.

Requirements	Scale
SV 100 | PC | USB	
PC with a USB port, running Windows 7 or above	

Technical specification

- 1 x Equilibrium Beam length: 480mm
- 2 x Equilibrium Beam Supports
- Beam mass with Roller Assemblies: 218g
- 4 x Beam Bearing Supports
- 3 x 500g Weight Hangers
- 1 x 250g Weight Hanger
- 4 x 20g Weights
- 2 x 10g Weights
- 3 x Sliding Pulley Brackets
- 1 x Angle Rule
- 1 x Weight Hook Carabiner
- 2 x 1000mm Adjustable Cord
- 1 x 600mm Adjustable Cord
- Equilibrium Beam Support 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

- Measurement of magnitude and direction of the reaction forces for a simulated ladder, propped against a wall either under its own weight or with an applied vertical load
- Concurrent and non-concurrent forces
- Equilibrium of a set of forces acting on a vertical plane

Features / benefits

- Ability to show non-concurrent equilibrium in a system using an equilibrium beam
- Ladder type beam with multiple locations to add additional weight up to a total beam weight of 470g
- Adjustable simple supports allowing the angle of the ladder beam to be adjusted
- Up to 1500g of reaction weights to measure the vertical and horizontal reaction forces at each end of the beam
- Supplied with Armfield structures software as standard

Essential accessories/equipment

- **SV100:** Bench Mounted Frame

Related laws

- Equilibrium of a set of forces acting in a vertical plane
- Link polygon
- Graphical solutions
- Polygon of forces
- Co-Planar vertical forces
- Equal and opposite forces
- Ground and wall reactions
- Three conditions of equilibrium

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
- **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

- **SV304:** Equilibrium of Forces
- **SV100:** Bench Mounted Frame **(Sold separately)**

Armfield standard warranty applies with this product