

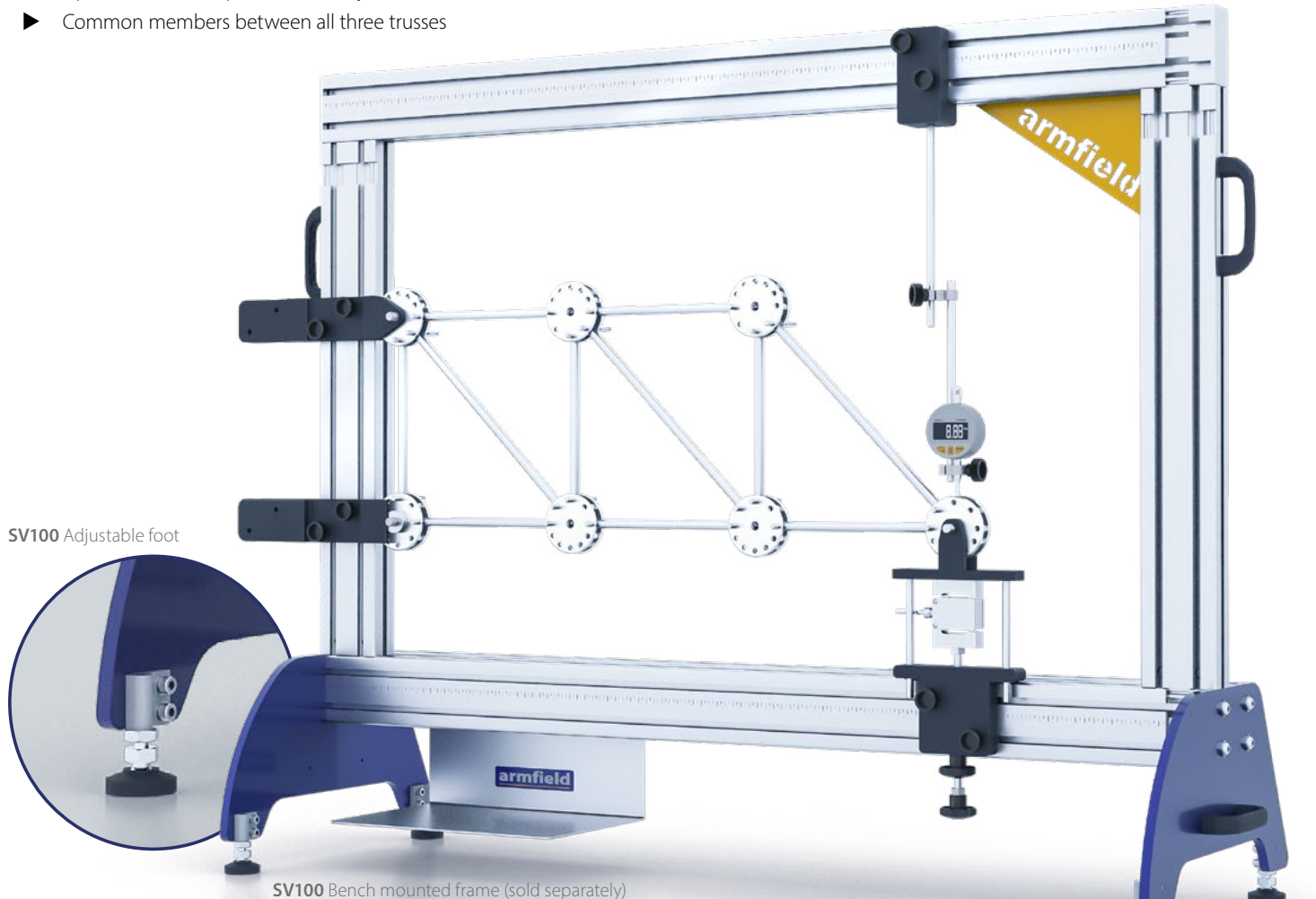
The experiment Deflection of Trusses allows the experimental investigation of deformation in trusses under load.

This then allows Castigliano theorems to be proven.

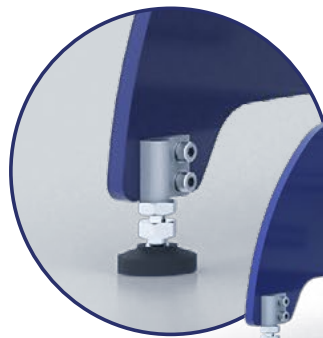
This experiment has the following properties:

- ▶ Assembly of three 3-bay trusses via various length members, detent pins and joint hubs
- ▶ Up to 10 members possible in one joint hub
- ▶ Common members between all three trusses

**ALLOWS THE EXPERIMENTAL INVESTIGATION OF DEFORMATION IN TRUSSES UNDER LOAD
SOFTWARE INCLUDED AS STANDARD**



SV100 Adjustable foot



SV100 Bench mounted frame (sold separately)

armBUS software



Precision digital indicator



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Issue: 1

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

Applications

ME CE IP

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Description

One of a range of experiment frameworks that teach structure principles, this experiment kit consists of 25 truss members of various lengths allow the construction of three 5-bay cantilever truss frameworks, with one framework having a 30° top member inclination.

The frames mount on two side brackets mounted from the left vertical edge of the universal frame. One bracket has a pivoting support whilst the other acts as a pivoting and rolling support. Forces can be applied to any truss hub using the load cell assembly.

The strain and force exerted in each member is measured using a strain gauge attached to each truss member. The signals from each member strain gauge and load cell are fed through the strain amplifier into the computer interface.

Deflection can be measured at any point on the framework using the digital indicator attached to the guide rod of the DTI mounting assembly suspended from the universal frame top rail. This assembly is fully adjustable and can be manoeuvred accurately over the joint.

Requirements

Scale



Electrical supply: 110/120V, 60Hz or 220/240V, 50Hz

- ▶ **SV100:** Bench Mounted Frame
- ▶ **SV101:** Structures Interface Unit
- ▶ PC with a USB port, running Windows 7 or above

Technical specification

- ▶ 7 x Truss Joint Hub
- ▶ Angle graduations: 30°,45°,60°,90°
- ▶ 1 x 80.5mm Member
- ▶ 3 x 176.5mm Member
- ▶ 2 x 198mm Member
- ▶ 6 x 207.5mm Member
- ▶ 1 x 272.5mm Member
- ▶ 3 x 295.5mm Member
- ▶ 1 x 325.5mm Member
- ▶ 1 x 370mm Member
- ▶ Truss Members
- ▶ Aluminium tube: \varnothing 10 x 1.0mm
- ▶ Material: 6060 T6 - BS EN 755-2:2016
- ▶ Cross-sectional area: 28.274 x 10⁻⁶m²
- ▶ 2 x Sealed Bearing
- ▶ 22 x 6mm Detent Pin
- ▶ Load Cell Assembly
- ▶ Unit: DBBSM Series S-Beam Load Cell
- ▶ Force range: 0–400N
- ▶ Measurable range of the digital indicator: 12.7mm (DTI)
- ▶ Resolution: 0.01mm

Overall dimensions

Length	1.176m
Width	0.392m
Height	0.922m

Packed and crated shipping specifications

Volume	0.1m ³
Gross weight	25kg

Experimental content

- ▶ Comparison of experimental deflections with theoretical values derived from Castigliano's second theorem
- ▶ Study of efficiency of different trusses
- ▶ Construction of pin jointed trusses

Features / benefits

- ▶ Three trusses from one kit
- ▶ True pin jointed structures
- ▶ Assembly of each truss
- ▶ Loading can be applied at all joints
- ▶ DTI adjustable to all joints (Digital Testing Indicator)
- ▶ Software included as standard

Related laws

- ▶ Statically Determinate Frameworks
- ▶ Method of Joints
- ▶ Method of Sections
- ▶ Stress
- ▶ Strain
- ▶ Area
- ▶ Young's Modulus
- ▶ Castigliano's Theorem
- ▶ Reactions
- ▶ Unit Load
- ▶ Compression
- ▶ Tension

Graphing detail



Essential accessories/equipment

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

Related products

Forces in a truss

- ▶ **SV200:** Pin-Jointed Frameworks (Roof and Warren Truss)
- ▶ **SV201:** Forces in a Truss and Redundant Truss

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

- ▶ **SV202:** Deflection of Trusses
- ▶ **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.

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