

The experiment plastic bending of portals allows the experimental investigation of portal frames placed under horizontal and/or vertical loads to cause plastic bending.

This experiment has the following properties:

- ▶ Two load cell assemblies for independent vertical and horizontal loading
- ▶ Adjustable pulley assembly to maintain true vertical and horizontal loading
- ▶ Supplied as standard with 3 Rectangular Portal Frames and 3 Pitched Portal Frames
- ▶ Linear scales to measure the deflection of the portal at each load point

**ALLOWS THE EXPERIMENTAL INVESTIGATION INTO PORTAL FRAMES PLACED UNDER HORIZONTAL AND/OR VERTICAL LOADS TO CAUSE PLASTIC BENDING
SOFTWARE INCLUDED AS STANDARD**



SV100 Bench mounted frame (sold separately)

armBUS software



Digital verniers measure deformation



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Issue: 1

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

Applications

ME CE IP

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Description

The portal frames are constructed from non-alloy structural steel with a section size of 13mm x 3mm. Rectangular portals and pitched portals, can be tested as part of this experiment.

The supports hold the portal specimen at each end using clamping plates, simulating a fixed support.

The external force is applied to the portal via two load cell assemblies. One load cell assembly is used for both the vertical and horizontal loading direction allowing independent loading.

The load is applied to the portal frame through two cable assemblies that take the movement of the load cell assembly and applies the same amount of deflection to the portal frame.

Each cable assembly runs over an adjustable pulley assembly that allows the direction of pull to remain constant as the portal frame deflects.

Requirements

Scale



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

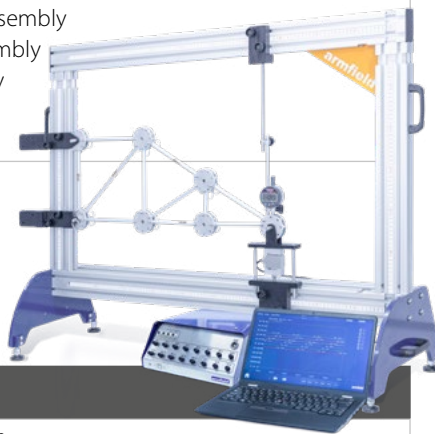
- ▶ SV100: Bench Mounted Frame
- ▶ SV101: Structures Interface Unit
- ▶ PC with a USB port, running Windows 7 or above

Technical specification

Portal Specimens

- ▶ Material: BS EN 10025-2 S275JR
- ▶ $\sigma_y = 275 \text{ Mpa}$
- ▶ $E = 210 \text{ Gpa}$
- ▶ Portal Section Size: 13mm x 3mm
- ▶ Portal Dimensions: 300mm x 200mm
- ▶ 3 Rectangular Portals
- ▶ 3 Pitched Portals
- ▶ Linear Scale Connecting Hardware
- ▶ Universal Frame Mounting Hardware
- ▶ Pitched Portal Pitch Angle: 6°
- ▶ 2 x Fixed Supports
- ▶ 2 x Load Cell Assembly
- ▶ 2 x Adjustable Pulley Assembly
- ▶ 2 x Loading Cable Assembly
- ▶ 2 x DTI Holder Assembly
- ▶ 2 x DTI Extension Bars
- ▶ 2 x Linear Scale

SV series is supplied with Armfield structures software as standard



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

- ▶ Relationship between the horizontal and vertical loads to the mode of collapse
- ▶ Plastic hinge
- ▶ Collapse mechanism
- ▶ Yield stress

Features / benefits

- ▶ Supplied as standard with 3 Rectangular Portal Frames and 3 Pitched Portal Frames
- ▶ Two load cell assemblies for independent vertical and horizontal loading
- ▶ Supplied with Armfield structures software as standard

Related laws

- ▶ Collapse Mechanism
- ▶ Bending Moment Diagram (BMD)
- ▶ Degree of Redundancy
- ▶ Plastic Hinges

Graphing detail



Essential accessories/equipment

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

Related products

Strength of materials

- ▶ SV500: Continuous and Indeterminate Beams
- ▶ SV501: Plastic Bending of Beams
- ▶ SV503: Deflection of Curved Bars

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

- ▶ SV502: Plastic Bending of Portals
- ▶ SV502-1: Additional Portal Samples (12PK)
- ▶ 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



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Aftercare

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