

The experiment semi-circular arch allows the experimental investigation of the horizontal thrust observed when loads are applied to a semi-circular arch with hinges at each end of the arch. The measurements taken can then also be used to validate calculated values for the horizontal thrust and deflections found using Castigliano's Theorem.

**ALLOWS THE EXPERIMENTAL INVESTIGATION INTO THE CHARACTERISTICS OF A FIXED ARCH UNDER VARIOUS LOAD CONDITIONS
SOFTWARE INCLUDED AS STANDARD**

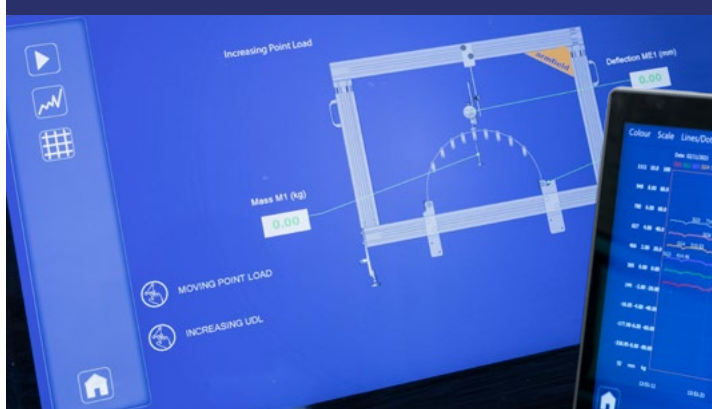
This experiment has the following properties:

- ▶ Ability to show mechanical principles of semi-circular arches
- ▶ Both point loads and uniformly distributed loads (UDL) can be simulated
- ▶ Pivoting support capable of measuring horizontal thrust

SV100 Bench mounted frame (sold separately)



armBUS software



Arch with UDL Applied



Description

The constant radius semi-circular arch used in this experiment has load hangers equidistant along its length for the weight hangers to be positioned at, allowing a range of set ups.

The arch uses two roller assemblies along with the arch supports allowing the arch ends to freely pivot as the loads are applied until equilibrium is reached.

The arch is clamped to the supports which simulate a pinned support at each end of the arch. The supports don't allow any horizontal or vertical movement but allow the supports to rotate.

One of the supports constrains the frame horizontally by a load cell. This allows the horizontal thrust at that support to be measured.

Requirements

Scale



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

- ▶ SV100: Bench Mounted Frame
- ▶ SV101: Structures Interface Unit
- ▶ SV102: Pinned Supports Kit
- ▶ PC with a USB port, running Windows 7 or above

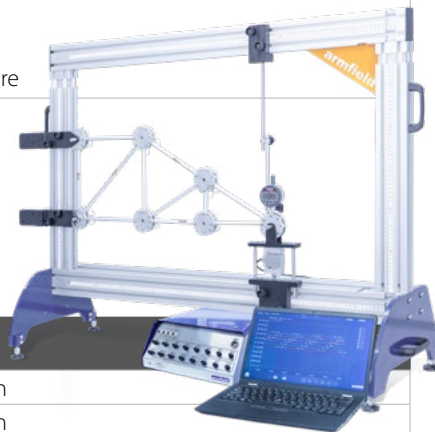
Essential accessories/equipment

- ▶ SV100: Bench Mounted Frame
- ▶ SV101: Structures Interface Unit
- ▶ SV102: Pinned Supports Kit

Technical specification

- ▶ 1 x Arch Specimen
- ▶ Arch Span: 500mm
- ▶ Specimen Material: Aluminium (BS EN 755-2 EN AW-6082 T6)
- ▶ Young's Modulus: 70 GPa
- ▶ Specimen Section Size: 20 x 3mm
- ▶ Unloaded Beam Assembly Mass: 530g
- ▶ 6 x 50g Empty Weight Hangers
- ▶ 3 x 500g Weight Hangers
- ▶ 1 x DTI Holder Assembly
- ▶ 1 x DTI Extension Bar
- ▶ 1 x Digital Indicator
- ▶ DTI Connecting Hardware

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 applied loads and horizontal reaction force (thrust)
- ▶ Comparison between theory and experimental results
- ▶ Horizontal reaction force influence lines
- ▶ Uniformly distributed load and point loads

Features / benefits

- ▶ Preformed Arch with 5:1 span to height ratio
- ▶ Weight hangers with additional disk weights to apply point load and UDL at set locations
- ▶ Load cell to measure horizontal reaction force at one end of the arch
- ▶ DTI to measure vertical deflection of arch with applied load
- ▶ Supports to constrain arch and prevent linear motion while allowing rotation
- ▶ Supplied with Armfield structures software as standard

Related laws

- ▶ Horizontal Reaction
- ▶ Influence Lines
- ▶ Uniformly Distributed Loads (UDL)
- ▶ Point Loads

Graphing detail



Related products

Bridges, Beams, Arches, Cables

- ▶ SV400 Simple Suspension Bridge
- ▶ SV401 Deflection of a Frame
- ▶ SV402 Suspended Centre Span Bridge
- ▶ SV403 Three-Pinned Arch
- ▶ SV404 Two-Pinned Arch

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

- ▶ **SV405:** Semi-Circular Arch
- ▶ **SV100:** Bench Mounted Frame (Sold separately)
- ▶ **SV101:** Structures Interface Unit (Sold separately)
- ▶ **SV102:** Pinned Supports Kit (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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