

The experiment Three-Pinned Arch allows the experimental investigation of the horizontal thrust observed when loads are applied to an arch with hinges at each end as well as at the peak of the arch. The measurements taken can then also be used to validate calculated values for the horizontal thrust found using the static equilibrium equations.

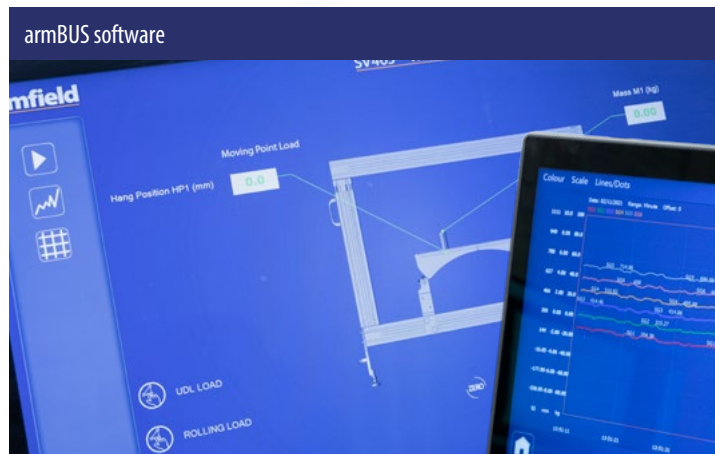
**ALLOWS THE EXPERIMENTAL INVESTIGATION INTO THE CHARACTERISTICS OF A THREE-PINNED ARCH UNDER VARIOUS LOAD CONDITIONS
SOFTWARE INCLUDED AS STANDARD**

This experiment has the following properties:

- ▶ Ability to show mechanical principles of three-pinned arches
- ▶ Point loads, uniformly distributed loads (UDL) and rolling loads can be applied to the arch
- ▶ Pivoting support capable of measuring horizontal thrust



SV100 Bench mounted frame (sold separately)



armBUS software



Arch secured to pivoting pinned support

Description

The arch is comprised of two half sections that meet in the middle with a roller bearing to simulate the central hinge. When assembled the arch sections form the three pinned arch with a flat horizontal plane for the different loads to be applied over the span of the arch.

The two arch sections are 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

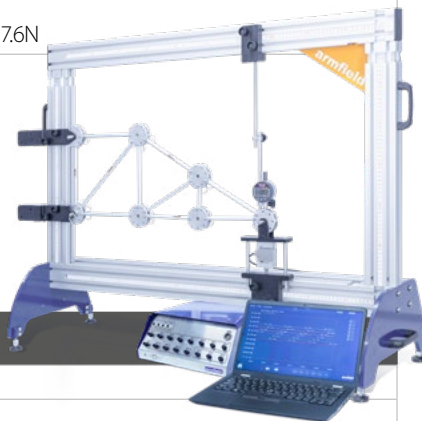
Essential accessories/equipment

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

Technical specification

- ▶ 1 x Three Hinge Arch Left Section
- ▶ 1 x Three Hinge Arch Right Section
- ▶ Arch Span: 500mm
- ▶ Arch Rise: 100mm
- ▶ 2 x 500g Weight Hangers
- ▶ 5 x UDL Masses
- ▶ UDL Mass: 310g
- ▶ UDL Mass Per Unit Length: 3.1g/mm
- ▶ 1 x Rolling Mass
- ▶ Rolling Mass: 810g
- ▶ 1x Instrument Level
- ▶ Load Cell Force Range: 0–17.6N

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
- ▶ Uniform Distributed loads (UDL), Point Loads and Moving Loads

Features / benefits

- ▶ Ability to apply point loads and UDL at different locations
- ▶ Constructed Arch with 5:1 span to height ratio and central pivot point
- ▶ Supports to constrain arch and prevent linear motion while allowing rotation
- ▶ Ability to apply point loads and UDL at different locations
- ▶ Supplied with Armfield structures software as standard

Related laws

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

Graphing detail



Related products

Bridges, Beams, Arches, Cables

- ▶ SV400 Simple Suspension Bridge
- ▶ SV401 Deflection of a Frame
- ▶ SV402 Suspended Centre Span Bridge
- ▶ SV404 Two-Pinned Arch
- ▶ SV405 Semi-Circular 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

- ▶ **SV403:** Three-Pinned 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



Products CE certified

armfield.co.uk

Aftercare

Installation
Commissioning
Training
Service and maintenance
Support: armfieldassist.com