



## TWO-PINNED ARCH

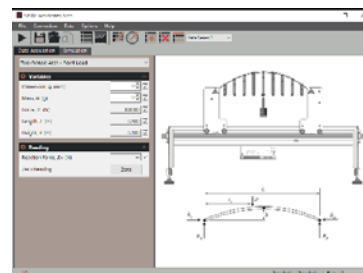


Experiment for the study of the characteristics of a two-pinned arch under various load conditions. Mounts on the Structures platform and connects to the Structures automatic data acquisition unit and software (VDAS® Onboard).



SHOWN FITTED TO THE STRUCTURES PLATFORM (STS1, AVAILABLE SEPARATELY)

LAPTOP NOT INCLUDED



SCREENSHOT OF THE VDAS® SOFTWARE

### KEY FEATURES

- One of a range of experiment modules that teach structures principles
- Fits to the Structures platform for ergonomic use and space-saving storage
- A simplified version of a realistic structure to give students an understanding of real-life structures
- Includes multiple loads for many combinations of loads including uniformly distributed loads (UDLs)
- Supplied with a storage tray to keep smaller items safe
- Direct reading of horizontal reaction for quick and simple experiments
- Complementary experiments available: Three-Pinned Arch (STS9) and Fixed Arch (STS11)
- Works with user-friendly software (VDAS®)



# TWO-PINNED ARCH



## DESCRIPTION

One of a range of experiment modules that fit to the Structures platform (STS1, available separately), this product helps students to understand how loads affect the horizontal reaction forces in a two-pinned arch.

Students apply loads to hangers suspended from the arch, held between two supports. One support allows rotational movement only, acting as a pinned support. The other support allows translational movement, acting as a roller support. A load cell prevents the translation, while measuring the horizontal reaction due to the load. Each support includes pointers that work with the scale on the platform for accurate positioning. Students use textbook equations to predict the reaction forces due to the load, comparing them with measured results, and learn how to create the influence line and bending moment diagrams. This helps confirm the reliability of the textbook equations and the accuracy of the experiment results.

This product includes additional masses so students may apply a uniformly distributed load (UDL) across the span of the arch for comparison of results with a single point load.

The load cell connects to the USB interface hub of the Structures platform for computer display and data acquisition (VDAS® Onboard).

## STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

## LEARNING OUTCOMES

- Horizontal reaction due to a varying single point load on a statically indeterminate structure
- Horizontal reaction due to a moving single point load on a statically indeterminate structure
- Horizontal reactions due to a uniformly distributed load on a statically indeterminate structure
- Influence lines and superposition
- Lines of thrust in an arch
- Graphical construction of a bending moment diagram for point loads
- The Secant assumption
- Maximum bending moments due to a load on an arch

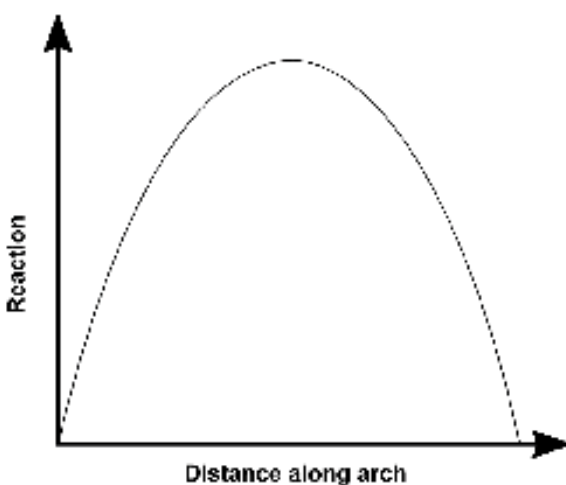
## ESSENTIAL ANCILLARY

- Structures Platform (STS1)

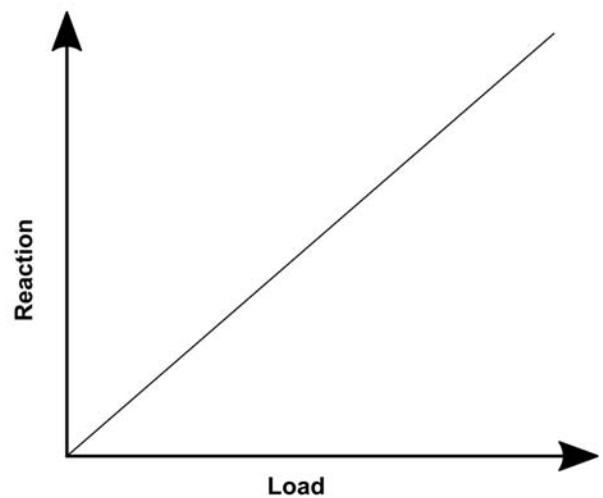
## SOFTWARE

TecEquipment has created data acquisition applications (VDAS® Onboard) for each experiment module, with additional simulated experiments.

The simulated experiments allow students to simulate the hands-on laboratory experiments, verifying their results. They also allow simulation of alternative set-ups, such as arches of larger span, extending the learning experience beyond the practical laboratory session.



TYPICAL EXPERIMENT RESULTS SHOWING HOW A MOVING LOAD AFFECTS THE HORIZONTAL REACTION



TYPICAL EXPERIMENT RESULTS COMPARING REACTION WITH A VARYING LOAD AT THE CROWN OF THE ARCH

# ≡ TWO-PINNED ARCH



## OPERATING CONDITIONS

### OPERATING ENVIRONMENT:

Laboratory

### STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

### OPERATING TEMPERATURE RANGE:

+5°C to +40°C

### OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

## DETAILED SPECIFICATIONS

TecEquipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

### DIMENSIONS AND WEIGHT:

- Nett (assembled): 660 mm long x 100 mm front to back and 320 mm high and 5 kg
- Approximate primary packed (with storage tray): 0.07 m<sup>3</sup> and 7 kg

### SPACE NEEDED:

- 1500 mm x 600 mm, level bench or desk

### ITEMS INCLUDED:

- Two arch supports, holding an arch of 0.5 m span x 0.1 m height
- Cable
- Nine mass hangers
- 50 x 20 g masses
- Storage tray
- Comprehensive user guide

