

VDAS[®] STS7
ONBOARD

UNSYMMETRICAL BENDING AND SHEAR CENTRE

Experiment for the study of the vertical and horizontal deflection of different unsymmetrical sections. Mounts on the Structures platform and connects to the Structures automatic data acquisition unit and software (VDAS[®] Onboard).



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

LAPTOP NOT INCLUDED

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
- Includes specimen beams of three different cross-sectional shapes for increased experiment range
- Two different study areas in one product: shear centre and bending
- High-resolution indicators for accurate measurements
- Supplied with a storage tray to keep smaller items safe
- Includes Vernier caliper to allow measurement of cross-section
- Works with user-friendly software (VDAS[®])

UNSYMMETRICAL BENDING AND SHEAR CENTRE

DESCRIPTION

One of a range of experiment modules that fit to the Structures platform (STS1, available separately), the product helps students understand symmetrical and non-symmetrical bending of three different beam shapes, including an equal 'L', a 'U' and rectangular. It also finds the shear centre of the channel ('U') beam.

For the symmetrical and non-symmetrical tests, a chuck clamps a beam while allowing rotation on its axis and allowing loads to be applied at various angles. Load applied at the free end produce resulting deflections, measured by a pair of precision indicators. Students plot their results on a Mohr's circle which allows them to find the experimental Principal Second Moments of Area and position of the principal axes. These may be compared to those for the arbitrary section axes and the values calculated by textbook beam equations. This helps to confirm the reliability of the textbook equations and the accuracy of the experiment results.

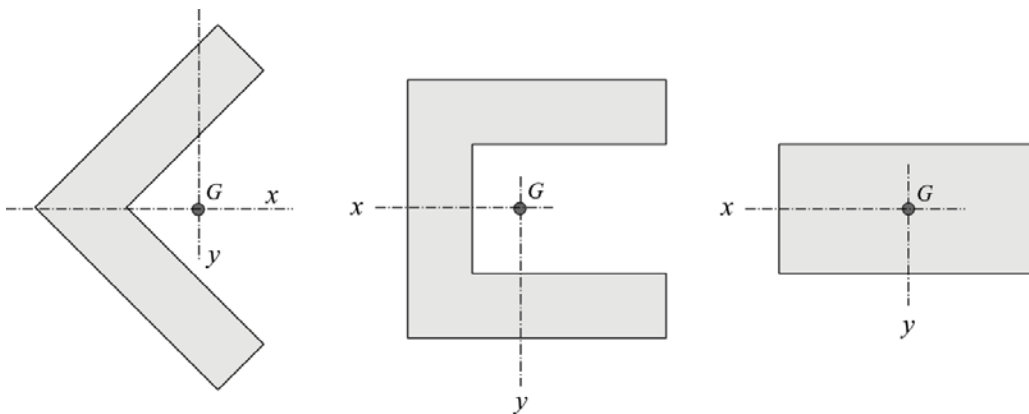
For shear centre tests, a chuck clamps the 'U' section beam. A plate clamped to the free end allows various offset loads to twist the beam. Students apply loads at various offsets and use the indicators to determine when the twist is zero, thus corresponding to the shear centre position.

This product includes a Vernier caliper for accurate measurements of the beam cross-sections.

The deflection indicators have their own displays, but they can connect to the USB interface nub 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



THE THREE DIFFERENT CROSS-SECTIONAL SHAPES

LEARNING OUTCOMES

- Show that shear centre can be outside beam section boundaries
- Shear centre of an unsymmetrical section
- Horizontal and vertical deflection in symmetrical and unsymmetrical sections at different loads and load angles
- Using Mohr's circle to find principal axes and Second Moments of Area

ESSENTIAL ANCILLARY

- Structures Platform (STS1)

SOFTWARE

TecQuipment 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 beams of different cross-sectional shape and material properties, extending the learning experience beyond the practical laboratory session.

UNSYMMETRICAL BENDING AND SHEAR CENTRE

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): 820 mm long x 260 mm front to back and 180 mm high and 10 kg
- Approximate primary packed (with storage tray): 0.07 m³ and 11 kg

SPACE NEEDED:

- 1500 mm x 600 mm, level bench or desk

ITEMS INCLUDED:

- Three test beams of different cross-sectional shape: rectangle, square angle and channel section
- A plate holding two deflection indicators, each of resolution 0.01 mm
- Clamped end assembly
- Measuring end assembly
- Two cables
- Two mass hangers
- 25 x 20 g masses
- Vernier caliper
- Storage tray
- Comprehensive user guide