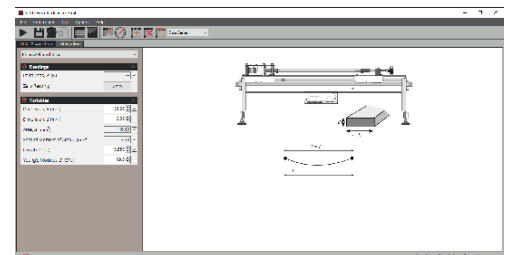
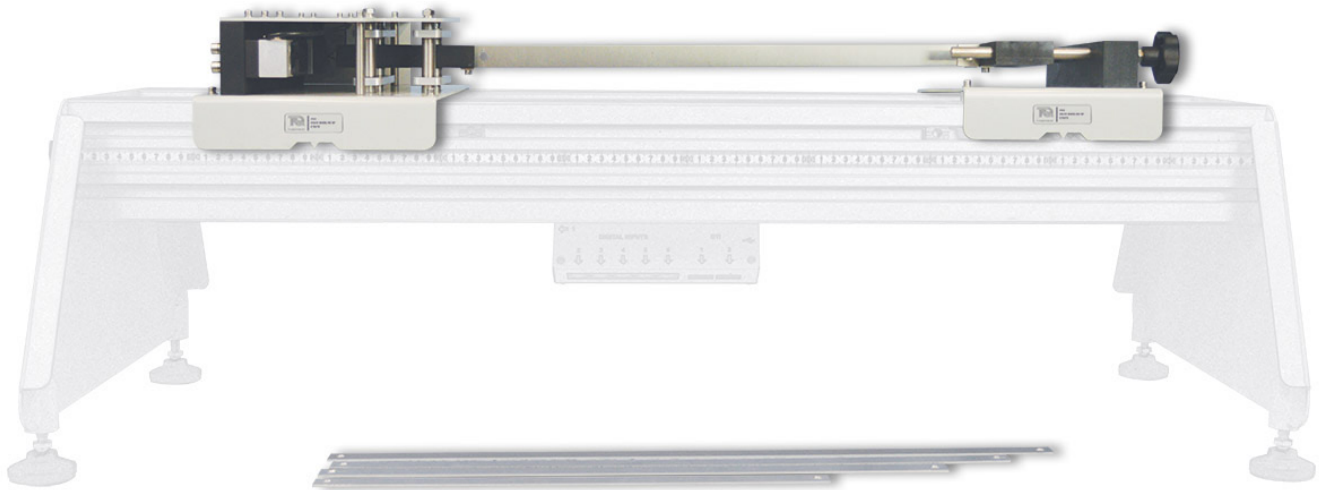




## E EULER BUCKLING OF STRUTS

**VDAS<sup>®</sup> STS12**

Experiment for the study of buckling of struts and the relationships between length, end fixing conditions and buckling load. Mounts on the Structures platform and connects to the Structures automatic data acquisition unit and software (VDAS<sup>®</sup> Onboard).



SCREENSHOT OF THE VDAS<sup>®</sup> 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
- Includes different fixings and a selection of different length specimen struts for multiple experiments
- Includes Vernier caliper for measurement of strut cross-section
- Supplied with a storage tray to keep smaller items safe
- Works with user-friendly software (VDAS<sup>®</sup>)



# EULER BUCKLING OF STRUTS



## DESCRIPTION

One of a range of experiment modules that fit to the Structures platform (STS1, available separately), this product helps students to understand the nature of buckling in slender beams that simulate 'struts'. Students fit one of a choice of struts between the two major parts of the product. One part has a hand-operated control to apply the buckling force. The other part has a load cell to measure the applied load.

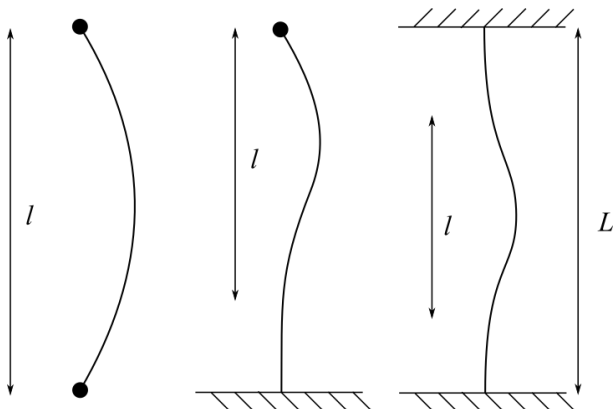
Students apply a buckling force to a strut, measuring the load and the point at which the strut collapses or 'buckles'. Students use textbook equations, including Euler's theory to predict the buckling loads, comparing them with measured results. This helps confirm the reliability of the textbook equations and the accuracy of the experiment results.

This product includes specimen struts of different lengths for comparison of the buckling loads. It also includes different strut end fixings for comparisons of how they affect the buckling load and shape of the strut as it buckles. A Vernier caliper (included) allows students to measure the cross-section of the struts.

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



SHOWING HOW THE FIXING CONDITION CHANGES THE 'EFFECTIVE LENGTH' ( $l$ ) OF THE STRUT

## LEARNING OUTCOMES

- Strut length and the collapse load
- Euler's critical load
- Slenderness ratio
- Effective length
- The collapse load and strut fixings, including:
  - Pinned-pinned
  - Fixed-pinned
  - Fixed-fixed

## ESSENTIAL ANCILLARY

- Structures Platform (STS1)

## SOFTWARE

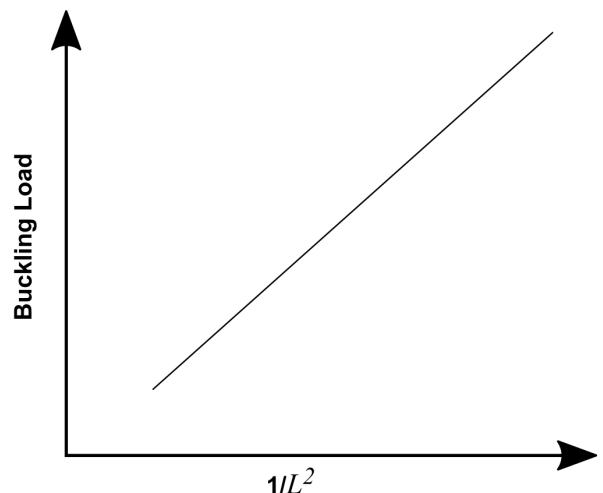
TecEquipment has created data acquisition applications (VDAS® Onboard) for each experiment module, with additional simulated experiments.

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

## DEFLEX®

DefleX® is a complimentary tool designed to introduce students to the concept and technique of Digital Image Correlation (DIC). This product is compatible with our DefleX®-3D product that uses two video cameras to track the movement of materials during a dynamic event. It is a complete and compact system for measuring full-field displacements and strains over a material's surface in three dimensions, offering students a digital blended learning experience as part of their engineering courses.

To find out more, click [here](#)



TYPICAL EXPERIMENT RESULTS COMPARING BUCKLING LOAD WITH  $1/\text{LENGTH}^2$



# EULER BUCKLING OF STRUTS



## 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

## SPECIFICATIONS

TecQuipment 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): 830 mm long x 260 mm front to back and 115 mm high and 12 kg
- Approximate primary packed (with storage tray): 0.09 m<sup>3</sup> and 14 kg

### SPACE NEEDED:

- 1500 mm x 600 mm, level bench or desk

### ITEMS INCLUDED:

- Two main parts: a load application assembly end and a load measurement assembly
- Selection of five different length struts of aluminium: each of nominal 20 mm x 2 mm cross-section
- Interchangeable end fixings
- Hexagon tools
- Cable
- Vernier caliper
- Storage tray
- Comprehensive user guide