FRAME DEFLECTIONS AND REACTIONS

Experiment for the study of rectangular portals subjected to vertical loads. Mounts on the Structures test frame and connects to the Structures automatic data acquisition unit and software.

**KEY FEATURES**
- Allows safe and practical experiments into frame deflections and reactions
- Realistic and verifiable experiment results
- Optional TecQuipment’s Structures Software package for extra, ‘virtual’ experiments, that simulate and confirm the results from your hardware and allow extended experiments
- Optional STR2000 unit with TecQuipment’s Structures Software package for automatic data acquisition and virtual experiments
- One of many interchangeable experiment modules from TecQuipment’s modern, flexible and cost-effective structures teaching system

**LEARNING OUTCOMES**
Study and comparison of load, horizontal reactions, fixing moments, sway and shear forces in a:
- rectangular portal with a uniform section; and
- rectangular portal with a non-uniform section

**KEY SPECIFICATIONS**
- Two aluminium alloy portal frames: one with a uniform section, one with a non-uniform section
- Five weight hangers and 150 x 10 g masses
FRAME DEFLECTIONS AND REACTIONS

DESCRIPTION
The experiment hardware fits onto a Structures Test Frame (STR1, available separately). The hardware includes two rectangular portal frames with the same dimensions. However, one of the frames has a constant second moment of area, while the other has one leg with a smaller second moment of area.

Students clamp each leg of one of the portal frames to supports attached to the test frame. They then load the top of the portal frame using masses on a hanger. Load cells on the supports connect to a Digital Force Display (STR1a, available separately). These measure the moment at one end of the portal frame and the horizontal reaction at the other. A digital deflection indicator measures sway at the top of the portal frame.

Students use the results of moments and reactions to plot bending moment diagrams. They compare the bending moment diagrams, the direction of sway (and its causes) to theoretical calculations. They then repeat the experiment using the other portal frame.

The lecturer guide provides details of the equipment including sample experiment results. The student guide describes how to use the equipment and gives experiment procedures.

For extra ‘virtual’ experiments, TecQuipment can supply the optional TecQuipment Structures Software (STRS), for use on a suitable computer. The virtual experiments simulate the tests you can perform with the hardware.

They also extend the choice of tests beyond that available using only the hardware, for example: higher loads, uniform loads or different test specimens. This extends the student’s learning experience.

For automatic data acquisition of your experiment results, TecQuipment can supply the optional Automatic Data Acquisition Unit (STR2000). Supplied as standard with the STR2000 is TecQuipment’s Structures Software that displays and logs your experiment results and gives the extra virtual experiments.

ESSENTIAL BASE UNIT
- Structures Test Frame (STR1)

ESSENTIAL ANCILLARY
- Digital Force Display (STR1a)

RECOMMENDED ANCILLARY
- Automatic Data Acquisition Unit (STR2000) for automatic data acquisition and virtual experiments

STANDARD FEATURES
- Supplied with lecturer guide and student guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer
Frame Deflections and Reactions

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
 TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.
 Net Dimensions and Weight:
700 x 610 x 60 mm and 4 kg
 Packaged Dimensions and Weight:
Approximately 0.12 m³ and 6 kg
 Portal Frames:
Two, of aluminium alloy, nominally 250 mm x 500 mm, one with a uniform section, one with a non-uniform section
 Load Application:
Five weight hangers and 150 x 10 g masses
 Accessories:
• Cable to connect to a digital force display
• Vernier
• Rule