

Stress and Strain Analysis in Thin-walled cylinders (EDC-SM-103)

EXPERIMENTAL DATA:

- Measuring strain with strain gauges in a thin cylinder
- Determination of principal strain by Mohr's Circle
- Investigation of relations between strains, pressure and stresses in a plane biaxial stress state
- Determination of Poisson's ratio for the cylinder material.



DESCRIPTION:

This experimental unit is used to investigate stresses and strains in a thin-walled vessel subjected to internal pressure. Pipes, pressure vessels, steam boilers etc. are classified as thin-walled vessels during design. The principal stresses play key role in calculating and designing these vessels. The stresses and strains being generated in a vessel cannot be directly measured but are determined by measuring the strains on the surface using strain gauges.

The unit consists of a thin-walled aluminium cylinder. The oil-filled vessel is closed with a lid at both ends. Manual hydraulic pump (provided) is used to generate the internal pressure. Strain gauges attached to the surface of pipe record the strain produced. This unit is provided with computer software so it can record accurate real time data from strain gauges.

TECHNICAL DATA:

- Aluminium Cylinder with
 - Length: 400mm
 - Diameter: 75mm
 - Wall Thickness: 3mm
- Maximum Internal Pressure: 40bar
- Manometer: 0 to 40 bar
- Strain gauges for measurement of strains.

RELATED LAWS:

- Materials
- Stress
- Forces
- Deformation
- Strains
- Hoop Stress
- Mohr's Circle

SCOPE OF DELIVERY:

- 1 x EDC-SM-103
- Software USB
- 1 x Instructional Manual

DIMENSIONS AND WEIGHT:

L x W x H (mm): 600 x 800 x 400

Weight Approx.: 20 kg

