

## Stress and Strain Analysis in Thick-walled cylinders (EDC-SM-107)

### EXPERIMENTAL DATA:

- Measuring strain with strain gauges in a thick cylinder
- Determination of principal strain by Mohr's Circle
- Investigation of relations between strains, pressure and stresses in a plane Triaxial stress state
- The direct stresses and strains occur: radial, circumferential, hoop and axial.



### DESCRIPTION:

This experimental unit is used to investigate stresses and strains in a thick-walled vessel subjected to internal pressure. Thick-walled cylinders are designed for uneven distribution of stresses through the wall. 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 stress state in thick wall cylinder is triaxial.

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. The cylinder has eccentric groove between its two halves where the strain gauges are mounted. Strain gauges attached to the surface of cylinder also, 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: 250mm
  - Diameter: 140mm
  - Wall Thickness: 50mm
- Maximum Internal Pressure: 80bar
- Manometer: 0 to 100 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-107
- Software USB
- 1 x Instructional Manual

### DIMENSIONS AND WEIGHT:

L x W x H (mm): 600 x 800 x 450

Weight Approx.: 30 kg

