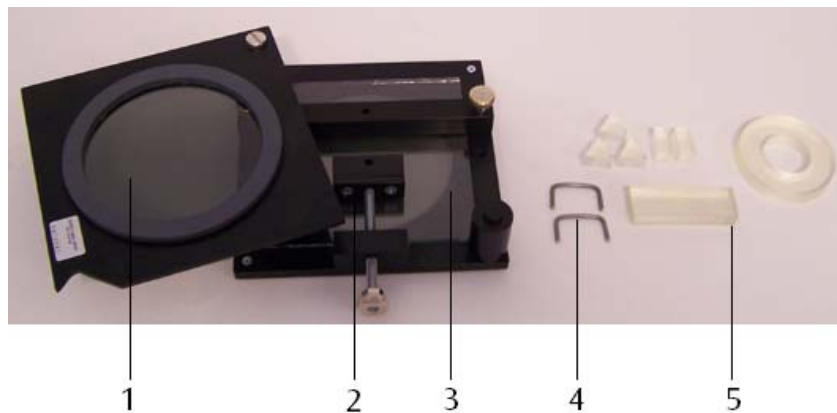


## Demonstration Polariscopes U8472580

### Instruction Sheet

06/08 ALF



- 1 Top plate with analyser
- 2 Specimen clamp
- 3 Base plate with polariser
- 4 Clips for applying tension
- 5 Specimens

#### 1. Description

The demonstration polariscope is used in combination with an overhead projector to visually demonstrate the stress distribution in specimens under tension or compression.

The polariser is contained in the base plate of the instrument and the analyser is in the rotatable top plate. A tensile or compressive load can be applied to the specimen by means of a screw mechanism. When the specimen is viewed in polarised light the resulting mechanical stresses become visible as coloured fringes.

The mechanical stresses cause the specimen to become bi-refringent (doubly refracting), so that the incident polarised light is split into two components vibrating at 90° to each other. Their phase velocities differ by an amount that increases in proportion to the stresses in the specimen. The incident light is elliptically polarised, and consequently it cannot be completely filtered out by the analyser. The birefringence depends strongly on the light wavelength. Consequently, if white light is used, the system of fringes consists of light modified such that the colours are mixtures of those components of the spectrum that are not eliminated. Fringes of a specific colour indicate positions of equal stress.

#### 2. Equipment supplied

- 1 Basic instrument
- 2 Metal clips for applying tension
- 1 Ring, 60 mm diam. × 10 mm thickness
- 1 Rectangular block, 60 × 10 × 10 mm<sup>3</sup>
- 2 Rectangular blocks, 20 × 10 × 10 mm<sup>3</sup>
- 3 Equilateral triangular blocks 17 × 10 mm<sup>2</sup>

#### 3. Technical data

Specimens:	Epoxy resin
Instrument dimensions:	150×15×45 mm <sup>3</sup> approx.
Total weight:	820 g approx.

#### 4. Operation

Additional equipment needed:

- 1 Overhead projector (230 V, 50/60 Hz) U30150-230 or
- 1 Overhead projector (115 V, 50/60 Hz) U30150-115

- Place the polariscope on the overhead projector.

- Fix a specimen firmly into the specimen clamp.
- Use the screw mechanism to apply pressure to the specimen and observe the coloured fringes in the projected image.
- For experiments with tensile loading, fix the ring specimen into the specimen clamp using the clips and apply tension by turning the screw to pull outward.

#### **Notes**

- Protect the specimens from heat. Do not expose them to direct sunlight.
- Do not apply loads to the specimens for long periods.
- Do not use aggressive detergents to clean the specimens.