

Plasticity

Williams P2 Parallel Plate Plastimeter

The Williams Plastimeter is widely used for determining the plasticity and recovery of silicones and unvulcanised rubber compounds.

Features

- Simple error free operation
- Consistent results assured
- Robust design
- Easy to use
- Measurements to 0.01mm
- Latch allows samples to be safely inserted between plates

Principle of Operation

The Plastimeter features two parallel platens. A lower platen that forms the base of the instrument, and an upper platen which can be raised and lowered vertically by a handle. The test consists of compressing a cylindrical sample of specified volume between two parallel plates and measuring the compressed height after a specified period. The sample is prepared from a sheet of unvulcanised rubber about 15mm thick. When the upper platen is lowered, a force of $49 \pm 0.05\text{N}$ is applied to the sample. A dial gauge reads the thickness of the test sample, which is the Plasticity Number.



Test Procedure

The test commences when the upper platen is gently lowered onto the sample with a force of 49N. The test sample is placed between two pieces of suitable material to prevent it sticking to the platens during the test. To allow for this, the dial gauge of the Plastimeter is set to zero with two pieces of such material between the platens (without the test sample). The sample height is taken at regular intervals, commonly 3 or 10 minutes using a dial gauge measuring in 0.01mm graduations.

At the end of the test, the result is converted to a Williams Plasticity Number by multiplying the sample height by 10.

Elevated Temperature Testing

For measurements at elevated temperatures (normally 70°C or 100°C) the sample is heated in an oven for 15 minutes before undergoing the plasticity test. The O7E Wallace Laboratory Chamber is designed specifically for this purpose. The chamber is suitable for temperatures up to 150°C.

Recover Tests 'A' and 'B'

Two procedures are specified for the Recovery test.

For Method A, the test sample is removed from the Plastimeter immediately after the Plasticity test described above has been carried out. It is allowed to cool for 1 min. and the height (h_2) is measured again.

The Recovery, $R_a = 100 (h_2 - h_1)$

For Method B, the procedure is similar to that for the Plasticity test except that the sample is compressed to a set height of 5 ± 0.01 mm. At the end of the compression period the sample is removed and allowed to recover for 5 min. at the test temperature. The height of the sample (h_3) is measured again.

The Recovery, $R_b = 100 (h_3 - 5)$

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Accessories

- Bench Thickness Gauge
- Rotary Specimen Cutter (16mm diameter)

Specifications

Williams Parallel Plate Plastimeter P2	
Part Number	WAP2
Dimensions (mm)	410 (h) x 150 (w) x 150 (d)
Weight	11 kg
Compression Force	49.00 ± 0.05 N
Sample Volume	2.00 ± 0.02cm ³
Operating Temperature	5 to 40°C; Altitude 2000m maximum
Humidity Range	10 to 80% RH non-condensing

Standards

ASTM D926

