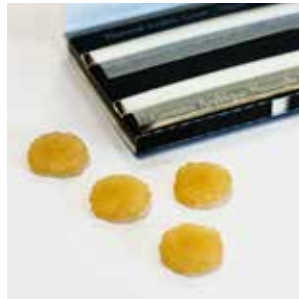


Plasticity



**INNOVATIONS IN
RUBBER TESTING**



MonTech RP 3000 Rapid Plastimeter for Polymers and Natural Rubber



The MonTech Rapid Plastimeter

measures the plasticity or viscosity of polymers and unvulcanised rubbers. The test is simple, clean and quick. The instrument is typically used in conjunction with the MonTech ageing oven for plasticity testing to determine the Plasticity Retention Index (PRI) of raw natural rubbers.

The variable temperature range from 25°C to 200°C for easier to read with freely programmable conditioning and load times allow a convenient characterisation of the flow behavior of natural and synthetic rubbers at variable test conditions. For some applications this method offers a quick, low cost alternative to a Mooney Viscosity test.

The instrument is supplied in a complete set along with a table-top, mechanical volumetric specimen cutter for a reliable preparation of test specimens with a volume of 0.40 cm³ according to international standards. The instrument is supplied with 10 mm diameter top platen installed period. Alternative top platens of 7.3 and 14 mm diameter are supplied as accessories. The platens are easily interchangeable.

Plasticity Retention Index (PRI):

PRI is a measure of the resistance of raw natural rubber to oxidation.

The oxidation effect is assessed by measuring the plasticity before ageing (P₀) and after ageing for 30 mins in the MonTech ageing oven for Plasticity testing at 140°C (P₃₀)

$$PRI = \left(\frac{P_{30}}{P_0} \right) \times 100$$

Working Principle

A modified parallel plate compression principle is used with automatically timed "conditioning" and "load" periods. A sample is compressed between two circular platens which are maintained at a temperature of typically 100°C.

The sample is conditioned for 15 seconds at a thickness of 1 mm. A compressive force of 100 N is then applied for 15 secs. The final thickness of the test piece expressed in units of 0.01 mm, is the plasticity number.

Besides this procedure described by the standards, the MonTech RP 3000 can operate at fully variable temperature and conditioning / load times.

During the loading period, the material flow and plasticity curve can be acquired by the optional MonPlast computer software.

Test Procedure

The sample is prepared using the mechanical, double-working specimen cutter and it is then enclosed between two pieces of tissue paper, as defined by international standards, before being placed between the platens. The tissue paper prevents the material sticking to the platens or sliding between them.

The automatic test sequence is started when the start lever on the instrument is rotated. Conditioning and loading periods are then automatically controlled.

The reduction in thickness of the sample as well as the load that is applied to the sample is displayed digitally on the PC screen by the optional MonPlast software.

After testing, all results are shown on the PC screen and automatically stored in the database for recalling them later or creating batch reports.

Features

The MonTech Plastimeter offers greatly enhanced operator access and is available in only one, full option version with all possible features included. One of the most important features is the powered zero and load calibration and automatic platen parallelism alignment totally eliminate the need for any manual setting of the instrument.

The RP 3000 Rapid Plastimeter can be calibrated in less than 20 seconds!

A strong aluminum and stainless steel frame, paired with direct linear drive technology ensures highest instrument rigidity and stability to guarantee the highest precision of test results.

- Fully automatic and easy operation
- Single/Median mode of operation
- Fully automatic calibration
- Built in diagnostics with Service and Diagnostics screen
- Variable platen temperature 25°C - 200°C
- Variable conditioning and load times
- Digital, continues temperature display on the PC as well as temperature graph

With optional MonPlast Software:

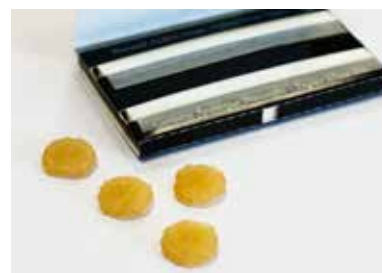
- Full P0 and PRI evaluation and reporting possibility
- Single/Median mode of operation
- Display and calculation of Plasticity curve
- Various parameters can be entered and stored to each individual test:
 - e.g. Batch number, Lot, Date, Time, Operator...
- By the help of the software a full traceability of aborted tests can be guaranteed
- All Parameters as well as results can later be printed out together with the load, Plasticity as well as Temperature graphs as a Batch Report.
- The language on the Plastimeter as well as the software can be changed online
 - Standard languages are English, German and French
- Integrated calibration and service reminder

Technical specification

Standards	BS 903:Pt A59: section A59.1, ISO 2007
Platen sizes	10 mm, 7.3 and 14 mm diameter
Platen temperature	25°C - 200°C
Test time	Default: 15 secs conditioning, 15 secs load Variable from 0 to 99 seconds
Compressive force	100 N
Calibration spacer	Included
Data Interface	RS 232
MonPlast computer software	optional
Data printer	optional
Weight	approx. 35 kg net

Package including:

- Full P0 and PRI evaluation possibility
- 3 sets of Platens in different sizes
- Variable Temperature 25°C to 200°C
- Double-working sample cutter
- RS232 Interface
- Standard accessories package
- Optional: MonPlast computer Software with flow curve acquisition and automatic PRI calculation



Double working sample cutter for fast and easy specimen preparation

MonTech PO 3000

Ageing oven for Plasticity Testing

The MonTech ageing oven for plasticity testing

ages rubber in accordance with international testing standards. In conjunction with the MonTech Plastimeter, it allows the user to determine the Plasticity Retention Index (PRI) of raw natural rubbers.

Housed in a robust stainless steel case, the MonTech ageing oven for plasticity testing features an aluminum block with four chambers that carry the drawer units and sample dishes. Heater elements are wrapped around and inside the block and high quality insulation inside the case minimizes heat loss.

An adjustable air blower system, which provides pre-heated air to the chambers, is located on the rear panel for easy service access.

Test samples are placed on round foil dishes, which are located in recesses in the drawer units. When a drawer is pushed in, a timing sequence starts only for that chamber.

As the 30 minute ageing process ends, the light next to the drawer changes color to remind the operator to remove the sample. Also the ageing oven beeps to show that ageing is finished. If the ageing period is exceeded, the light changes to red indicating that the samples should be discarded.

A temperature of 140°C (required by the standard) is maintained by a PID Controller, which continuously displays the chamber temperature. The MonTech ageing oven for plasticity testing is protected by a warning system, which is initiated if the correct temperature is exceeded by more than 10°C.

Features

- Temperature controlled to $140 \pm 0.2^\circ\text{C}$
- Four chambers with independent timers
- Stability check and overheat protection
- Digital temperature display



PO 3000 - Sample loading made easy



1 - Remove drawer from the oven



2 - Place aluminum dish



3 - Install aluminum dish



4 - Remove installation tool



5 - Load samples



6 - Put drawer back in the oven to start the 30 minute ageing sequence

Technical specification

Standards	BS 903 Pt. A59, ASTM D 3194, ISO 2007
Temperature Recovery	1 minute at 140°C after sample insertion
Operating Temperature	140 ± 0.2°C (adjustable from ambient to +200°C)
Chamber Dimensions	4 chamber with 50 mm x 12 mm x 280 mm
Max Samples per Oven	48
Max Samples per Tray	12
Dishes Per Tray	4
Heating Chambers	4
Air exchange rate	adjustable 0 to 120 times / hour
Weight	approx. 27 kg net
Electrical	90-250 V, 10 Amps, 47-63 Hz, Single phase

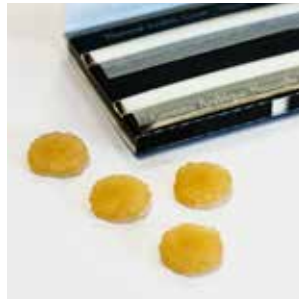


Drawers loaded with samples

Package including:

- Temperature controller (PID)
- 4 trays with 4 dishes each
- Electronic system with 4 independent timers, beeper and monitoring system
- Standard accessories package

Plasticity



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