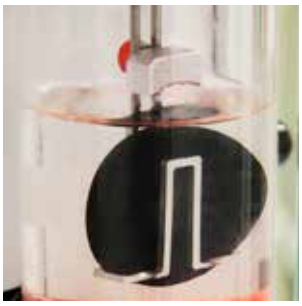
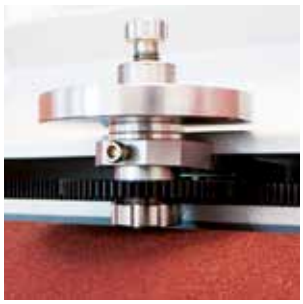
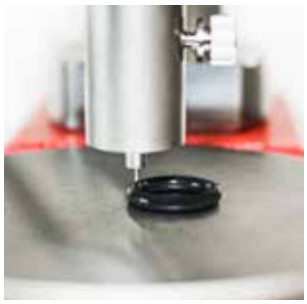
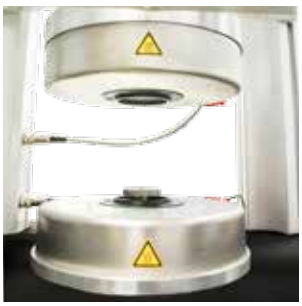
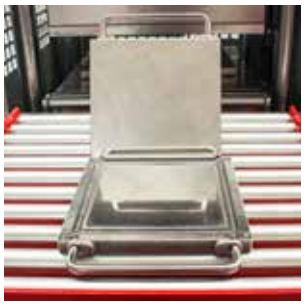
MonTech®
Rubber Testing Solutions

Hardness and Density




INNOVATIONS IN RUBBER TESTING


MonTech H&D 3000 Automated Hardness & Density Testing Instrument

2 INSTRUMENTS IN 1: With the MonTech H&D 3000, hardness AND density testing of cured rubber samples is made simple, fast and reliable. Arbitrary test sequences are easily pre-programmed, samples are sequentially processed and test data is automatically collected, without the need for operator involvement. Due to the unique rotary tray design, no manual magazine handling is needed; the instrument can be continuously loaded and operated.

→ Hardness and Density testing is combined together into a single tabletop machine requiring minimal bench space in the lab. The system is designed for unattended operation with a fully automated test sequence, totally eliminating any operator influence.

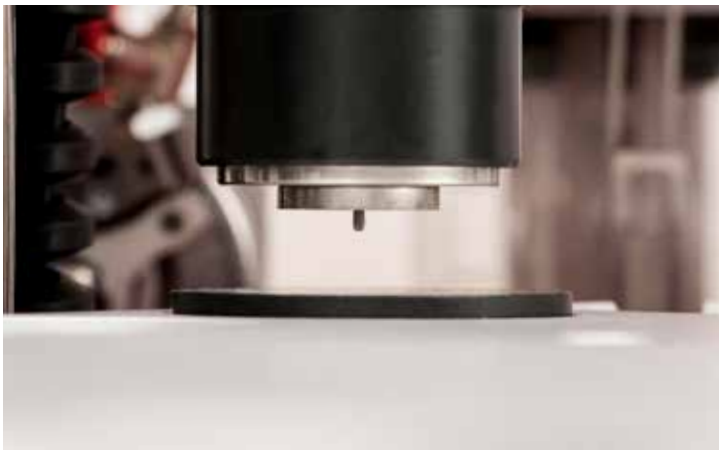
→ Test samples can be continuously loaded into an endless rotary tray at the front of the machine and are identified directly on the computer by a host system or by a barcode.

→ Fully synchronized parallel operation of hardness and density measurement permits total cycle times about 50 Seconds!
(3 points Shore A + Density)

→ During each test, the environmental and immersion fluid temperatures are accurately measured and recorded for a fully automated compensation of the specific gravity test results.

→ All test results are recorded online by the MonDevice software system featuring extensive test specification management, more than 60 different datapoints specially for the H&D 3000, automated Pass / Fail evaluation and data export to host systems and databases.

→ A standard analytical balance with integrated calibration is used for density testing, providing the most accurate results and full traceability. The scale is digitally connected to the main instrument controller for automatic data transmission



Hardness measuring head

The motorized and weight loaded hardness measuring unit featuring an integrated alignment and a digital measurement of the indentor displacement guarantees the highest precision hardness readings on up to 5 different test points per sample.
Various types of hardness heads in accordance to different international standards such as Shore A, Shore D and IRHD are available.

(multiple or interchangeable configurations available)

Precise sample handling

Stainless steel linear, rotational and multiposition electronic / pneumatic actuators provide safe and reliable handling of test samples.
Actuators are mechanically separated into two groups: one for dry and one for wet samples to avoid any cross-contamination of the samples prior to weighing in the immersion liquid.

Integrated pump circuits

ensure that the level of the density liquid in the dip tank is carefully controlled. After each density test, an adjustable amount of liquid is automatically renewed, keeping the density liquid fresh and in good condition.
Also the pumps can be used to automatically fill, empty and change the density liquid in less than 30 seconds.

Endless rotary tray magazine

The rotary sample tray allows continuous operation of the machine, totally avoiding any unproductive time.
The testing area is separated by a supervised transparent safety door and covers all around the machine.

Hydrostatic weighing

Density / Specific gravity is determined by using the "weight in air" and "weight in water" methods.
The H&D 3000 features two integrated weighing stations.
After weighing the sample in air on the first weighing station, and placing the sample on the second weighing station, a user-defined number of wetting cycles can be programmed to remove any air bubbles around the sample. Afterwards the weight is taken.
Simultaneously, the temperature of the density liquid is measured and used as a correction for density calculation.
All readings are rapidly taken by a precise weighing system based on a standard analytical precision scale, minimizing the possibility of water absorption by the sample.

Sample removal

All test samples are automatically removed after being tested and put into a separate container on the lower left side of the instrument.
This guarantees that rotary tray for fresh samples never gets contaminated with the liquid used for density testing- for continuously highest accuracy and precision.
Optionally, samples can be automatically sorted in separate containers for passed and failed specimens.

Technical specification - General

Samples	Cured rubber discs
Sample diameter	Circular discs with 30 - 45 mm diameter, 5 - 8mm thickness (other dimensions and shapes available on request)
Sample capacity	Continuous rotary sample tray with 20 sample capacity (Optional sample trays up to 2000 samples are available)
Data Interface	Ethernet (10/100 MBit), USB (int.), CF card (int.), RS232 (opt.)
Dimensions (H x W x D)	600 mm x 650 mm x 680 mm
Weight	approx. 80 kg net
Electrical	90-250 V, 1 Amp, 47-63 Hz, Single phase
Instrument options	- Rotary and stacking sample magazines for up to 2000 samples - Barcode scanner for Compound and Batch identification - Additional Hardness testing heads: Shore B, C, D, DO, O, OO, OOO, Micro A, Micro D, IRHD N, M, H, L, VLRH - Sample separation in different containers or stacks (Pass / Fail) - Rebound testing integration - ...

Technical specification - Density

Test method	Hydrostatic weighing according ISO 2781, ASTM D1817
Measurement range	< 1.0 g/cm^3 to 2.8 g/cm^3 (lower density range possible with anti-float holder)
Temperature Measurement	Standard for immersion fluid and ambient temperature

Technical specification - Hardness	Shore A	IRHD N
Test method	Shore A in accordance with: ISO 868, DIN 53505, ASTM D2240, ISO 7619, NFT 51-174, BS 903-A26	IRHD N in accordance with: DIN ISO 48, ASTM D1415, NFT 46-003, BS 903-A26
Indenter	Hardened steel rod Truncated 35° cone 0.79 mm diameter	Spherical Ball 2.50 mm diameter
Measurement range	0 - 100 Shore A	0 - 100 IRHD
Pressing force / load	Contact pressure: 12.5 N Spring Force: 8.065 N	Preload: 0.29 N for 2 Seconds Main load: 5.4 N for 1-99 Seconds
Resolution	0.1 Shore	0.1 IRHD

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