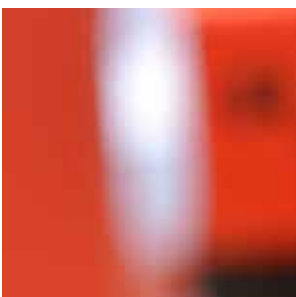


## *Hardness testing*



***INNOVATIONS IN  
RUBBER TESTING***





# MonTech HT 3000 Test stands

## A selection of test stand allows a comfortable stationary use of HT 3000 Hardness testers

Test stands vary in their level of automation to further simplify the hardness testing process and eliminate operational influence:



### HT 3000 MANUAL

Part No.: MH 8.1000

Manual test stand with simplified lever operation  
Integrated height adjustment and adjustable test surface

### HT 3000 AUTO

Part No.: MH 8.2000

Automatic test stand with motorized hardness head movement  
Single button operation and integrated power supply, controlled indentation speed acc. standards  
Optional: variable indentation speed, Pass/Fail indicator light



### HT 3000 AUTO ROTATION FIVE

Part No.: MH 8.2020

Automatic test stand with motorized hardness head movement and continuous multi sample automation by integrated rotary tray.  
Multiple readings per sample with average or median calculation.  
Simplified single button operation, different centering masks for various sample and product shapes are optionally available.



### HT 3000 AUTO ROTATION ONE

Part No.: MH 8.2010

Automatic test stand with motorized hardness head movement and single sample automation by rotating sample platform.  
Multiple readings per sample with average or median calculation.  
Simplified single button operation and optional centering masks.



# MonTech HT 3000 Modular Precision Hardness testing for Rubber, Plastics, ...

## Adaptable stationary Shore and IRHD Hardness testing

in accordance with international standards featuring a flexible changeover of testing heads and measurement applications making the HT 3000 Modular the most versatile hardness testing unit available for laboratory samples, parts and product testing.

The system features an integrated multi-axis stepper motor control to raise and lower the testing head as well as dead-load weights in accordance with the specific testing standard, type of head installed and the selected test method. This guarantees user-independent test results and an extremely good repeatability. Immediate feedback on testing results is provided by the display integrated into the testing head as well as by the optionally available MonLink computer software system or tablet computer attached to the test stand.

### The HT 3000 Modular system consists of:

- A test stand with either integral or height adjustable table
- The pickup unit with integrated drive system and connection flange
- One or multiple testing heads according to various standards
- Optional application specific positioning and centering devices
- Optional software systems for data acquisition

All control electronics and interfaces are directly integrated into the solid base of the test stand eliminating the majority of cables, simplifying installation as well as providing a good and solid base for a high stability of the entire structure.

## HT 3000 Modular precision testing heads

The HT 3000 Modular testing heads are available in various configurations according to different standards and hardness scales so that virtually any hardness testing application can flexibly be covered. The quick connect design allows a changeover of testing heads within seconds - without the needs for tools or re-calibration.

Every testing head is equipped with a integrated precision measurement and electronic system as well as a graphical, back-lit display and control buttons.

All critical data such as head type, calibration information as well as system and measurement software is directly stored in this electronic system.

This allows easy interchangeability as well as in case of re-calibration only requires the head to be sent for calibration and not the entire measuring device.

**Please find on the following page an overview with most popular system configurations and testing heads available!**

## Application examples



IRHD Micro measurement on O-Rings



Precision centering of O-Rings



IRHD Normal measurement on parts



Laser centering and measurement



HT 3000 Modular system with height adjustable test stand,  
Shore A measuring head

## Options and accessories for simplified handling and increased productivity

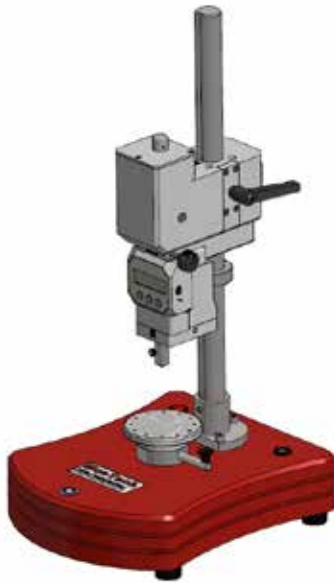
An essential part of the HT 3000 Modular product range are application specific accessories to simplify testing for any kind of rubber part or geometry.

Available accessories include manual or automated fixing, holding, centering and alignment devices for oil-seals, O-rings, sealing profiles, ...

Additional options include integrated laser thickness gauges, automated sample handling, temperature control units, verification control rings and rubber blocks, accredited calibrations as well as a variety of software systems for specification management, data acquisition with graphical display as well as reporting.

# MonTech HT 3000 Modular System Overview

The main part of a HT 3000 Modular System is the test stand - with integrated electronics system and height adjustable pickup bracket:



Modular test stand with tilting table and integrated electronics unit



Modular test stand with height adjustable table and integrated electronics unit

Test stands can be combined with over 40 available types of testing heads according to different measurement scales and methods:



Shore A / B / C / D  
for flat sheets and buttons



Shore D / C / D0  
for parts testing / uneven surfaces



Shore A / B / 0  
for parts testing / uneven surfaces



Shore 0 / A0 / D0  
for parts testing / uneven surfaces



Shore 00  
for parts testing / uneven surfaces



Shore 000 / 000-S  
for parts testing / uneven surfaces



Shore M / AM  
for parts testing / uneven surfaces



Micro Shore A  
Shore hardness testing for thin parts



VLRH  
Very low rubber hardness



IRHD N / H / L  
for soft to medium rubber parts



IRHD M  
Micro hardness testing for thin parts



Universal Force / Load Testing  
with 10N or 50N loadcell

In addition the HT 3000 Modular system can further be expanded with accessories for sample handling and data processing such as:



Laser centering and positioning system  
with integrated thickness measurement for O-Rings, Buttons, ...



Mechanical centering system with / without table extension  
available in different configurations for O-Rings, hoses, parts, ...

- Stationary table extensions
- Parts and sample fixtures
- Rotating sample holders
- Stands for production integration
- Certified reference rubber block sets
- Indenters and Control rings
- External display units
- MonScan data import software
- MonLink data management system
- LIMS, CAE and CAQ integration

# MonTech HT 3000 Chamber

## Environmentally controlled Hardness testing

### High-end, application based hardness testing under thermal influence

Understanding product performance at the specific applications conditions is a key criteria to design and produce high performance parts and components. In the tire, automotive, aerospace as well as general technical rubber industry parts and products are subjected to a huge thermal spectrum – in order to understand the material behavior and especially the change of the material hardness under those extreme conditions, the HT 3000 chamber has been developed.

The HT 3000 Chamber consists of an all-stainless 240 Liter measuring chamber available in two temperature ranges from -40°C or optionally -70°C to + 180°C.

Optionally the chamber can also be equipped with controlled humidity or de-humidification. High air circulation rates inside the test area guarantee uniform temperature and humidity distribution in the test space.

An outstanding spatial temperature distribution is achieved through aerodynamic air flow not only from the backside but also from the sides of the chamber. The HT 3000 chamber is fitted with a highly energy efficient, triple stage compressor unit with a closed refrigeration system. This completely eliminates the need for external gases or cooling media, allowing continuous operation at lowest operational cost.

On top of the chamber a specifically adapted HT 3000 Modular testing unit is mounted with a specially adapted Shore A or IRHD testing head reaching all the way into the chamber. All tests are in full compliance with DIN 53505, ISO 868, ISO 7619, ASTM D 2240, JISK 6253 (Shore A) or DIN ISO 48, NFT 46-003, ASTM D 1415, BS 903, Part. A26 (IRHD N) .

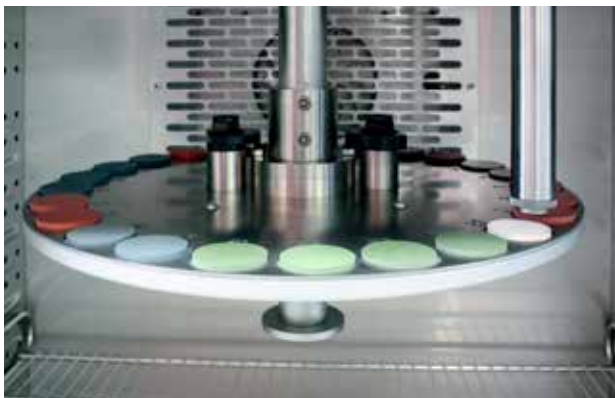
This design guarantees that the precision measuring mechanism with all critical components remain outside the chamber while the test specimens are precisely subjected to the thermal profile required by the specific application.



#### **Fully automatic or manual operation - available test configurations in the chamber:**

- Rotary tray with up to 25 sample position for automated sequential sample testing at multiple points on multiple samples or sample groups
- Stable platform for products and parts testing, complete with a special specimen holder and porthole access to the holder from the right side of the chamber.

All test processes of the HT 3000 Chamber are precisely controlled by the MonLink software where test series can be configured, samples can be identified and grouped as well as thermal sequences can be configured. In automatic mode the chamber follows an exact temperature profile testing samples at multiple points in set intervals whereas thermal stability is closely monitored. This allows even longtime ageing test as well as creep testing sequences to be programmed and executed fully automatic. In manual mode product or part samples can be tested quickly by simply placing the specimen in the test area, setting the desired temperature and conditioning time.



The entire testing process can be monitored through the large, heated viewing window at the front of the chamber.

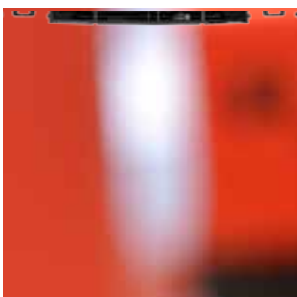
Integrated in the 5 layer insulated and heated window is a LED light bar for a clear visibility inside the test area.

All testing sequences are fully software guided sequences provide the operator with all necessary information to execute and monitor single or series tests.

All data during the testing process is stored automatically in a database as well as a report format and available for a detailed analysis later.

This includes data and plots on Hardness vs. Temperature, Hardness vs. Time, ... Customized configurations of the chamber and automation unit are available upon request.

## Hardness testing



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