

SHORE DUROMETERS

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The durometer hardness scale was defined by Albert F. Shore, who developed a measurement device called a durometer in the 1920s. The term durometer is often used to refer to the measurement, as well as the instrument itself. Durometer is typically used as a measure of hardness in polymers, elastomers, plastics and rubbers.

Durometer scales

There are several scales of durometer hardness, used for materials with different properties. The two most common scales, using slightly different measurement systems, are the type A and type D scales. The A scale is for softer plastics, while the D scale is for harder ones. There are 12 scales, depending on the intended use; types A, B, C, D, DO, E, M, O, OO, OOO, OOO-S, and R. Each scale results in a value between 0 and 100, with higher values indicating a harder material.

Method of measurement

Durometer, like many other hardness tests, measures the depth of an indentation in the material created by a given force on a standardized presser foot. This depth depends on the hardness of the material, its viscoelastic properties, the shape of the presser foot, and the duration of the test. The durometers allows for measurements of the initial hardness, or the indentation hardness after a given period of time. The basic test requires applying the force in a consistent manner, without shock measuring the hardness.

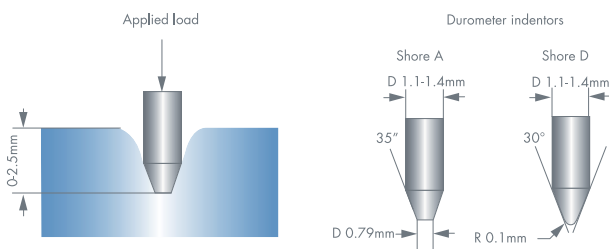
Depth of the indentation

If a timed hardness is desired, force is applied for the required time and then read. The material under test should be a minimum of 6.4mm.

The final value of the hardness depends on the depth of the indenter after it has been applied for 15sec on the material. If the indenter penetrates 2.5mm or more into the material, the durometer is 0 for that scale. If it does not penetrate at all, then the durometer is 100 for that scale. It is for this reason that multiple scales exist. Durometer is a dimensionless quantity, and there is no simple relationship between a material's durometer in one scale, and its durometer in any other scale, or by any other hardness test.

Durometer hardness of various common materials

| Material | Durometer Scale |
|-----------------------|-----------------|
| Bicycle gel seat | 15-30 OO |
| Chewing gum | 20 OO |
| Sorbothane | 40 OO |
| Sorbothane | 0 A |
| Rubber band | 25 A |
| Door seal | 55 A |
| Automotive tire tread | 70 A |
| Soft skateboard wheel | 75 A |
| Hydraulic O-rings | 70-90 A |
| Hard skateboard wheel | 98 A |
| Ebonite rubber | 100 A |
| Solid truck tires | 50 D |



SHORE DUROMETERS

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INRH SERIES



HS100
ANALOGUE TYPE A

FEATURES

- Testing rubber, plastic, leather and all other soft materials
- Fast and easy to read
- Portable
- Use by hand
- Available in Shore A

TECHNICAL SPECIFICATIONS

| | |
|---------------------------|-----------------------|
| Test scales available | A |
| Result display | Hardness result Shore |
| Measuring range | 0-100 |
| Result display resolution | 1 pt. increments |
| Pointer sweep | 360° |
| Pressure foot | ø18mm x 25mm length |
| Weight | 200gr |

STANDARD DELIVERY

- Instrument
- INNOVATEST® certificate
- Carrying case

OPTIONAL ACCESSORIES

- Reference block

ORDER DETAILS

HS100 Handheld durometer for Shore A hardness testing

HS100
PENETRATOR





SHA0001
SHORE "A" TESTER



SHD0002
SHORE "D" TESTER

FEATURES

- Fast and easy to read
- Portable
- Hand-held operation or via optional bench stand
- Available in either Shore A or Shore D
- Testing rubber, plastic, leather and other soft materials
- Supplied with a setting / reference block
- The optional bench stand is intended for use with 1kg loading for Shore 'A' scales and 5kg loading for Shore 'D' scales
- According to DIN 53505, ASTM D2240, ISO R/868
- Standard UKAS certified

TECHNICAL SPECIFICATIONS

| | | |
|-----------------------|---|-----------------|
| Test scales available | A or D Scale | |
| Standards | Conforms to DIN 53505, ASTM D2240, ISO R/868 | |
| Result display | Hardness result Shore | |
| Pressure foot | ø18mm | |
| Applications A scale | Soft rubber, natural rubber products, neoprene, polyester, soft PVC, leather, thiokol, nitrile rubbers, etc. | |
| Applications D scale | Hard rubber, hard synthetic materials, thermoplastics, polystyrol, vinyl sheets, cellulose acetates, densified wood, etc. | |
| Penetrator | A scale | blunt taper 35° |
| | D scale | sharp point 35° |
| Measuring range | 0-100 | |

STANDARD DELIVERY

- Instrument
- UKAS certificate of calibration
- Blunt taper 35° penetrator (A scale)
- Sharp point 35° penetrator (D scale)
- Reference block
- Carrying case
- Manual

OPTIONAL ACCESSORIES

- Bench stand (SHA0003)
- Reference block

REFERENCE BLOCK



SHA PENETRATOR



SHD PENETRATOR



ORDER DETAILS

- SHA0001** Shore "A" scale
- SHD0002** Shore "D" scale
- SHA0003** Bench stand



DSAS001
SHORE "A" TESTER



DSDS001
SHORE "D" TESTER

FEATURES

- Testing rubber, plastic, leather and all other soft materials
- Fast and easy to read
- Large digital display, digits 8mm high
- Supplied as standard with UKAS certificate of calibration
- Portable
- Use by hand or mounted on a stand
- Available in Shore A or Shore D
- Supplied with a reference block
- Data output for SPC
- Power on/off automatic
- Electronic module protection to IP65, even with data output
- According to DIN 53505, ASTM D2240, ISO R/868
- Can be used in conjunction with Shore bench stand

TECHNICAL SPECIFICATIONS

| | | |
|-----------------|---|-----------------|
| Scale | Shore A or Shore D | |
| Resolution | 0.1 unit | |
| Standards | Conforms to DIN 53505, ASTM D2240 and ISO R/868 | |
| Measuring range | 0-100 | |
| Pressure foot | ø18mm | |
| Penetrator | A scale | blunt taper 35° |
| | D scale | sharp point 35° |
| Indenter | ø1.25mm | |
| Battery | Lithium 3V, CR2032 | |
| Data output | RS-232 combined with external power supply | |

STANDARD DELIVERY

- Instrument
- Button battery
- Reference block
- Blunt taper 35° penetrator (A scale)
- Sharp point 35° penetrator (D scale)
- UKAS certificate of calibration
- Carrying case
- Manual

OPTIONAL ACCESSORIES

- Bench stand
- Communication cable
- Reference block
- Software

SHA0003



DSAS
PENETRATOR



DSDS
PENETRATOR



ORDER DETAILS

- DSAS001** Handheld digital durometer for Shore A hardness testing
- DSDS001** Handheld digital durometer for Shore D hardness testing
- SHA0003** Bench stand



THS-200
SHORE "A" TESTER

FEATURES

- Digital durometer for Shore A hardness testing
- Pocket size model with integrated probe
- Testing soft rubber, plastic and other soft materials
- According to DIN 53505, ASTM D 2240, ISO 7619, JIS K7215
- RS-232 data output
- Operating stand optional
- Bright and clear LCD display
- 300 hours continuous use with standard batteries: no cables!
- Automatic switch off
- Battery low indication

TECHNICAL SPECIFICATIONS

| | |
|---------------------------|---|
| Test scales available | Shore A |
| Standards | Conforms to DIN53505, ASTM D2240, ISO 7619, JIS K7215 |
| Result display | Hardness result, average value, max value (peak value lock), battery indication |
| Measuring range | 0-100 |
| Result display resolution | 0.2 unit |
| Data output | RS-232 |
| Statistics | Highest hardness, average |
| Features | Automatic switch off, battery low alarming |
| Operating temperature | 0°C to 40°C |
| Power requirements | 3 x 1.5V batteries |
| Battery life | 300 hours |
| Dimensions | 168mm x 31mm x 30mm |
| Weight | 144gr |

ORDER DETAILS

THS-200/A Handheld digital durometer for Shore A hardness testing

THS-200/01 Stand for THS-200/A (see below)

THS-200/01 STAND FOR THS-200/A

- Operating stand for THS-200/A
- Convenient and accurate way for repetitive testing of hardness
- Eliminates human error
- Measured values are more accurate and reliable
- Hardness of rubber and plastics can be measured

TECHNICAL SPECIFICATIONS

| | |
|-----------------------|--------------------|
| Max. sample thickness | 20mm |
| Construction | Aluminum and steel |
| Net weight | 19.8kg |
| Durometer types | THS-200/A |

STANDARD DELIVERY

- Instrument
- Batteries
- Manual
- INNOVATEST® certificate

OPTIONAL ACCESSORIES

- Communication cable
- Operating stand with constant load THS-200/01

THS-200/01





THS-210
SHORE "D" TESTER

FEATURES

- Digital durometer for Shore D hardness testing
- Pocket size model with integrated probe
- Testing hard rubber, plastic and other soft materials
- According to DIN 53505, ASTM D 2240, ISO 7619, JIS K7215
- RS-232 data output
- Operating stand optional
- Bright and clear LCD display
- Automatic switch off
- Battery low indication

TECHNICAL SPECIFICATIONS

| | |
|-----------------------|--|
| Test scale available | Shore D |
| Standards | Conforms to DIN53505, ASTM D2240, ISO 7619, JIS K7215 |
| Display | Hardness result, average value, max. value (peak value lock), battery indication |
| Data output | RS-232 |
| Measuring range | 0-100 |
| Measurement deviation | Within 20-90 HSD, error $\leq \pm 1$ HSD |
| Display resolution | 0.2 unit |
| Operating temperature | 0°C to 40°C |
| Power requirements | Built-in 3.7V rechargeable battery |
| Dimensions | 173mm x 56mm x 42mm |
| Weight | 233gr |

ORDER DETAILS

THS-210/D Handheld digital durometer for Shore D hardness testing

THS-210/01 Stand for THS-210/D (see below)

THS-210/01 STAND FOR THS-210/D

- Operating stand for THS-210/D
- Convenient and accurate way for repetitive testing of hardness
- Eliminates human error
- Measured values are more accurate and reliable
- Hardness of rubber and plastics can be measured

TECHNICAL SPECIFICATIONS

| | |
|---|-----------------------|
| Durometer types | THS-210/D |
| Max. sample thickness | 80mm |
| Max. diameter of working table | $\varnothing 116$ mm |
| Max. lifting displacement | 24mm |
| Max. touch distance between pressure foot and working table | 0.05mm |
| Dimensions | 420mm x 200mm x 170mm |
| Weight | 22kg |

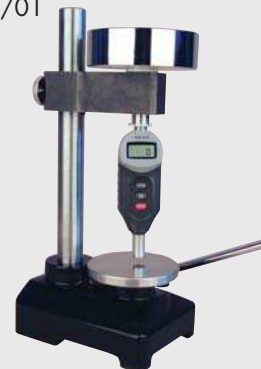
STANDARD DELIVERY

- Instrument
- Charger
- Manual
- INNOVATEST® certificate

OPTIONAL ACCESSORIES

- Communication cable
- Operating stand THS-210/01
- Printer TA-230

THS-210/01




INRH SERIES

HIGH END LAB INSTRUMENT FOR RUBBER, SOFT PLASTICS AND POLYMERS

FEATURES

Micro measuring force hardness tester for soft materials such as rubbers and polymers based on voice coil closed loop force feedback technology. Motorized test head can move 100mm up/down and allows large workpiece accommodation. The voice coil motor has made it possible to set the load to be measured as required. In addition, since it is possible to set any required measuring time, measurement can automatically be performed for the optimum time, and this makes it possible to deal with soft samples (like jellies, chewing gum, bread, etc.) that could not be measured using conventional standards.

Can be operated stand alone or over PC. Software available for data analysing and file storage.

Available configurations:

INRH-01 (micro measuring force hardness tester) JIS K 6253 (type A / type E) / ASTM D 2240 (type OO) emulation

INRH-02 (IRHD rubber hardness tester, M method), JIS K 6253, ISO 48, DIN 53 519, BS903, ASTM D 1415

By connecting the unit to a personal computer, the relationship between time and displacement can be shown in graph form. Information on the manner of displacement can also be obtained as numeric data, which is useful in the evaluation of physical properties.

TECHNICAL SPECIFICATIONS

| | | |
|---------------------------------------|--|---------------|
| Hardness testing method | | |
| INRH-01 | Fixed load system (IRHD/original), Variable load system (A, E, OO) | |
| INRH-02 | Conforming to JIS K 6253 | |
| Measuring range | INRH-01 | 0-100 degrees |
| | INRH-02 | 30-100 IRHD |
| Minimum display unit | INRH-01 | 0.1 degrees |
| | INRH-02 | 0.1 IRHD |
| External interface | RS-232C (3 m max.), start switch | |
| Power supply | 100-240 VAC, adapter for 24 VDC | |
| Rated power | Approx. 18 W | |
| Statistical processing | Easement curve and general statistical processing (mean value, median value, etc.) | |
| Load application method | Voice coil motor | |
| Position detection method | Differential transformer | |
| Indicating accuracy | INRH-01 | ±0.1 degrees |
| | INRH-02 | ±0.1 IRHD |
| Quantizing error | INRH-01 | 0.1 degrees |
| | INRH-02 | 0.1 IRHD |
| Measuring head rise /drop distance | 100mm | |
| Measurable sample dimensions | W = 160, D = 110, H = 100 (H min. = 0.3 or less) | |
| Working temperature range | 5°C - +40°C, In storage: -10°C - +60°C | |
| Working ambient humidity | 40 - 80% RH (to be no condensation) | |
| Standards | Conforms to EC Directive (EN61326) | |
| Weight | Approx. 8kg (body) / Approx. 0.6kg (power supply unit) | |

STANDARD DELIVERY

- Main unit
- Indentors
- INNOVATEST® certificate
- Installation & user manual

OPTIONAL ACCESSORIES

- Hardness blocks
- PC measuring system

ORDER DETAILS

| | |
|----------------|---------------------------------------|
| INRH-01 | Micro measuring force hardness tester |
| INRH-02 | IRHD hardness tester |