

CALISUM

SHORE HARDNESS TESTER

CS-402

A B C D

E O DO OO

This Shore Hardness Tester is small in size, light in weight, easy to carry, it is convenient to use and operate. It's ruggedness will allow many years of use if proper operating techniques are followed. Please read the following instructions carefully and always keep this manual within easy reach.

3. Front Panel Descriptions



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1. Features

- * Designed to determine the indentation hardness of materials ranging from cellular products to rigid plastics. Each Durometer type is made to a specific scale (i.e. A, B, C, D, DO, E, O, OO) and is capable of producing a value between 0 and 100.
- * Shore A is designed for soft vulcanized rubber, natural, thermoplastic elastomers, flexible polyacrylics and thermosets, wax, felt, and leathers.
- * Shore B is designed for moderately hard rubber, thermoplastic elastomers, paper products, and fibrous materials.
- * Shore C is designed for medium-hard rubber, thermoplastic elastomers, medium-hard plastics and thermoplastics.
- * Shore D is designed for hard Rubber, thermoplastic elastomers, harder plastics, and rigid thermoplastics.
- * Shore DO is designed for rubber, thermoplastic elastomers, and very dense textile windings.
- * Shore E is designed for hard sponge, EVA.
- * Shore O is designed for soft rubber, thermoplastic elastomers, very soft plastics

tand thermoplastics, medium-density textile windings.

- * Shore OO is designed for extremely soft rubber, thermoplastic elastomers, sponge, extremely soft plastics and thermoplastics, foams, low-density textile windings.
- * It meets standards: DIN 53505, ISO 868, ISO 7619, ASTM D 2240, JIS K7215.
- * Used the exclusive Micro-computer LSI circuit and crystal time base to offer high accuracy measurement.
- * Digital display gives exact reading with no guessing or errors.
- * Can communicate with PC for recording, printing and analysing by the optional software and cable for RS232C interface.
- * Automatic power off to conserve power.
- * Use operation stand of optional parts can get good accuracy and repetitiveness due to constant measurement force to eliminate the errors caused by artificially applied different force.

2. Specifications

Display : LCD Display
Case: High impact ABS
Resolution: 0.1 H

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Fig-1 Information Form

3-1	Number of measurements in the state of average value
3-2	Indicator of Average value
3-3	State of average value
3-4	Display
3-5	CAL key
3-6	RS232C Interface
3-7	Max hold key
3-8	Power key
3-9	Indicator of Max value
3-10	Battery Cover
3-11	Wrist Ring
3-12	N/Average key
3-13	Zero key
3-14	Sensor

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4. Measuring Procedure

- 4.1 Specimen should allow measurement to be taken at least 12 mm from any edge. Specimen surface should be flat and parallel to allow the presser face to contact to the specimen over an area which has a minimum radius of 6mm from the durometer probe. The specimen may be constructed with layered pieces to achieve the necessary thickness requirements, however measurements taken on these specimens may not agree with those made on solid specimens, due to the surface faces between layers not being in complete contact.
- 4.2 Depress and release the "Power key" to power the tester on.
- 4.3 Depress the "MAX" key till the mark MAX shows on the display.
- 4.4 Hold the durometer vertically with the point of the indenter at least 12 mm from any edge. Apply the presser foot to the specimen as rapidly as possible, without shock, keeping the foot parallel to the surface of the specimen. Apply just sufficient force to obtain firm contact between the presser foot and the specimen. Hold for 1 or 2 seconds, the maximum reading can be obtained automatically.

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Range: 10~90HA/HD(B/C/E/O/DO/OO)

Accuracy: ±1H

Measurement speed: >30 (readings per minute)

Operating temperature: 0°C~40°C

Power : 2x1.5v AAA(UM-4) battery

Size: 176x63x25mm

Weight: 310 g

Standard Accessories:

Main unit
Pin length test block
Carrying case
Operation manual

Optional Accessories:

* Hardness test block
* USB data output
* RS-232 data output
* Bluetooth data output

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4.5 To take the next measurement, just depress the "Zero key" and repeat 4.4. On the other hand, you can depress the "Max hold key" till the mark MAX disappears from the display. And then repeat the step 4.3 and 4.4.

4.6 If other than a maximum reading is needed, no need to set the mark "MAX" showing on the display. In such case, the reading on the display is an instant value. Just hold the durometer in place without motion and obtain the reading after the required time interval (Normally less than 1 second).

4.7 How to take average value

4.7.1 To take the average value of many times of measurements, just depress and release the "N/AVE key" to make the symbol "N" showing on the display, followed by a digit between 1-9 with the prefix "No." Here the digit is the times of measurements used to calculate the average value. Every time depress and release the "N/AVE key", the digit will increase 1. And the digit will become "1" while depressing the "N/AVE key" at "9".

4.7.2 Adjust the digit to the number needed

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and depress "MAX key" or "Zero key" to return to the measurement state or wait for several seconds till "0" on the display.

4.7.3 Take measurements as per steps from 4.3 to 4.5. Be sure that every test should be 6 mm apart. Every time take a measurement, the reading and the times of measurements show on the display. When the times of measurements is equal to the number set, the unit first displays the reading of the last, and then display the average value of last "N" measurements, followed by 2 beeps, with a symbol "AVE" indicating on the display.

4.7.4 To take the next average value, just repeat 4.7.3.

4.7.5 To release from average measurement, just depress the "N/AVE" till "N" disappears.

5. CALIBRATION CHECK

To check whether the tester is accurate, just Insert the indenter into the hole of the calibrated test Block. Apply enough force to make firm contact between the top surface of the test block and the presser foot. The reading should agree with the value stamped on the test block. If not, just carry out Zero calibration and High end calibration.

5.1 Zero calibration

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Hold the durometer vertically with the point of the indenter hanging in the air, the reading on the display should be "0". If not, depress the "Zero key" to make the tester display "0".

5.2 High end calibration

Just place the indenter onto a flat glass, apply enough force to make firm contact between the glass and the presser foot. The readings on the display should lie between 99.5 and 101. If not, press "CAL key" to carry out high end calibration.

6. BATTERY REPLACEMENT

6.1 When the battery symbol appears on the display, it is time to replace the batteries.

6.2 Slide the Battery Cover away from the tester and remove the batteries.

6.3 Install batteries paying careful attention to polarity.

7. NOTE

Readings below 10HD for Shore D type may be inexact and should not be reported for some materials. Measurements should be made on a Shore A type.

Readings above 90HA for Shore A should be made on a Shore D type durometer.

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