

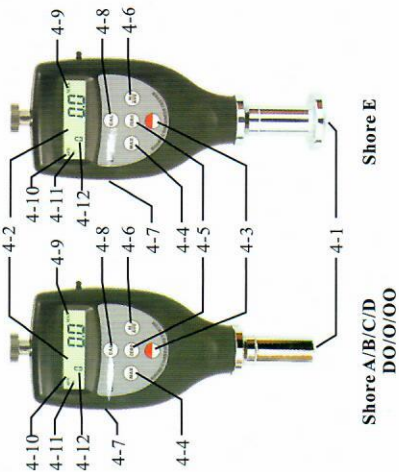
# DIGITAL SHORE HARDNESS TESTER

- SHORE A**     **SHORE E (ASKER C)**
- SHORE B**     **SHORE DO**
- SHORE C**     **SHORE O**
- SHORE D**     **SHORE OO**

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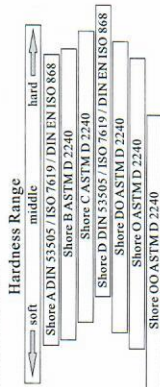
## 4. FRONT PANEL DESCRIPTIONS



- 4-1 Sensor
- 4-2 Display
- 4-3 Power key
- 4-4 Max hold key
- 4-5 Zero key
- 4-6 N/Average key
- 4-7 RS232C interface
- 4-8 CAL key
- 4-9 Indicator of Max Value
- 4-10 Indicator of Average value
- 4-11 State of average value
- 4-12 Number of measurements in the state of average value

## 5. MEASURING PROCEDURE

## 1. SELECTION GUIDE



### Typical samples and requirements

Type	Typical Examples of Materials Tested	Durometer hardness	Material Thickness
Shore A	soft rubber, elastomers, natural rubber products, Neoprene, Polyester, resin, leather, soft PVC, etc.	20-90A	4 mm, DIN EN ISO 868 6 mm, DIN 53505 ISO 7619, ASTM D 2240
Shore B	Middle hard rubber materials, type writer rollers, etc.	Above 90A Below 20D	6 mm, ASTM D 2240
Shore C	plastics and middle hard rubber materials	Above 90B Below 20D	6 mm, ASTM D 2240
Shore D	fiber plastics, hard rubber, hard plastic materials, Plexiglas, stiff thermoplastic, Formica, print roller, vinyl-plate, cellulose acetate, etc.	Above 90A	4 mm, DIN EN ISO 868 6 mm, DIN 53505 ISO 7619, ASTM D 2240
Shore DO	plastics and middle hard up to hard rubber materials	Above 90C Below 20D	6 mm, ASTM D 2240
Shore O	soft elastic materials, print rollers, middle firm textile fabrics, nylon, Orlon, Perlon, Rayon	Below 20 DO	6 mm, ASTM D 2240
Shore E	soft rubber, highly elastic materials, plastically deformable materials	Above 90 D Below 20A	6 mm, ASTM D 2240
Shore OO	sponge- and cellular rubber, foam rubber, silicone, gel-like materials	Below 20 O	6 mm, ASTM D 2240

- 5.1 Test specimen  
The minimum thickness is specified in a different standard, see part 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.
- 5.2 Depress and release the "Power key" to power the tester on.
- 5.3 Depress the "MAX" key till the mark MAX shows on the display.
- 5.4 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.
- 5.5 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.
- 5.6 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

## 2. 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. For the selection guide of shore hardness scale, please refer to part 1.
- \* 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.

## 3. SPECIFICATIONS

- Display: 4 digits, 10 mm LCD
- Display Range: 0-100 H
- Measurement Range: 10-90 H
- Resolution: 0.1 H
- Measurement deviation:  $\leq \pm 1H$
- Power supply: 2x1.5V AAA (UM-4) battery
- Operating condition: Temp. 0-50°C

- durometer in place without motion and obtain the reading after the required time interval (Normally less than 1 second).
- 5.7 How to take average value
- 5.7.1 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".
- 5.7.2 Adjust the digit to the number needed and depress "MAX key" or "Zero key" to return to the measurement state or wait for several seconds till "0" on the display.
- 5.7.3 Take measurements as per steps from 5.3 to 5.5. 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.
- 5.7.4 To take the next average value, just repeat 5.7.3.
- 5.7.5 To release from average measurement, just depress the "N/AVE" till "N" disappears.
- 6. CALIBRATION CHECK  
To check whether the tester is accurate, just insert the

Humidity <80%  
Size: 176x65x28mm (6.9x2.6x1.1inch)  
Weight: about 170g  
(not including batteries)  
PC interface: RS232C interface  
Power off: 2 modes

Manual off at any time by depressing the power key till OFF shows on the display or Auto power off after 2 minutes from last key operation.

Accessories:  
Carrying case .....1 pc.  
Operation manual .....1 pc.  
Test block .....1 pc.

**NOTE:** this test block is not the real hardness test sample. It is only an imitation. Just place the block onto a flat glass, then place the point of indenter into the hole of the block when take measurements.

Optional accessory:  
Cable and software for RS232C  
Operating Stand

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.

## 6.1 Zero calibration

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".

## 6.2 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.

## 7. BATTERY REPLACEMENT

- 7.1 When the battery symbol appears on the display, it is time to replace the batteries.
- 7.2 Slide the Battery Cover away from the tester and remove the batteries.
- 7.3 Install batteries paying careful attention to polarity.