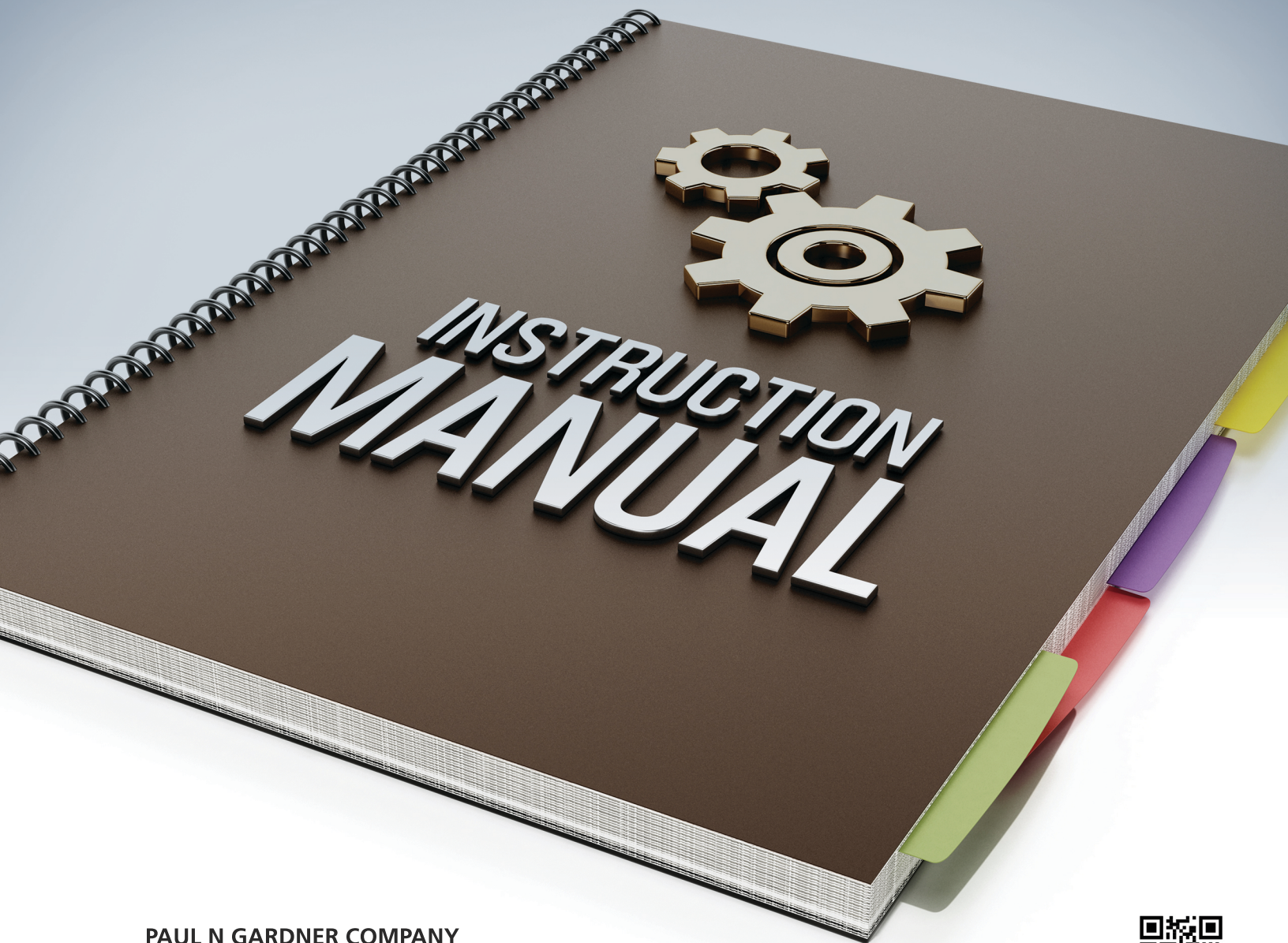




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# INSTRUCTIONS

## GARDCO DISTRIBUTED PRODUCTS



# Model 409 ASTM Type D Durometer

**PTC**<sup>®</sup>  
INSTRUMENTS

PTC<sup>®</sup>'s Model 409 Type D Durometer is designed to measure ASTM Type D hardness of hard rubber, plastics, soft metals, epoxies, and other similar materials. The Model 409 meets or exceeds current ASTM D2240 Specifications.

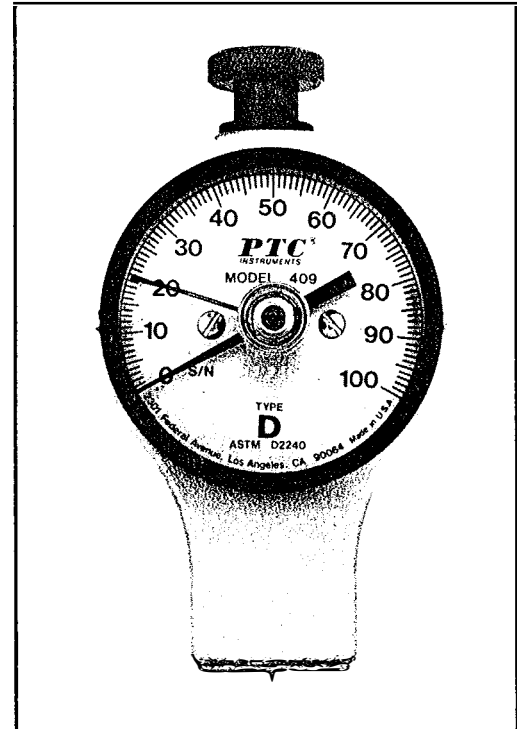
Hardness is one of the most significant physical properties of elastomeric compounds. The hardness reflects all, or in part, such other qualities as resilience, durability, uniformity, tensile strength, and abrasion resistance.

The instrument features a low glare aluminum dial with bold, easy to read numbers. The durometer comes with an ancillary hand, which records the peak reading. The hand is held by a nonimpeding magnetic clutch. The case tapers to a base that is 1" x 1" for better access to confined areas. A removable mounting knob (8-32 threads) permits both easy hand-held use or attachment to PTC<sup>®</sup>'s and other durometer stands for precise laboratory work. The die cast aluminum housing is finished in a light gray. Each durometer comes with its own test report, test block, and sturdy carrying case.

The mainspring is precision wound from special high carbon steel, heat-treated for long life and centerless ground for accuracy. Each instrument is individually calibrated to ASTM specifications. PTC<sup>®</sup>'s special cam adjustment allows complete control over the extension reading on the dial. Accurate readings can be obtained in any position.

## SPECIFICATIONS

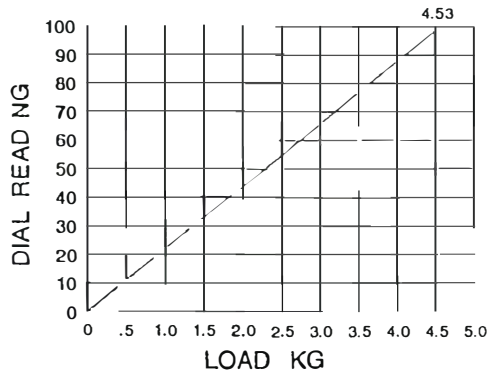
1. Meets or exceeds current ASTM D2240 Specs.
2. Range (Type D) ..... 0 to 100 points.
3. Accuracy .....  $\pm 1$  point.
4. Dimensions:
  - Height ..... 4 in. (10.2 cm).
  - Width ..... 2 1/4 in. (5.7 cm).
  - Depth ..... 1 3/4 in. (4.4 cm).
5. Weight ..... 6 oz. (170 g).
6. Shipping weight ..... 2 lbs. (907 g).



*Model 409 Type D Durometer  
for plastic and all semi-hard  
and plastic-like materials*

## CERTIFICATION SERVICE

A 10-point certification for the Model 409 Durometer is available from PTC<sup>®</sup>. Calibration is performed in accordance with MIL-STD-45662A and current ASTM D2240 Specifications. Calibration equipment is traceable to the National Institute of Standards and Technology. Each certification provides "as received" and "as certified" data. The points calibrated are 10, 20, 30, etc. over the durometer's scale from 0 to 100. Certifications are only available for durometers, test blocks are not certifiable.



*Force displacement curve  
for Model 409 spring  
ASTM D2240 Type D*

## OPERATING INSTRUCTIONS

The following procedures are based on ASTM Standard D2240. This standard is recognized as being definitive, however, not all applications require such stringent controls.

Readings below 10/D may be inexact and should be made on a Type A durometer.

The surface of the sample to be tested shall be clean and smooth. The sample should be at least 1/4 inch (6 mm) in thickness unless it is known that identical results are obtained with a thinner specimen. Thinner materials can be stacked to obtain the minimum thickness (DO NOT GLUE). Such results may not agree exactly with those of a solid specimen. Most materials above 50/D can be tested with a 1/8 inch (3 mm) minimum thickness. The sample should be large enough so that the indenter is at least 1/2 inch (12 mm) from any edge unless it is known that identical results are obtained when measurements are made closer to the edge. The surface of the specimen shall be flat over a sufficient area to permit the presser foot to contact the specimen over an area having a radius of at least 1/4 inch (6 mm) from the indenter point. The temperature of the specimen should be 73.4°F ±3.6°F (23°C ±2°C). The specimen should be allowed to rest at this temperature for at least 1 hour prior to testing, as the properties of most materials change with temperature.

Place the specimen on a hard, horizontal surface. Set the ancillary hand of the durometer near zero on the dial. Hold the durometer vertically with point of the indenter at least 1/2 inch (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 from the ancillary hand. If other than a maximum reading is needed, hold the durometer in place without motion and obtain the reading after the required time interval. Make 5 tests at least 1/4 inch (6 mm) apart and use the average value.

## GUARANTEE & CALIBRATION SERVICE

*Pacific Transducer Corp. guarantees the workmanship and materials of these instruments for one year from the date of purchase.*

*PTC® offers a free calibration check service on these instruments. This offer covers only a calibration check and should not be construed as replacement of parts or repairs. Return postage required.*

## CALIBRATION CHECK

For a complete calibration check of mainspring and visual and mechanical check of indenter, the instrument should be returned to PTC® (see Guarantee & Calibration Service) or refer to ASTM D2240 Specifications. For a quick field check, follow the guidelines below. Under no circumstance should the check block be used as a standard to calibrate a durometer.

1. The pointer should read zero when no force is applied to the durometer or indenter.
2. Hand hold the 409 and insert the indenter into the hole of the calibrated check block. Apply enough force to make firm contact between the top surface of the check block and the presser foot. The dial reading should agree with the value stamped on the check block (±1 point).
3. The indenter must protrude 0.098 to 0.100 inches below the presser foot.
4. When the indenter is fully displaced the durometer should read 100 points.

## CUSTOM DUROMETERS

For unusual materials or working conditions, custom durometers are often needed. PTC® can fill these needs with custom-designed and built instruments specially suited to the customer's needs. Custom force curves and special indenters are often used to fill such requirements. A complete file is maintained on all custom instruments for repeat orders.

**PTC®**  
INSTRUMENTS