



## QUALITY GAUGES FOR CHECKING THE HARDNESS OF NON-METALLICS



Rex Gauge Company has been specializing in quality durometers for over sixty years. We pride ourselves in the fact that Rex Durometers are easy and convenient to use, as well as durable and extremely accurate. Our personnel are truly professionals in their trade, as is evident in the fine workmanship and quality that go into each gauge—from the first calibration to the final approval before delivery to the customer.

Due to increased worldwide sales, Rex Gauge Co. has recently expanded its production capacity to a 56,000 square foot, 7 acre facility. With our new building, Rex will offer more quality products and even better service.

Even though we're bigger, we still offer the same old-fashioned, same day service which our customers have appreciated for over sixty years. Plus, our expertise allows us to customize any Rex instrument to meet your company's specific needs. For information or a quotation, please call your representative today at **1-800-927-3982**.

All Rex components are manufactured in the USA.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Otto J. Schultes".

Otto J. Schultes *President*

A handwritten signature in black ink, appearing to read "Ryan Schultes".

Ryan Schultes *Vice President*

# The Original Vest-Pocket Style Durometer

**Size: .5" x 4.5"H Net Weight: 1.5 oz.**

Mass produced since the 1930's and patented by Rex in 1947, the Model 1500 is still considered to be the best all around instrument of its kind. While other manufacturers have attempted to copy the Rex design, none can offer the quality of a Rex 1500.

## MODEL 1500

With its light weight and small size, it is a convenient gauge to carry around the shop. (Should it be dropped, even if not in its leather carrying case, it will almost never be damaged or become inoperative). Because the gauge is so durable, the Model 1500 comes with a lifetime guarantee.

The key to the gauge's durability is its sliding vernier scale—there are no cams, gears, or levers to wear out. This vernier scale holds the maximum reading, which is especially useful for testing hard to reach areas.

The vernier scale is marked in increments of 5 points.

### Features:

- Ultra lightweight
- Excellent for hard to reach places
- Virtually unbreakable
- Precision Construction
- Holds reading until reset
- Furnished with a leather pouch
- NIST Traceable

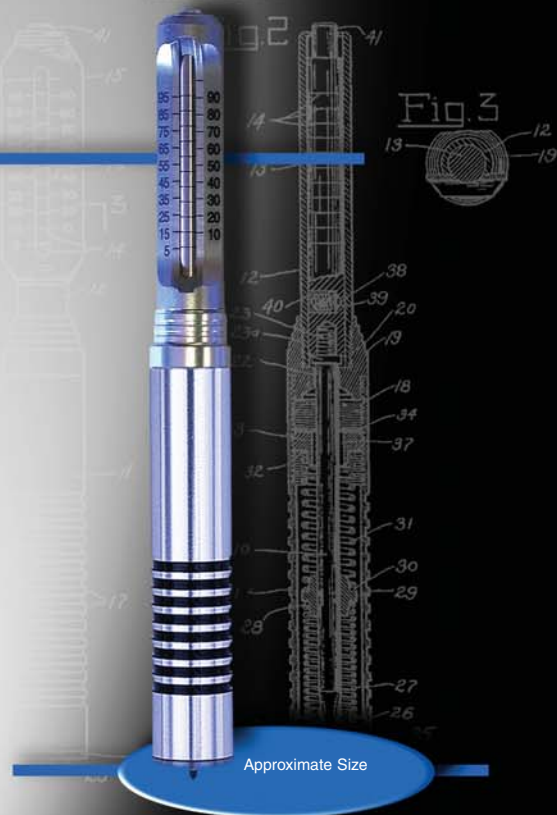
UNITED STATES PATENT OFFICE

June 3, 1947

2,421,449

HARDNESS MEASURING INSTRUMENT

Filed May 16, 1942



Available in Types A, D, B, C, DO, O



# Mini-Dial Durometer

Size: 1.675" x 5.6"H

Net Weight: 3.85 oz.

## MODEL H-1000

The Rex H-1000 Mini-Dial Durometer is both compact and easy to use. Its small dial face and included leather clip-on carrying case make it easy for an inspector to carry the gauge for work around the shop, or out in the field. The H-1000 durometer holds the maximum reading, until reset by pressing the button at the top of the gauge. The max-hold feature and small dial size make the H-1000 a good choice for hard to reach places, or for out of sight testing.

### Features:

- Small face (1.675" Dia.)
- Easily fits into your pocket or clipped on belt
- Increments of 1 from 0-100
- One year warranty
- Furnished with a leather carrying case
- Conforms to ASTM D-2240 and NIST Traceable



Available in Types A, D, B, C, DO, O, E, R

# Standard Dial Durometer

**Size: 2.25" x 6.125"H**  
**Net Weight: 6 oz.**

## MODEL 1600

The Model 1600 Durometer is Rex's standard model for good reason. The gauge features a full-sized dial face for readability to within 1/2 point. The 1600 offers the maximum accuracy available in a dial model gauge at a minimum cost.

### Features:

- Large dial
- Full 360° sweep
- Superior 1/2 point accuracy
- Custom made carrying case
- One year warranty
- Conforms to ASTM D-2240 and NIST Traceable



Available in Types  
A, D, B, C, DO, O, OO, OOO, M, E, R

# Max-Hand Durometer

Size: 2.25" x 6.125"H  
Net Weight: 6 oz.

## MODEL 1700

Introduced in 1965, the Model 1700 was designed to enable the user to observe and measure the “creep” present in a specimen.

Creep refers to the tendency of the durometer reading to decrease over a period of seconds after the initial reading is taken. This occurs because the springloaded durometer indenter may continue to penetrate the specimen as the gauge is held against the surface (depending on the type of material being tested). For example, in a specimen where creep is present, the initial reading may be 35.0 durometer points, while the reading after three seconds may be 33.5 durometer points.

The Model 1700 features a max-hand, and an active-hand, so that creep may be observed. The max-hand holds the maximum reading, while the active-hand can be observed creeping down the scale. The 1700 is equipped with a max-hand reset button on the top left of the gauge.

### Features:

- Holds maximum reading until reset
- Reads maximum and creep
- Unique foolproof reset
- Superior 1/2 point accuracy
- Custom made carrying case
- One year warranty
- Conforms to ASTM D-2240 and NIST Traceable



Available in Types A, D, B, C, DO, O, E, R

# Max-Hand Durometer

Size: 2.25" x 6.125"H  
Net Weight: 6 oz.

## MODEL 2000

The Max-Hand 2000 durometer is Rex Gauge Company's latest innovation for the testing of specimens with creep\*. The Max-Hand 2000 has a max-hand and an active-hand for observing the creep characteristics of a specimen. What makes the Model 2000 unique is the magnetic-drag, maximum reset mechanism. The user simply rotates the reset knob on the front of the gauge to clear the previous reading. The simplicity of the reset mechanism ensures a lifetime of use, and makes the Max-Hand 2000 the most affordable durometer for testing specimens with creep.

\*For an explanation of "creep", see the Model 1700 on page 6.

### Features:

- Reads maximum and creep
- Cost effective, hand operated
- Holds maximum reading until reset
- Custom made carrying case
- Superior 1/2 point accuracy
- One year warranty
- Conforms to ASTM D-2240 and NIST Traceable



Available in Types A, D, B, C, DO, O, E, R

# Digital Durometer

Size: 2.25" x 6.125"H  
Net Weight: 7.15 oz.



## MODEL DD-3

The Rex DD-3 Digital Durometer is an excellent instrument for data collection or repetitive quality control testing. With its impressive list of features, the DD-3 is truly state-of-the-art, and is the ideal durometer for lab use. Some of the features are: a large direct drive LCD display, RS232 data ports for computer compatibility, tolerancing, a locking feature to prevent accidental erasure of tolerances, automatic shutoff, low battery warning, and new accessories such as MTI and SPC type printers, audio attachments and software.

### Features:

- High and low buttons for setting tolerance limits
- Solid state circuitry with LCD display
- Comes with batteries and AC adapter
- One year warranty
- Response speed is immediate
- Holds reading until reset
- 0.1 Resolution
- Dial rotates up to 270°
- Custom made carrying case
- Certification included
- Accessories also available: Printer, Audio Attachment and Lab Software
- Conforms to ASTM D-2240 and NIST Traceable

Available in Types A, D, B, C,  
DO, O, OO, OOO, M, E, R



# Multi-Scale Durometer

Size: 2.25" x 6.125"H

Net Weight: 6.0 oz. with one barrel adapter

## MODEL MS-1

For the technician that must perform hardness tests on various types of non-metallic materials, Rex Gauge Company provides the Multi-Scale durometer test kit.

The Multi-Scale base kit consists of a Rex A scale durometer, and your choice of one or more color-coded barrel adapters for D, B, C, DO, O, OO, OOO, or E scales (see the quick reference guide on page 18 for applications). Changing scales is accomplished by unscrewing one barrel and replacing it with another - no supplementary calibration or adjustments are necessary. A test block, calibrated to the selected scale is also included. The block allows the user to perform quick, functional checks on the instrument. The indicator and barrels are made in the USA, and are calibrated to the ASTM D2240 standard for durometer hardness testers.



# Elastomer Test Specimen Kits

## TEST BLOCK KITS

These kits will prove to be invaluable in helping to maintain durometer read-out accuracy for the scientific, manufacturing, and research and development fields. These kits act as a reference check for the operational status of the gauge, and allows the user to develop the proper feel for the use of the gauge (many users exert too much force on the gauge, thus obtaining erroneous readings).

Instant identification of a particular hardness range is fast and easy due to our color identification system.

While these test blocks are a convenient form of comparative verification, they are not intended to be used for the purpose of durometer calibration. Rather, they are a form of "quick reference" to the operational status of the durometer being used.

A large variation would indicate the need for recalibration of the durometer being utilized. This should be done in accordance with the methods indicated in ASTM D-2240.

**Test Block Kits and Single Test Blocks are available in A, D, B, C, DO, O, OO, OOO, M and E.**

The material (rubber) from which the test blocks are made is fairly stable; however, it is strongly recommended that the calibration of the test blocks be verified annually.



Model TBK-A



Model TBK-00



Model TBK-D

# Rex Durometer Calibrator

**Size: 15.5" x 7.5" x 11.5"H**  
**Net Weight: 30.5 pounds**

## CALIBRATOR

The Rex calibrator was designed to be simple to use. Unlike a conventional scale, it doesn't require the fabrication of a fixture to hold the gauge, and the user doesn't have to perform any calculations to determine if the gauge is in calibration. With the RDC-1, the user simply secures the gauge in the clamp and slides the weight to the appropriate point on the scale. If the gauge reads within +/- 1 of the point indicated on the scale, it's in calibration.



The RDC-1 offers quality unparalleled by any other. With its heavy steel base, stainless steel column, and billet aluminum components, the RDC-1 is the sturdiest calibrator made. All components are precision CNC machined to exacting tolerances, then plated or painted to insure long life. The RDC-1 is delivered fully calibrated, with documentation traceable to NIST. It also comes with instructions and technical notes covering specifics about durometer calibration.

### Features:

- The instrument is portable and can be used on any convenient workbench or desk
- Accurately control, internally, the calibration requirements necessary for product consistency
- Direct reading for easy calibration
- Allows for periodic checks on durometers over the entire scale
- Made and assembled in the USA
- Conforms to ASTM D-2240 and NIST Traceable



**Model RDC-1**

Rex Gauge Company's RDC-1 durometer calibrator was designed to help durometer users obtain in-house calibration ability. The calibrator allows the user to calibrate gauges in the A, D, B, C, DO, O, E scales, and is furnished with an adapter which allows the user to check the calibration of competitive gauges.

## SPECIALTY GAUGES



**Model 2100**

Designed specifically for checking tires in racing applications, the 2100 is essentially a type A gauge with a few added features. The gauge is lighter than the standard model 1600, is furnished with a clip-on sheath, has a special dial face and hand, and is black anodized.



**Right Angle Durometer**

The right angle durometer allows the user to check linings or installed gaskets inside tanks or other cylinders. The gauge can perform tests in a confined space where a standard gauge could not be positioned properly.





**Model 1600-SP  
Type E**

SP Gauges are manufactured to conform with a specified standard and durometer type (ASTM, ISO, DIN, JIS, or Asker Type). SP gauges are available in analog and digital models.



**Model 1600-SP  
Type CF**



**OS-5 Bowling  
Mini-Stand**

A portable and affordable alternative to the larger stands, the OS-5 can be used in conjunction with a Rex type D durometer to check the hardness of bowling balls. The stand holds the gauge perpendicular to the ball during testing, thus eliminating the human error sometimes associated with checking hard, curved surfaces.

## CUSTOM DESIGNS



Slim Probe A



Chisel Shaped Angled Foot

- We have the capacity to offer custom built durometers for specific needs or applications.
- We offer Custom Gauges and Fixturing for unusual materials or working conditions.
- Because of our "Modular Concept" we can make basic design changes to our probes, or special indentors to customize our instruments.
- If you can furnish us with a sample of your material, we can furnish you with a gauge to check almost any non-metallic material.

### Slim Probe "A": Narrow Foot

For checking narrow or irregular shapes. Foot size is .110 x.50". Can be modified to fit your particular needs.

### Chisel Shaped, Angled Foot

For hard to reach or narrow areas.

### Slim Probe "B": 3/16" Diameter Foot

A thinner foot for reaching hard to get places. Can be modified to fit your needs.

### ASTM OO

For checking foam, or soft rubber. The gauge is pictured with the OO/OOO constant load weight (top), and the extended foot (extended foot can be attached to any type or model Rex durometer).

### Constant Load Weight

This constant load weight can be attached to any model Rex durometer with an 822g springload (types A, B, O and E). Because it provides the correct testing pressure on the gauge and acts as an extended foot, the constant load weight eliminates human error.

\*Not all custom designed gauges will conform to ASTM specifications.

For More Information  
on Rex Custom Durometers  
**MODELS, SPECIAL TYPES,  
and FIXTURING**  
visit [SPACEGAUGE.COM](http://SPACEGAUGE.COM)



**Slim Probe B**



**ASTM 00**



**Constant Load Weight**



# Increased Accuracy and Productivity

## OPERATING STANDS

### The OS-1 Operating Stand

The OS-1 provides a convenient and accurate way to perform repeated hardness tests. The stand provides the correct testing pressure as noted in ASTM D-2240, thus eliminating human error.

The OS-1 may be used with durometer types A, D, B, C, DO, O, OO, OOO and E.



**Model OS-1**

Used for Types A, D, B, C, DO, O, OO, OOO, E



**Model OS-2**

Used for Types A, B, O, E



**Model OS-2H**

Used for Types A, B, O, E



## The OS-2 and OS-4 Operating Stands

Smaller versions of the OS-1 stand, the OS-2 and OS-4 provide a convenient and accurate way to perform repeated hardness tests. All stands provide the correct testing pressure as noted in ASTM D-2240, thus eliminating human error. The OS-2 can be used for type A, B, O and E, while the OS-4 is for use with types OO and OOO.

## The OS-2H, OS-3 and OS-4H Operating Stands

The OS-2H, OS-3 and OS-4H offer all the features of the standard Rex OS-2 and OS-4 stands, plus a dampening feature. The dampener lowers the durometer at the same rate for each test, resulting in superior repeatability for all durometer tests (especially in the sensitive OO, OOO and M durometer types). The OS-2H can be used for durometer types A, B, O and E. The OS-3 is used only for type M durometers, and is ideal for o-ring testing (o-ring fixtures are available). The OS-4H is for use with the OO and OOO durometer types.



**Model OS-3**

Used for Type M only



**Model OS-4**

Used for Types OO, OOO



**Model OS-4H**

Used for Types OO, OOO



O-Ring Fixture Set also available.



















# Quick Reference Guide

## QUICK REFERENCE GUIDE

Rex Gauge company has been specializing in quality durometers for over 60 years. Rex Durometers are known World-Wide for their quality, dependability, and accuracy. Except where noted, all gauges comply with ASTM D-2240. Most gauges are available in A, D, B, C, DO, O, OO, OOO, M, E and R. All are in stock and ready for immediate delivery. Custom designed hardness/softness gauges and operating stands, along with many accessories, are available.

## GUARANTEE

All Rex Durometers and accessories are guaranteed for a period of one (1) year against defective workmanship and/or material. This guarantee does not apply to products that are mishandled, misused, etched, stamped, or otherwise marked or damaged. The instrument will be repaired or replaced (at our option) without charge by Rex Gauge Company.

DUROMETER TYPES	INDENTOR SHAPE	MAIN SPRING
 <b>TYPE A</b> (ASTM D2240) Soft rubber, plastics and elastomers, printer's rolls, tires.	 Flat Cone Point 35° Included Angle	822 GM 1.81 LB.
 <b>TYPE D</b> (ASTM D2240) Hard rubber and plastics such as thermo plastics, flooring and bowling balls.	 Sharp Cone Point 30° Included Angle	4536 GM 10.0 LB.
 <b>TYPE B</b> (ASTM D2240) Harder elastomers and plastics. Paper and fibrous materials. Use above 93 Duro A.	 Sharp Cone Point 30° Included Angle	822 GM 1.81 LB.
 <b>TYPE C</b> (ASTM D2240) Medium hard elastomers and plastics. Also useful to avoid surface marks.	 Flat Cone Point 35° Included Angle	4536 GM 10.0 LB.
 <b>TYPE DO</b> (ASTM D2240) Dense granular material, textile windings.	 3/32" Spherical	4536 GM 10.0 LB.
 <b>TYPE O</b> (ASTM D2240) Very soft elastomers, textile windings, soft granular materials. Use below 20 Duro A.	 3/32" Spherical	822 GM 1.81 LB.
 <b>TYPE OO</b> (ASTM D2240) Light foams, sponge rubber gels, animal tissue.	 3/32" Spherical	113 GM
 <b>TYPE OOO</b> (ASTM D2240) Ultra soft gels and sponge rubber.	 1/2" Spherical	113 GM
 <b>TYPE M</b> (ASTM D2240) Thin irregularly shaped rubber such as O-Rings (as thin as .050).	 Sharp Cone Point 30° Included Angle	78 GM

# Technical Notes

The durometer is the international standard for the hardness measurement of rubber, plastic and other non-metallic materials. Durometers are described in the American Society for Testing and Materials specification ASTM D-2240, which is the recognized specification for the instrument and test procedures.

There are a number of brands of durometers, all of which must conform to the same ASTM specifications if they are to be known as genuine durometers. Sometimes a durometer scale may be referred to by its brand name. The "A" scale is the durometer A scale (or type A) and all brands will, or should give interchangeable readings.

## HARDNESS AND OTHER RELATED CHARACTERISTICS

The durometer hardness test is non-destructive and the small instrument size, with no need for elaborate specimen preparation, makes it an ideal method for checking materials under any condition with accuracy and reliability. All durometers have a springloaded indenter which applies an indentation load to the specimen, thus sensing the "hardness", which can be related to other material characteristics. Use of a durometer provides a quick yet accurate way to indirectly measure other material properties, such as: tensile modulus, resilience, plasticity, compression resistance and elasticity.

It is relatively simple to determine the correlation between durometer hardness and other properties for a given material. A set of specimens of the material (or family of materials) is first tested on a standard tester for property desired, ie. tensile strength. A set of durometer readings for the same samples is then observed and noted. Thereafter, only the durometer hardness need be observed on similar material specimens to obtain a reasonable measure of the other property. Some properties correlate exactly, while others are sufficiently close for practical use as an initial quality control or materials engineering test.

## CALIBRATION, CHECKING, ETC...

"My durometer rests below zero, is it out of calibration?" This is a common question asked by durometer users. The answer to the question, in most cases, is no. Certain Rex gauges and models rest at roughly six points below zero: this is because the gauges are made with a preload of 56g at a

zero reading. Therefore, a durometer giving a less-than-zero reading at rest is not out of calibration. With A 56g load the gauge will read zero.

To make a simple calibration check, take a reading on smooth glass or steel. (**WARNING:** this is not recommended for type D durometers—the gauge may be severely damaged). The gauge should read within 1/2 point of 100. In a Rex Durometer, the unique built-in linearity assures that the gauge is in proper calibration throughout the entire scale. Should a Rex Durometer not give the above reading on a smooth, hard surface, it may be assumed that the durometer has been damaged, and it should be sent to Rex for inspection and/or repair.

## TEST PROCEDURES

Because durometers measure hardness by relating the penetration of an indenter into a specimen, and because the indenter travel may reach .100", it follows that a specimen must be of sufficient thickness to ensure a proper, sensitive test. Generally, samples to be tested should not be less than 1/4" (6mm) thick. Exceptions may be made for harder materials because the indenter is at less than half stroke. For

example, a material that checks near 80 durometer points can be as thin as .118" (3mm), because the indenter will only extend .020" during testing.

**What must be avoided is a specimen so thin that the indenter may sense the hardness of the underlying surface.** This will give a false

reading due to the "anvil effect". **The Rex type M durometer can be used when checking materials thinner than 1/4" (as thin as .050").**

When testing flat specimens too thin to give accurate readings, the specimens may be stacked to provide the required thickness.

In addition to sufficient thickness for testing, sufficient material around the sides of the indenter must be present. With soft materials, a minimum 1/4" (6mm) is recommended. Hence, all Rex Durometers are made with a 1/2" diameter foot which provides the necessary area of contact. Rex offers an extended foot useful for testing very soft materials, or for enhancing repeatability in a lab-type environment.

All products and specifications subject to change.

### COMPARISON CHART

A		10	20	30	40	50	60	70	80	90	100
B		10	20	30	40	50	60	70	80	90	100
C		10	20	30	40	50	60	70	80	90	100
D		10	20	30	40	50	60	70	80	90	100
DO		10	20	30	40	50	60	70	80	90	100
O		10	20	30	40	50	60	70	80	90	100
OO	10	20	30	40	50	60	70	80	90	100	
M		30	40	50	60	70	80	90			

This chart is for comparison purposes only.  
This is not and cannot be used as a conversion reference.



Photo courtesy of NASA.

## Rex Gauge Durometers

The Model SG-5000 Durometer  
*For Use in Manned Space Flight*

The Rex SG-5000 durometer was developed exclusively for use by NASA astronauts.



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