

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
 TYPE A (ASTM D2240) Soft rubber, plastics and elastomers, printer's rolls, tires.	 Flat Cone Point 35° Included Angle	822 GM 1.81 LB.
 TYPE D (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.
 TYPE 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.
 TYPE C (ASTM D2240) Medium hard elastomers and plastics. Also useful to avoid surface marks.	 Flat Cone Point 35° Included Angle	4536 GM 10.0 LB.
 TYPE DO (ASTM D2240) Dense granular material, textile windings.	 3/32" Spherical	4536 GM 10.0 LB.
 TYPE O (ASTM D2240) Very soft elastomers, textile windings, soft granular materials. Use below 20 Duro A.	 3/32" Spherical	822 GM 1.81 LB.
 TYPE OO (ASTM D2240) Light foams, sponge rubber gels, animal tissue.	 3/32" Spherical	113 GM
 TYPE OOO (ASTM D2240) Ultra soft gels and sponge rubber.	 1/2" Spherical	113 GM
 TYPE M (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													10	20	30	40	50	60	70	80	90	100

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