Shore®

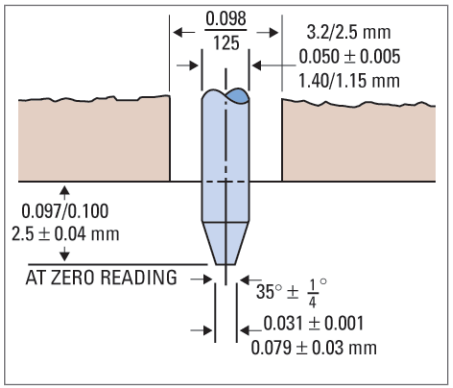
An Instron® Company

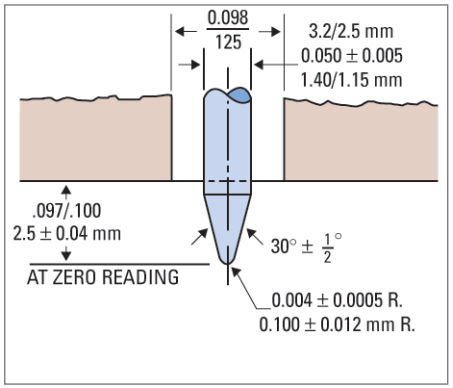
Durometers

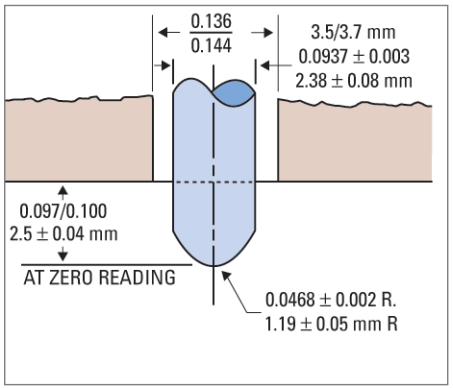

Shore S1
42.7
TEST
11-89.5
PASS LAST
AUTOMATIC OPERATING STAND
Shore
An Instron Company
MODEL: 902

Shore® Durometers

Frustum Cone







Indenter Geometry

For hardness testing of elastomers and plastics, Shore® durometers are ideal. Shore durometers conform to all ASTM and international standards and are easy-to-use. This brochure contains durometers and durometer systems that cover the entire spectrum of indentation hardness testing of rubber-like materials. Each durometer type is made to a specific scale (i.e. A,B,C,D) and is capable of producing a value between 0 and 100. For M scale testing, Shore manufactures the micro system, which is designed to determine the hardness of soft elastomers too thin or too irregularly shaped, such as small o-rings, for measurement with macro durometers. All durometers except for the M scale units can be used as a portable device. Test stands are recommended for best accuracy and are required for M scale testing due to its increased sensitivity.

Shore Test Method

The Shore test uses a hardened indenter, an accurately calibrated spring, a depth indicator, and a flat presser foot. The indenter protrudes from the middle of the presser foot and extends 2.5 mm from the surface of the foot. In the fully extended position the indicator displays zero. When the indenter is depressed flat even with the presser foot's surface, the indicator displays 100. Therefore, every Shore point is equal to 0.0025 mm penetration (M scale is 0.00125 mm). To perform a test, the unit is placed on the sample so that the presser foot is held firmly against the test surface. The spring pushes the indenter into the sample and the indicator displays the depth of penetration. The deeper the indentation, the softer the material and the lower the indicator reading. The Shore A and D scales are by far the most commonly used. The M scale uses a very low force spring and was developed to allow testing very small parts like o-rings that cannot be tested in the normal A scale. Because different materials respond to the test scales in different ways, there is no correlation between the different scales. Shore test methods are defined in the following standards: ASTM D 2240, DIN 53 505, ISO 7619 Part 1, JIS K 6253, ASKER, C-SRIS-010 1 (now obsolete) Please consult factory for availability of Shore durometer for ASKER C testing.

Application

If you are not sure which durometer is right for your testing requirement, please contact us and we will gladly assist with your selection. Shore Instruments has been manufacturing durometers and solving customers' rubber hardness testing issues for more than 80 years. You can speak with one of our Shore Instruments' representatives for testing advice to address challenges resulting from the latest advances in industry and technology.

Calibration

A NVLAP® accredited calibration certificate is included with every new durometer. Annual recalibrations are recommended. Shore offers a full line of calibration and repair services. Please refer to the calibration section on page 14 for complete details.

Scale of	Material To Be Used	Catalog Number	Model	Maximum Force	Indenter
A	Rubber: soft vulcanized (ie tire), natural nitrile. Elastomeric Materials (rubber and rubber-like): GR-S, GR-1, neopene, thiokol, flexible polyacrylic esters. Other: wax, felt, leather, etc. (materials that normally yield under fingernail pressure such as the heel on your shoe).	9130-021 407030000 407040000 407041000 407141100 407041400	S1-A XA XAMX XACL XACLMX XAMXHAF	821 g	Frustum cone 
B	Rubber: moderately hard (ie typewriter rollers, platens, etc.).	9130-022 407030100 407041500	S1-B XB XBHAF	821 g	Sharp 30° angle 
C	Rubber: medium hard Plastics: medium hard	9130-023 407030200 407040200 407042000	S1-C XC XCMX XCHAF	4533 g	Frustum cone 
D	Rubber, Hard Plastics: harder grades such as rigid thermoplastics, plexiglas, thermopolystyrene, vinyl, sheet, cellulode acetate, thermosetting laminates (ie formica) Other: paper-filled calendar rolls, calendar bowls, etc. (materials that would not normally indent under fingernail pressure, such as a pocket comb).	9130-024 407030300 407040300 407041900 407042000	S1-D XD XDMX XDHAF XDMXHAF	4533 g	Sharp 30° angle 
DO	Textile Windings: very dense, slasher beams, etc.	9130-025 407030400 407040400 407042100	S1-DO XDO XDOMX XDOHAF	4533 g	0.0468 radius 
E	Soft rubber, sponges and foams	9130-057 9130-058	XE XEMX	821 g	0.0980 radius 
O	Rubber: soft (ie soft printer rolls, artgum) Textile Windings: medium density(ie rayon, orlon, nylon)	9130-026 407030500 407040500 407042300	S1-O XO XOMX XOHAF	821 g	0.0468 radius 
OO	Textile Windings: low density Other: sponge rubber and plastics (not for use on foamed latex)	9130-027 407030600 407042500	S1-OO XOO XOOHAF	113 g	0.0468 radius 
000-S	Plastic Foams: suit foams, open or closed cells	407030800	X000-S	197 g	0.420 radius 
M	Rubber: o-rings and thin sheet min 1.25 mm (0.05 in) thick. Complete with stand.	9130-032 407140000	719/S1 DIG 714/ ANALOG	78 g	Sharp 30° angle 

The durometer selection guide will help you select the appropriate Shore hardness tester for your application. The combination of spring force and indenter geometry per ASTM D 2240 (as defined by ASTM DIN 53505, ISO 7619-1 and ASTM D 2240) determines the type of durometer required for a particular application. There is not one type of durometer that can cover the entire hardness spectrum. When selecting a durometer it is important to take the readings into consideration (readings below 10 or above 90 are not considered reliable). In such cases the next appropriate scale should be chosen.

All Shore Durometers are compliant to ASTM D2240. The Shore S1 Digital Durometers meet or exceed ASTM D2240, DIN53505, and JIS K 6253.

Why Modular Design?

Modular design allows for quick scale changes, just snap in one of eight precalibrated probes.

	Description	Description
9130-021	Type A full unit - A probe and head unit	S1 A
9130-024	Type D full unit - D probe and head unit	S1 D
9130-032	Type M - micro system includes stand	S1–719

The Shore® model S1 portable digital durometer is a handheld hardness tester especially designed for rubber and other elastomeric materials. The instrument is housed in black polypropylene that is shaped to fit comfortably in the hand. The tester has a calibrated spring to create a known load on the indenter. Hardness is measured by determining the depth of penetration of the indenter, relative to the presser foot, into the material being tested. The measurement displays on a high-contrast LCD, which also displays test parameters, set-up, tester functions, specimen and sample information. The user-friendly design features a six-button control panel, sound transducer, RS232 serial port, statistical capabilities, and memory for up to 256 test results.

Principle of Operation

The tester unit has a detachable probe that contains an indenter and calibrated spring suitable for the various durometer scales. The probe also contains circuitry that lets the main durometer unit automatically recognize it. This gives the operator the ability to interchange probes for different durometer scales using one durometer head. The probe is factory calibrated and does not need any further calibration upon delivery.

Features

- High contrast LCD display with backlighting and large easy-to read numbers
- Test counter automatically counts the number of tests and number of parts
- Ergonomically-designed
- Ability to quickly switch scales by changing precalibrated probes
- Statistics, including average or median result options, and minimum and maximum tolerance settings
- Automatic sleep mode for long battery life, low battery indicator
- Optional AC adapter available
- Meets or exceeds ASTM D 2240, DIN 53505, JIS K 6253
- Fits all existing Shore stands with optional base and cable adapter (Excluding Type M).

Scale Types	A, B, C, D, DO, O, OO, M
Overall Dimensions	203 mm x 76 mm x 38 mm (8 in x 3 in x 1.5 in)
Weight	0.45 kg (1 lb)
Dwell Time	Variable 1 to 25 seconds
Temperature (Operating)	+10 °C to +38 °C (+50 °F to +100 °F)
Humidity (Operating, Storage)	10% to 90% non-condensing
Power Requirements	4-AAA batteries
Display Resolution	0.1
Memory	256 test results: 16 tests in each of 16 parts
Data Output	RS-232C, adjustable; computer or printer
Testing Standards	Meets or exceeds ASTM D 2240, DIN 53505

Catalog Number	Description
9130-035	SI digital display unit, accepts all probes
9130-121	Type A - probe only
9130-122	Type B - probe only
9130-123	Type C - probe only
9130-124	Type D - probe only
9130-125	Type DO - probe only
9130-126	Type O - probe only
9130-127	Type OO - probe only

Catalog Number	Description
9130-036	Base/ cable adapt - For use with stands or for handheld probe testing
9130-037	120 VAC adapt
9130-038	220 VAC adapt
9120-501	Strip printer, universal voltage
9130-152	Computer interface cable (RS 232), S1 to PC
9130-039	Plastic carrying case, holds SI, three additional probes, blocks
9130-153	S1 902 operating stand interface cable (existing stands only), S1 to stand
9139-154	S1 902 operating stand to computer cable (existing stands only)
9100-500	Data collection software
9130-370	Retrofit existing Type M system to S1 style (includes S1)

What is the difference between OOO or OOO-S?

There are currently two types of OOO durometers that comply with ASTM D 2240 now recognized in the industry. In 2003, ASTM D 2240 designated the most widely used Shore Instruments version, as the OOO-S in order to differentiate Shore from OOO scale durometers manufactured by other suppliers. The two distinct OOO units differ in indenter geometry and extension as well as spring force calibration. ASTM D 2240 recognizes both variations of the OOO and refers to the OOO-S as a Shore Instruments manufactured device.

Round Style Durometers

The Shore® round style durometer was introduced in 1944. It is a general purpose device that is the most widely used instrument for the hardness testing of cellular, soft and hard rubber-like and plastic material. It is small enough to be carried in the pocket and rugged enough to operate in the most hostile environments. The round style durometer was designed to satisfy the industries' needs for a unit with a scale graduated in increments of one rather than five with a resolution of one durometer point. The analog durometer may be manually applied or, for better repeatability and accuracy, mounted on a compatible operating stand.

Principle of Operation

Shore analog durometers employ a calibrated spring that generates a known preload on the indenter. The durometer measures hardness by determining the depth of penetration into the material under test. The dial is graduated from 0-100 with a pointer sweep of 265 degrees.

Features

- Rugged aluminum housing and movement frame, stainless steel precision compression main spring
- Indenter guard and a glass lens that resist scratching and discoloration
- Vinyl covered steel carrying case and test block are included
- NVLAP® accredited certificate of calibration
- Available Styles: standard, maximum hands, half inch foot and constant load durometers
- Fits all existing Shore stands

Model	Standard and Maximum Hand Durometers	Constant Load Durometers	Half inch foot Durometers
Scale Types	All	All	All
Display Body Diameter	67.3 mm (2.65 in)	67.3 mm (2.65 in)	67.3 mm (2.65 in)
Display Body Thickness	28.4 mm (1.12 in)	28.4 mm (1.12 in)	28.4 mm (1.12 in)
Overall Length	86.9 mm (3.42 in)	90.2 mm (3.55 in)	97 mm (3.82 in)
Presser Foot Dimension	35 mm x 19 mm (1.4 in x 0.75 in)	51 mm x 51 mm (2 in x 2 in)	12.77 mm (0.5 in)
Weight	220 g (0.5 lb)	1080 g (2.4 lb)	220 g (0.5 lb)

Manual Stands for Round and Digital Durometers

Shore® operating stands are used to improve the accuracy and reproducibility of both analog and digital durometer hardness tester readings by ensuring that the presser foot is exactly parallel to the specimen table. Any analog or digital durometer can be mounted on an applicable operating stand. The operating stand is primarily intended for use on a test specimen with parallel sides. Irregularly shaped objects may be tested in a nest or a fixture to make the given surface parallel to the durometer presser foot.

Note: Operating stands used in conjunction with Shore S1 digital durometers require use of Base Cable Adapter (9130-036).

	DR	DRCL	CV	LR
Catalog Number	407110000	407110100	407120000	407130000
Compatible Durometer	A, B, C, D, D0, 00, 000	A, B, 0	A, B, 0	00 (no weight); A, B, 0, T (small weight); C, D, D0 (small and large weight)
Throat Depth	57 mm (2.25 in)	57 mm (2.25 in)	57 mm (2.25 in)	76 mm (3 in)
Throat Height	152 mm (6 in)	152 mm (6 in)	114 mm (4.5 in)	165 mm (6.5 in)
Table Dimensions	53 mm x 80 mm (2 in x 3 in)	53 mm x 80 mm (2 in x 3 in)	97 mm x 60 mm (3.8 in x 2.4 in)	153 mm (6 in)
Weight	5.45 kg (12 lb)	6.35 kg (14 lb)	8.2 kg (18 lb)	8.2 kg (18 lb)
Minimum Specimen Thickness	Per ASTM D 2240	Per ASTM D 2240	Per ASTM D 2240	Per ASTM D 2240
Load Application Velocity	–	–	5.49 mm/s to 5.95 mm/s (0.216 in/s to 0.234 in/s)	–
Damping Oil	–	–	Mobile DTE24 light or equivalent	–
ASTM Type	2	2	3	1

ASTM D 2240 specifies three categories of operating stands:

Type 1
Basic, manual operating stands.

Type 2
Stands capable of controlling the rate of descent

Type 3
Hydraulically, pneumatically or electromechanical driven.

Shore manufactures stands that fall into all three categories. For assistance in selecting the proper operating stand to fit your durometer, please refer to the Shore ‘Stand Selection Matrix’ found on page 9.

Stand Selection Matrix

	A		B		C		D		DO		O		OO	
Operating Stands	S1	X	S1	X	S1	X	S1	X	S1	X	S1	X	S1	X
Model DR	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Model DRCL	●	●	●	●							●	●		
Model CV	●	●	●	●							●	●		
Model LR (no weight)														●
Model LR (small weight)	●	●	●	●							●	●		
Model LR (small & large weight)					●	●	●	●	●	●				
Model 902 (no weight)	●		●								●			
Model 902 (large weight)					●	●	●	●	●	●				

Principle of Operation

The DR and DRCL (DR constant load) stands provide a stable mounting and test fixture for either analog or digital durometers. Both models allow you to adjust specimen table and durometer heights. When a durometer is mounted and properly aligned, the durometer's presser foot is exactly parallel to the specimen table on the stand, ensuring accurate and repeatable readings. The DR stand requires that you manually lower the durometer and then apply appropriate pressure to the specimen. In contrast, the DRCL stand provides a loading weight of known value for this purpose. Variation in the velocity of durometer application is a common cause of differences in hardness readings. For example, when testing materials with high creep properties, false readings may be obtained if the durometer is improperly or rapidly applied to the surface. The CV conveloader features a constant load weight and a hydraulic cylinder that automatically controls the application velocity of the durometer. When you release the pawl lever, the weight drives the durometer downward at a steady rate, controlled by the calibrated hydraulic dashpot. The durometer contacts the specimen at a constant speed and force, ensuring repeatable and accurate test results. The LR leverloader features a constant load weight for highly accurate and reproducible hardness readings. To operate, the lever is depressed to raise the specimen to the durometer, which in turn lifts a constant load weight seated on a shaft above the instrument. The mass of the durometer and instrument shaft assembly, in combination with the small weight, produces the mass necessary for Types A, B, and O durometers. The addition of the large weight produces the mass necessary for Types C, D and DO durometers. The durometer and instrument shaft assembly produces sufficient mass for testing with Type OO durometers.

Features

- Cast iron and stainless steel construction (DR, DRCL, CV)
- Cast iron, cast aluminum and stainless steel construction (LR)
- Precision rack and pinion instrument height control (DR, DRCL, CV)
- Precision machined bronze bearings on moving parts (LR)
- Separate pinion block and table height adjustment (DR, DRCL, CV)
- Small and large weights (LR)
- Leveling block (LR)
- Vinyl dust cover
- The durometer is not included

The Shore 902 Automatic Operating stand is a Type 3 stand, as described in ASTM D 2240. The key advantage of automatic stands is their ability to perform hands-off high volume testing between 300 to 400 cycles per hour. For assistance in selecting the proper operating stand to fit your durometer, please refer to the Shore 'Stand Selection Matrix' found on page 11.

Principle of Operation

Automatic operating stands provide both constant load and application velocity, through a gear-driven electric motor and braking mechanism that alternately lowers the durometer onto the specimen and then raises it in preparation for the next testing cycle. This automatic return ensures that every test has the same starting point. Electronic controls are used to adjust the amount of time the durometer remains in the raised or lowered position, allowing time for the changeout of specimens and the recording of readings. The Shore 902 automatic stand is designed primarily for a digital durometer. The stand receives dwell times directly from the digital durometer and also has the ability to communicate with a computer.

Features

- Precision-machined aluminum construction
- Cast jig plate base
- Precision ground indenter shafts
- Linear bearings for friction free travel
- Large weight for Type C, D and DO (Model 902)
- Vinyl dust cover
- The durometer is not included

Model	S1 902	S1 902 (220 V)
Catalog Number	9130-444	9130-445
Compatible Durometer	A, B, C, D, D0, 0	A, B, C, D, D0, 0
Table Dimensions	152 mm x 128 mm (6 in x 5 in)	152 mm x 128 mm (6 in x 5 in)
Overall Dimensions	266 mm x 152 mm x 355 mm (10.5 in x 6 in x 14 in)	266 mm x 152 mm x 355 mm (10.5 in x 6 in x 14 in)
Throat Depth	83 mm (3.25 in)	83 mm (3.25 in)
Throat Height	79 mm (3 in)	79 mm (3 in)
Weight	15.9 g (35 lb)	15.9 g (35 lb)
Maximum Specimen Thickness	19 mm (1.25 in)	19 mm (1.25 in)
Power Requirements	120 V, 60 Hz	230 V, 50 Hz

Micro-o-ring Type M durometer systems produce accurate, repeatable hardness readings on soft elastomers too thin or too irregular in shape, such as small o-rings, for measurement with a standard durometer. Used on specimens with cross sections as thin as 1.25 mm (0.05 in) and up to 7 mm (0.275 in). The sensitivity of the M scale requires the use of a stand. Shore® Micro-o-ring test systems conform to ASTM D 2240 for Type M (micro hardness durometer).

Principle of Operation

The hardness values given by this instrument differ from those produced by a Type A durometer. Due to the light load applied to the indenter, testing with this instrument will not indicate the cold flow or creep characteristics of the material you test. Only minimal application pressure is required to attain full-scale readings. This allows the user the ability of testing production pieces rather than test slabs, which may not reflect the actual hardness values of the finished product.

Features

- Unique system of o-ring fixtures with interchangeable inserts tailored to accommodate standard cross sectional diameters from 1.78 mm to 6.99 mm (0.070 in to 0.275 in)
- Flat inserts for testing of flat and irregular shapes
- Custom-made inserts are available
- Rubber test block kit to monitor the performance of the unit
- Model 714/ 719: Stainless steel and cast iron construction, precision rack, pinion, and hydraulic dash pot, adjustable table height
- Hydraulic dashpot controls velocity and ensures precision application of the test load to the surface of the specimen
- Vinyl dust cover

Model	714 Analog	S1 719 Digital
Catalog Number	407140000	9130-032
Scale Range	0 to 100	0 to 100
Scale Resolution (Points)	1	0.1
Hardness Range	10 to 90	20 to 90
Descent Rate	3.2 mm/s (0.0125 in/s)	3.2 mm/s (0.0125 in/s)
Indenter Extension	1.25 mm (0.049 in)	1.25 ±0.02 mm (0.049 ±0.001 in)
Indenter Type	Sharp 30° angle	Sharp 30° angle
Indenter Diameter	0.8 mm (0.03 in)	0.8 mm (0.03 in)
Maximum Spring Force	78 g	78 g
Throat Depth	22 mm (0.87 in)	25 mm (1 in)
Throat Height	32 mm (1.25 in)	25 mm (1 in)
Table Dimensions	95 mm x 55 mm (3.25 in x 2 in)	95 mm x 55 mm (3.25 in x 2 in)
Testing Standards	ASTM D 2240	ASTM D 2240
Weight	7.7 kg (17 lb)	5.9 kg (13 lb)

Test blocks are used as a method of verifying the operational status of a durometer. Using test blocks as a monitoring tool indicates if a durometer is operating correctly. Test blocks, spring type or rubber, are not intended for use as a precision standard or calibration device. Durometer calibration can only be accomplished by direct measurement of the spring force and display accuracy, using a system of weights applying a force to the durometer spring.

Principle of Operation

Prior to using a durometer, it is recommended that you verify that the durometer is performing correctly by measuring the hardness of a rubber test block and then comparing it to the factory calibration data included with the unit. The silicone material used in these test blocks is relatively stable; however, variations in readings will occur over time and calibration should be verified annually by the direct method. The Shore® rubber test block kit consists of seven color-coded silicone discs compounded to yield Type A hardness values of averaged ranges of 30, 40, 50, 60, 70, 80 and 90. Test blocks are available for use with Shore A, M scale (ASTM D 2240) or IRHD (ASTM D 1415) scale durometers. Test blocks are calibrated using durometers that conform to ASTM D 2240.

- The kits contain seven silicone discs: 30 (White), 40 (Yellow), 50 (Blue) 60 (Green), 70 (Red), 80 (Brown), 90 (Black)
- IRHD kit conforms to ASTM D 1415
- Vinyl covered steel carrying case
- Certificate of Calibration
- Accuracy: +/- 2-points of actual stated readings for Shore A; +/- 5-points for Shore M

Model	Individual Test Blocks	Metal Blocks (Type C and D)	Kits (Type A, M, IHRD)
Scale Types	A and M*	C and D	IHRD, A and M
Accuracy	±2-points of actual stated readings	±2-points of actual stated readings	±2-points of actual stated readings
Diameter	49 mm (1.9 in)	–	–
Depth	9.6 mm (.4 in)	–	–
Overall Dimension	–	47 mm x 16 mm x 9 mm (1.8 in x .6 in x .4 in)	279 mm x 127 mm x 32 mm (11 in x 5 in x 1.25 in)
Weight	24 g (0.05 lb)	21 g (0.04 lb)	708 g (1.6 lb)

*For availability in other scale types, please consult the factory

The Shore® resiliometer measures resilience of elastomers by dropping a plunger of controlled weight and geometry from a fixed height on the test specimen. It is especially useful in developing compounds to absorb vibration. The lower the resilience, the less vibration transmissibility. The Shore resiliometer is to resilience what the Shore durometer is to indentation hardness. It complements the Shore durometer and measures an entirely different property. Unless the resilience as well as the hardness of compounds are identified, the compounds are not fully tested. Using both instruments raises quality control levels to its peak.

Why Use a Resiliometer?

The measure of a material's capacity for elastic recovery is its resilience. Resilience is an indicator of a material's ability to absorb energy without undergoing permanent deformation. Resilience is an important factor when developing compounds to absorb vibration.

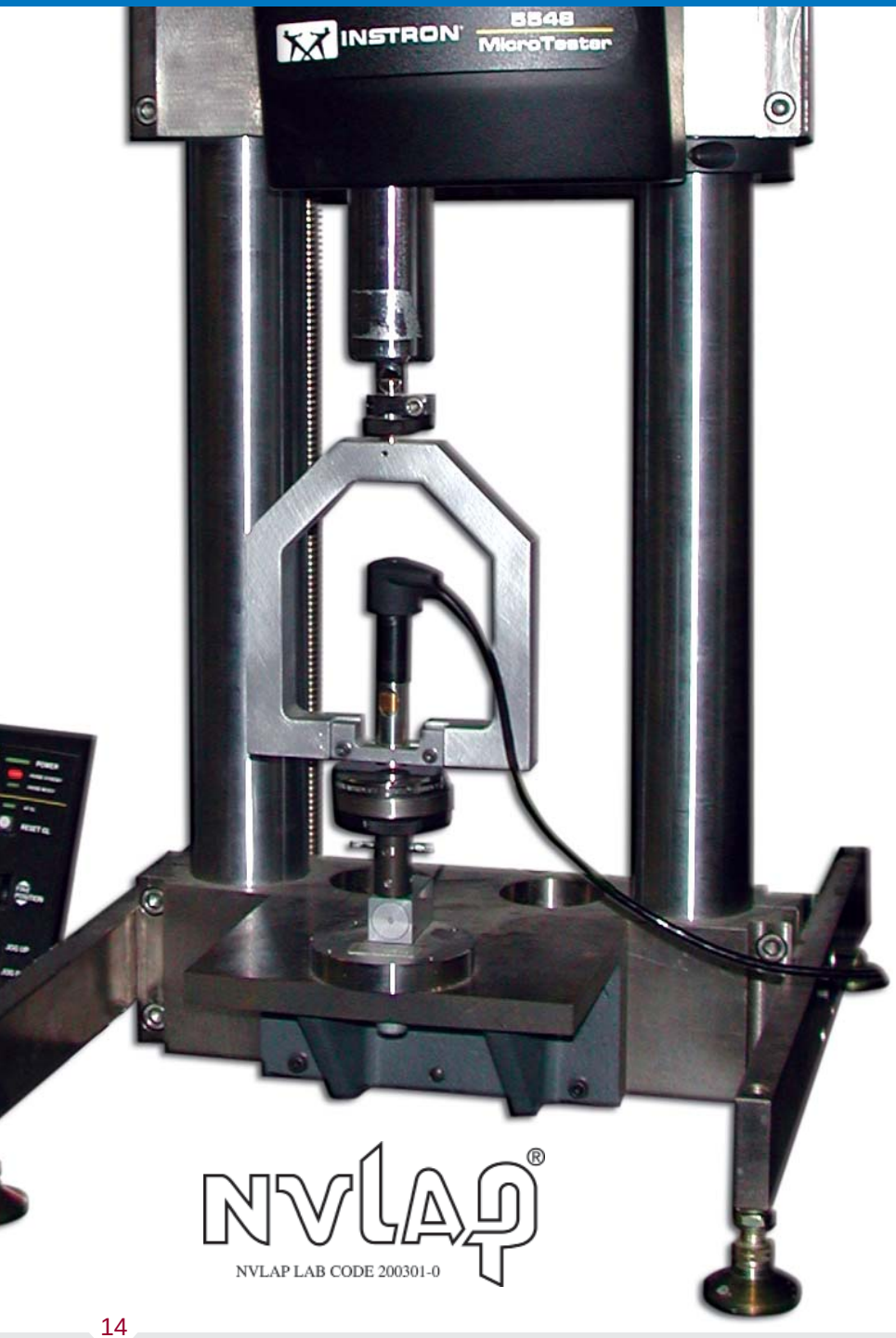
Principle of Operation

The rebound is measured by observing the height to which the top of the plunger rebounds on the 0 to 100 scale.

Features

- Base, post, scale, plunger, brush, pass or fail mask.
- Supplied with vinyl dust cover, instructions and parts list.
- Conforms to ASTM D 2632.

Catalog Number	407400000
Scale Range	0 to 100
Scale Resolution (Points)	1.0
Throat Depth	49 mm (1.9 in)
Jaw Capacity	9.6 mm (.4 in)
Table Dimensions	180 mm x 115 mm (2.1 in x 4.5 in)
Overall Dimensions	559 mm x 248 mm x 241 mm (22 in x 9.75 in x 9.5 in)
Weight	7.7 g
Testing Standards	ASTM D 2632



The Shore laboratory, based in the Massachusetts facility, is a full service repair and precision calibration facility for all types of durometers, test blocks, and related systems and accessories. The lab is accredited by NVLAP® to ISO/ IEC 17025. Our scope of accreditation can be found at www.instron.com. The lab performs calibrations to the following standard methods: ASTM D 2240, DIN 53505, ASTM D 1415, ISO 48, ASTM D 2632, ASTM C 886, ASTM E 448

The lab meets the following quality standards:

- ISO/ IEC 17025
- ISO 10012-1
- NCSL Z540-1

Standard calibration and repair of analog durometers:

- Replacement of the gasket and crystal (round-style)
- Replacement of the plastic lens (quadrant-style)
- Testing and certification of calibration

Standard calibration and repair of operating stands:

- Adjustments
- Cleaning and lubrication
- Velocity calibration (CV, 900, 902, 903 and IRHD)
- Hydraulic oil changed (CV)

Testing and certification of calibration Type M Micro System* standard calibration includes:

- Cleaning and calibration of micro stand
- Replacement of the indenter
- Calibration of the micro durometer and rubber test block kit
- Certificate of calibration supplied

**It is strongly recommended that any test block (or kit) used with the micro system is sent in with the instrument for repair or calibration. Type M rubber test block kits are calibrated to the micro system All rubber test blocks and test block kits are recalibrated and recertified. Metal test blocks are not recertified, but are readjusted to read the value engraved on the test block.*

Factory Repair Services

Please contact us directly for pricing or technical information regarding your specific instrument. Priority service is available upon request.

Alignment

It is critical that the presser foot is flat against the surface of the sample during the test. Carefully position handheld units so that the presser foot is in even contact and the indenter is perpendicular with the test surface. Any deviation will cause low readings. When using a stand, low readings frequently result when the unit is mounted at a slight angle so that the presser foot is not parallel with the sample supporting surface. The smallest angle will cause errors. Use the alignment tool provided with the stand for best results.

Test Times

When comparing results it is important to use the same test times. Some materials exhibit a large degree of flow after the full test load is applied. A one or two second difference in taking the reading can cause significant variations.

Constant Force

The force used to press the durometer against the test surface should be constant. Too little force may not allow the presser foot to be in firm contact with the surface of the part. Too much force may cause the material to flow into the indenter opening resulting in an excessive compressive stress that will effect the Shore readings. This is particularly true for softer materials. When comparing results always make sure the force is the same.

Round Part Testing

Small round parts, like o-rings, are particularly difficult to test. Care must be taken to align the centerline of the sample with the centerline of the indenter. Any offset will cause low readings. The M scale was designed for testing o-rings and must be used for any that are too small for the A scale.

Sample Thickness

ASTM D 2240 defines the minimum thickness of parts to be tested. Testing thinner samples may result in bad results. Parts can frequently be stacked or plied to get to the required thickness. If stacking is not possible, some testing may be required to make sure the thickness is not causing bad results. Typically parts that are too thin will give results that are too hard.

Define Test Parameters

No matter what test methods you use always document them on the test report so that they can be reproduced.

Regular Calibrations

All instruments are subject to drift over time. Frequent testing with test blocks will help you monitor the performance of testers on a day-to-day basis. Rubber test blocks, however, are subject to hardness changes as they age. Therefore, annual direct calibrations are important to maintain a stable testing program.

How Do I Arrange Service for My Shore durometer?

Calibration and repair of any Shore product can easily be arranged by contacting us via telephone, fax, or email.

- Phone: +1 800 695 4273 x5870 (U.S. only); +1 781 575 6000 (outside U.S.)
- Fax: +781.575.5770
- Contact us: www.shoreinstruments.com/calibration

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