

12 Durometer & IRHD Hardness Tester

Abundant Lineups of Hardness Testers for ISO and JIS standard.

Durometers show the degree of hardness by value whether a non-rigid material like rubber is soft or hard (hardness gauge for rubber or plastic). Recently, JIS standard and ISO standard have been drastically revised and details of hardness tester of rubber and method of measuring hardness are changed. As an all embracing manufacturer of non-rigid material hardness tester, Teclock proposes lots of measuring methods of measuring hardness of not only rubber and plastic but many non-rigid materials and elastic materials.



IRHD(M-method) Hardness Tester for standard can measure hardness of O-ring, small rubber parts and thin rubber sheet.



Pocket type and Digital Durometer with peak hold type.



Durometer Sensor

In order to solve individual difference of measured value, it is clearly mentioned in the standard to measure hardness by mounting durometer to special stand.

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Features of Durometer by Teclock

Original designed the key parts

We develop and design the most critical mechanical parts, movements. So, Original Durometer was developed as the application measurement equipment of dial gauge using rack and pinion etc.. These movements are supplied to other durometer companies by OEM.

Lineups best in the world

The variety of materials, from Urethane foam to Plastic can be measured by Teclock Durometer. So, We design the Pressurized Face shape for sufficient adhesion to many work materials. Number of Lineups is best in the world.

Sleek and Ergonomic design

We develop the products after in pursuit of measurement quality by easy to hold shape, pressured surface shape for sufficient adhesion to work piece and ergonomic design.

Calibration certificate can be issued

Teclock can originally issue 3 kinds of traceability system diagram, calibration and inspection report.

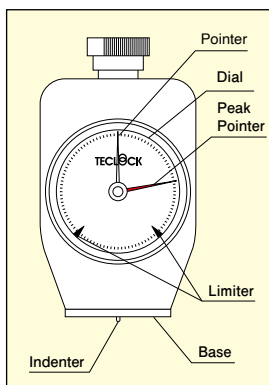
Measuring hardness with Durometer

1) In case of measuring by pushing by hand, putting pressurized surface of durometer held by hand from the top vertically with a certain speed to the flat face of work piece which is put on the flat face. Then, after adhering it, regard the value measured within the passed time prescribed by standard as "hardness"

2) In case of measuring hardness by mounting durometer to stand, measuring speed (not more than 3.2mm/sec.), pressurized load (type A, E is 1kgf, type D is 5kgf) and pressurized surface diameter (φ18mm) of type A / D durometers including tolerance are standardized.

3) Measuring point of test piece is to be inside from its edge by 12mm or more and clearance is to be 6mm and more. Thickness is normally 6mm and more, and 10mm and more for type E.

4) Test environment : Temperature is 23°C±2, humidity is 50±5% and median or average is applied for measured value. If 50 show in type A case, it is described[A50]. These are ruled for each standard.



Description



As to measuring hardness by pushing by hand, durometer to work piece form the top and read value by making pressed surface adhere to durometer.



In order to solve individual difference of measured value, it is clearly mentioned in the standard to measure hardness by mounting durometer to stand.

Measuring hardness with Durometer

Standard	Type	Test Time	Test Report ex. by Type A	Data Summary
JIS K 6253 -2012 Rubber, vulcanized or thermoplastic Determination of hardness	Type A, D, E Durometer	Vulcanized rubber : 3sec Thermoplastic rubber : 15sec or after regulating time	A 50	5-points median more than 6mm off
JIS K 7215 -1986 Testing Methods for Durometer Hardness of Plastics	Type A, D, E Durometer	1sec or less	HDA 50	5-points or more median 6mm or more
JIS S 6050 -2002 Plastics erasers	—	At first weighing and 30sec later	—	Average of 3 initial 30 sec later measurement
JIS K 7312 -1996 Physical testing methods for molded products of thermosetting polyurethane elastomer	Type A (Shore A) Type D (Shore D) Type C (Asker C)	At first weighing and 30sec later	HsA 50	Average of 5 initial 30 sec later measurement
JIS K 6301 -1995 Physical testing methods for vulcanized Rubber (Aug.-1998 abolition)	Type A, C Durometer	At first weighing	50 HsJIS A	Average of 5 initial
ISO 7619 -2010 Rubber, vulcanized or thermoplastic Determination of hardness	Type A, D, E(AO) Durometer	Vulcanized rubber : 3sec Thermoplastic rubber : 15sec or after regulating time	A 50	5-points median more than 6mm off
ISO 868 -2003 Plastics and ebonite Determination of indentation hardness	Type A, D Durometer	Within 1sec after firm contact or After 15sec±1sec	A / 50 /1	5-points median more than 6mm off
ASTM D 2240 -05 Standard Test Method for Rubber Property Durometer Hardness	Type A, B, C, D, E, DO, O, OO, OOO Durometer	Within 1sec after firm contact(Max. value) or After determined other test time	A / 50 /1	5-points of average
DIN 53505 -2000 Shore A and Shore D hardness testing of rubber	Type A, D Durometer	After 1sec or 3sec after firm contact	50 A (with Test time)	3-points or more median

Calibration certificate can be issued to all Teclock durometers.

There is a case that durometers correspond to "Monitoring Machine" and "Measuring Machine" of ISO 9001. Teclock has obtained the authentication of ISO 9001 and can originally issue 3 kinds of traceability system diagram, calibration certificate and inspection report.



[illegible]

137

SmartTester GX-02 series

Automatic Hardness Tester

Automatic hardness tester [GX-02 series] can perform the measurement with the operating speed, the measuring weight and the pressing-surface dimensions which are specified in JIS K 6253 "Determination of hardness - Vulcanized rubber and Thermoplastic rubber".

Features

- One-touch Measurement by Touch panel LCD.
- Display and Data output Peak hold, Timer hold, Median and Average.
- High adhesion between pressurized face and test piece by Alignment Unit.
- Calibration certificate can be issued.

Specifications

Standards	ISO 7619 / JIS K 6253 compliance
Minimum indication	0.1
System features	Peak-holding function, Timer-holding function (Timer value 0.5, 1 to 99sec), Tolerance judging function, Mean value outputting function (n=1 to 30), Data output (PC printer), Outer functions control output
Outside interface	RS-232C
Power	AC100~240V(ACAdapter)
Dimensions	170(W)×160(L)×470(H)mm
Weight	11kg(Including weight 1kg)
Sensor unit	Model : GSS-619 (Type A) GSS-620 (Type D) GSS-621 (Type E) Pressing-surface diameter : $\phi 18$ mm (ESS-621, type E is 127mm) Code length : 2m Dimensions : 50(W)×35(L)×124(H)mm Weight : 320g

Measuring modes : 3 types

- 1) Normal mode :
The maximum value is acquirable.
- 2) Test time mode :
The median value and mean value are calculated.
- 3) PC mode :
Operable by PC by using the dedicated software.

Features

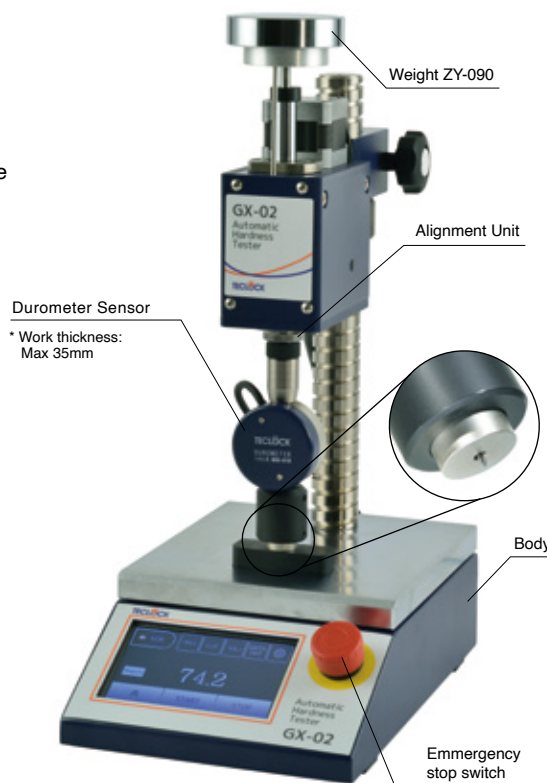
- Tolerance judging feature
- Data output format : RS-232C

System configuration

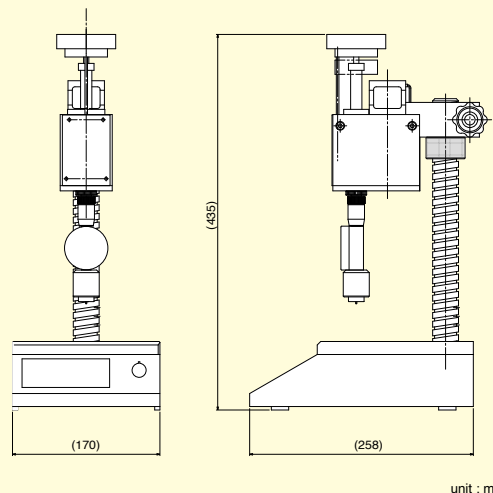
Model	Body	Weight	Sensor unit	Measuring object
GX-02A		ZY-090	GSS-619	Normal rubber & soft plastic
GX-02D	GX-02	ZY-090+ZY-128	GSS-620	Hard rubber & plastic
GX-02E		ZY-090	GSS-621	Soft rubber



New JIS compliance ISO compliance

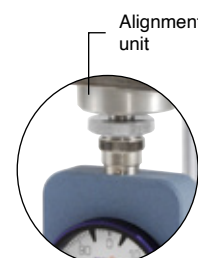


Dimensions



Alignment Unit for Durometer Stand

As it can move front / back and left /right it is the new function which has materialized high adhesion between pressurized face of durometer and face to be measured of test piece. It is mounted to GX-610II, GS-612, GS-615 and all durometers including GX-02 type.



SmartTester GX-700 II

NEW



Totally Automatic type IRHD·M method

New JIS compliance

ISO compliance

- Innovative White-based New ID
- Big size Color LCD with Touch panel

- Micro-hardness can be measured by 1/8 scale each durometer of type A, E, E2, OO and FO in addition to IRHD /M method.
- Hardness of O ring and small rubber parts can measured with totally automatic.
- Voice coil motor is adopted for load system. Friction and reproducibility of inner mechanism is improved, which is different from weight system.
- It is plug-in type that plunger (contact point) can be easily changed and recalibration on test method change is not needed.
- By LED lights, Easy to be visible the measuring point.
- As test piece table is wide, various measuring jigs can be set up.
- Calibration certificate can be issued.

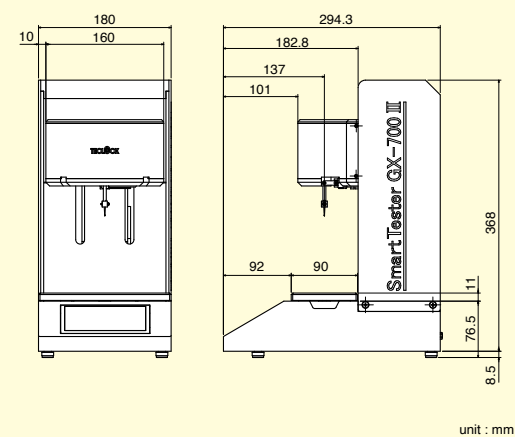
GX-700II



Specifications

Hardness testing method	IRHD-M-method	Durometer Hardness	
Compliance standards	ISO 48/ JIS K 6253	ISO 7619/JIS K 6253 TECLOCK Standards/ ASTM D 2240	
Measuring accuracy	±0.1 IRHD	Type A/E ±1	JIS K 6253
		Type E2/FO ±1	TECLOCK Standards
		Type OO ±2	ASTM D 2240
Measuring range	30~100 IRHD	0~100	
Minimum indication unit	0.1		
Measurement part movable distance	100mm		
Measurable test-piece dimensions	W=180 / D=90 / H=90		
Outside interface	USB		
Power	AC Adapter Input : AC100~240V, 50/60Hz, 1.1A / Output : DC24V, 1.9A		
Weight	15.5kg (with AC adapter)		
Accessories	PC application CD (for Windows 10)		
	PC connecting cable/AC adapter		
	Spare plunger (x1) (ZS-121) for IRHD		
Rubber specimen(option)	ZY-917 6 types set (w/Inspection table)	-	

Dimensions

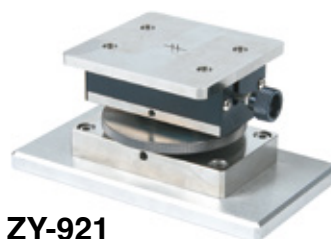


O Ring Measuring Jig (GX-700II Option)

This is the device for centering of O ring of which wire diameter is 0.5mm-10mm. The pin at stage center which fixes position of O ring slightly moves up/down and left/ right independently and fixes the position. In addition, it is possible to rotate it to an arbitrary position.

Specifications

Model	ZY-921
Stage dimensions	90×86mm
Applicable O-ring diameter	$\phi 0.5 \sim \phi 10$ mm
Weight	2.9kg



ZY-921

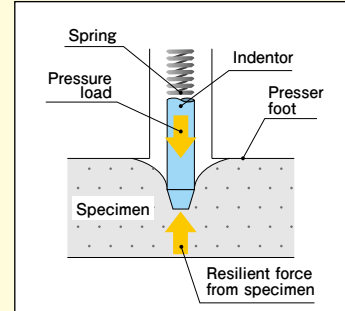


Model Selection of Durometer

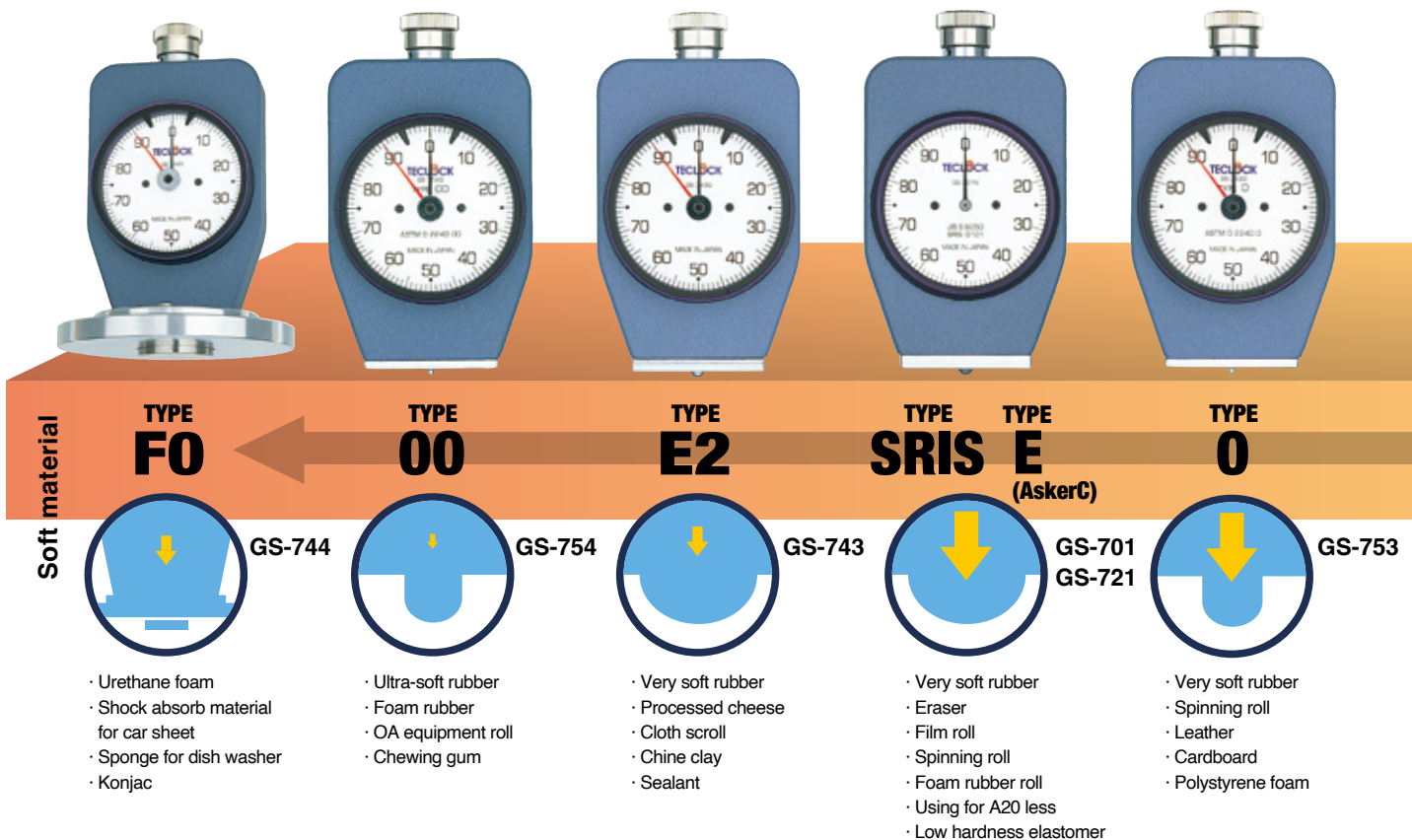
There are many type of durometers based on spring force, contact point size and its shape. This is according to the international standard, in order to have the most accurate and the precise results with the several shape of works and those material characteristic. Teclock durometers are in comply with the international standards, but also have an own standard to measure the variety of materials. Please refer to the table below to choice the most suitable model.

Mechanism of the hardness measurement

Contact point with the pressurizing force gives deformed surface. Then, a work piece makes force against this force. Hardness means that when both pressurizing force and repulsive force are equivalent, measure the depth of indenter. The depth of indenter indicates from 0 to 100. This figure shows the values of hardness. The figure has no force unit, but only relative physical value.



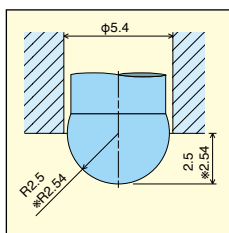
Note : If model number is the same, it means to apply the same specification.
ex : GS-719N and GS-719G are the same specification.



Shape of Contact Point of Durometer

Teclock Durometer has 5 types of contact point shape. Besides, there are some different spring force types. Combination contact point surface and spring force, it can apply the most suitable durometer to a work piece. These shape and pressurizing force are referred to ISO and JIS standard.

Hemisphere of SR5.08

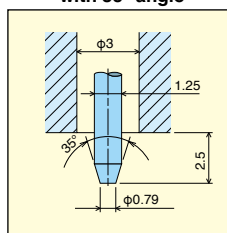


(Unit:mm)
*GS-701



GS-701
GS-721
GS-743

Truncated Cone of $\phi 0.79$ with 35° angle

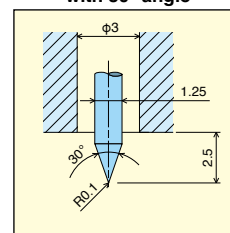


(Unit:mm)



GS-706
GS-709
GS-719
GS-751

Conical Cone of R0.1 with 30° angle



(Unit:mm)



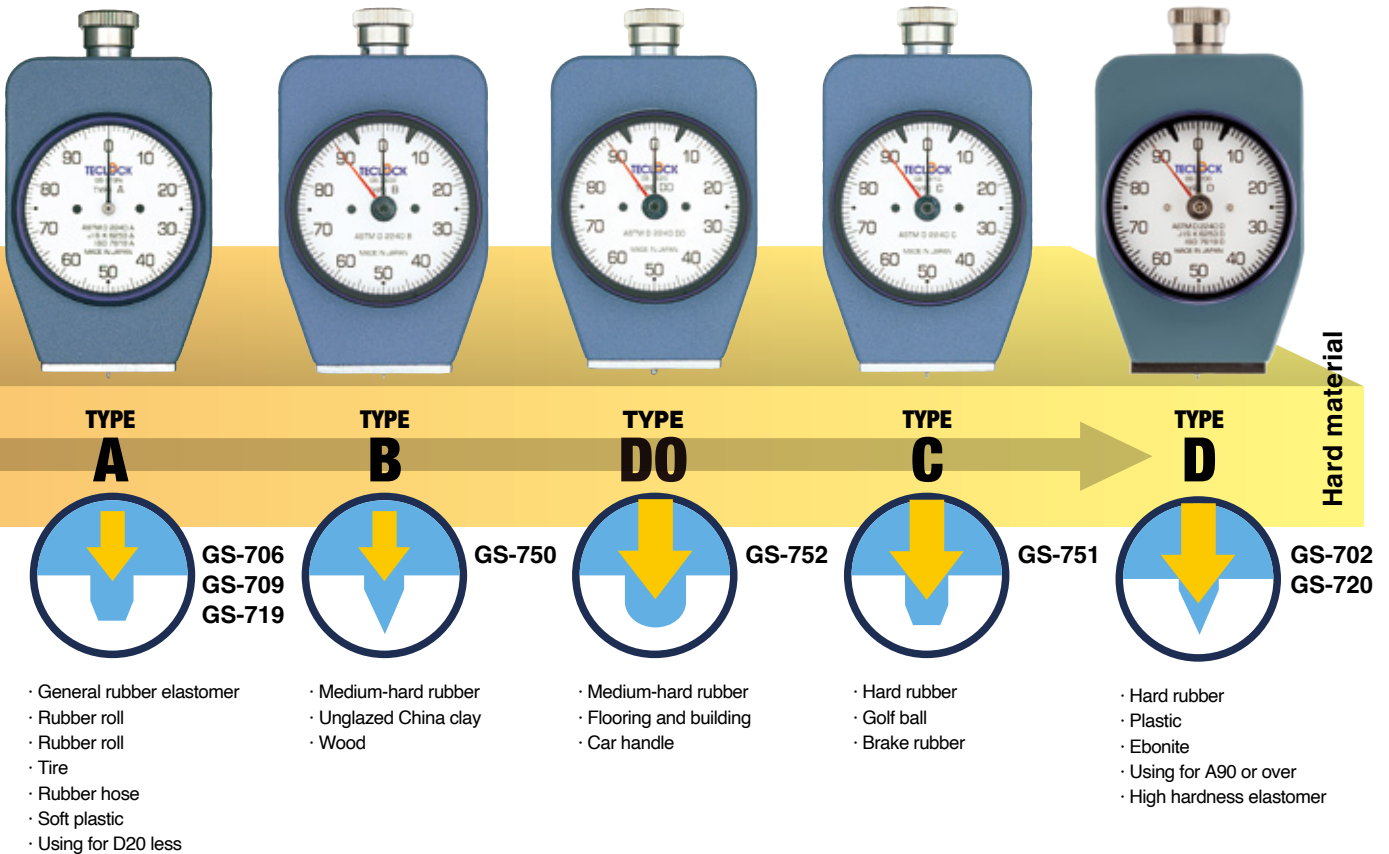
GS-702
GS-720
GS-750

Comparison of Measured Value by Durometer

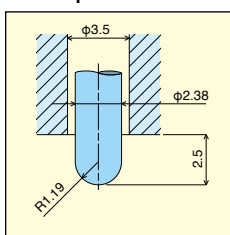
It is the comparison list of measured data by each durometer based on type A. As hardness values fluctuate owing to various factors temperature and humidity on measuring, dimension and shape, and vulcanizing condition in a certain range, it is impossible to verify complete relative relation between each type. However, refer to the list in right side for comparison value.



	Soft	Hard
TYPE A JIS K 6253 JIS K 7215	0 10 20 30 40 50 60 70 80 90 100	
(old A) JIS K 6301	0 10 20 30 40 50 60 70 80 90 100	
TYPE E JIS K 6253	0 20 30 40 50 60 70 80 90 100	
TYPE SRIS JIS K 7312	0 20 30 40 50 60 70 80 90 100	
TYPE E2 TECLOCK E2	0 30 40 50 60 70 80 90 100	
TYPE D JIS K 6253 JIS K 7215	0 10 20 30 40 50 100	
TYPE DO ASTM D 2240	0 10 20 30 40 50 60 70 80 90 100	
TYPE O ASTM D 2240	0 20 30 40 50 60 70 80 100	
TYPE OO ASTM D 2240	0 50 60 70 80 90 100	
TYPE B ASTM D 2240	0 10 20 30 40 50 60 70 80 90 100	
TYPE C ASTM D 2240	0 10 20 30 40 50 60 70 80 100	



Hemisphere of SR1.19

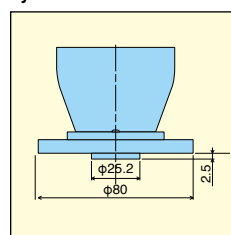


(Unit:mm)



GS-752
GS-753
GS-754

Cylinder con of φ25.2mm



(Unit:mm)

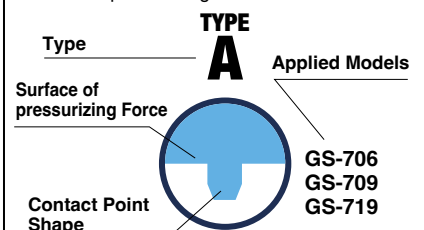


GS-744

The above table also refers to the digital types.

How to read table

Pressurizing Force to a work piece. The arrow size above shows the strength of the pressurizing force. The biggest arrow shows the most pressurizing force which are type D, C and DO. The smallest arrows the minimum pressurizing force.



Compliance with JIS K 6253 standard

For Hardness test of vulcanized or thermoplastic rubber

Analog

Digital

New JIS compliance

ISO compliance

This is Durometer to comply with JIS K 6253 (new JIS) standard established in 1993 for the purpose of conforming to ISO (International Standard Organization). Durometers consist of 3 types namely, Type A for medium hardness, Type D for high hardness and Type E for low hardness.

Type A tends to indicate higher value by 1~2 points compared with former Type A durometers. Type D is suitable for hard rubber having more than 90 hardness measured by type A durometer and Type E is suitable for soft rubber of which hardness is 20 and below measured by Type A durometers.

Standard Type



GS-719N

Type A Durometer
General rubber



GSD-719K

Type A Durometer
Digital type
With peak detection

Digital Durometer with Peak Hold Function

This is the model for which peak hold (Maximum value is held) function is mounted.

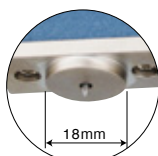
This is effective to measure hardness of Elastomer of which maximum value is unreadable due to relaxation phenomenon.

Minimum read value is 0.5 and it is a half of analog type.

Measured data can be treated as statistics by connecting with optional printer SD-763P.

Pressurized Face $\phi 18\text{mm}$ Durometer mounted to Stand

Pressurized face diameter of type A and type D durometer mounted to a stand is defined 18mm by JIS standard and ISO standard. $\phi 18\text{mm}$ type A (GS-719R) and type D (GS-720R) can be used as they are for measuring by pushing by hand.



GS-719R

Type A Durometer
Stand mounting compatible type
Peak pointer type



GSD-719K-R

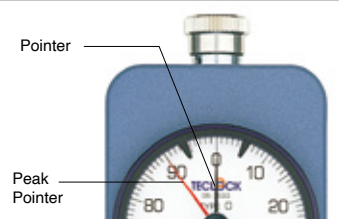
Type A Durometer
Digital type
Stand mounting compatible type
Peak pointer type

Specifications

Model	Type	Application/ Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height (mm)	Weight (g)
GS-719N	Type A	General rubber (Medium hardness)	JIS K 6253 ISO 7619 ISO 868 ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	200
GS-719G	Type A (Peak Pointer Type)	General rubber (Medium hardness)		550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	208
GS-719R	Type A $\phi 18\text{mm}$ /stand combined	General rubber (Medium hardness)		550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	213
GS-720N	Type D	Hard rubber (High hardness)		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	200
GS-720G	Type D (Peak Pointer Type)	Hard rubber (High hardness)		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	208
GS-720R	Type D $\phi 18\text{mm}$ /stand combined	Hard rubber (High hardness)		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	213
GS-721N	Type E AO	(High hardness) Soft rubber	JIS K 6253 ISO 7619	550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	200
GS-721G	Type E (Peak Pointer Type)	(High hardness) Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	208
GS-719P	Type A (Pocket Type)	General rubber (Medium hardness)	JIS K 6253	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	100
GSD-719K	Type A	General rubber, soft plastic	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	313
GSD-720K	Type D	Hard rubber, Plastic	JIS K 6253, ISO 7619	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	313
GSD-721K	Type E (AO)	Very soft rubber	JIS K 6253, ISO 7619	550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	313
GSD-719K-R	Type A $\phi 18\text{mm}$ /Stand combined	General rubber (Medium hardness)	JIS K 6253, ISO 7619, ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	320
GSD-720K-R	Type D $\phi 18\text{mm}$ /Stand combined	Hard rubber (High hardness)	JIS K 6253, ISO 7619, ISO 868, ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	320

Peak Pointer Type

Some of Rubbers, Elastomer' elastic body is not easily read the maximum value after firm contacting with a presser foot of durometer, due to the stress relaxation. The pointer indicates the descendent value but the peak pointer is holding the maximum measured value. The peak pointer type can easily read the maximum value efficiently. In case the pointer cannot be read directly due to some obstacles although the measuring can be done, the measured value can be confirmed from peak pointer after measuring. The upper / lower limiters equipped will be effectively used in tolerance judgment.



Deep Hole / Long Leg Type



In some cases, such as the measurement surface of uneven or with a narrow flat area and the bottom of deep hollow, it may be impossible to achieve the proper results because of the difficult contact of the presser foot. The Deep Hole (H) type and the Long Leg (L) type make such measurements possible with a small or long presser foot. Both are supplied with Peak Pointer and the upper/lower limiters. The Long Leg type meets also to DIN 53505 standard.

Analog

Digital

**GS-720H**

Type D Durometer
Deep hole type
Peak pointer type

**GS-719L**

Type A Durometer
Long leg type
Peak pointer type

**GSD-719K-H**

Type A Durometer
Digital type
Deep hole type
With peak detection

**GSD-719K-L**

Type A Durometer
Digital type
Long leg type
With peak detection

Specifications

Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Presser Foot Diameter (mm)	Indenter Height (mm)	Weight (g)
Analog	GS-719H (Peak Pointer type)	General rubber / Deep hole type (narrow hole)	JIS K 6253, ISO 7619 ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 12	2.50	140
	GS-719L (Peak Pointer type)	General rubber / Long leg type (thick hole)	JIS K 6253, ISO 7619 ASTM D 2240, DIN 53 505	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 18	2.50	360
	GS-720H (Peak Pointer type)	Hard rubber / Deep hole type (narrow hole)	JIS K 6253, ISO 7619 ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 12	2.50	140
	GS-720L (Peak Pointer type)	Hard rubber / Long leg type (thick hole)	JIS K 6253, ISO 7619 ASTM D 2240, DIN 53 505	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 18	2.50	360
Digital	GSD-719K-H	General rubber / Deep hole type (narrow hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 12	2.50	194
	GSD-719K-L	General rubber / Long leg type (thick hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240, DIN 53 505	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 18	2.50	380
	GSD-720K-H	Hard rubber / Deep hole type (narrow hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 12	2.50	194
	GSD-720K-L	Hard rubber / Long leg type (thick hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240, DIN 53 505	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 18	2.50	380

Mounting impossible to stand with all varieties.

Pocket Type

Durometer of pocket type
it is convenient to carry.

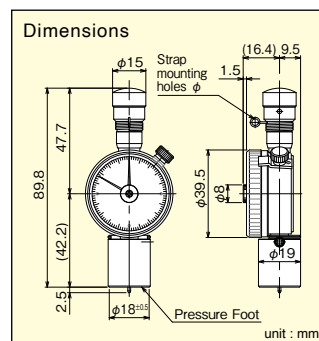
Analog

New JIS
compliance**GS-719P
GS-709P**

Type A Durometer
Peak pointer type



Comparison with standard type. (Left)



*Dimensions of the GS-755 is page 145.
GS-779G is Page 146.

Specifications

Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
GS-719P	TypeA(Peak Pointer type)	General rubber(Medium hardness)	JIS K 6253	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	100
GS-709P	TypeA(Peak Pointer type)	Soft plastic,General rubber	JIS K 7215	549-8061mN (56-822gf)			100
GS-755	TypeOOO	Ultra soft rubber	ASTM D 2240	203-1111mN (20.7-113.3gf)	Hemisphere of SR6.35	1	125
GS-779G	Type Approximate	Thin Sheet Hardness	—	388-1288mN (9-131gf)	ϕ 0.35		100

Compliance with JIS K 7215 standard

Durometers for hardness test of plastic

Analog

Digital

This standard is prescribed by plastic industry in Japan apart from testing method of hardness of rubber. This is basically equal to Durometer of JIS K 6253, as only its round up method of spring load value etc. is different. But we distinguish model name as another Durometer according to the view of conformity to standard.



GS-702N

Type D Durometer
Plastics
Hard rubber



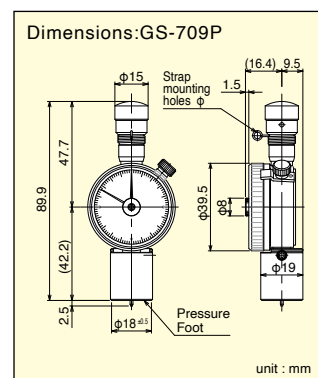
GS-709N

Type A Durometer
General rubber
Soft plastic



GS-709P

Type A Durometer
General rubber
Soft plastic



Specifications

	Model	Type	Application/Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-702N	Type D	Plastics/Hard rubber	JIS K 7215 ISO 868 ASTM D 2240	0-44483mN (0-4536gf)	Conical Cone of R0.1 with 30° angle	2.50	200
	GS-702G	Type D (Peak pointer type)	Plastics/Hard rubber		0-44483mN (0-4536gf)	Conical Cone of R0.1 with 30° angle	2.50	208
	GS-709N	Type A	Soft plastic/General rubber		549-8061mN (56-822gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	200
	GS-709G	Type A (Peak pointer type)	Soft plastic/General rubber		549-8061mN (56-822gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	208
	GS-709P	Type A (Pocket type)	Soft plastic/General rubber		549-8061mN (56-822gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	100
Digital	GSD-719K	Type A	Soft plastic/General rubber	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	313
	GSD-720K	Type D	Plastics/Hard rubber		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	313

Compliance with JIS K 7312 standard

Durometers for hardness test of plastic

Analog

Digital

Standard about physical test method of polyurethane Elastomer. One of the test items is hardness test and rubber industry generally calls type A durometer "shore-A" and type D durometer "shore- D". In addition, type C for low hardness range is called ASKER and GS-701N(G) is the same product ASKER-C. It complies with hardness test of JIS S 6050 "Plastic eraser". Furthermore, SRIS 0101 (ex Society of Rubber Industry, Japan standard of Measure) which was the base of these standard was already discontinued, but only type name is remained.



GS-701N

Asker C
Soft rubber
for Windings yarn

Specifications

	Model	Type	Application/Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-701N	Asker C	Soft rubber, Foam rubber Eraser, Windings yarn	JIS K 7312	539-8385mN (55-855gf)	Hemisphere of SR5.08	2.54	200
	GS-701G	Asker C			539-8385mN (55-855gf)	Hemisphere of SR5.08	2.54	208
Digital	GSD-701K	Asker C		JIS S 6050	539-8385mN (55-855gf)	Hemisphere of SR5.08	2.54	313

Compliance with ASTM D 2240 standard



Durometers for hardness test of rubber characteristic

Analog

Digital

ASTM (American Society for Testing and Materials) is historically old and various types of durometers are prescribed. Teclock provides all of this ASTM durometers for the usage of hard material application to ultra soft material application in our line up.

**GS-750G**

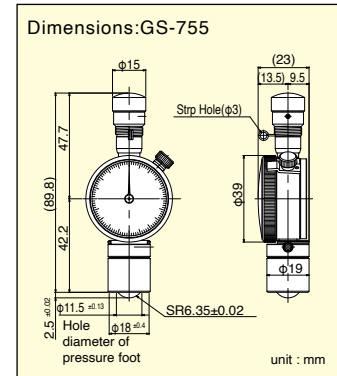
Type B Durometer
Medium-hard rubber

**GS-754G**

Type OO Durometer
Very soft rubber

**GS-755**

Type OOO Durometer



Specifications

	Model	Type	Application/Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-750G	Type B (Peak Pointer type)	Medium-hard rubber	ASTM D 2240	550-8050mN (56.1-821.1gf)	Conical corn of R 0.1 with 30° angle	2.50	208
	GS-751G	Type C (Peak Pointer type)	Hard rubber		0-44450mN (0-4533gf)	Truncated cone of ϕ 0.79 with 35° angle	2.50	208
	GS-752G	Type DO (Peak Pointer type)	Medium-hard rubber		0-44450mN (0-4533gf)	Hemisphere of SR 1.19	2.50	208
	GS-753G	Type O (Peak Pointer type)	Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR 1.19	2.50	208
	GS-754G	Type OO (Peak Pointer type)	Very soft rubber		203-1111mN (20.7-113.3gf)	Hemisphere of SR 1.19	2.50	208
	GS-755	Type OOO	Very soft rubber		203-1111mN (20.7-113.3gf)	Hemisphere of SR 6.35	2.50	125
Digital	GSD-750K	Type B	Medium-hard rubber		550-8050mN (56.1-821.1gf)	Conical corn of R 0.1 with 30° angle	2.50	313
	GSD-751K	Type C	Hard rubber		0-44450mN (0-4533gf)	Truncated cone of ϕ 0.79 with 35° angle	2.50	313
	GSD-752K	Type DO	Medium-hard rubber		0-44450mN (0-4533gf)	Hemisphere of SR 1.19	2.50	313
	GSD-753K	Type O	Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR 1.19	2.50	313
	GSD-754K	Type OO	Very soft rubber		203-1111mN (20.7-113.3gf)	Hemisphere of SR 1.19	2.50	313

TECLOCK Original Standard Durometer

Analog

Digital

**GS-743G**

Type E2 Durometer
Soft rubber

**GS-744G**

Type FO Durometer
Soft styrene foam



Hardness is measured by placing GS-744G on the sponge sheet. Dispersion of polystyrene level can be judged.

This is available as TECLOCK original standard based on customers' requirement, even though they are not prescribed in JIS or ISO. Type E 2 durometer for soft rubber with around half of spring load value of Type E, and Type FO to measure hardness of polystyrene sponge for the level of sponge for washing dishes are available.

Specifications

	Model	Type	Application/Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-743G	Type E2 (Peak Pointer type)	Soft rubber	TECLOCK E2	550-4300mN (56.1-438.6gf)	Hemisphere of SR2.50	2.50	208
	GS-744G	Type FO (Peak Pointer type)	Soft styrene foam	TECLOCK FO	550-4300mN (56.1-438.6gf)	Cylindrical cone of ϕ 25.2	2.50	500
Digital	GSD-743K	Type E2	Soft rubber	TECLOCK E2	550-4300mN (56.1-438.6gf)	Hemisphere of SR2.50	2.50	313
	GSD-744K	Type FO	Soft styrene foam	TECLOCK FO	550-4300mN (56.1-438.6gf)	Cylindrical cone of ϕ 25.2	2.50	500

Simplified Micro-Hardness Tester for Thin Sheet Hardness

This is simplified micro-hardness tester which measures hardness of thin sheet such as rubber and elastomer. Height of indenter is 1mm that is 1per 2.5 of that of normal durometer. It is effective for dispersiveness of sheet hardness and its relative comparison. It is original standard of Teclock and designed so as to obtain the value similar to type A durometer.

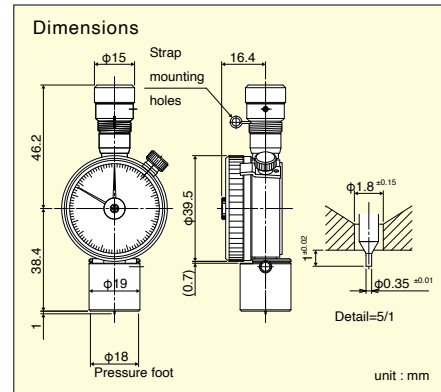
Analog


GS-779G

Peak pointer type

Specifications

Model	Type	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height (mm)	Weight (g)
GS-779G	Type A approximate	88-1288mN (9-131gf)	φ0.35	1	100



Compliance with JIS K 6301 standard

Vulcanized Rubber Physical Test (discontinued in 1998 August)

Analog
Digital


GS-706N

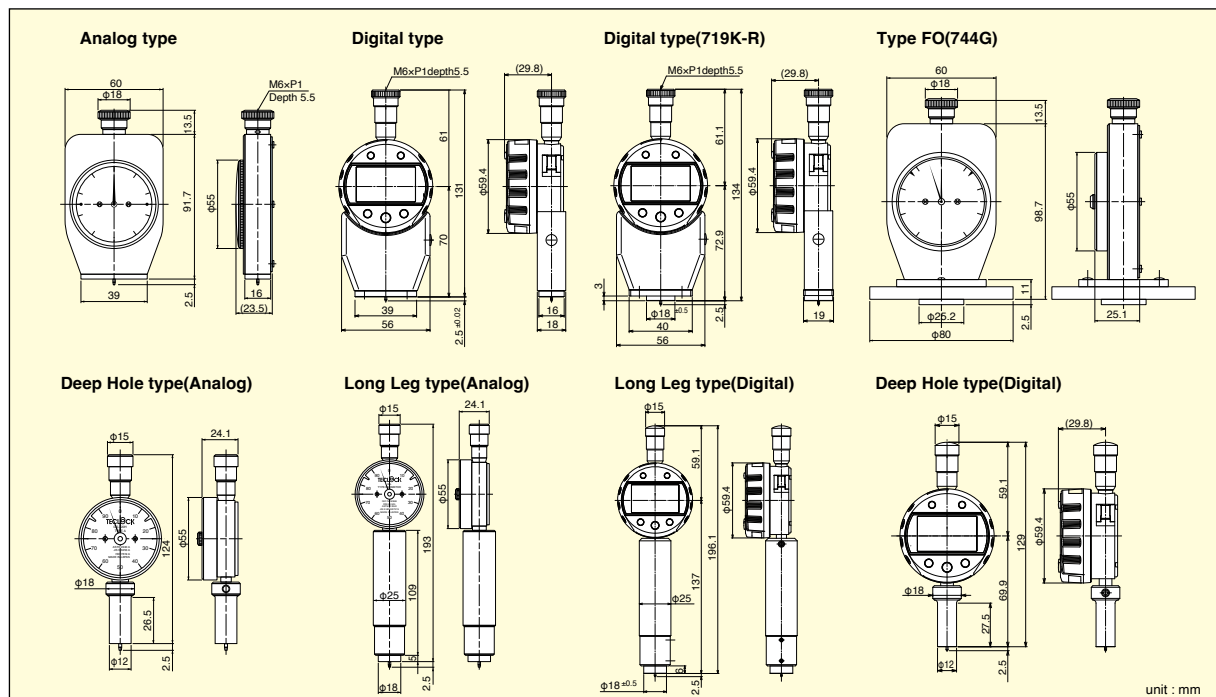
JIS A (old type)
General rubber

JIS K 6301 was established in 1950 and had sustained base of rubber industry of our country but was discontinued in 1998 because it did not comply with ISO and also JIS K 6253 was prescribed on its behalf. However, It had been used for 60 years as "Rubber hardness tester" and even now it is used as test data between certain parties in charge with mutual consensus although movement to new JIS has progressed and standard is discontinued. There are 2 models such as Spring type A and type C for hard rubber.

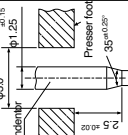
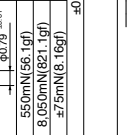
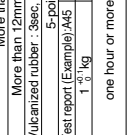
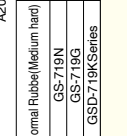
Specifications

	Model	Type	Application/ Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-706N	JIS A(old type)	General rubber	JIS K 6301 Spring type A	539-8385mN (55-855gf)	Truncated Cone of φ 0.79 with 35° angle	2.54	200
	GS-706G	Type A(old type) Peak Pointer type	General rubber	JIS K 6301 Spring type A	539-8385mN (55-855gf)	Truncated Cone of φ 0.79 with 35° angle	2.54	208
Digital	GSD-706K	Type A(old type)	General rubber	JIS K 6301 Spring type A	539-8385mN (55-855gf)	Truncated Cone of φ 0.79 with 35° angle	2.54	313

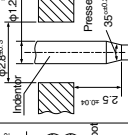
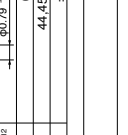
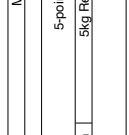
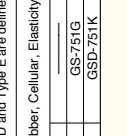
Dimensions



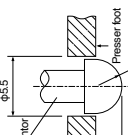
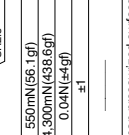
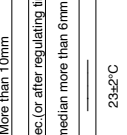
Durometer Standard Table

Specification of Testers		JIS K 6253-2012	JIS K 6301-1995	1998 Abolition
Name of standard	TypeA	TypeD	TypeE	TypeC
Presser foot dimension	More than 12mm(ϕ 8.0, 5mm for Stand)	More than 14mm	More than 14mm	Approx. 3.2mm hole
Indenter shaft diameter				
Indenter tip diameter	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1
Indenter tip angle	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$
Indenter amount exceeding from presser foot	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01
Weight at 0	550mN(56.1gf)	0mN(0gf)	539.5mN(55gf)	981mN(100gf)
Weight at 100	8,050mN(821.1gf)	44,500mN(4,539gf)	8,050mN(821.1gf)	44,130mN(4,500gf)
Load	± 7.5 mN(8.16gf)	± 44.5 mN(45.38gf)	± 7.5 mN(8.16gf)	± 20 gf
Load allowance value accuracy/indicating balance value	± 0.5 (mounted on a stand) ± 1	± 0.5 (mounted on a stand) ± 1	± 0.5 (mounted on a stand) ± 1	± 0.45
Other standards		ASTM D 2240 ISO 7619	More than 6mm More than 12mm More than 10mm	More than 6mm More than 12mm More than 10mm
Test pieces and Measuring Condition		Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range	Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range	Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range
Suitable specimen to the standards		More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) D50 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C	More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) E 60 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C	More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) Hs JIS C 50 5-points average value 5-points median more than 6mm off Test report (Example) I 60 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C
Our original durometers		Normal Rubber(Medium hard) GS-719N GS-719G	Normal Rubber(Low hard) GS-720N GS-720G	Hard Rubber GS-703N GS-703G
Our original digital durometers		GSD-719KSeries	GSD-720KSeries	GSD-703K

*Note1 ISO 7619 is referred to as a type AO *Note2 For stand 500mm² or more

Specification of Testers		ASTM D 2240-05	TypeO	TypeOO
Name of standard	TypeB	TypeC	TypeO	TypeOO
Presser foot dimension	6mm diameter 2.5-3.2mm hole	6mm diameter 2.5-3.2mm hole	6mm diameter 2.5-3.2mm hole	6mm diameter 2.5-3.2mm hole
Indenter shaft diameter				
Indenter tip diameter	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1
Indenter tip angle	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$
Indenter amount exceeding from presser foot	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01
Weight at 0	550mN(56.1gf)	0mN(0gf)	550mN(56.1gf)	203mN(20.7gf)
Weight at 100	8,050mN(821.1gf)	44,500mN(4,539gf)	8,050mN(821.1gf)	1,111mN(113.3gf)
Load	± 7.5 mN(8.16gf)	± 44.5 mN(45.38gf)	± 7.5 mN(8.16gf)	± 0.182 N
Load allowance value accuracy/indicating tolerance value	± 0.5 (mounted on a stand) ± 1	± 0.5 (mounted on a stand) ± 1	± 0.5 (mounted on a stand) ± 1	± 2
Other standards		ASTM D 2240-05	ASTM D 2240-05	ASTM D 2240-05
Test pieces and Measuring Condition		Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range	Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range	Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range
Suitable specimen to the standards		More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) D50 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C	More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) E 60 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C	More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) Hs JIS C 50 5-points average value 5-points median more than 6mm off Test report (Example) I 60 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C
Our original durometers		GS-750G	GS-751G	GS-753G
Our original digital durometers		GSD-750K	GSD-751K	GSD-753K

Further, Type A, Type D and Type E are defined by ASTM D 2240. So, Type M, too, then Teclock does as a special specification.

Specification of Testers		TypeE2	TypeFO
Name of standard	TypeE2	TypeFO	TypeFO
Presser foot dimension	More than 16mm, Diameter 5.5mm hole	More than 80mm diameter, 26mm hole in Center diameter	More than 80mm diameter, 26mm hole in Center diameter
Indenter shaft diameter			
Indenter tip diameter	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1	$\phi 3.0$ ± 0.1
Indenter tip angle	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$	30° $\pm 0.5^{\circ}$
Indenter amount exceeding from presser foot	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01	$\phi 0.79$ ± 0.01
Weight at 0	550mN(56.1gf)	550mN(56.1gf)	550mN(56.1gf)
Weight at 100	4,300mN(438.6gf)	4,300mN(438.6gf)	4,300mN(438.6gf)
Load	± 0.04 N(± 4 gf)	± 0.04 N(± 4 gf)	± 0.04 N(± 4 gf)
Load allowance value accuracy/indicating tolerance value	± 1	± 1	± 1
Other standards		ASTM D 2240-05	ASTM D 2240-05
Test pieces and Measuring Condition		Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range	Flat area dimension Thickness Measuring position Time to read Number of measurement and data summary Weight of constant pressure weight Temperature condition Acclimate time of specimen Use range
Suitable specimen to the standards		More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) D50 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C	More than 6mm More than 12mm from edge face Vulcanized rubber : 1sec, or after regulating time Test report (Example) E 60 1 $\frac{1}{2}$ kg one hour or more in the condition by JIS K 6250, ex. 23-2°C
Our original durometers		GS-709N	GS-709N
Our original digital durometers		GSD-709K	GSD-709K

Further, Type A, Type D and Type E are defined by ASTM D 2240. So, Type M, too, then Teclock does as a special specification.

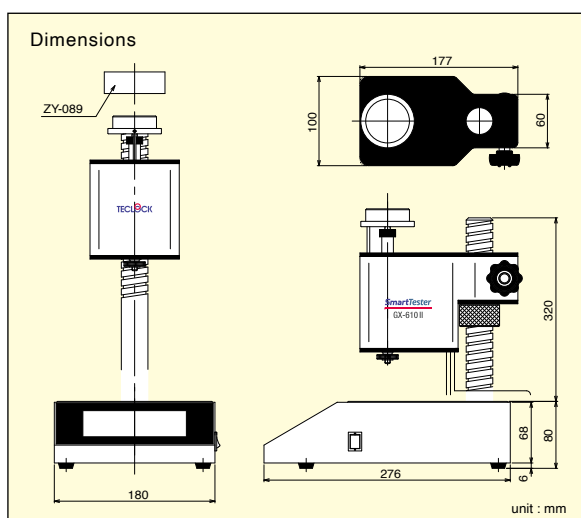
SmartTester GX-610 II

Durometer stand mounted VFD with touch panel

New JIS
complianceISO
compliance

Features

- Large and easy-to-see display.
- Easy-to-understand operation with touch panel.
- Accurate and repeatable descent speed controlled by stepping motors.
- High adhesion between pressurized face and test piece by Alignment Unit.
- Measurement of TypeA, TypeD or TypeE by exchange the sensor and weight.
- Calibration certificate can be issued.



Specifications

Moving-down speed	1.0~20.0mm/sec (Every 0.1mm/sec setting possible)
Pressing mass	Unit mass 346g(With spring load) Standard weight(ZY-089) 487.5g
Display brightness	Following 1.0(A)
Current consumption	W180xL276xH400(mm)
Dimensions	Input AC100-240(V)Output DC 24(V)
Weight	Body 11.4(kg)/AC Adapter 0.2(kg)
Operating temperature	10 - 30(°C)
Storage temperature	-10 - 50(°C)
AC Adapter	8-step setting possible
Touch sound	Hi/Lo setting possible
Touch sensitivity	Yes/No setting possible



* The durometer is option.

Weight ZY-128
(Option)Weight ZY-089
(Accessory)

Adaptive Durometer

Stand	Durometer			Weight for Load	
	Type	Durometer ex.	Load	Weight Code No.	
GX-610II	Analog	"A,B,E, AskerC,O,Old A"	for 1kg	ZY-089(Accessory)	
	Digital	GSD-719K-R etc.		ZY-090(Optional)	
	Analog	"D,ASTM C, DO, Old JIS C"	for 5kg	ZY-089(Accessory)+ ZY-128(Optional)	
	Digital	GSD-720K-R etc.		ZY-090(Optional)+ ZY-128(Optional)	
GS-612	Analog	"A,B,E, AskerC,O,Old A"	for 1kg	ZY-089(Accessory)	
	Digital	GSD-719K-R etc.		ZY-090(Optional)	
	Analog	"D,ASTM C, DO, Old JIS C"	for 5kg	ZY-089(Accessory)+ ZY-128(Optional)	
	Digital	GSD-720K-R etc.		ZY-090(Optional)+ ZY-128(Optional)	
GS-615	Analog	"A,B,E, AskerC,O,Old A"	for 1kg	ZY-078(Accessory)	
	Digital	GSD-719K-R etc.		ZY-079(Optional)	
	Analog	"D,ASTM C, DO, Old JIS C"	for 5kg	ZY-078(Accessory)+ ZY-128(Optional)	
	Digital	GSD-720K-R etc.		ZY-079(Optional)+ ZY-128(Optional)	

Measuring Stand for Durometer



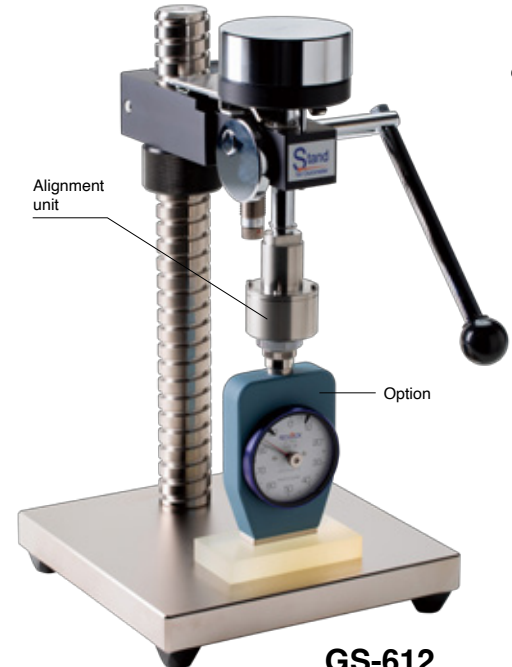
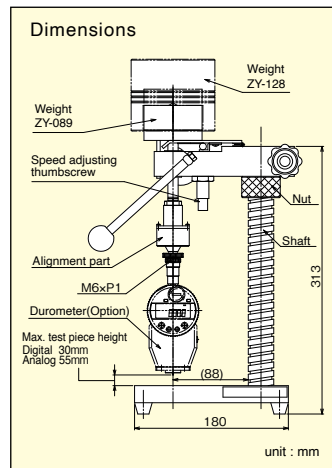
In case of measuring with durometer by pushing by hand, measuring values vary in some degree due to individual difference. Therefore, Measuring stand is materialized as measuring method for high reproducibility, which is prescribed in JIS and ISO.

New JIS compliance

GS-612 Manual Operation type Durometer Stand with Speed Controller

- Speed controller with high reliability is adopted for moving down speed adjustment unit.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 65mm for analog and 40mm for digital are obtained for possible measuring range.
- Shaft with square thread is adopted that can prevent holder falling down and moving up and down.
- 1kg can be measured by type A and type E durometer as they are.
- Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-090 for measuring 1kg..
- Calibration certificate of mass (with durometer) can be issued, which are prescribed in ISO / JIS.

Mass	8.5kg
Model	
	GS-612
	ZY-128
	ZY-090



GS-612



Weight ZY-128 (Option)

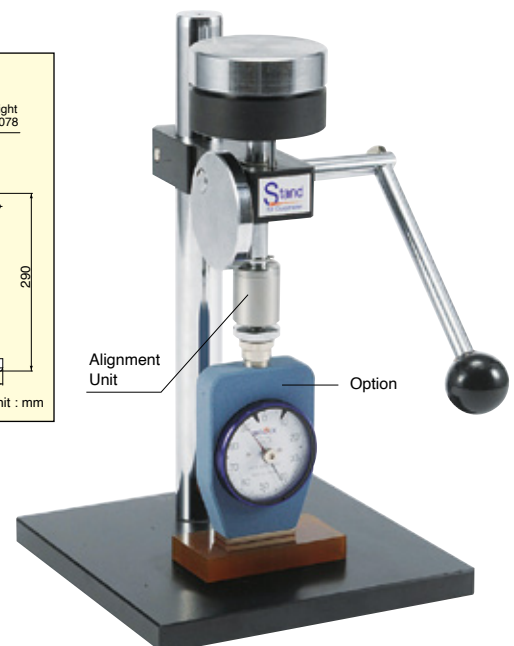
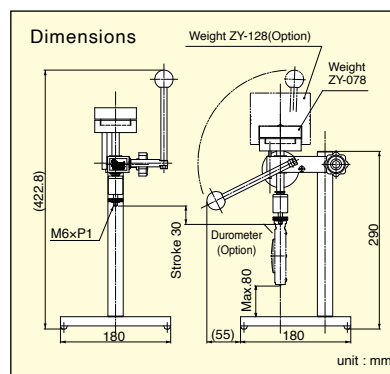


Weight ZY-089 (Accessory)

GS-615 Manual Operation type Durometer Stand

- Hardness can be measured by durometer with load prescribed by JIS by mounting durometer and manual operation.
- Adopting cam has realized easy operation and cost performance.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 1kg can be measured by type A and type E durometer.as they are. Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-079 for measuring 1kg..
- Calibration certificate can be issued (Operation speed certificate can not be issued.).

Mass	3.9kg
Model	
	GS-615
	ZY-128
	ZY-079



GS-615



Weight ZY-128 (Option)



Weight ZY-078 (Accessory)

Durometer Periodical Inspection / Calibration

Durometer is a testing machine. In case that it corresponds to "Monitoring Machine" and "Measuring Machine" of ISO 9001 (JIS G 9001), controlling machines along with it is needed. Teclock is one of a few manufacturers of durometer which has obtained the authentication of ISO9001 and can originally issue 3 kinds of traceability system diagram, calibration certificate and inspection report that are needed for calibration documents. In addition, Teclock can issue 3 kinds of documents for durometer tester and indenter height gauge, that are needed for internal inspection. Use these for control based on internal calibration standard.

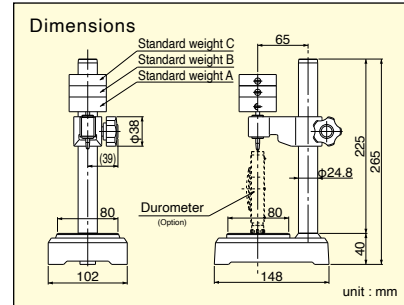
Durometer Tester



Durometer is optional.

GS-607

This is inspection machine which simply checks spring load value of analog type durometer. Putting defined load with 3 pieces of standard weight to the inverted durometer and inspecting whether graduation of 25, 50 and 75 correctly point out. Calibration certificate can be issued. (Digital type durometer and other makes products can not be calibrated.) In addition, in the standard of overseas and also domestic, inspection method by using mechanism of even balance and with normal position of durometer is introduced.



Specifications

Code.No.	Applicable Durometer	Weight(kg)
GS-607	GS-701N/GS-701G/GS-706N/GS-706G	3.7
GS-607A	GS-709N/GS-709G	3.7
GS-607B	GS-719N/GS-719G/GS-721N/ GS-721G/GS-750G/GS-753G	3.7
GS-607C	GS-743G	3.7

Type D durometer for tester does not manufacture. Calibration certificate is Available.

Indenter Extension Gauge



ZY-119

ZY-120

Height of indenter (contact point) of durometer is simply checked. ZY-119 is for JIS K 6301 and ZY-120 is for JIS K 6253. Products of other makers can be checked.

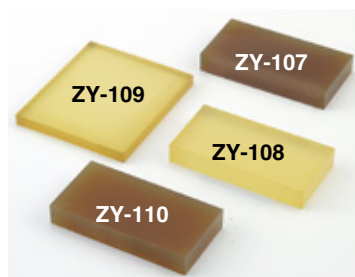
Specifications

Code No.	Indenter Height (mm)	50DEG	2DEG	Applicable Durometer
ZY-119	2.54 type	1.27mm	2.489mm	GS-701N/G, 706N/G
ZY-120	2.5 type	1.25mm	2.45mm	GS-GSD-719, 720 Series

Calibration certificate is possible.

Rubber Piece for Durometer Measuring

This is not rubber test piece. It is used for easy checking to find out failure of durometer. Measuring hardness when it is purchased and use it for daily control of durometer.



for Durometer



for IRHD Tester

Specifications for Durometer

Code No.	Type	Dimension(mm)	Applicable Durometer
ZY-107	nearly A50	40x80x12 Thickness	TypeA (GS,GSD-719J Series)
ZY-108	nearly A80	40x80x12 Thickness	
ZY-109	nearly D40	70x80x7 Thickness	TypeD (GS,GSD-720J Series)
ZY-110	nearly E70	40x80x12 Thickness	TypeE (GS,GSD-721J Series)

Specifications for IRHD Tester

Code No.	Hardness IRHD	Dimension (mm)	Color	Material
ZY-917	Set of 6 pcs. (ZY-080~ZY-085)			
ZY-080	40±5	25x25x2	Blue	Silicon
ZY-081	50±5		Black	Silicon
ZY-082	60±5		Yellow	Silicon
ZY-083	70±5		Bengara	Silicon
ZY-084	80±5		Gray	Silicon
ZY-085	90±5		Transparent	Urethane

Precautions on use of Durometer (Rubber / Plastic hardness measurement)

1. Confirmation of performance

Please confirm requested standard and type of durometer on the occasion of receiving. Please refer to the standard of JIS K 6253, K 7215, K 6301, ISO 7619, ISO 868 and ASTM D 2240 in detail.

2. Test environment

- (1) Test environment for measuring samples is prescribed at internal and external standard as " $23\pm 2^{\circ}\text{C}$, humidity $50\pm 5\%$ ".
- (2) please avoid using it where dust and oil mist attach to it.

3. Precaution on use

- (1) Check before using
 1. Confirm whether operation is smooth.
 2. Confirm whether accretion is on pressurized surface or indenter.
 3. Confirm whether the indicator indicates "0 point".
- (2) Never disassemble device and loose screws.
- (3) Do not give the products any shock by being dropped or excessive load.
- (4) Keep the products away from direct sun light, excessive high or low temperature, and high humidity or dust. Avoid using and storing the products under the circumstances of water or oil.
- (5) Do not press the products to hard samples like glass or metals excepting for the purpose of checkup and inspection.
- (6) Do not clean with organic detergent (thinner or benzine) and not put oil onto the products.
- (7) Do not apply a load to the indenter in right angle. Do not hit the products with a hard item.

4. Maintenance

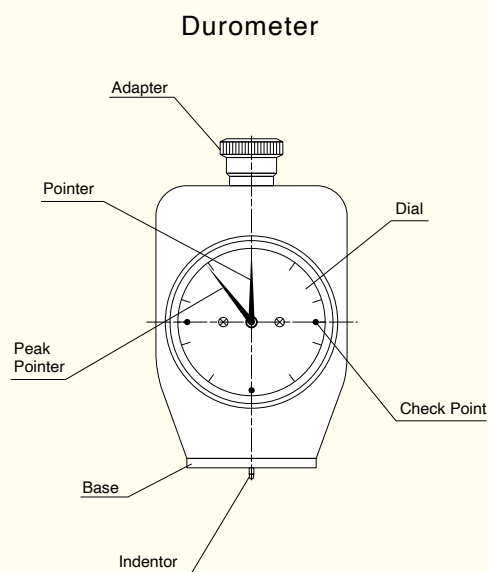
- (1) In case that outer dial can not be read due to dirt of crystal, please wipe stains from the crystal by using a dry cloth or a cloth dampened with neutral detergent.
- (2) In case that some sort of defect is observed for indicator, indenter and spring load value by check up and repair or adjustment is needed, please inform the sales outlet where the products are bought. Products repaired or adjusted by parties not authorized by TECLOCK can not be warranted by us.

5. Periodical inspection

Durometers are needed to be inspected during a certain period, which depends on usage frequency. Especially, in case that instruments are controlled by "inspection, measuring and test instruments " of ISO 9000 series, it is important element.

- (1) Indenter height : Indicator should indicate 0 on free condition. Then it is checked whether indicator is in 100 by pressing pressurized surface onto hard and flat and smooth surface. Meanwhile, be careful so that indenter edge shape of Type D durometer is not changed.
- (2) Indenter shape : It is checked by measuring microscope whether dimension and shape of indenter edge is in the permissible value of standard. In case that there is abrasion or damage , indenter needed to be changed.
- (3) Spring force : It is checked by giving load against each indicated value whether indicator correctly indicates. Please use durometer tester "GS-607 series" to check load of ● mark check point of 25, 50 and 75 on outer dial. Permissible error of indicated value is ± 1 .

Nomenclature



“Duro” of Durometer means “hardness”

Durometers were launched as one of the devices from Shore the US measurement tools company in the early years of the 1900. “Duro” comes from Latin, and means “hardness” as etymologically same with “Duralumin” of aluminum alloy. The original device from Shore used to be used as the Durometer standard, therefore Shore A is still remained as one of the popularized names of Type A.

Since then, Durometers have been used in all over the world. In Japan, Durometers were called “Rubber Hardness Tester” in general. The primary durometers had scales counted by double width size than current durometers. Nowadays, the data of hardness is recognized as high importance issue. Therefore, the standard of durometers has been getting more stringent than it used to be.

