

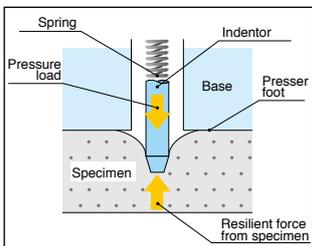
Durometer & IRHD Hardness Tester

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.

Model Selection of Durometer

As to measured value by durometer (rubber and plastic hardness tester), when the base of durometer and work piece are



cohered each other, the indentor changes shape of work piece by pressurized force caused by spring of durometer and work piece makes force against this force. Force amount of indentor is indicated as hardness when this pressurized force and repulsive force are equivalent.

If repulsive force is weak, it shows low value (soft), on the contrary, if repulsive force is strong, it shows high value (hard). There are various type of durometers of which force of springs and shape of indentors are different. The reason why there are various kinds of durometers, it is for the purpose of showing degree of hardness with higher sensitivity against difference of material characteristics and shape of surface which work pieces have. Select a suitable product referring to the figure in the right.

FO GS-744G	Soft material	•Urethane foam •Shock absorb material for car sheet •Sponge for dish washer •Konjac
OO GS-754G		•Ultra-soft rubber •Foam rubber •OA equipment roll •Chewing gum
E2 GS-743G		•Very soft rubber •Processed cheese •Cloth scroll •Chine clay •Sealant
C GS-701N E GS-721N		•Very soft rubber •Eraser •Film roll •Spinning roll •Foam rubber roll
O GS-753G	Hard material	•Very soft rubber •Spinning roll •Leather •Cardboard •Polystyrene foam
GS-719N A GS-709N GS-706N		•General rubber elastomer soft plastic Tire •Rubber roll•Rubber roll
B GS-750G		•Medium-hard rubber •Unglazed China clay •wood
DO GS-752G		•Medium-hard rubber •Flooring and building •Car handle
C GS-751G GS-703N	Hard material	•Hard rubber •Golf ball •Brake rubber
D GS-720N GS-702N		•Hard rubber •Plastic •Ebonite



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

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 ($\phi 18\text{mm}$) 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 $23^{\circ}\text{C}\pm 2$, humidity is $50\pm 5\%$ 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.



Compliance with JIS K 6253 standard for Hardness test of vulcanized or thermoplastic rubber

Analog

New JIS compliance

Digital

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



NEW
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



NEW
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	Indenter Shape (mm)	Indenter Height (mm)	Weight (g)
GS-719N	Type A	General rubber (Medium hardness)	JIS K 6253	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)		ISO 7619	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50
GS-720N	Type D	Hard rubber (High hardness)	ISO 868	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)	ASTM D 2240	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)	JIS K 6253 ISO 7619 ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	213
GS-721N	Type E (AO)	(High hardness) Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	200
GS-721G	Type A(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	125
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 ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	313
GSD-721K	Type E (AO)	Very soft rubber		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)		550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	320
GSD-720K-R	Type A $\phi 18\text{mm}$ / 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.

