SH-22 Specifications

Probe					
Model		SH-22-S005	SH-22-E1	SH-22-E2	SH-22-E4
Indenter		Micro Vickers diamond indenter			
Indenting force		1N (Approx. 0.1kgf)	10N (Approx. 1kgf)	20N (Approx. 2kgf)	40N (Approx. 4kgf)
Measuring range	Vickers hardness	400-1000HV*1 (Hardness value in scales of HRC, HRB, HS, HBW are also indicated for reference.)	100 - 1000HV		
	Rockwell C hardness		10.0 - 70.0HRC		
	Rockwell B hardness		60.0 - 100.0HRB		
	Shore hardness		20.0 - 100.0HS		
	Brinell hardness		85 - 550HBW		
Reproducibility (With measuring stand)	Vickers hardness	± (5%rdg)HV*1	± (3%rdg)HV		
	Rockwell C hardness		±1.0HRC		
	Rockwell B hardness		±2.0HRB		
	Shore hardness		±1.0HS		
	Brinell hardness		± (3%rdg)HBW		
Nonlinearity (With measuring stand)		400 to 1000HV ± (5%rdg)HV (Measuring on standard hardness block)	200 to 1000HV ± (5%rdg)HV (Measuring on standard hardness block)		
Allowable measuring angle		Within ±3°			

Object to be measured	
Material to be measured	Steel and metals which can be measured with hardness standard block made of the material
Size of object to be measured	Bigger than 15mm × 15mm, thicker than 6mm*2
Measurable curvature	Shaft/Pipe OD: bigger than 10mm Ball radius: bigger than 20mm (At use of standard attachment)
Surface roughness	Under Ra1.6

Display	
Scale conversion	HV, HRC, HRB, HS, HBW, N/mm²
Display of measured value	4 digits
Display resolution	1HV, 0.1HRC, 0.1HRB、0.1HS, 1HBW, 1N/mm²
Display contents	Measured value, Measuring times, Maximum value, Minimum value, Standard deviation, Average value

General specifications	
Power supply	AC adapter (100-240V), or rechargeable lithium ion battery
Operating temperarure	0 - 50 ℃
Dimensions	Display unit 97mm(W)×170mm(H)×50mm(D) Probe head diameter 20mm (With grip) 8mm (Without grip) Probe length 195mm Carrying case 389mm (W)×132mm (H)×200mm (D)
Mass	Display unit Approx. 405g Probe Approx. 270g

Function specifications	
Data memory	2000 data
User settable item	Upper limit, Lower limit, Measurement times (for automatic statistics function)
Alarm	Alarm signal
Output	Data output in ASCII code from RS-232C socket

Standard configuration

1 Display unit, 1 Probe (with grip), 1 Probe cable (1.5m), 1 Hardness standard block: around 55HRC, (For SH-22-S005: around 600HV), 1 AC adapter, 1 Recharger, 1 Lithium ion battery, 1 Carrying case, 1 Instruction manual, 1 test report, 1 guarantee card

Options

Standard hardness block around HV600 (included in standard configuration of SH-22-S005)/around 50HS/around 300HBW, Measuring stand (SH-P07), Thermal printer (DPU-S245, with connecting cable), Printer paper in roll, Stand for main unit (SH-P03), Grip*3, Nosepiece for narrower area

*1 Contact us about measurement of the hardness which is over/under the range showed here.
*2 Contact us about measurement with SH-22-S005 (of 100g indenting force, designed for thinner material checking)
*3 Contact us about specification details

●Contact us about CE version.
TEL.03-5825-7362 FAX.03-5825-5591

●Contact us about request for installation in automatic testing system, or one for use of contact point signal.

●SONOHARD SH-22 is calibrated with standard hardness block made by Yamamoto Scientific Tool Co., Ltd. Hardness blocks are manufactured complying to ISO6508-3/JIS B7730 and ISO6507-3/JIS B7735.
Our performance guarantee is based on hardness standard blocks made by Yamamoto Scientific Tool Co., Ltd.

Read an instruction manual before use of our products. Specifications may be changed without notice.

JFE Advantech Co., Ltd.
JFE
URL : http://www.jfe-advantech.co.jp/

Tokyo Head Office (Overseas Sales)
JFE Kuramae Bldg. 2-17-4, Kuramae Taito-Ku, Tokyo
111-0051, Japan
e-mail: tokyo@jfe-advantech.co.jp Tel. +81-3-5825-5577 Fax. +81-3-5825-5591

Head Office and plant
3-48, Takahata-cho, Nishinomiya, Hyogo
663-8202, Japan
e-mail: honsha@jfe-advantech.co.jp Tel. +81-796-66-1508 Fax. +81-798-65-7025

EC-SH-22-01
17.09 Ⓚ

Ultrasonic Hardness Tester

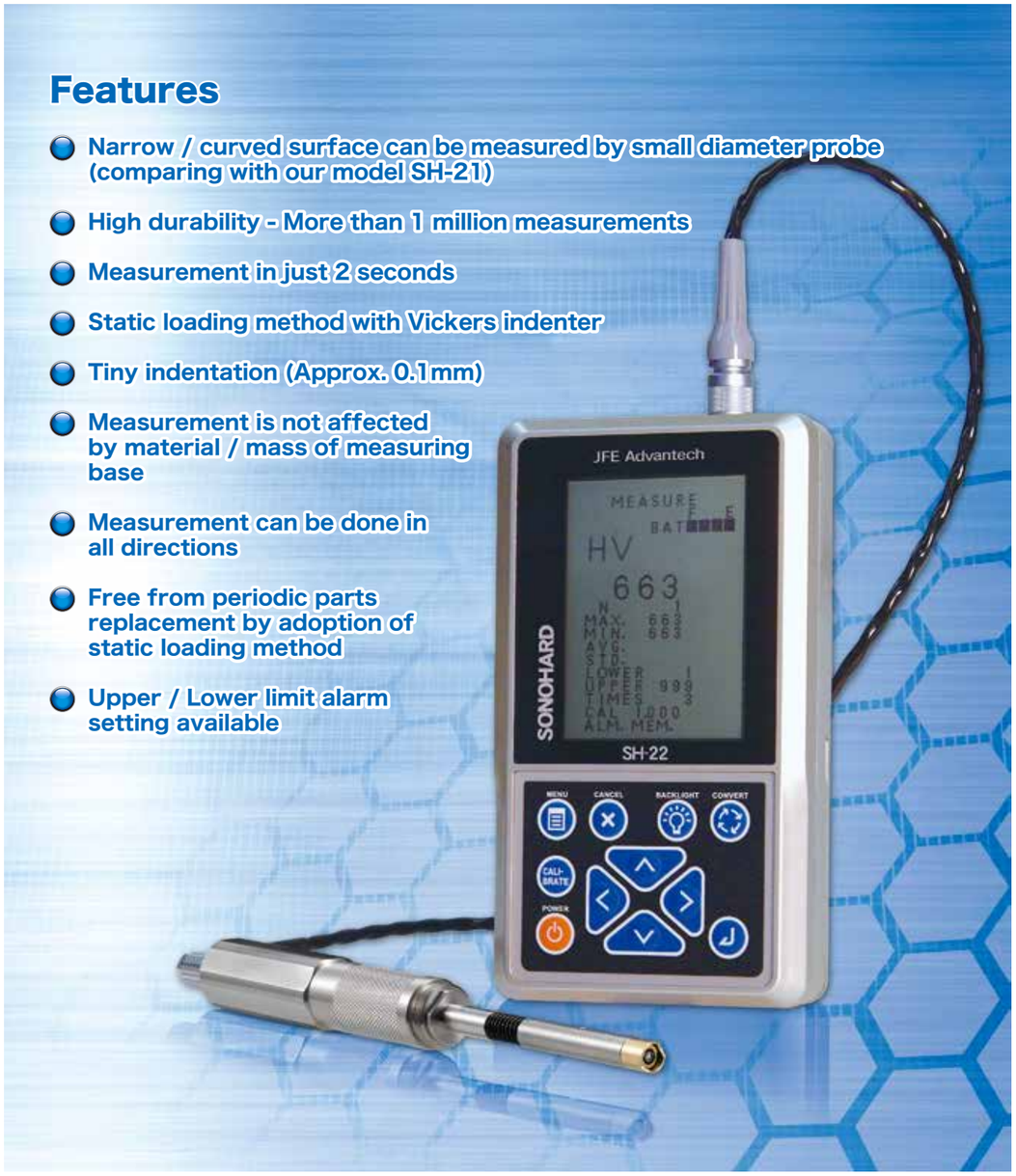
SONOHARD SH-22

ISO9001 JQA-0950

Perfect for hardness check on narrow/curved surface of quenched material

Features

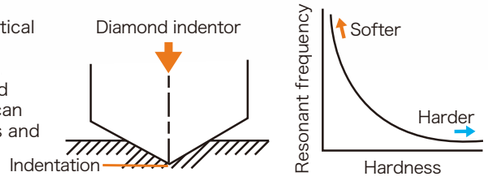
- Narrow / curved surface can be measured by small diameter probe (comparing with our model SH-21)
- High durability - More than 1 million measurements
- Measurement in just 2 seconds
- Static loading method with Vickers indenter
- Tiny indentation (Approx. 0.1mm)
- Measurement is not affected by material / mass of measuring base
- Measurement can be done in all directions
- Free from periodic parts replacement by adoption of static loading method
- Upper / Lower limit alarm setting available



Made in Japan by
JFE Advantech Co., Ltd.
JFE

The Handy Hardness Tester (SONOHARD) model SH-22 completely differs from conventional testers which measure sizes of indentations on test samples using microscopes. SH-22 applies a diamond indenter equipped on a vibrating rod that presses on a test surface at a fixed force and then measures the hardness by fluctuation of ultrasonic vibration.

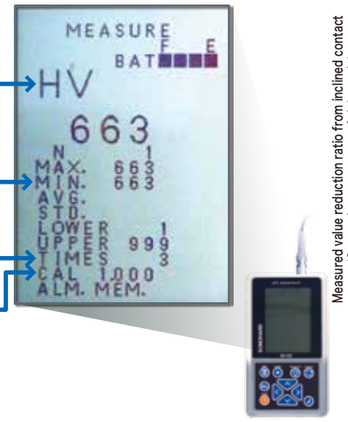
When the vibration rod is applied to a softer surface object of identical material at a fixed force, it makes a deeper indentation and is constrained. Due to this, the resonance frequency highly increases. Conversely, vibration rod is less constrained when it applied on hard object surface and resonance frequency do less. Hardness value can be calculated using the correlation between the frequency changes and hardnesses.



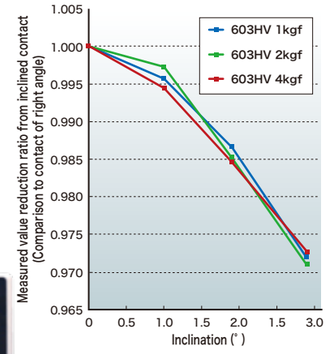
*SH-22 is calibrated with standard hardness block made with steel before shipment from our works. Recalibrate your SH-22 at measurement of other materials than steel for correct measurement.

Function / Display

- Choose a scale from HV, HRC, HRB, HS, HBW.
- Statistics function : Maximum value, Minimum value, Average value, Standard deviation
- Setting of measurement times for statistical calculation
- Calibration factor (ex. Approx. 1.000 for measurement of steel)



Influence from contact angle



Model lineup

Model lineup	SH-22-S005	SH-22-E1	SH-22-E2	SH-22-E4
Indenting force	1N (Approx. 0.1kgf)	10N (Approx. 1kgf)	20N (Approx. 2kgf)	40N (Approx. 4kgf)
Typical application	Press-formed metal sheet Gravure printing roll (chrome/copper plated) Thin metal sheet, Thin plated sheet	Crankshaft Camshaft Gravure printing roll (copper plated) Gear, Small parts Narrow measuring area, Bearing, Nitrided part	Crankshaft Camshaft Heat treated parts Carburized part	Crankshaft (Rougher surface) Camshaft (Rougher surface) Object of rougher surface Welded part, forged parts (Mainly adopted to be equipped automatic testing machines)

Indentation size

Relationship between Vickers hardness value and indentation size

HVxxx = 0.1891X P/d² P : Indenting force (N) d : Indentation depth (mm)

or HVxxx = 1.8544 X P/d² P : Indenting force (kgf) d : Indentation depth (mm)

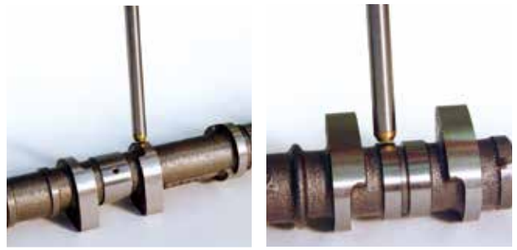
Hardness (HV)	At indentation force of 1N (approx. 0.1kgf)			At indentation force of 10N (approx. 1kgf)			At indentation force of 20N (approx. 2kgf)			At indentation force of 40N (approx. 4kgf)		
	Indentation size (calculated value)	Indentation depth (calculated value)	Reference hardness (HRC)	Indentation size (calculated value)	Indentation depth (calculated value)	Reference hardness (HRC)	Indentation size (calculated value)	Indentation depth (calculated value)	Reference hardness (HRC)	Indentation size (calculated value)	Indentation depth (calculated value)	Reference hardness (HRC)
200	0.030	0.004	(11)	0.096	0.014	(11)	0.136	0.019	(11)	0.193	0.028	(11)
400	0.021	0.003	41	0.068	0.010	41	0.096	0.014	41	0.136	0.020	41
800	0.015	0.002	64.5	0.048	0.007	64.5	0.068	0.010	64.5	0.096	0.014	64.5

Application examples of SH-22

Measurement of a gear

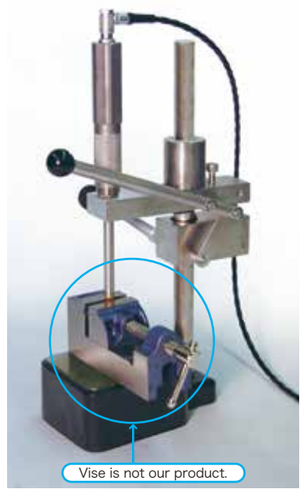
With grip Without grip
(Grip can be removed for check on narrow area)

Measurement of a crankshaft



Measurement of a camshaft

Options



Measuring stand
SH-P07

Thermal printer
DPU-S245

Examples of use