

Ultrasonic Hardness Tester SONOHARD™ SH-22A Specifications

Hardness tester		SH-22A-E01	SH-22A-E1	SH-22A-E2	SH-22A-E4
Model					
Indenter	Micro Vickers diamond indenter				
Frequency	Manual probe approx. 38 to 40kHz				
Indenting force	1N (Approx. 0.1kgf)	10N (Approx. 1kgf)	20N (Approx. 2kgf)	40N (Approx. 4kgf)	
Measuring range	Vickers hardness	400-1000HV*1		100 - 1000HV	
	Rockwell C hardness	(Hardness value in scales of HRC, HRB, HS, HBW are also indicated for reference.)		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 x15mm, 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 Ra1.6µm

General specifications	
Power supply	AC adapter (100-240V), or rechargeable lithium ion battery
Operating temperature	0 to 50 degrees Celsius
Dimensions	Display unit 97mm(W)x170mm(H)x50mm(D)
	Probe head diameter 20mm (With grip) 8mm (Without grip)
	Probe length 195mm
	Carrying case 389mm (W)x132mm (H)x200mm (D)
Mass	Display unit Approx. 420g (including battery) Probe Approx. 270g (without cable)

Display	
Scale conversion	HV, HRC, HRB, HS, HBW, N/mm ² (tensile strength) Compliant with SAE J417, JIS B 7731
Display of measured value	Digital 4 digits
Display resolution	1HV, 0.1HRC, 0.1HRB, 0.1HS, 1HBW, 1N/mm ²
Display contents	Measured value, Measuring times, Maximum value, Minimum value, Standard deviation, Average value

Function specifications	
Data memory	2000 data
User settable item	Upper limit, Lower limit, Measurement times (1 to 99)
Alarm	Alarm signal (beeping)
Output	Data output in ASCII code from RS-232C socket or printer (RS-232C)

Standard configuration
1 Display unit, 1 probe (with grip SH-P26), 1 Probe cable (1.5m), Hardness standard block : around 55HRC. (For SH-22A-E01 : around 600HV), 1 standard attachment SH-P16, attachment for narrow area (round-shaped) SH-P17, 1 AC adapter 100V to 240V (A10WN-09010), 1 recharger (MK-9512), 1 Lithium ion battery (MK-9511), 1 Carrying case (MK-9701A), 1 Instruction manual, 1 test report

Options
Standard hardness block around HV600 (included in standard configuration of SH-22A-E01)/around 50HS/around 300HBW, Measuring stand (SH-P07), Thermal printer (DPU-S245 with connecting cable), Printer paper in roll(TP-S245L), Stand for main unit (SH-P03), Nosepiece for narrower area(SH-P11), Attachment for narrow area (square-shaped) SH-P23

*1 Contact us about measurement of the hardness which is over/under the range showed here.
*2 Contact us about measurement with SH-22A-E01 (of 100g indenting force, designed for thinner material checking)
*3 Contact us about specification details

●Contact us about CE version.
[TEL +81-3-5825-5577 FAX +81-3-5825-5591 E-mail tokyo@jfe-advantech.co.jp](mailto:tokyo@jfe-advantech.co.jp)

●Contact us about request for installation in automatic testing system, or one for use of contact point signal.
●SONOHARD™ SH-22A is calibrated with standard hardness block made by Yamamoto Scientific Tool Laboratory Co., Ltd. Hardness blocks are manufactured complying with ISO6508-3/JIS B7730 and ISO6507-3/JIS B7735.
Our performance guarantee is based on hardness standard blocks made by Yamamoto Scientific Tool Laboratory Co., Ltd.

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

Ultrasonic Hardness Tester

SONOHARD™ SH-22A



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

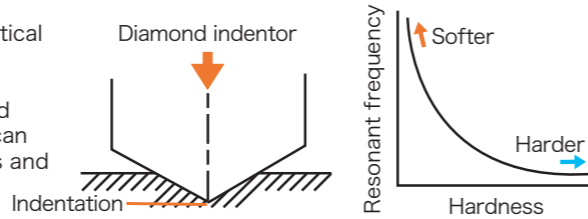
Features

- **Small Probe** — 8φ head for narrow space / curved surface
- **Highly durable** — 1 million use or more and no need of periodical parts replacement using Static Loading Method
- **Quick measurement** — Measures in just around 2 seconds to save your time
- **Unnoticeable Indentation (Approx. 0.1mm)** — Ideal for product inspection
- **Location Free** — Not affected by workbench material (wooden, iron, resin, etc.)
- **Direction Free** — Able to measure in all directions
- **Configurable Threshold** — Alarms when exceeds Upper / Lower limit
- **Integratable Device** — Inline integration for automatic testing measurements (Optional function)



Ultrasonic Hardness Tester (SONOHARD™) model SH-22A completely differs from conventional testers which measure sizes of indentations on test samples using microscopes. SH-22A 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-22A is calibrated with standard hardness block made with steel before shipment from our works. Recalibrate your SH-22A at measurement of other materials than steel for correct measurement.

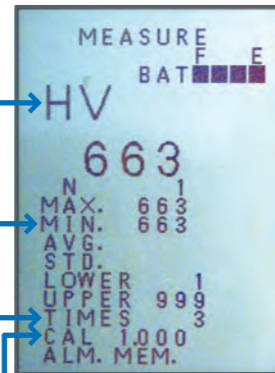
Function / Display

Choose a scale from HV, HRC, HRB, HS, HBW.

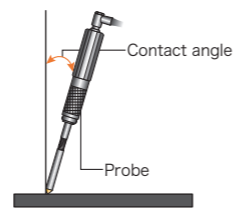
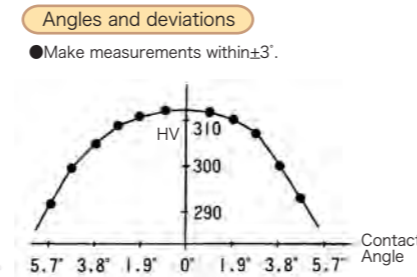
Statistics function :
Maximum value, Minimum value,
Average value, Standard deviation

Setting of measurement times for
statistical calculation

Calibration factor (ex. Approx. 1.000
for measurement of steel)



Contact angle and deviation



Model lineup

Model lineup	SH-22A-E01	SH-22A-E1	SH-22A-E2	SH-22A-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 for automatic testing machines)

Indentation size

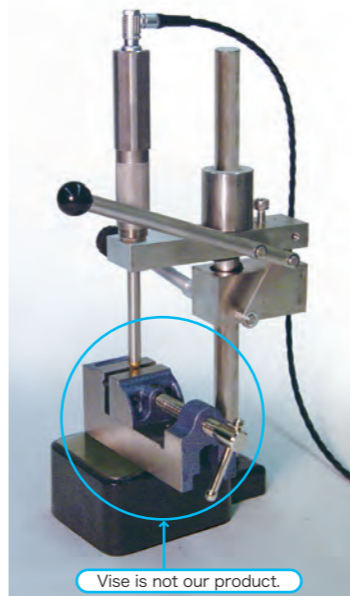
Relationship between Vickers hardness value and indentation size
 $HV_{xxx} = 0.1891 \times P/d^2$ P : Indenting force (N) d : Indentation depth (mm)
 or $HV_{xxx} = 1.8544 \times P/d^2$ P : Indenting force (kgf) d : Indentation depth (mm)

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-22A



Options



Measuring stand SH-P07



Thermal printer DPU-S245

Examples of use

