

## PORTABLE HARDNESS TESTERS

*Represented by*

**SHANGHAI JINGOO PETROLEUM APPARATUS CO., LTD.**

Add: Room 103, Meilin Creative Park A3, #228 Banting Road, Songjiang District, Shanghai, China

Web: [www.jingooapigage.com](http://www.jingooapigage.com) | Tel: +86-21-51098802 | Email: [sales@jingooapigage.com](mailto:sales@jingooapigage.com)



TABLE OF CONTENTS

**BRINELL HARDNESS TESTERS**.....2

    HYDRAULIC BRINELL HARDNESS TESTER.....2

    CHAIN HYDRAULIC BRINELL HARDNESS TESTER.....3

    MAGNETIC HYDRAULIC BRINELL HARDNESS TESTER.....4

    PIN IMPACT BRINELL HARDNESS TESTER.....5

    DOUBLE FUNCTIONAL PIN BRINELL HARDNESS TESTER.....6

    MAGNETIC BRINELL HARDNESS TESTER.....8

    BRINELL INDENTATION MEASUREMENT SYSTEM.....9

**ROCKWELL HARDNESS TESTERS**.....10

    DIGITAL MAGNETIC ROCKWELL HARDNESS TESTER.....10

    MAGNETIC ROCKWELL HARDNESS TESTER.....11

    SMALL ROCKWELL HARDNESS TESTER.....12

    C-SHAPE ROCKWELL HARDNESS TESTER.....14

    SUPERFICIAL ROCKWELL HARDNESS TESTER.....16

**BRINELL & ROCKWELL HARDNESS TESTERS**.....18

    BRINELL & ROCKWELL HARDNESS TESTERS.....18

    MAGNETIC DIGITAL BRINELL AND ROCKWELL HARDNESS TESTER.....20

**WEBSTER HARDNESS TESTERS**.....21

**COATING THICKNESS GAUGE**.....22

**PORTABLE THERMOMETERS**.....23

**BARCOL HARDNESS TESTER**.....24

## INSTRUMENT FEATURES

- **Test principle.** Apply hydraulic principle permitting loading 3,000 kgf manually.
- **On-site Testing.** It could be applied in workshop, simple operation, easy carrying, and testing body hardness of large parts piece by piece.
- **Permanent Indentation.** By 3,000 kgf and 10mm test ball, the indentation is permanent for re-inspecting.
- **High Reliability.** It follows Brinell hardness test method completely, the same as desk testers, reflecting the actual mechanical property of material or parts.
- **High Accuracy.** Indication error, repeatability error and test force accuracy comply with ISO, and ASTM standards, the same as desk testers.
- **Wide Application Range.** As long as clamped to the parts, it could test parts in any shape and size.
- **Wide Test Range.** It could test various common metal materials by its combination of different test force and test head, that is, wide test range.



PHB-3000

## APPLICATION

- On-site test of steel products, nonferrous metal, castings, forgings, and semi-finished heat treatment parts.
- Applied to too large parts for desk testers to test. Replace Leeb testers which are in low accuracy and reliability.
- Indentation could be read by Brinell indentation measurement system and hardness values displayed directly.

## TECHNICAL PARAMETERS

Test Force:	3000 kgf ( 1000 kgf, 750 kgf, 500 kgf optional )
Test Ball:	10mm Carbide alloy ball ( 5mm optional )
Test Range:	32~650 HBW
Opening Dimension:	350 mm (Height) x 100 mm (Throat depth)
Indicator Error:	complies with ISO 6506, ASTM E10, and ASTM E110.
Repeatability Error:	complies with ISO 6506, ASTM E10, and ASTM E110.
Test Force Error:	complies with ISO 6506, ASTM E10, and ASTM E110.
Weight:	13.8 kg

## STANDARD ASSEMBLY

Tester
Handle
Brinell hardness block
Anvil (flat, V-type, spot-type )
20X Reading Microscope
10mm Carbide alloy ball

## OPTIONAL ACCESSORIES

Brinell Hardness Block (high or low value)
Carbide alloy ball (5 mm, 10 mm)
Spare Parts (Hydraulic oil capsule, Hydraulic oil, O-ring etc.)
Maintaining Tools
Brinell Indentation Measurement System
Rechargeable Angle Grinder

## WORKING PRINCIPLE

Fix the test head of Brinell hardness tester to the test frame. When testing, fix the measuring frame onto the surface of the test piece firmly, load force by operating the handle.

The test head is a mini hydraulic system which contains a control valve for controlling force. When force loading to 3,000 kgf, the control valve opens, pressure releasing. According to ASTM standard, force loading should be repeated 3 to 4 times, keeping the pin of the pressure gauge reaching the point of 3,000 kgf 3 to 4 times. In this way, it equals the test regulation of test force 3,000 kgf, 10mm test ball, force maintaining time 10 to 15 seconds.



PHB-3000a

## INSTRUMENT FEATURES

- **On-site testing.** It could be operated in workshop for its simple operation, easy to carry, used in testing large cylinder workpiece on site.
- **Permanent Indentation.** Permanent indentation after test is for rechecking.
- **High reliability.** It completely follows Brinell hardness test principle, reflecting the mechanical property of the test material or parts, the same as desk testers.
- **High accuracy.** The test force accuracy complies with relevant regulations home and abroad, the same accuracy as desk tester, complying with ISO6506, ASTM E10, and ASTM E110 standards.

## APPLICATION

- On-site testing of Steel Pipes, Bearings, Gas Cylinders
- Replace inaccurate and unreliable Leeb hardness tester
- Read value of Brinell hardness directly after test with Brinell Indentation Measurement System

## TECHNICAL PARAMETERS

Test Force:	3000 kgf ( 1000 kgf, 750 kgf, 500 kgf optional )
Test Ball:	10 mm Carbide alloy ball ( 5 mm optional )
Test Range:	32~650 HBW
Test Diameter:	≤500 mm
Indicator Error:	complying with ISO,ASTM standards
Repeatability Error:	complying with ISO,ASTM standards
Test Force Error:	≤ ± 1%,complying with ISO, ASTM standards
Weight:	14.5 kg

## STANDARD ASSEMBLY

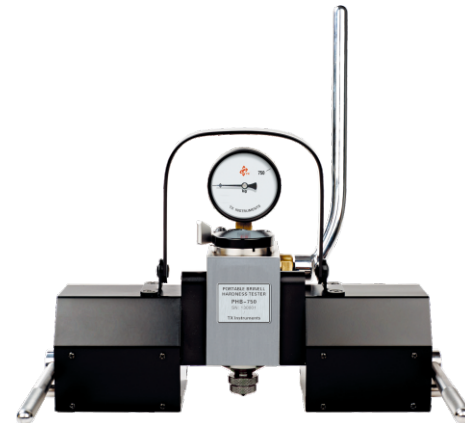
Tester
Load Handle
Brinell Hardness Block
20X Reading Microscope
10mm Spare Carbide Alloy Ball
Chain Measuring Frame
1.3m Chain

## OPTIONAL ACCESSORIES

Brinell Hardness Block ( high Value, Low Value )
Carbide Alloy Ball ( 5 mm,10 mm )
Maintaining Spare Parts ( Hydraulic Oil Capsule, Hydraulic Oil, O-Ring etc. )
Maintaining Tools
Other Specification Chains
Brinell Indentation Measurement System

## INSTRUMENT FEATURES

- Test available if attached to one side of part.
- No need to move the part.
- No need to search for a spot for clamping.
- Test condition of 5 mm test ball, 750 kgf test force, causes a larger indentation and better representativeness and easier to read than 2.5 mm test ball condition.
- Compared with other hydraulic Brinell hardness testers, simpler operation, easier to carry.
- If surface available, test materials, parts and structural steel in any shape and size.



PHB-750

## APPLICATION

- For castings, forgings, steel plates, structural and die steel, which other testers could not test or hard to test.
- For macro axis, crossbeam, huge or super-huge heat treatment parts.
- For pipe, huge equipment and huge steel structural parts that welded or assembled already.
- Only for the magnetizer steel.

## TECHNICAL PARAMETERS

Test force:	750 kgf
Test ball:	5 mm carbide alloy ball
Test range:	100~650 HBW
Indicator Error:	complies with ISO 6506, ASTM E10, and ASTM E110.
Repeatability Error:	complies with ISO 6506, ASTM E10, and ASTM E110.
Test Force Error:	complies with ISO 6506, ASTM E10, and ASTM E110.
Weight:	15.8 kg
Surface:	flat: area $\geq$ 290 mm x 90 mm

## STANDARD ASSEMBLY

Tester
Load Handle
Pinch bar
Brinell Harness Block
Seat Iron
40X Reading Microscope
5 mm Spare Carbide Alloy Test Ball

## INSTRUMENT FEATURES

- It applies Brinell hardness test method, loading test force by hammer impacting, force controlled by shear pin precisely. Accurate test force leads to a good result consistency.
- Test force  $F=1580$  kgf, diameter of test ball  $D=7.26$  mm, which leads  $F/D^2=30$ . It follows Brinell similarity principle, equals to normal condition of 3,000 kgf, 10mm test ball.
- Simply hit on side to test part, low requirements on the shape and size of test piece.
- Only consume 1 piece of cheap shear pin for each test.
- Reliability, repeatability and accuracy are higher than Leeb hardness testers.



PHB-1

## TECHNICAL PARAMETERS

Test Force:	1,580 kgf
Indenter:	7.26 mm Steel Sphere Indenter, test range 100~350 HBW 4 mm Hard Alloy Sphere Indenter, test range 350~650 HBW
Indicator Error:	$\leq 5\%$
Repeatability Error:	$\leq 5\%$
Test Range:	100~650 HBW
Net Weight:	0.8 kg
Application:	Castings, Forgings, Steel Products, Heat Treatment Parts

## APPLICATION

Suitable for testing the huge, super-huge parts those other instruments could not test.

## STANDARD ASSEMBLY

7.26 mm Steel Indenter
Shear Pin Housing
Housing
Handle
Brinell Hardness Block
Pin (250 pieces/box)
Pin Cleaner
20X Reading Microscope
Carrying Case

## OPTIONAL ACCESSORIES

7.26 mm Steel Sphere Indenter,
4 mm Hard Alloy Sphere Indenter
Shear Pin Housing
Housing
Brinell Hardness Block
Pin (250 pieces/box)
20X Reading Microscope
40X Reading Microscope
Rechargeable Angle Grinder
Brinell Indentation Measurement System



## INSTRUMENT FEATURES

- It applies Brinell hardness test method, with static screw or dynamic hammer impact loading test force, through a calibrated shear pin to control the force precisely.
- Good force value consistency, no influence by operator.
- Test force  $F=1580$  kgf, diameter of test ball  $D=7.26$  mm, which leads  $F/D^2=30$ . It follows Brinell similarity principle, equals to normal condition of 3,000 kgf, 10 mm test ball.
- Good repeatability and high accuracy. The accuracy is the same as desk tester.
- Simple and flexible operation. Middle or small parts could apply static force loading, and large part could apply hammer impact.
- Only consume 1 piece of cheap shear pin for each test.
- It could replace Leeb hardness tester in low accuracy and reliability.

## TECHNICAL PARAMETERS

Test Force:	1,580 kgf
Indenter:	7.26 mm Steel Indenter, test range 100~350 HBW 4 mm Carbide Alloy Indenter, test range 350~650HBW
Indicator Error:	Static type $\leq 2\sim 3\%$ Comply with ISO, ASTM Hammer Impact Type $\leq 5\%$
Repeatability Error:	Static type $\leq 2\sim 3\%$ Comply with ISO, ASTM Hammer Impact Type $\leq 5\%$
Test Range:	100~650 HBW
Opening dimension:	150mm(Height) x100mm(Throat Depth)
Net Weight :	4.2 kg
Application:	Castings, Forgings, Steel Products, Heat Treatment

## APPLICATION

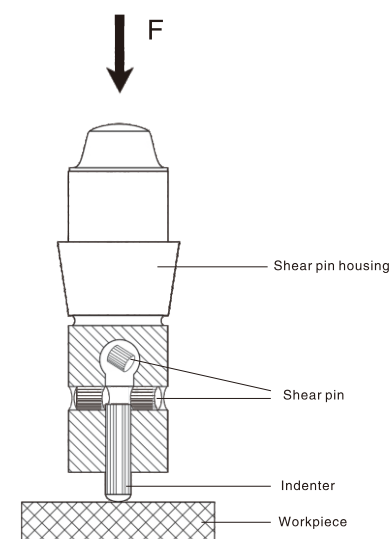
- In static type, high accuracy, good repeatability, so if the size suitable, it is prior to dynamic type.
- In dynamic type, regular contrast test with static type is to be done, so as to inspect its accuracy.



PHB-150 Static Type



PHB-1 Pin Impact Type



Working principle diagram

## STANDARD ASSEMBLY

Tester  
7.26 mm Steel Indenter  
Shear Pin Housing  
Flat Anvil  
V-shape Anvil  
Housing  
Handle  
Brinell Hardness Block (HB10/3000)  
Pin (250 pieces/box)  
Pin Cleaner  
20X Reading Microscope  
Rubber Protective Cover  
Carrying Case



Shear pin housing, Indenter



Housing



Shear pin

## OPTIONAL ACCESSORIES

7.26 mm Steel Indenter,  
4 mm Carbide Alloy Indenter  
Pin (250 pieces/box)  
Brinell Hardness Block (HB10/3000)  
Sphere Spot Anvil (for pipe or curved plate)  
Small Flat Anvil (for small parts)  
20X Reading Microscope  
40X Reading Microscope  
Rechargeable Angle Grinder  
Brinell Indentation Measurement System



20X Reading Microscope



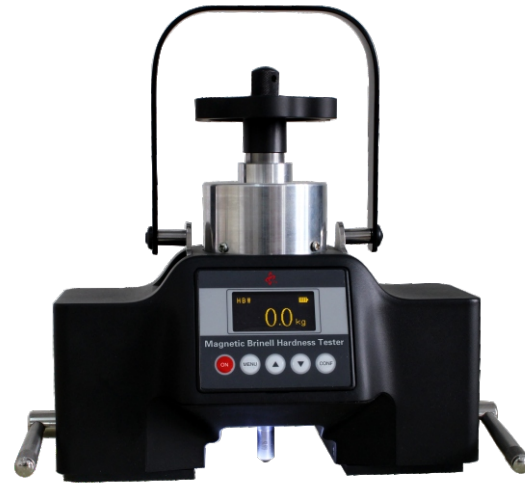
Rechargeable Angle Grinder



MS-1

## PRINCIPLE AND APPLICATION

- By means of magnetic attraction force, the tester can be mounted on the steel part to be tested. Its Brinell hardness test method and test conditions meet the requirement of standards ASTM E110 and ISO 6506-2.
- Designed for rapid and accurate Brinell hardness test in the field, in combination with the MS-1 Brinell indentation measurement system.
- Suitable for large or heavy steel parts that cannot be tested with bench hardness testers.
- Suitable for steel plates, steel pipes, moulds, dies and other heat treated parts.
- Suitable for testing on welding lines of boilers, pressure vessels and pressure pipes.
- Alternative for Leeb hardness testers with lower accuracy and reliability.

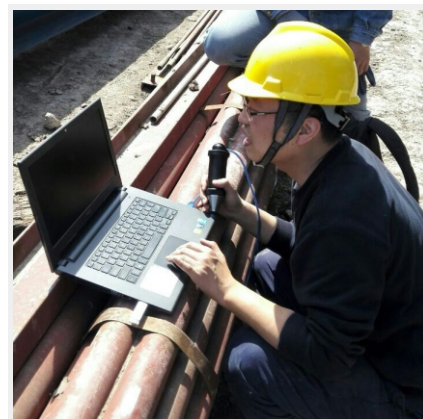


PHB-200

## STANDARD ASSEMBLY

Tester  
seat Iron  
2.5 mm carbide ball indenter  
Test blocks (2)  
40X Reading Microscope  
Recharger  
Battery case  
Carrying case

## OPTIONAL



MS-1

## FEATURES

- Unique and patented.
- The smallest and the most accurate in-field Brinell hardness tester.
- Easy operation with very high accuracy.
- Only one side of the work piece needs to be reached.
- Force and dwell time display on LED screen.
- Bright and clear view at lighted test point.
- Test blocks available for daily verification.

## TECHNICAL PARAMETERS

Test force:	187.5 kgf
Test force tolerance:	$\leq \pm 1\%$ , complying with ISO and ASTM standards
Indenter:	2.5 mm carbide ball
Range of testing:	100 ~ 650 HBW
Indication error:	complying with ISO and ASTM standards
Repeatability:	complying with ISO and ASTM standards
Ambient temperature:	5 ~ 45°C
Dimensions:	245 × 105 × 238 mm
Weight:	5.1 kg
Minimum specimen:	Flat: Area $\geq 195 \text{ mm} \times 60 \text{ mm}$ Thickness $\geq 5 \text{ mm}$ Cylinder: Diameter $\geq 50 \text{ mm}$ Length $\geq 200 \text{ mm}$ Thickness $\geq 8 \text{ mm}$

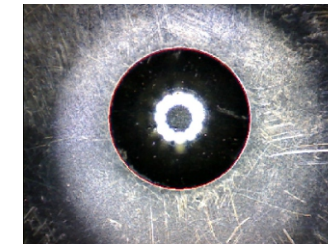
## FEATURES

- 100% recognition rate for indentations on various surface finishing.
- Manual and automatic recognition available, with manual rarely used.
- Clear and sharp image from special designed annular light source and high-grade lenses.
- Magnets inlaid camera with more stable image.
- Simple user interface and easy to use.
- Historical data automatic saving.
- Works in combination with any Brinell hardness tester.

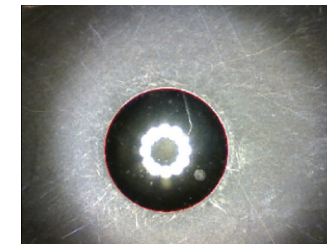


MS-1

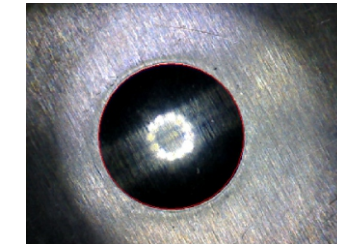
## INDENTATION IMAGES



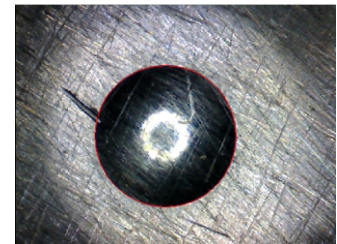
Buffed



Lapped



Machine Grinded



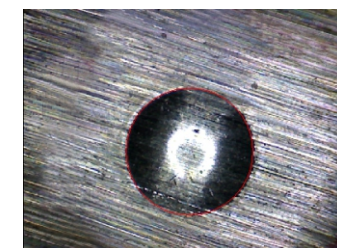
Angle Grinded



Machine Milled



Rusted



Wheel Sanded (1)



Wheel Sanded (2)

## TECHNICAL PARAMETERS

Ms-1 a:	For use with 10mm and 7.26mm ball, 3000/1580/1000/500kgf test force.
Ms-1 b:	For use with 5mm, 4mm and 2.5mm ball, 1580/750/250/125/187.5/62.5kgf test force.
Ms-1 c:	For use with 2.5mm ball.
Test Range:	16HBW~650HBW
Accuracy:	$\pm 1\%$ HBW
Repeatability:	$\pm 1\%$ HBW
Resolution:	11 $\mu\text{m}$ (Ms-1 a) 5.6 $\mu\text{m}$ (Ms-1 b) 2.8 $\mu\text{m}$ (Ms-1 c)

## STANDARD ASSEMBLY

Camera  
Standard Calibration Block  
Carrying Case  
Optical filter





MS-2a

Brinell Indentation Measurement System

### GENERAL DESCRIPTION

MS-2a Brinell Indentation Measurement System is mainly composed of camera, and special image processing software. The Brinell hardness indentation image is captured by the camera, the diameter of indentation is automatically identified and measured, and the Brinell hardness value is automatically calculated and directly displayed. Instead of using a reading microscope to manually measure, calculate the mean diameter and consult a table to obtain the hardness value. The image of MS-2a Brinell indentation Measurement System is brighter and clearer, the measurement is more convenient and rapid, and the result is more accurate and objective.

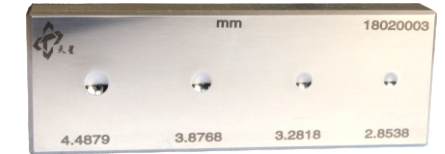
### FUNCTION AND FEATURES

- The advanced image processing technology domestic and abroad can ensure the accurate identification of indentation boundary.
- It has 100% of the automatic recognition ability for the indentation on rough and rusted surface, No need for manual tangent to assist measurement.
- Smooth shape design brings more comfortable grip.
- The newly designed optical system and lighting device ensure that the shallow indentation image also has clear edges and ideal contrast.
- Cables are stronger, softer, more durable, and more resistant to interference.
- The newly upgraded software, is up to  $1\ \mu\text{m}$  measurement resolution, which enables the whole system to achieve higher measurement accuracy and repeatability.
- Each standard block is provided with 4 standard indentations of known diameter and size, which can check the deviation of indentation measurement at any time.
- Can be calibrated with the liner scale, indentation measurement results with traceability.
- Historical data is stored automatically and can be downloaded at any time.



### TECHNICAL PARAMETERS

Image Resolution:	1600×1200
Field of View :	8 mm×6mm
Test Resolution :	$1\ \mu\text{m}$
Hardness Testing Range :	16 HBW- 650 HBW
Diameter Testing Range:	2.4 - 6mm ( 10mm Ball Indenter)
	2- 4mm ( 7.26mm Ball Indenter)
	1.2- 3mm ( 5mm Ball Indenter)
	0.6- 1.5mm ( 2.5mm Ball Indenter)
Diameter Accuracy :	$\pm 0.4\%$ ( 10mm Ball Indenter)
	$\pm 0.8\%$ ( 5mm Ball Indenter)
	$\pm 1.2\%$ ( 2.5mm Ball Indenter)
Diameter Repeatability:	0.4% ( 10mm Ball Indenter)
	0.6% ( 5mm Ball Indenter)
	0.4% ( 2.5mm Ball Indenter)
Net Weight of Camera :	0.385kg



Standard Test Block

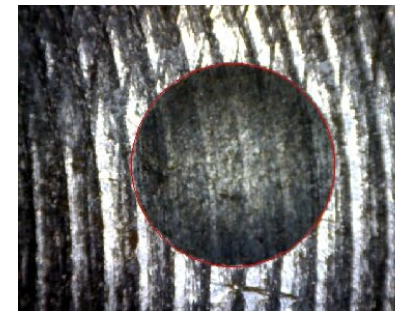
### STANDARD ASSEMBLY

Camera  
Standard Test Block 2 pcs  
Suitcase  
Documents

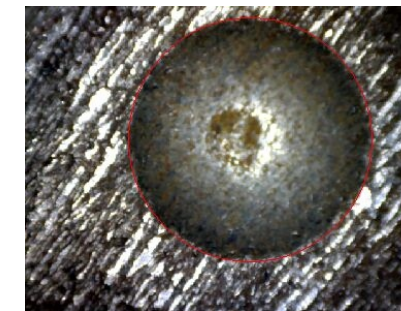
### OPTIONAL ASSEMBLY

Magnetic Touching Joint

### Recognizable Indentation



Rough Blade



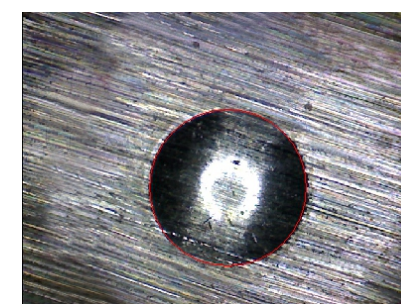
Unclear Boundary



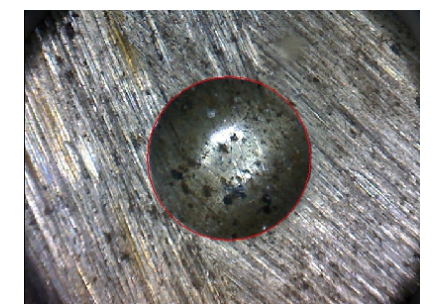
Incomplete Boundary



Rusted Surface



Part of the boundary is unclear



Angle Grinded



## APPLICATION

- Apply to test too large or heavy iron and steel parts for the desk testers.
- Test the hardness of steel parts, bearings, moulds; large and medium-sized heating parts.
- Test a large batch of parts piece by piece on site.
- Replace inaccurate and unreliable Leeb hardness tester, in a wide range of manufacture industry.

## FEATURES

- World leading product designed and manufactured by Tianxing with patent, because of high-accuracy sensor and unique distance measuring technology, reaching far higher test accuracy than other portable hardness testers.
- It is fixed onto the surface of a iron and steel part smartly with magnetic chucks. Simply reached one side of the part, the test could be accomplished. Only if the surface is available, an iron and steel part could be tested, no matter what shapes and sizes are.
- It follows the Rockwell Hardness Test Principle, and complies with relevant regulation of ISO6508, and ASTM E18 standards.
- It simplifies the operation steps of Rockwell Hardness Test: directly load total test force; maintain it for a few seconds; release the total test force and then the test is finished. It takes about only 10 seconds for a test, high effective.
- It permits customer to calibrate the tester with a standard block at any time.
- It could be operated under a temperature range of 0°C to 50°C either indoor or outdoor.

## TECHNICAL PARAMETERS

Initial Test Force:	10 kgf
Total Test Force:	60 kgf, 100 kgf, 150 kgf
Testing Range:	20~88 HRA, 20~100 HRB, and 20~70 HRC
Testing Resolution:	0.1 HR
Indication Error:	complying with ISO6508, ASTM E110 and ASTM E18 standards
Repeatability Error:	complying with ISO6508, ASTM E110 and ASTM E18 standards
Test Force Error:	$\leq \pm 1\%$
Operating Temperature:	0~50°C
Nominal Dimension:	245 mm × 105 mm × 138 mm
Weight:	5.3 kg
Test Piece Surface:	Flat: Area $\geq$ 195 mm × 60 mm Thickness $\geq$ 5 mm Cylinder: Diameter $\geq$ 60 mm Length $\geq$ 200 mm Thickness $\geq$ 8 mm

## STANDARD ASSEMBLY

Tester
120° Diamond Indenter
1/16" Carbide Alloy Ball Indenter
Rockwell Hardness Block
Seat Iron
Recharger
Battery Box
Carrying Case



PHR-200

## WORKING PRINCIPLE AND APPLICATION

Fix Rockwell test head to the surface of iron and steel parts to test the hardness by applying magnetic force. Follow Rockwell hardness test method completely and the test condition complies with standard of ISO 6508 and ASTM E18.

Apply in on-site quick test body hardness of steel parts. Test steel plate, steel pipe, axis, mould, huge forgings and huge and medium-size heat treatment parts if surface available. Test hardness of weld joint in boiler, pressure vessels, and pressure pipes.

Replace low accurate and reliable Leeb hardness testers.

## INSTRUMENT FEATURES

- Attach to one side of part to test, no need to move it.
- Quick, convenient, no damage test.
- Similar reading system as micrometers, easy to read, and good repeatability.
- Rather high accuracy, complying with ISO 6508 and ASTM E18.

## TECHNICAL PARAMETERS

Initial test force:	10 kgf
Total test force:	60 kgf, 100 kgf, 150 kgf
Test head:	120° diamond indenter, 1/16" carbide alloy ball
Indication Error:	complying with ISO 6508 , ASTM E18 and ASTM E110
Repeatability Error:	complying with ISO 6508 ASTM E18 and ASTM E110
Test Resolution:	0.5 HR
Weight:	4.7 kg
Surface:	Flat: Area $\geq$ 180 mm × 60 mm Thickness $\geq$ 5 mm Cylinder: Diameter $\geq$ 60 mm Length $\geq$ 200 mm Thickness $\geq$ 8 mm

## STANDARD ASSEMBLY

Tester
120° diamond indenter
1/16" carbide alloy ball
Rockwell hardness block
Adapter
Carrying case

## OPTIONAL ACCESSORIES

120° diamond indenter
1/16" mm carbide alloy ball
Rockwell hardness block (HRB, HRC high value, HRC middle value, HRC low value)
Special Adapter (customized by required size)



PHR-100

PHR SERIES / SMALL ROCKWELL HARDNESS TESTER

INSTRUMENT FEATURES

- Small and light. Min weight 0.8 kg
- Operation as simple as micrometer.
- Convenient. Used on table or take off.
- Reliable. Designed by Rockwell hardness test method.
- As accurate as desk testers. Complying with ISO 6508 and ASTM E18.
- Traceable standard block.
- Traceable test force.
- Certificated indenter by standard Rockwell hardness tester.



PHR-2

APPLICATION

- Test thin, small, long and irregular parts
- Test standard parts, hardware and cutter etc.
- Test inner and outer surface hardness of steel pipe directly.
- Very suitable for parts with small bearing face(e.g. small stamping)
- Match different anvils, test irregular parts.

TECHNICAL PARAMETERS

Initial test force: 10 kgf  
Total test force: 60 kgf, 100 kgf, 150 kgf  
Test head: 120° Diamond Indenter  
1/16" carbide alloy ball  
Indication Error: complying with ISO 6508 , ASTM E18 and ASTM E110  
Repeatability Error: complying with ISO 6508, ASTM E18 and ASTM E110  
Test Resolution: 0.5 HR  
Test range: HRA, HRB, HRC...HRV etc, 15 scales.  
Application range: common metal including iron and steel, Cu, Al, Ni, Ti, Pb, carburized layer and hard alloy, etc.



Packing of PHR-2

STANDARD ASSEMBLY

- Tester
- Bench stand
- 120° Diamond Indenter
- 1/16" carbide alloy ball
- 3 Rockwell test blocks
- Flat anvil
- V anvil
- Extensions
- Carrying case

OPTIONAL ACCESSORIES

- 120° Diamond Indenter
- Carbide ball indenter(1/16", 1/8")
- Steel ball indenter(1/4", 1/2")
- Standard test blocks (HRC– high, HRC– low, HRB)
- Raised spot anvil
- Slim raised spot anvil (for small supporting surface workpieces)
- Concave cylindrical anvil
- Convex cylindrical anvil (for tubings and curved sheets)
- Anvil for testing ball (for steel ball)
- Spare magnifier



MODEL SELECTION

Model	Opening Size W x D (mm)	Net Weight (kg)		Gross Weight (kg)		Package Dimensions (mm x mm x mm)		Remarks
		Tester	Bench Stand	Tester	Bench Stand	Tester	Bench Stand	
PHR-1	25 x 25	0.8	1.5	2.8	1.8	330 x 255 x 150	215 x 148 x 232	The first number in the model specification means the opening width (inch), the sencond number means the opening depth (inch), if only one number it means the width and depth are the same value.
PHR-2	50 x 50	1.2	1.5	3.7	1.8	390 x 280 x 160	215 x 148 x 232	

PRODUCT PHOTO



PHR-1



PHR-2



PHR SERIES C-SHAPE ROCKWELL HARDNESS TESTER

STRUCTURE AND APPLICATION

It is a small, light, accurate portable hardness tester.  
It consists of C-shape frame, screw arbor, and test head.  
It could test flat or curve parts as long as the parts could be clamped and the test surface erects the test head.  
It could be applied in production inspection and acceptance inspection to replace low accurate Leeb hardness tester.

INSTRUMENT FEATURES

- Follow Rockwell hardness test method and test condition, and the result is reliable.
- Fix the instrument to part and clamp it and test the hardness of part, no need to move the part.
- Test fast, convenient, non-destructive.
- Structure as simple as micrometer, accurate, convenient, repeatable.
- As accurate as desk tester, error less than 1.5HRC.

TECHNICAL PARAMETERS

Initial test force: 10 kgf  
Total test force: 60 kgf, 100 kgf, 150 kgf  
Test head: 120° Diamond Indenter  
1/16" carbide alloy ball  
Indication Error: complying with ISO 6508, ASTM E110 and ASTM E18  
Repeatability Error: complying with ISO 6508, ASTM E110 and ASTM E18  
Test Resolution: 0.5 HR  
Application range: common metal including iron and steel, copper, aluminum,

APPLICATION INSTRUCTION

Compared with small type, C-shape type applies part clamping structure and similar reading system as micrometer, so it is prior to small type for its good stability, repeatability, accuracy.



PHR-8-4



Packing of PHR-8-4

STANDARD ASSEMBLY

- Tester
- 120° diamond indenter
- 1/16" carbide ball indenter
- Rockwell test block
- Flat anvil
- V anvil
- Carrying case

OPTIONAL ACCESSORIES

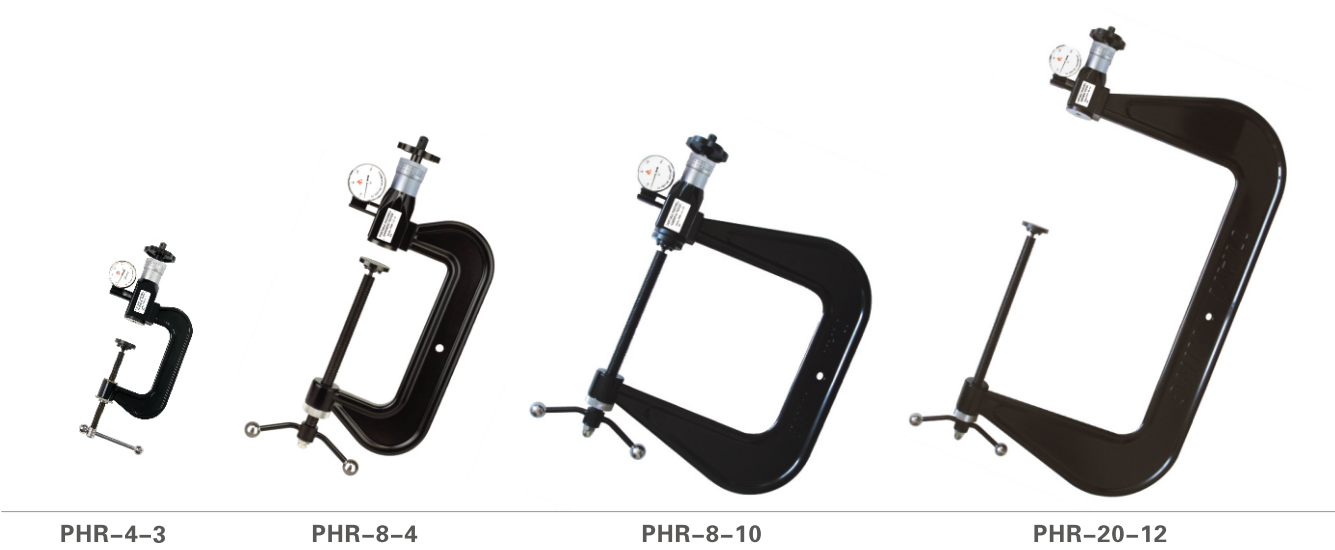
- 120° diamond indenter
- Carbide ball indenter(1/16", 1/8")
- Steel ball indenter(1/4")
- Rockwell test blocks (HRC-high, HRC-low, HRB)
- Special anvils (as per requirements)



MODEL SELECTION

Model	Opening Size W x D (mm)	Net Weight (kg)	Gross Weight (kg)	Package Dimensions (mm x mm x mm)	Remarks
PHR-4-3	100 x 75	2.2	8.5	510 x 380 x 180	The first number in the model specification means the biggest opening width (inch), the sencond number means the biggest opening depth (inch).
PHR-8-4	200 x 100	4.0	10.7	710 x 470 x 200	
PHR-8-10	200 x 250	5.5	14.2	720 x 650 x 230	
PHR-20-12	500 x 300	7.8	21.0	1020 x 760 x 240	

PRODUCTS PHOTOS



PHR SERIES / SUPERFICIAL ROCKWELL HARDNESS TESTER

FEATURES

- Test the superficial hardness of metals.
- The test principle and accuracy comply to standard ISO6508.
- With the bench stand it can be used on the desk as well as on site.
- Tests the hardness of thin plates, slim tubes, thin shafts, small balls and small stampings, workpieces with small supporting surface as well as parts requiring small indentation, replacing Vickers hardness tester.
- It is used for finished workpiece non-destructive hardness test directly. The small indentation is acceptable to most workpieces.
- Traceable standard hardness block.
- Indenter inspected with standard Rockwell hardness tester.
- Test force calibrated with load cells directly traceable to national secondary benchmark.

TECHNICAL PARAMETERS

Initial Test Force: 3 kgf  
Total Test Force: 15 kgf,30 kgf,45 kgf(for PHR-1ST 15 kgf only)  
Indenter: 120° Diamond Indenter  
1/16" carbide ball  
Accuracy: complying with ISO 6508,ASTM E18  
Resolution: 0.5 HR  
Testing Range: HRN, HRT,HRW, HRX, HRY, etc. 15 scales.  
Application: All metals including iron, steel copper, aluminium, zinc, lead, tin, carburized steel, nitrided steel etc.

APPLICATION

- Tests thin shaft > Φ2 mm with V anvil.
- Tests small ball > Φ2.5 mm with ball testing anvil.
- Tests small and irregular stampings with small supporting surface using slim raised spot anvil.
- Tests tin plate and cold-rolled sheet using PHR-1S and diamond raised spot anvil .
- Tests thin-wall slim pipes > Φ4.8 mm using PHR-1ST .



PHR-1S



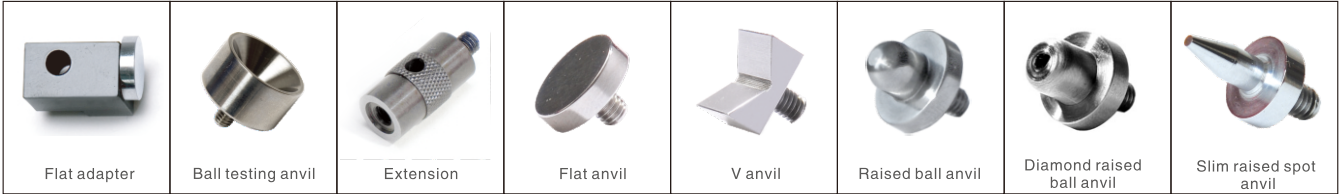
PHR-1ST

STANDARD ASSEMBLY

- Tester
- Bench stand
- 120° diamond indenter
- Carbide ball indenter(1/16")
- 3 superficial Rockwell test blocks
- 1 HR15T test block only (PHR-1ST)
- Flat anvil
- V anvil
- Extension
- Flat adapter (PHR-1ST)
- Carrying case

OPTIONAL ACCESSORIES

- 120° diamond indenter
- Carbide ball indenter(1/16", 1/8")
- Steel ball indenter(1/4", 1/2")
- Standard test blocks (HR15N, HR30N,HR45N, HR15T, HR30T, HR45T)
- Raised spot anvil
- Slim raised spot anvil (flat top: Φ1.5 mm, Φ2.5 mm, Φ3.5 mm)
- Diamond raised spot anvil
- Ball testing anvil
- Spare magnifier



MODEL SELECTION

Model	Specimen /Opening Size W x D(mm)	Net Weight (kg)		Gross Weight (kg)		Package Dimensions (mm x mm x mm)		Remarks
		Tester	Bench Stand	Tester	Bench Stand	Tester	Bench Stand	
PHR-1S	25 × 25	0.8	1.5	2.6	1.8	330 × 255 × 150	215 × 148 × 232	
PHR-2S	50 × 50	1.1	1.5	3.6	1.8	390 × 280 × 160		
PHR-1ST	Dia > 4.8	0.8	1.5	2.0	1.8	330 × 255 × 150		

PRODUCT PHOTO



PHR-1S

PHR-2S

PHR-1ST

# PHBR SERIES / BRINELL & ROCKWELL HARDNESS TESTERS

## INSTRUMENT FEATURES

- Add the functions of Brinell hardness test on PHBR series testers. Combined Brinell and Rockwell test functions in one instrument.
- Test method follows Brinell and Rockwell hardness test and accuracy is in accordance with ISO 6506, 6508 and ASTM E10, E18.
- Different modes and anvils are available for parts in various sizes and shapes.
- Traceable standard hardness blocks.
- Traceable test force.
- Indenter inspected with standard Rockwell hardness tester.

## TECHNICAL PARAMETERS

Rockwell initial test force:	10 kgf
Rockwell total test force:	60 kgf, 100 kgf, 150 kgf
Brinell test force:	62.5 kgf, 125 kgf, 187.5 kgf
Rockwell indenter:	120° Diamond Indenter, 1/16" carbide alloy ball
Brinell test ball:	2.5 mm, 5 mm hard alloy ball
Indicator Error:	complies with ISO and ASTM.
Repeatability Error:	complies with ISO and ASTM.
Test resolution:	Rockwell 0.5 HR Brinell 0.005 mm(indentation diameter)
Test range:	Rockwell HRA, HRB, HRC Brinell 16~650 HBW
Application range:	Rockwell for products or semi-finished products of common metals, including steel, copper, aluminum, carburized layer, hard alloy, etc. Brinell for castings, forgings, steel raw materials, non-ferrous metal.

## APPLICATION

- Small type applies for thin steel plate and small parts.
- C-shape type applies for huge or medium-size parts not available for magnetic type.
- Magnetic type applies for huge steel plates, axis, steel pipes, moulds, weld joints and other groupware.
- Rockwell hardness testers are mainly for products or semi-finished products after final heat treatment.
- Brinell hardness testers are mainly for raw materials, castings, forgings, or semi-finished products without heat treatment.



PHBR-2



PHBR-8-4



PHBR-100

## STANDARD ASSEMBLY

- Tester
- Holding seat
- 120° diamond indenter
- 1/16", 2.5 mm carbide alloy ball
- Rockwell hardness block
- Brinell hardness block (HB 2.5/187.5)
- 40X Reading Microscope
- Flat anvil (small, C-shape)
- V anvil (small, C-shape)
- Adapter (magnetic)
- Extensions (small)
- Spare microscope (small)
- Carrying case

## OPTIONAL ACCESSORIES

- 120° diamond indenter
- 1/16", 2.5 mm, 1/8", 5 mm carbide alloy ball
- 1/4", 1/2" steel test ball
- Rockwell hardness block (HRB, HRC-high, HRC-low)
- Brinell hardness block
- Flat anvil
- V anvil
- Slim raised spot anvil (small)
- Anvil for testing ball (small)
- Convex and concave cylinder anvil (small)
- Spare microscope (small)
- 40X Reading Microscope



40X Reading Microscope

			
Diamond	1/16" ball	1/8" ball	1/4" ball

## MODEL SELECTION

Model	Specimen /Opening Size W x D (mm)	Net Weight (kg)	Gross Weight (kg)	Package Dimensions (mm x mm x mm)	Remarks
PHBR-2	50 x 50	1.2	3.7	390 x 280 x 160	
PHBR-4-3	100 x 75	2.3	5.7	510 x 380 x 180	
PHBR-8-4	200 x 100	4.0	12.7	710 x 470 x 200	
PHBR-8-10	200 x 250	5.5	15.2	720 x 650 x 230	
PHBR-20-12	500 x 300	7.8	22.0	1020 x 760 x 240	
PHBR-100	Flat surface>60x180 Cylinder diameter>Φ100	4.9	12.0	480 x 390 x 210	

\* Only additional accessories are specified. Refer to PHR Rockwell hardness testers for complete list of accessories.



DESCRIPTION

World initial Magnetic Digital Brinell and Rockwell Hardness Tester, which can make accurate Brinell hardness test with conventional indentation method of ISO 6506.2 and ASTM E10. it can also make rapid Brinell hardness test with depth-measuring method of ASTM E103, and read hardness value directly. At the same time it also can do Rockwell hardness test according to Rockwell hardness testing method in ISO 6508.2 and ASTM E18. These functions can meet the demand of precise and rapid Brinell hardness testing on-site of large steel and iron parts.

Simplified operation of Rockwell hardness and depth-measuring Brinell hardness very simple with high efficiency.

This instrument stores an accurate basic hardness, that is depth curve made from plenty hardness blocks.It also stores several Brinell curves of common materials. We can supply the service of making precise Brinell curve of common material according to customers' requirement. Advanced curve correction methods can be used to test a variety of special materials.

This instrument can check and calibrate the accuracy on-site by precise indentation method at any time.



PHBR-200

INSTRUMENT FEATURES

- **Accuracy:** Accurate force value. Test accuracy of Indentation Brinell Method as well as Rockwell test comply with ISO and ASTM standard. Depth-measuring Method accuracy can satisfy on-site test request.
- **Speediness:** Simple operation, high efficiency, test time less than 10s.
- **Stability:** Excellent stability and repeatability, reliable values transfer, keep test accuracy unchanged for a long time.
- **Testing On-site:** Insensitive to temperature changing on workshop.
- **Unique Method:** Test by absorbing to iron and steel parts, and it can finish the test by unilaterally touching the parts. It can test any dimension parts, especially steel tubes and weld on pipes.

MAIN TECHNICAL PARAMETERS

Initial Test Force:	10 kgf
Total Test Force:	60 kgf, 100 kgf, 150 kgf, 187.5 kgf
Testing Range:	20~88 HRA, 20~100 HRB, 20~70 HRC ,150~400 HBW
Testing Resolution:	0.1 HR or 1 HBW
Indication Error:	Comply with ISO and ASTM standards
Repeatability Error:	Comply with ISO and ASTM standards
Test Force Error:	≤ ± 1% Comply with ISO and ASTM standards
Operating Temperature:	5~45℃
Dimension:	245 ( length ) x 105 ( width ) x 138 mm ( height )
Weight:	5.3 kg

STANDARD ASSEMBLY

Tester
120° Diamond Indenter
1/16" Carbide Alloy Ball Indenter
2.5mm Carbide Alloy Ball Indenter
Rockwell Hardness Block
Brinell Hardness Block
40X Reading Microscope
Iron Seat
Recharger
Carrying Case

INTRODUCTION

- A portable instrument which can perform on-site hardness test on aluminum alloys. The test result can be got with only a simple clamp. It is convenient, efficient and reliable.
- Webster hardness tester is the preferred instrument for testing aluminum alloys mechanical performance in accordance with American standard ASTM B647.
- Used for quick test the hardness of aluminium profiles, tubings, sheets, accessories and other soft metal. Especially suitable for quick, non-destructive on-site 100% final products qualification test.
- Webster hardness tester can be also used for testing hardness of copper, brass and soft steel.

TECHNICAL PARAMETERS

Testing Range:	0 ~ 20 HW (equivalent to 20 ~ 110 HRE, Model W-20)
Resolution:	0.5 HW (5 ~ 17 HW)
Repeatability:	0.5 HW (5 ~ 17 HW)
Weight:	0.5 kg

STANDARD ASSEMBLY    OPTIONAL ACCESSORIES

Tester
Standard hardness block
Spare indenter
Calibration wrench
Small screwdriver
Carrying case
Dial assembly

Indenter
Standard hardness block
Dial glass



W-20



W-20a



W-20b

FEATURES

- **Indenter:** Re-engineered with advanced material and new production technology manufactured, higher hardness, long service life, good interchangeability.
- **Indicator Hand:** High strength indicator hand, less likely to be bent by long-term using or mis-operation.
- **Dial Glass:** High strength, high toughness, uneasy to be broken or scratched.
- **Handle:** Forged aluminum alloy handle with fine anodized finishing, high resistance to abraision and stain.
- **Hardness Blocks:** Tested by standard rockwell hardness tester, the hardness block are attached with test report.
- **Stability:** Stable full scale point, stable calibration point, indicator never glides.
- **Conversion:** Results can be converted to Vickers, Rockwell and Brinell.

MODELS

- W-20: the most popular model, used to test normal aluminum profiles.
- W-20a: used to test aluminum profiles with thickness within 13 mm.
- W-20b: used to test aluminum tubings with inner diameter over 6 mm.
- W-B75: used to test brass tubings and brass sheets.
- W-BB75: used to test copper tubings and copper sheets.
- W-B92: used to test soft stainless steel sheets, cold-rolled steel, etc.

## APPLICATION

- The ED400 Coating Thickness Gauge is the improved model of the ED300 Gauge. The performance is prominently improved.
- The gauge is used to measure the thickness of the insulating coating on non-ferrous metals. It is mainly used to measure the anodic oxide coating on aluminium alloy profiles, aluminum composite panel, aluminum work pieces and etc. It can also be used to measure the thickness of the insulating foil on other non-ferrous metals such as paper and plastic foil.
- It is suitable for quick non-destructive coating thickness inspection for production, sale and engineering. It is used for production inspection, acceptance inspection and quality supervision.
- The ED400 gauge conforms the international standard ISO 2360.



ED400

## FEATURES

- **Wider Range:** Measuring range from 0 to 500  $\mu\text{m}$ .
- **Better Accuracy:** Accuracy is up to 2% of coating thickness.
- **High Resolution:** Resolution is up to 0.1  $\mu\text{m}$ .
- **Simpler Calibration:** Only two calibration points, 0 and 50  $\mu\text{m}$ , are needed to ensure the accuracy within the whole measuring range.
- **Less Substrate Sensitive:** Less variation when the substrate material is changed from aluminum to different substrate materials such as aluminum alloys, copper and brass. The error is smaller than 2  $\mu\text{m}$ .
- **Better Reliability:** With high integration and stability electronic components, the circuit board is enhanced with better reliability.
- **Better Stability:** With advanced temperature compensation technology, the temperature drifts very slightly with temperature. The calibration cycle of gauge is longer.
- **Long Life Probe Core:** The probe is re-designed with high strength magnetic core material, and the service life of the probe is prominently extended.

## TECHNICAL PARAMETERS

Range:	0 – 500 $\mu\text{m}$
Accuracy:	0 – 50 $\mu\text{m}$ : 1 $\mu\text{m}$ 50 – 500 $\mu\text{m}$ : 2%
Resolution:	0 – 50 $\mu\text{m}$ : 0.1 $\mu\text{m}$ 50 – 500 $\mu\text{m}$ : 1 $\mu\text{m}$ 0 – 500 $\mu\text{m}$ : 1 $\mu\text{m}$ (optional)
Operating Temperature:	5 – 45 $^{\circ}\text{C}$
Dimension:	150 × 80 × 30 mm
Weight:	280 g

## STANDARD PACKAGE

Gauge  
Probe  
Calibration substrate (6063 aluminum alloy)  
Calibration plate (1 pcs, with verification certificate)  
Carrying case

## OPTIONAL ACCESSORIES

Spare probe  
Calibration substrate (6063 aluminum alloy)  
Calibration plate (1pcs, with verification certificate)

## LT-02 SURFACE THERMOMETER

## APPLICATION

- The LT-02 thermometer consists of the digital gauge and the probe. It is used to measure the surface temperature of conductive metals. The typical application is to measure the temperature of the heated aluminium rods at the extruding machine.

## FEATURES

- **Fast:** The tips of the probe forms a thermocouple with the workpiece, and the thermal balance is reached.
- **Convenient:** Place the probe on the workpiece and read the result.
- **Accurate:** The thermocouple is conducted through the workpiece.
- **Durable:** No wearing part is included in the probe.

## TECHNICAL PARAMETERS

- Type of Probe: Type K thermocouple
- Range: 0–800  $^{\circ}\text{C}$
- Resolution: 1  $^{\circ}\text{C}$
- Dimensions of Gauge: 105 × 70 × 20 mm



LT-02

## LT-06 THERMOMETER FOR LIQUID ALUMINIUM

## INTRODUCTION

- The LT-06 thermometer is used to measure the temperature of the liquid aluminium during the smelting procedure. The thermometer consists of a digital gauge, a probe and a protective sheath. The sheath is corrosion resistant to liquid aluminium, so the thermometer has very long service life.

## TECHNICAL PARAMETERS

- Range: 0–800  $^{\circ}\text{C}$
- Accuracy: 1% + 1  $^{\circ}\text{C}$
- Dimensions of Gauge: 105 × 70 × 20 mm
- Dimensions of Probe:  $\Phi 8 \times 1500 \text{ mm}$  (1500 mm and 2500 mm optional)
- Dimensions of Sheath:  $\Phi 16 \times 310 \text{ mm}$
- Dimensions of Probe:  $\Phi 32 \times 250 \text{ mm}$
- Weight: 340 g



LT-06



## APPLICATION

- 934-1 Barcol Impressor is mainly applied to test aluminum and aluminum alloys. It is suitable to test pure aluminum, aluminum alloys, thick pieces of aluminum sheets, thick pieces, bars and assembled aluminum alloys parts (e.g. aluminum alloy doors, windows and ladders)
- 934-1 Barcol Impressor is also used to test fiber reinforced plastics and hard plastics with ASTM D2583.
- 934-1 Barcol Impressor complies with ASTM B648-00 Test Method for Indentation Hardness of Aluminum Alloys by Means of a Barcol Impressor.
- 935 Barcol Impressor is used to test soft plastics, lead, tin and other soft metals.
- 936 Barcol Impressor is used to test rubber, wood and leather etc.



934-1

## FEATURES

- **Easy to Use:** Single hand operation; easy to use; high efficiency; able to make test at any site.
- **High Sensitivity:** Barcol Impressor has 100 graduations. Its sensitivity is much higher than the Webster hardness tester.
- **Wide Testing Range:** Used to test from very soft pure aluminum to very hard aluminum alloys.
- **Less Thickness Requirement:** It can test on any workpieces with thickness greater than 0.8 mm.
- **No Supporting Required:** It can test from only one side of the workpiece. It is unnecessary to move or support the workpiece. It is used to test very large and thick workpieces and assembly parts.
- **Easy Conversion:** The test results can be converted to HB, HR, HV and HW easily through the conversion table.
- **High Quality Indenter:** The indenter has very high hardness, long service life and good interchangeability.

## TECHNICAL PARAMETERS

Testing Range:	0 – 100 HBa (equivalent to 25 – 135 HBW)
Resolution:	0.5 HBa
Indication Error:	± 2 HBa (42 ~ 48 HBa) ± 1 HBa (81 ~ 88 HBa)
Repeatability Error:	± 2 HBa (42 ~ 48 HBa) ± 1 HBa (81 ~ 88 HBa)
Weight:	0.5 kg

## STANDARD ASSEMBLY

Tester
2 Spare indenters
Standard hardness block (high)
Standard hardness block (low)
Calibration wrench
Leg
Carrying case

## OPTIONAL ACCESSORIES

Spare indenters
Standard hardness block (high / low)
Dial glass
Flat leg

In 2006, we purchased this HRBS-150 standard Rockwell hardness tester of which comprehensive error is within 0.4HR. We perform regular calibration by using Rockwell and superficial Rockwell standard test blocks certificated with national secondary benchmark Rockwell hardness tester owned by NIM (National Institute of Metrology).

Each Rockwell, superficial Rockwell and Webster hardness test block and each diamond and ball indenter supplied by our company is inspected with this standard Rockwell hardness tester. Non-conforming product will be rejected.

The test blocks supplied by our company are traceable to national secondary benchmark through calibration by this standard Rockwell hardness tester, so that the accuracy of the hardness testers manufactured by our company is reliably assured and supervised.

