

Brinell Hardness Tester



Model: HBS-3000



Model: HBE-3000A

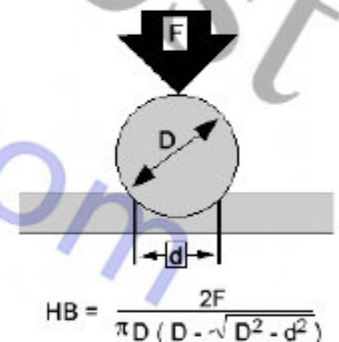
1, General introduction

The Brinell Hardness tester that shows the largest indentation among all the hardness tests is able to reflect the comprehensive features of the material, and the test is unaffected by the organization microscopic segregation and the compositional unevenness of the specimen; and hence it is a hardness testing with high precision.

Principle:

All Brinell tests use a carbide ball indenter. The test procedure is as follows:

- The indenter is pressed into the sample by an accurately controlled test force.
- The force is maintained for a specific dwell time, normally 10-15 seconds.
- After the dwell time is complete, the indenter is removed leaving a round indent in the sample.
- The size of the indent is determined optically by measuring two diagonals of the round indent using either a portable microscope or one that is integrated with the load application device.
- The Brinell hardness number is a function of the test force divided by the curved surface area of the indent. The indentation is considered to be spherical with a radius equal to half the diameter of the ball. The average of the two diagonals is used in the following formula to calculate the Brinell hardness.



$$HB = \frac{2F}{\pi D (D - \sqrt{D^2 - d^2})}$$

2, References

ASTM E10 "Standard Test Method for Brinell Hardness of Metallic Materials"

ISO 6506 "Metallic materials -- Brinell hardness test"

3, Application

Because of the wide test force range the Brinell test can be used on almost any metallic material. The part size is only limited by the testing instrument's capacity.

Strengths

1. One scale covers the entire hardness range, although comparable results can only be obtained if the ball size and test force relationship is the same
2. A wide range of test forces and ball sizes to suit every application
3. Nondestructive, sample can normally be reused

Weaknesses

1. The main drawback of the Brinell test is the need to optically measure the indent size. This requires that the test point be finished well enough to make an accurate measurement
2. Slow. Testing can take 30 seconds not counting the sample preparation time



Hardness Blocks



Carbide ball indenter

Model:
HBE-3000A Electronic Brinell Hardness Tester
Key Features

- 1), Unified product combining the precise mechanical structure with the computer control by means of the mechanical and electrical circuit system;
- 2), Adopts the motorized test force application without weight blocks.
- 3), Uses 0.5‰ accuracy compression sensor to feedback the information and the CPU control system to automatically compensate the test force lost during the testing;
- 4), The test force and the load dwell time can be directly set pressing the selected keys on the touch-keyboard, with reliable repetition, precise reading and easy operation.

Main technical specification

MODEL		HBE-3000A
Test force	N	612.9, 9 80, 1226, 1839, 2452, 4903, 7355, 9807, 14710, 29420
	Kg	62.5, 100, 125, 187.5, 250, 500, 750,1000, 1500, 3000
Testing range		(8-650)HBW
Accuracy of indication value		
HBW≤125		Max. indication tolerance: ±3.0, repetition: ≤3.5
125<HBW≤225		Max. indication tolerance: ±2.5, repetition: ≤3.0
HBW>225		Max. indication tolerance: ±2.0, repetition: ≤2.5
Max. height of test specimen		220mm
Max. width of test specimen		130mm
Amplification of Microscope		20*
Min Reading Grade of the Drum wheel of the microscope		0.005mm
Power		AC 220V, 50/60HZ
Net Weight		125Kg
Standard Accessories		Standard Rockwell hardness block: 2 pcs; 20* microscope; steel ball indenter: (φ2.5mm, φ5mm, φ10mm); Test Tables: (Large, Small and V-shaped); Power cord, manual, etc.

Model:
HBS-3000 Digital Brinell Hardness Tester
Key Features

- 1), Unified product combining the precise mechanical structure with the computer control by means of the mechanical and electrical circuit system;
- 2), Adopts the motorized test force application without weight blocks.
- 3), Uses 0.5% accuracy compression sensor to feedback the information and the CPU control system to automatically compensate the test force lost during the testing;
- 4), The indentation is directly measured on the instrument through the microscope, and the LCD screen indicates the diameter;
- 5), the hardness value, and 17 different hardness testing comparison tables as well as the HBW range automatically shown under the present presetting.
- 6), It is possible to preset the load dwell time and the intensity of the light on the window page, and design F/D2 selection table to facilitate the operation of the user.

Main technical specification

Model	HBS-3000	
Test force	N	612.9, 980, 1226, 1839, 2452, 4903, 7355, 9807, 14710, 29420
	Kg	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000
Testing range	(8-650)HBW	
Accuracy of indication value		
HBW≤125	Max. indication tolerance: ±3.0, repetition: ≤3.5	
125<HBW≤225	Max. indication tolerance: ±2.5, repetition: ≤3.0	
HBW>225	Max. indication tolerance: ±2.0, repetition: ≤2.5	
Max. height of test specimen	185mm	
Max. width of test specimen	130mm	
Amplification of Microscope	20*	
Min Reading Grade of the Drum wheel of the microscope	0.625um	
Power	AC 220V, 50/60HZ	
Net Weight	130Kg	
Standard Accessories	Standard Rockwell hardness block: 2 pcs; 20* micrometer eyepiece; steel ball indenter: (φ2.5mm, φ5mm, φ10mm); Test Tables: (Large, Small and V-shaped); Power cord, manual, etc.	