

BRINELL HARDNESS TESTERS

BRINELL HARDNESS TESTING

The Brinell scale characterizes the indentation hardness of materials through the scale of penetration of an indenter, loaded on a material test-piece.

Proposed by Swedish engineer Johan August Brinell in 1900, it was the first widely used and standardized hardness test in engineering and metallurgy.

The typical tests use a 10, 5, 2.5 or 1 mm diameter steel ball as an indenter with a test force starting at 1kgf up to 3,000kgf (29 kN) force. For softer materials, a lower force is used; for harder materials, a tungsten carbide ball is substituted for the steel ball.

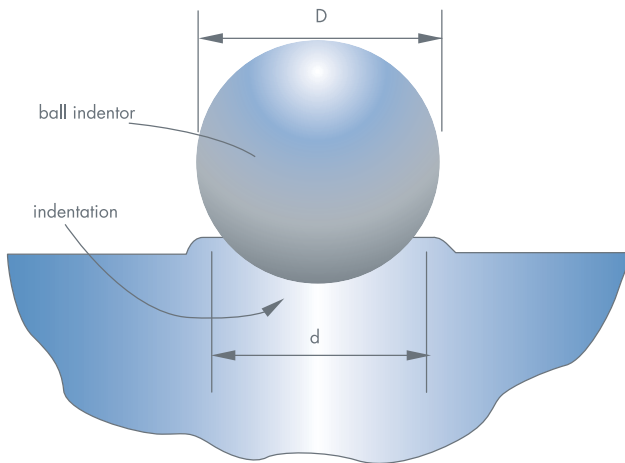
After the impression is made, a measurement of the diameter of the resulting round impression (d) is taken. It is measured to plus or minus 0.05mm using a low-magnification microscope. The hardness is calculated by dividing the load by the area of the curved surface of the indentation, (the area of a hemispherical surface is arrived at by multiplying the square of the diameter by 3.14159 and then dividing by 2).

Common values

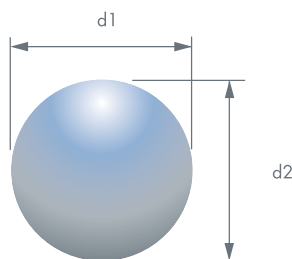
The standard format for specifying tests can be seen in the example "HBW 10/3000". "HBW" means that a tungsten carbide (from the chemical symbol for tungsten) ball indenter was used, as opposed to "HBS", which means a hardened steel ball. The "10" is the ball diameter in millimeters. The "3000" is the force in kilograms force.

Standards

- European & international EN ISO 6506-1
- American ASTM E10-08



(a) Brinell indentation



(b) measurement of indent diameter

BRINELL HARDNESS TESTERS



NEXUS 3000 SERIES



BRINELL OPTICAL SCANNING SYSTEM HB100

BRINELL HARDNESS TESTERS

NEXUS 3000 SERIES

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3000LDB BASIC

WITH ANALOGUE MICROSCOPE

Brinell

- Load cell, closed loop system
- Test loads 61.5kgf - 3000kgf
- External microscope with analogue scale for indentation measurement
- Brinell video microscope system optional

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NEXUS 3001

WITH ANALOGUE MICROSCOPE

Brinell & Vickers

- Load cell, closed loop system
- Test loads 30kgf - 3000kgf
- LCD display showing Brinell and Vickers value, statistics and tester settings
- Simultaneous conversion to Rockwell, Vickers, Brinell and Leeb.
- External microscope with analogue scale for indentation measurement
- Brinell video microscope system (optional)

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NEXUS 3002

WITH DIGITAL MICROSCOPE

Brinell & Vickers

- Load cell, closed loop system
- Test loads 30kgf - 3000kgf
- LCD display showing Brinell and Vickers values, statistics and tester settings
- Simultaneous conversion to Rockwell, Vickers, Brinell and Leeb
- External digital microscope for automatic indentation measurement

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NEXUS 3001 XL

WITH ANALOGUE MICROSCOPE

Brinell & Vickers

- Load cell, closed loop system
- Test loads 30kgf - 3000kgf
- LCD display showing Brinell and Vickers value, statistics and tester settings
- Simultaneous conversion to Rockwell, Vickers, Brinell and Leeb.
- External microscope with analogue scale for indentation measurement
- Brinell video microscope system (optional)
- **XL version, 450mm workpiece height, 250mm throat depth**

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NEXUS 3002 XL

WITH DIGITAL MICROSCOPE

Brinell & Vickers

- Load cell, closed loop system
- Test loads 30kgf - 3000kgf
- LCD display showing Brinell and Vickers values, statistics and tester settings
- Simultaneous conversion to Rockwell, Vickers, Brinell and Leeb
- External digital microscope with analogue scale for automatic indentation measurement
- **XL version, 450mm workpiece height, 250mm throat depth**

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NEXUS 3000 XL SERIES

MOTORIZED SPINDLE

Nexus 3000 XL options

- The XL models can be supplied with a motorized spindle, featuring automatic workpiece detection, force application, unloading, repositioning. Fully automatic without operator interference.



**BRINELL OPTICAL
SCANNING SYSTEM HB100**

Portable video scanning system to automatically measure Brinell indentations and determine the Brinell hardness value. Excellent solution for quick and easy measurement of Brinell hardness values with ball diameters 1, 2, 2.5, 5 and 10mm and for applied loads of 1 to 3000kg.

- Including (removable) magnetic base for accurate and precise measuring
- Easy to use: Position the scanning system on the indentation made in a flat or curved surface, press the button to determine the relative hardness and diameter of the indentation
- Accuracy of the measured diameter is up to 0.001µm
- Possibility to set tolerance value Yes/No (upper & lower limits)
- Possibility to show the last 5 hardness measurements taken
- Automatic storage of images and accompanying measurement data files
- Storage of operator id, date/hour, hardness parameters, measured hardness values, location of stored image

Software Features

- Measures the indentation automatically or by hand
- Saves the image of the indentation in a dedicated format and folder
- Test results can be imported into Excel
- Each measurement is filed with information about the ball diameter, applied load, load duration
- The 5 last measurements can be shown on screen
- Images taken can be copied



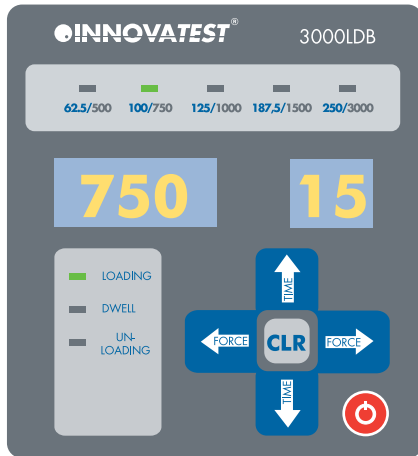
3000LDB
BRINELL 61.5KGF TO 3000KGF

FEATURES

Simple straight forward Brinell hardness tester with test force ranging from 61.5kgf to 3000kgf. Closed loop, load cell, force feedback system for reliable load application, without overshoot.

- Sturdy, regular, 30kN (3000kg) test allowance
- Rugged construction to with-stand harsh environments
- Very affordable price
- External microscope with analogue scale for indentation measurement

*ALSO AVAILABLE WITH BRINELL SCANNING SYSTEM HB100



TECHNICAL SPECIFICATIONS

Brinell scales	HBW 10/3000, HBW 10/1500, HBW 10/1000, HBW 10/500, HBW 10/250, HBW 10/125, HBW 10/100, HBW 5/750, HBW 5/250, HBW 5/62.5, HBW 2.5/187.5
Test loads	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000kgf
LCD display indication	Test force selected, applied test force, dwell Time
Test force application	Closed loop controlled load motor
Load duration	Adjustable dwell time 5-60 sec (5 sec step)
Accuracy	Conforms to EN-ISO 6506
Specimen accommodation	Vertical space 220mm Horizontal space (from center-line) 135mm
Specimen requirements	External surfaces roughly ground, Ra <21.6µm
Power supply	220V AC, 50Hz
Measuring microscope	Magnification 20x, resolution 5µm
Machine dimensions	236mm x 550mm x 753mm (WxDxH)
Machine weight	125kg

ORDER DETAILS

3000LDB Closed loop Brinell hardness tester

STANDARD DELIVERY

- Measuring microscope 20x
- Ball indentors $\varnothing 2.5\text{mm}$, $\varnothing 5\text{mm}$ and $\varnothing 10\text{mm}$
- V-anvil
- Large (160mm) flat anvil
- Small flat anvil
- Testing table $\varnothing 80\text{mm}$
- Fuse 2A (3 pcs)
- Hardness test block 150-250 HBW 10/3000
- Hardness test block 75-125 HBW 10/1000
- Hardness test block 150-250 HBW 2.5/187.5
- INNOVATEST® certificate
- Installation and user manual

OPTIONAL ACCESSORIES

- Brinell microscope with dual filar line, objectives for 10x, 15x, 20x, 30x and 40x magnification
- Brinell video microscope system
- Certified indentors & balls
- Reference hardness blocks





NEXUS 3001
WITH ANALOGUE MICROSCOPE

NEXUS 3000 XL SERIES
MOTORIZED SPINDLE

NEXUS 3002 XL INV
AUTOMATIC MEASUREMENT

FEATURES

Top quality Brinell & Vickers testing in one super rigid frame. "Made in Germany" optical system with high quality objectives and either analogue or digital reading. Conversion to other hardness scales and online statistics. Connectivity for data output via RS-232.

- Load cell, closed loop system
- Test loads 30kgf - 3000kgf
- LCD display showing Brinell and Vickers value, statistics and tester settings
- Simultaneous conversion to Rockwell, Vickers, Brinell and Leeb rebound testing
- Microscope with analogue scale for indentation measurement (3001 model)
- Digital microscope for automatic indentation measurement (3002 model)
- Standard supplied with objectives for 10x, 25x and 150x magnification
- Brinell video microscope system (optional)
- Brinell INV-IMPRESSIONS automatic indent measuring and filing system
- **XL version, 450mm workpiece height, 250mm throat depth**

TECHNICAL SPECIFICATIONS

NEXUS 3001/3002

Brinell scale HB	31.25, 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000kgf
Vickers HV	30, 40, 50, 60, 80, 100, 120kgf
Ball indentors	10, 5, 2.5, 1mm
Test force selection	Electronic, closed loop, load cell, force feedback system, indication in kgf or N. Test force selectable over menu operation
Test procedure	Automatic, loading/dwell/unloading
Loading speed	Variable, depending on load application
Test force accuracy	< 1% full range
User display	Diameter of indent, length of diagonals, hardness value, converted value, test force, online statistics
Display resolution	0.1 HB, HV
Hardness conversion	Rockwell, Vickers, Brinell, Leeb & Tensile 2 scales simultaneously
Standardization	EN, ISO 6507, EN ISO 6506, ASTM E-384, ASTM E-10-08, ASTM E-384
Statistics	Total tests, max, min, average, range, standard deviation, all in real time after each test
Control panel	Start test, stop test, dwell time, print, clear, menu operation for date, time, scale and load settings, language
Firmware	V2.01, German, English, French (standard) V2.02, English, Italian, Spanish
Memory	Large memory for testing results
Data output	RS-232, Bi-Directional, USB
Loading mechanism	Fully automatic, closed loop, force feedback, loading, dwell, unloading
Dwell time setting	Default 10 seconds, user defined 1 to 99 seconds
Printer	Optional silent high speed printer
Eyepiece microscope	Analogue or optional bright dual line filar eyepiece with 15x magnification, 0.1µm reading
Vertical capacity	220mm (450mm XL model)
Horizontal capacity	135mm (250mm XL model) from center-line
Humidity	10% to 90% non condensing
Machine weight	130kg (160kg XL model)
Power requirements	100VAC to 240VAC, 50/60Hz, single phase
Power consumption	390W
Guarantee	2 years limited guarantee

INV-IMPRESSIONS

High performance PC- based camera indent measuring system.
Automatic measurement of the indent on the LCD screen.
Store, file, handle images and data on the harddisk.

ORDER DETAILS

- NEXUS 3001** Brinell, analogue micrometer reading
- NEXUS 3001XL** Brinell, analogue micrometer reading, tall version
- NEXUS 3002** Brinell, Vickers, digital microscope
- NEXUS 3002XL** Brinell, Vickers digital microscope, tall version
- NEXUS 3002XL INV** Brinell, Vickers automatic measuring system

STANDARD DELIVERY

- Analogue microscope with 10x, 25x and 100x magnification (3001)
- Digital microscope with 10x, 25x and 100x magnification (3002) for automatic measurement
- Ball indentors \varnothing 1mm, \varnothing 2.5mm, \varnothing 5mm and \varnothing 10mm
- V-anvil \varnothing 80mm
- Large flat anvil \varnothing 200mm
- Small flat anvil \varnothing 60mm
- Testing table \varnothing 80mm
- Fuse 2A (3 pcs)
- Hardness test block 150-250 HBW 10/3000
- Hardness test block 75-125 HBW 10/1000
- Hardness test block 150-250 HBW 2.5/187.5
- RS-232 data output
- 4 adjustable feet
- INNOVATEST® certificate
- Installation and user manual

OPTIONAL ACCESSORIES

- Motorized spindle for fully automatic testing on XL models
- Large testing table 350mm x 250mm
- HB100 Video measuring and data base system
- Extended height/width frame XL models
- Motorized X-Y stage
- Indentors & hardness test blocks
- Certified indentors
- Reference hardness blocks
- Solid tester table & storage cabinet
- Specified color requirement





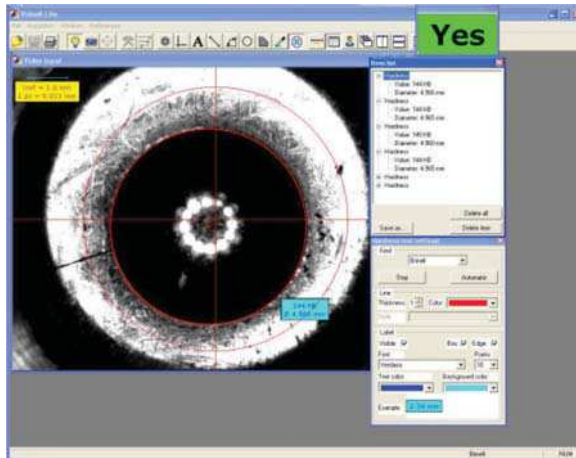
HB100
PORTABLE BRINELL INDENT SCANNER

FEATURES

Portable video scanning system to automatically measure and determine the Brinell hardness value.

Excellent solution for quick and easy measurement of Brinell hardness values made with ball diameters 1, 2, 2.5, 5 and 10mm and applied loads of 1kgf to 3000kgf.

- Including magnetic base for accurate and precise measuring
- Easy to use: Position the scanning system on the indentation made in a flat or curved surface, press the button to determine the relative hardness and diameter of the indentation
- Accuracy of the measured diameter is up to 0.001µm
- Possibility to set tolerance value Yes/No (upper & lower limits)
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STANDARD DELIVERY

- Video-optical head
- Firewire interface for pc or laptop
- Software
- Power supply AC 100-240V 50/60Hz, 1.0A
- Frame grabber
- Video cable (2.3m)
- RCA-RCA video cable (1.5m)
- 12V power cable (0.85m)
- Set of USB cable, CD with driver & dongle

SOFTWARE FEATURES

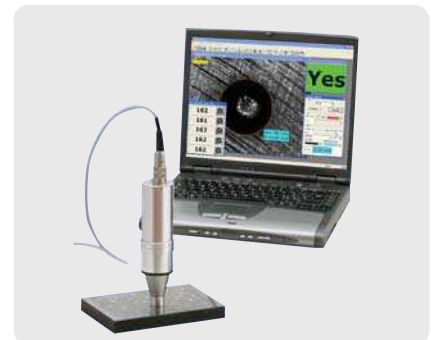
- Measures the indentation automatically or by hand
- Saves the image of the indentation in a dedicated format and folder
- Test results can be imported into Excel
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- 5 last measurements can be shown on screen
- Images taken can be copied

OPTIONAL ACCESSORIES

- Battery charger 12V, 7A
- Battery charger 12V, 1.2A
- Aluminum carrying case for HB100 + battery only
- PC or laptop

TECHNICAL SPECIFICATIONS

Power supply	12V
Power consumption	300mA
Dimensions	ø43mm x 270mm
Dimensions carrying case	Ext. 380mm x 265mm x150mm Int. 350mm x 250mm x140mm
Weight	650gr



ORDER DETAILS

HB100 Portable Brinell video scanning system

