

B.O.S.S.[®] Brinell Optical Scanning System

Specification Sheet
SS-BOSS-0310
March 2010

The B.O.S.S. Brinell Optical Scanning System was developed to provide more accurate and consistent HB hardness measurement. The system minimizes errors caused by subjective operator interpretation of the indentation diameter. Typical error using conventional Brinell measurement techniques is 0.1mm between operators. Using the B.O.S.S. system, measurements are made consistently, by multiple operators, to well within 0.01mm.

The B.O.S.S. system can be added to any Brinell hardness tester, even our Newage Pin Brinell product. The system is comprised of a precision optical scan head with cable that connects via USB to your personal computer with the B.O.S.S. software installed. Simply place the scan head over the indentation to be measured. The superior optics show a clear image of the indentation on the computer display. The optics may be adjusted using the software by the operator. Once the image is clearly displayed, simply press the capture button. The software determines the exact outer edge of the indentation at eight locations and provides you with an accurate indentation diameter to within 0.01mm. Measurement is instantaneous. There is no interpretation required by the user. Along with the captured image, HB value and any associated scale conversion is displayed.

Access to the software can be security protected so that only authorized users have access. You use the software to select the primary hardness scale you are testing to, plus you have provisions to perform automatic hardness scale conversion. You may even create a user-defined scale for your unique application. Tolerances may also be established within the software for developing statistical calculations for HI, LO and OK indications. X-Bar and R Charts can be used to plot High and Low test results. Results can be displayed or printed using a serial printer. Pre-formatted report layouts are supplied including a data printout, data printout with user notes annotations, X-Bar Charts, R Charts, and histogram. User's can configure their report format headers. A Print Preview function allows you to view the report prior to printing. The software's View Menu is used to display up to six different test attributes on your screen: X- Bar/R Chart, Histogram, Tile, Auto Tile, Tool Bar and Status Bar. These view attributes can be used to customize your screen and how test results are displayed. Users may "tile" up to three individual test files. A "Start" key on the operating display is used to automatically call the next test.

Features

- Accurate, Consistent, Empirical Measurement
- Easy-to-Use, Intuitive Setup & Operation
- Brinell Scale can be Converted Automatically to Other Hardness Scales
- Customize Your Display Views
 - View up to 3 test result files
 - Customize View with X-Bar/R Chart, Histogram, Data Tables
- Embedded Statistical Analysis
 - Average, Min/Max, Range, Std Dev, CpK, LcL, Ucl
- Print Preformatted Reports
- Add Test Setup Features:
 - Average Tests
 - Round Correction
 - Operator Comments & Acknowledgements
 - Tolerances

System Requirements

Operating System:	Windows [®] 95 and higher
Computer Processor:	Pentium of Higher
Memory:	Minimum 16mB RAM Minimum 1 mB Hard Drive
Graphics:	VGA Color
Serial Output:	1 Serial Port



The B.O.S.S. system provides consistently accurate readings regardless of the operator or facility. The test values don't shift when the second shift starts. Shown here the B.O.S.S. system is being used to read a Brinell impression on a die block.



The B.O.S.S. system can be very portable. At left is a tablet-style PC in a protective case with shoulder strap.

Quality Assured.

AMETEK[®] | **Newage[®]**
Hardness Testing

Measurement Is Fast and Easy

The entire test sequence is very simple. Place the scan head on the work piece and move it so part of the impression meets the center point on the screen. Press the button on the scan head. In a fraction of a second the B.O.S.S. captures an image of the impression (so operators don't have to hold the scan head still while measuring), then uses the image to measure the diameter to the nearest 0.01 mm. The system displays the resulting Brinell value, the diameter measurement, and the identified edges at eight positions. Tolerance and warning values can be entered that will cause test results to appear color-coordinated according to tolerance status or initiate an audible signal for out-of-tolerance results. Additionally, values can be converted into other scales according to ASTM E-140.

Reduce Operator Influence On Results

It is well known that measuring Brinell impressions can result in measurement errors of 0.1 mm between operators - the range is even greater between labs. This error can take up your entire tolerance specification. The B.O.S.S. will virtually eliminate operator influence on test results. Gage R&R evaluations show dramatically improved repeatability. With the B.O.S.S. your test results won't change with every shift change.



The optional mobile enclosure helps keep your B.O.S.S. system clean of environmental contaminants and provides a firm work area- whether in the lab or production area.

Modular Architecture

The B.O.S.S. system can be used with any configuration of computer - desktop, laptop, or tablet. We can provide you with a complete system or integrate the optical system and software onto your computer system.

When using the Lab B.O.S.S. in factory-floor environments the B.O.S.S. enclosure enables operators to keep the computer and printer in a clean, filtered-air environment. If heat levels are too high an air conditioning accessory can be added. Inside there is room for a computer, printer, and 2 paper trays. The monitor is located on a swivel arm at 5½ feet elevation. The keyboard is outside the enclosure. If necessary, a membrane keyboard can be used. A Retractable Scan Head Tether option helps prevent the scan head from being dropped. It can be mounted almost anywhere.

Measure... Instantly

The entire test sequence is very simple. Place the scan head on the work piece and move it so part of the impression meets the center point on the screen. Press the button on the scan head. In a fraction of a second the B.O.S.S. captures an image of the impression (so operators don't have to hold the scan head still while measuring), then uses the image to measure the diameter to the nearest 0.01 mm. The system displays the resulting Brinell value, the diameter measurement, and the identified edges at eight positions. Tolerance and warning values can be entered that will cause test results to appear color-coordinated according to tolerance status or initiate an audible signal for out-of-tolerance results. Additionally, values can be converted into other scales according to ASTM E-140.

Test Setup

Configuring your test setups using the B.O.S.S. software is easy, straight-forward and efficient. Menus, dialogue boxes, and intelligent prompts guide your through the test setup procedure. Because the system is file-based, all setup parameters such as hardness sale, tolerance limits, part information, etc. are created and saved with the individual file. Files are created in a .csv format. Each new file has a set of attributes that define the test file. These attributes include:

- Part Number
- Part Name
- Spec Order
- Heat Number
- Load Number
- Furnace Number
- Lab Number

You also have the ability to add "comments" to further define the test setup file.



The click of a button instantly captures an image of the test impression. This captured image is then used in measuring so operators don't have to hold the scan head still longer than an instant.

Scale Selection and Conversion

During test setup you configure a primary and secondary scale. The primary scale is normally HB. The secondary scale is any scale you would like to be able to convert your hardness result to. A menu is provided for scale setup.

Averaging

Averaging allows you to save averaged results for a group of tests rather than the results of each and every individual test result. You may specify the number of results that comprise a Group for which the averaging is performed. Options for averaging include: use all results, eliminate the highest and lowest result, eliminate the furthest result from the average, and eliminate if the standard deviation exceeds a user-defined value.

Tolerances

You may set tolerances for your test to provide warnings and indications on individual test results. Tolerance settings include: low tolerance limit, low tolerance warning, high tolerance limit and high tolerance warning. Tolerance limits can be set to produce an audible alarm and they can be setup to require the operator to acknowledge the tolerance condition.

Optical Setup & Controls

The B.O.S.S. system uses a camera in the scan head, attached to a computer, to measure Brinell impression widths according to ASTM E-10. The

B.O.S.S. software provides utilities to modify the camera performance including line control functions such as color, width or line type. Additional adjustments include gain, camera shift, image color and measurement axis.

Flexible Measurement Techniques

The B.O.S.S. system may operate in either manual or automatic mode.

In manual mode, the Brinell impression is measured in both axes and the value averaged and converted to a hardness value, all according to the standard. Once the impression is made and image is displayed, the measurement lines that define the impression diameter may be manually positioned. The operator must judge as to the location of the edges of the impression and select the top, bottom, right and left edges using the mouse.

In automatic mode, when you position the scan head into position over the sample, the image of the impression is displayed. Select the Measure function and the indicators defining the indentation edges will appear. If the edges appear correctly, select the Accept button. If they edges do not appear correct, the operator can clear the image and repeat the measurement procedure.

Intuitive Navigation

B.O.S.S. operators frequently comment on the system's exceptional user friendliness. The on-screen navigational tools are intuitive and easy-to-use. As an example, a right click of the mouse automatically positions the sample from the cursor position to the center of the display- ideal for centering impressions, selecting a test position, or for just navigating across the display.

Inch/Millimeter Scale Option

This optional function requires the Inch/Millimeter optional add-on. If "inch" or "mm" is selected as the scale during a test setup, the tester will allow the operator to measure distances at any angle.

Full Screen Viewing

A full screen view function lets the operator also see the maximum possible surface area of the impression.

Image Save Option

The "Image Save" feature is an optional software upgrade that allows you to save your image as a .bmp file. The operator can capture the camera image and name the image. The .bmp extension is automatically added to the image name and the image is saved to the current directory or to a operator-assigned directory. The image may be printed or amended to reports. The image may be magnified using the magnification controls (1X, 2X).

Pin Brinell Option

An optional software module is available for your B.O.S.S. system that lets you use the software with your Pin Brinell instrument. You would use the Scale Conversion setup menu to set your primary scale as DIA (for diameter) and your secondary scale as PIN. You then have the option to select the pin type: D, E, F, G or H pins, the type of indenter, standard or carbide and the Pin Brinell type: impact or clamp. You can also set the material as steel or iron.

Data Management

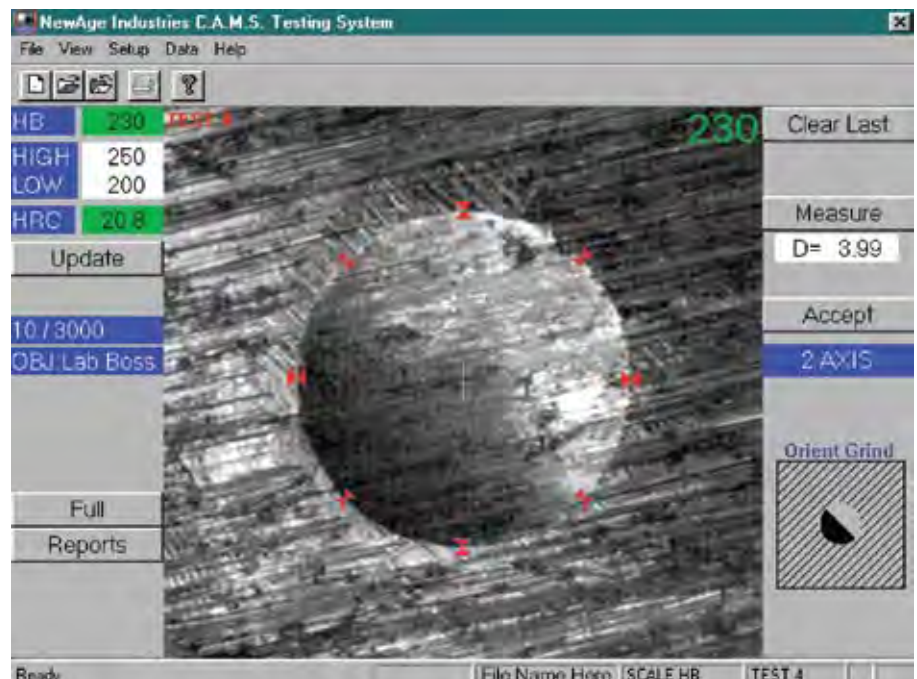
Comprehensive reports can be printed showing the image in a .bmp format, plus statistical results. Averages can be calculated with the ability to filter High and Low values, eliminate the result furthest from the average, or eliminate a result if the standard deviation exceeds a user-defined limit.

Advanced Statistical Package

The optional software module supplied additional statistical calculations for your results. Reports can be created and printed showing the test data from a file combined with an associated histogram and X-Bar and R-Chart. When averaging is performed, after each set of results the report will show the averaged value and intermediate values. The X-Bar and R-Chart will show a position for the averaged value and a line extending through the average value indicating the range for your results.



Statistical reports can be generated for each data file and are available in several formats including histograms and X-Bar & R charts.



The B.O.S.S. software measures on ground or smooth test surfaces, dark gray iron or light reflective aluminum. Here the screen shows a measurement, result, tolerance values, and other information.

Ordering

Lab B.O.S.S. Systems

Part No.	Description
OS-100WP	Desktop System with monitor and scan head, Pico Card
OS-100WP-LS	Desktop System with monitor and "small nose" scan head, Pico Card
OS-100-WC	B.O.S.S. System without computer or monitor (customer must supply)

Lap B.O.S.S. Systems

Part No.	Description
OS-300W	Laptop System with scan head, USB
OS-300W-LS	Laptop System with "small nose" scan head, USB

Mini Tablet B.O.S.S. Systems

Part No.	Description
OS-300WT	Mini Tablet System with scan head, USB
OS-300WC	B.O.S.S. System without computer (customer must supply), USB

B.O.S.S. Software Modules

Part No.	Description
MS-253W	Advanced Statistical Software, for Lab or Lap B.O.S.S. Systems
MS-273	Image Save Software, for Lab or Lap B.O.S.S. Systems
MS-270W	Inch/Millimeter Scale Software, for Lab or Lap B.O.S.S. Systems
OS-275	Pin Brinell Measurement Software, for OS-100W-LS

B.O.S.S. Software Upgrades

Part No.	Description
C61011002	Upgrade, DOS to Windows XP Operating System
C61011030	Upgrade, DOS to Windows XP Operating System, for new computers
C61011041	Windows 95/98 to Windows XP Operating System
C61011047	Windows 95/98 to Windows XP Operating System for new computers

B.O.S.S. Scan Heads only

Part No.	Description
QS-300WE	B.O.S.S. scan head only, USB
OS-100WE	B.O.S.S. scan head only, Mutech Card systems
OS-100WEP	B.O.S.S. scan head only, Pico Card systems

Options and Accessories

Part No.	Description
OS-013	Scan Head Cable, armoured, 10' (Mutech)
OS-014	Scan Head Cable, armoured, 20' (Mutech)
OS-015	Scan Head Cable, armoured, 10' (Pico)
OS-016	Scan Head Cable, armoured, 20' (Pico)
OS-019	Scan Head Cable, armoured, 15' (USB)
OS-103	Scan Head Tether, Recoiling Balancer only
OS-104	Scan Head Tether, Bench Clamp Mount
OS-106	Scan Head Holding Retractable Tether System
OS-108	Mobile Enclosure for Lab B.O.S.S. System
HA-0204	Scan Head Holding Bracket
HA-0158	B.O.S.S. Calibration Block, certified
SA-0112	Cable Adapter, 9- to 15-pin, armoured (Mutech)
SA-0212	Cable Adapter, 9- to 15-pin, vinyl (Mutech)
SA-0227	Cable, USB Scan Head, 6'
MT-210	USB Printer, with cable
OS300WT/PC	Carrying Case, for mini tablet PC
OS300WT/CS	Shoulder strap, for QS-300WT



Two types of scan head are available: 1" diameter footprint or 5/8" diameter with a snap-on 1-3/8" base.

AMETEK[®]
MEASUREMENT & CALIBRATION TECHNOLOGIES

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