

# 2020 HARDNESS TESTING CATALOG



**Advanced**  
Hardness Solutions  
Equipment | Software  
Test Blocks | Accessories

Home of the  
Hardness Testing legacy brands



**Wilson  
Instruments**



# Buehler Leads the Way in Hardness Testing

## Over 80 Years of Industry Leadership

Founded in 1936 in the United States, Buehler has become one of the world's leading companies in the area of hardness testing – both in industrial development and production-related quality assurance and in academic research.



*Wilson  
Instruments*

## From Research to Industrial Use, Buehler Provides Reliable Solutions

With Reichner, Wilson and Wolpert, Buehler combines the names of great innovators in the area of hardness testing under one roof. With this knowledge and experience, the company has grown into one of the world's leading suppliers of hardness testing equipment. In 2011, Wilson Hardness merged with Buehler to provide an even broader product offering.

Wilson Rockwell, Knoop/Vickers and Brinell hardness testers, along with the associated software, and a comprehensive range of accessories constitute the core of the company's current product portfolio. Buehler products and processes are used in quality assurance and in the development laboratories of major research facilities in numerous sectors, amongst them the aeronautical and aerospace, automotive, electrical, energy generation and medical equipment industries.

Globally located Buehler Solution Centers provide customers with the opportunity to directly work with the company's specialists. These Solution Centers are located throughout the United States, Asia, United Kingdom, France and in Germany. They are equipped with the most up-to-date technology for the preparation of materialographic specimens and with latest-generation of hardness testers, including the DiaMet™ testing software that is perfectly adapted to hardness testing. Experienced specialists take a hands-on approach to solving our customers' testing challenges.

Buehler is a strong, trusted partner relied upon by organizations for reliable solutions and consistent results in material preparation, testing and analysis.





## Wilson Celebrates 100 Years

The year 2020 marks a century of the Wilson brand of hardness equipment. Buehler is proud to be part of the legacy that has created the hardness testing standards for the market. We are also proud of where we have taken Wilson. Our hardness product innovations include equipment, software and test blocks.

Buehler remains steadfast in providing the metallographic solutions, applications, service and innovations for industry. When you purchase Buehler products, you also partner with our team of professionals dedicated to understanding your needs and market space. Buehler maintains its legacy of industry partnership with affiliations such as the ASM International, American Society for Testing and Materials and International Metallographic Society.

Buehler acquired the Wilson hardness line of products in 2011 to provide full lab solutions for quality conscious industries. Along with Wilson, Buehler has acquired the Reichert, and Wolpert product lines to combine the names of great hardness innovators under one roof. In 2020, we celebrate the Wilson hardness legacy and recommit to engineer and manufacture the most advanced hardness testing equipment, state-of-the-art software and ISO-certified reference blocks.



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Celebrating  
**100**  
YEARS  
Wilson®  
Hardness





# HARDNESS TESTING

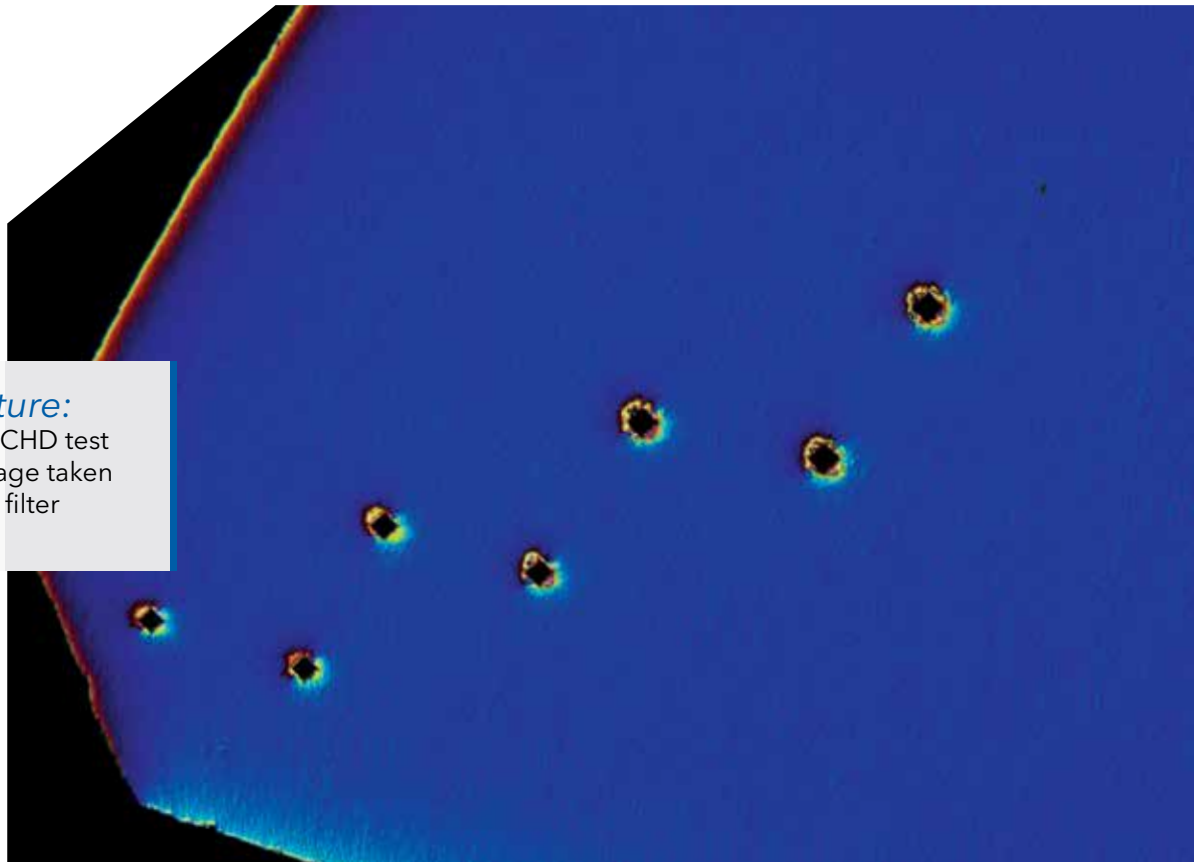
Wilson® hardness testers include a comprehensive range of hardness testers from Rockwell®, Knoop, Vickers, and Brinell

Wilson® hardness testers include a comprehensive range of hardness testers from Rockwell®, Vickers-Knoop, and Brinell to fully automatic production systems. Our testers are complemented by a range of test blocks, accessories, and fixtures. Our calibration laboratory is recognized as the global leader in the production of premium test blocks and indenters.

Providing service and support that is dedicated to ensuring the highest quality calibration, verification, and service throughout the world and our applications support combines years of experience with unparalleled expertise.

## *Featured Microstructure:*

Case hardened gear wheel, CHD test with HV0.5 Vickers scale, image taken with polarized light and DIC filter  
~Buehler





# DiaMet™ Hardness Software

## DiaMet - Hardness Testing Made Easy



Navigation within the DiaMet™ Software is made easy by its clean design and is supported by simple and intuitive gestures. Virtual tabs on top of the screen let you navigate between to Home, Program, Testing and Reporting. Comprehensive feedback is shown on the status bar, which makes interactions clear and efficient. Being designed for touch panel use, with an entirely new look and feel, DiaMet is simple, useful, and smart to work with! Easy To Operate by touch, mouse or keyboard. DiaMet Enterprise options let you Scan, Stitch and edge detect your sample to find exact locations where you can drop in pre-configured testing templates to speed up your operation.

## Wilson® DiaMet™ Multisample



### Easy sample holder setup

Select standard 4 or 6 fold sample holders or create your own

### Define start coordinates

For each sample, the center or any needed X, Y or Z coordinate can be programmed and used for navigation or pattern placement



### Simple Stage Navigation

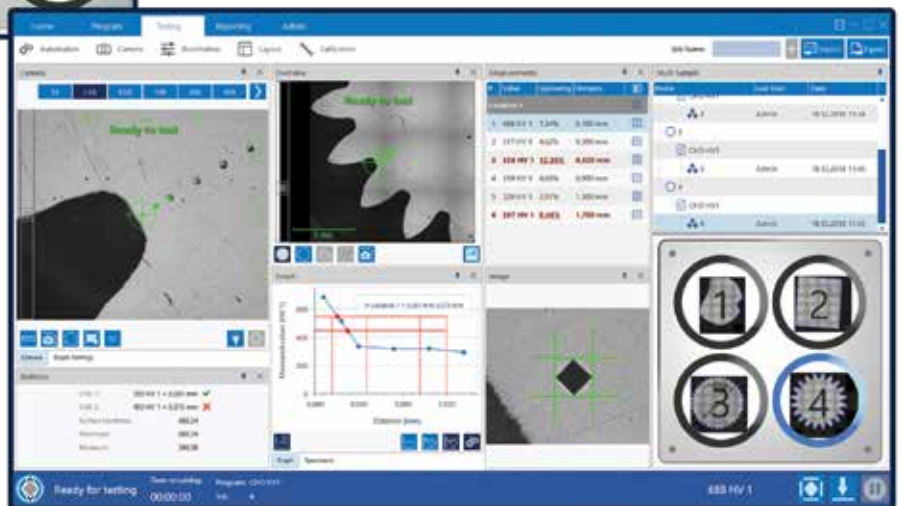
Click on the sample of the holder and move to the defined sample coordinates

### Perfect overview

When scanning the contour or the whole sample, it is displayed on the holder

### Easy testing workflow

Clear your tested sample holder and start with the next batch of samples right away





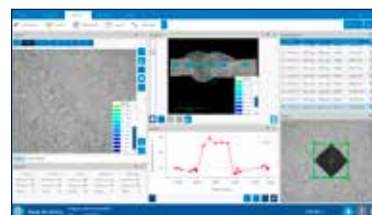
## DiaMet - Automation Packages

Automated Microindentation system available with different levels of automation. All control of the hardness instrument can be handled through comprehensive software. Automatically test and measure indentations, as well as set up and run automatic testing sequences and generate reports through export of data with minimal operator interaction. All parameters of the test, such as load monitoring, dwell times, and focusing are controlled through the software providing a very user friendly system. Hardness conversion into other scales is supported.

DiaMet Features	Manual (Cam Only)	Basic	Semi-Automatic	Full-Automatic	Enterprise
Manual Indent Measure	●	●	●	●	●
Auto Indent Measure	●	●	●	●	●
Barcode Scanner Interface	●	●	●	●	●
Statistics, Reporting & Export tools	●	●	●	●	●
K1c Testing	●	●	●	●	●
Weld Testing	●	●	●	●	●
Auto-illumination		●	●	●	●
Digital zoom		●	●	●	●
Motorized XY-stage control			●	●	●
Multi Sample Testing				●	●
Auto-focus				●	●
Edge detection				●	●
Contour, Scanning & stitching					●
Hardness mapping					●
Specimen templates					●

### Weld Testing

Weld testing has never been easier. Use the intuitive weld pattern generator in the program section and align your pattern on each weld section within seconds.



### Color Mapping

Mapping gives an indication of the hardness distribution across a region of interest. Especially helpful for surface treated materials.



### Geometric Functions

Basic measurements support you across the board of hardness testing. Make simple length or angle measurements, circle or area calculations with our geometry tool.







# Vickers Hardness Testers

## Wilson® All-in-One VH3100 Vickers Hardness Tester

The best pre-configured full automatic Vickers hardness tester on the market. The All-in-One Wilson VH3100 has all you need for your production control hardness testing requirements. This machine setup is configured to perform easiest operation but with advanced software solutions - DiaMet Enterprise.



Wilson All-in-One VH3100 - 125mm Vertical Capacity  
**Part Number - VH3100**

Description	
Hardness scales	ISO and ASTM certified Vickers indenter
Loads	HV0.05-HV0.1-HV0.2-HV0.3-HV0.5-HV1-HV2-HV3-HV5-HV10
Objectives	10x and 50x long working distance objective for measurements and navigation
Stage	Motorized 180x180mm stage (travel 110x140mm)
Overview camera	Bright field overview camera with 13x13mm FOV, for navigation, scanning or stitching
DiaMet Enterprise	All software features you need - including mapping, edge detection, scanning, stitching of overview image, CHD calculations, statistics, weld testing, exporting and barcode scanner interface
DiaMet workstation and monitor	High performance PC with 24" FullHD touchmonitor



Please select the correct sample holder for your sample diameter or clamping device additionally.





## Sample Holders and Accessories

A good sample holder keeps your specimen stationary and provides support during testing. Buehler sample holders also level tapered samples to ensure that the test surface is perfectly perpendicular to the indenter. This ensures an accurate and problem free execution of your test job.

### Leveling Vise



Self leveling vise for one round mounted sample up to 40mm (requires additional insert), incl. magnets

886164

Self leveling vise for a single 50mm round mounted sample, no inserts applicable. Incl. magnets.

886167

### 4 Fold Leveling Vise



Self leveling vise for four round mounted samples up to 40mm (requires additional inserts). Incl. magnets.

886169

Self leveling vise for four 50mm round mounted sample, no inserts applicable. Incl. magnets.

886175

### 6 Fold Leveling Vise



Self leveling vise for six round mounted samples up to 40mm (requires additional inserts). Incl. magnets.

886178

### Universal Leveling Vise



Universal clamping & leveling vise. Can be used to hold tapered pieces, wires and mounted samples.

900086323

### EZ Clamp



Single mount canister

9100575 Canister (requires cap selection)

9100570 Mount Cap for 1in mounts

9100571 Mount Cap for 1.25in mounts

9100572 Mount Cap for 1.5in mounts

9100576 Mount Cap for 2in mounts

9100574 Magnetic Stop and Stage Mount

\*Mount Cap requires the Canister

### Sample Holder Insert



Sample holders 886164, 886169 and 886178 require one insert ring per slot.

886170 Ø 1in [25mm] insert

886171 Ø 30mm insert

886172 Ø 40mm insert

886173 Ø 1.25in insert

886174 Ø 1.5in insert

### Precision Vise



Opening max 45mm

9100258

### Anti-Vibration Table



Active anti-vibration table 600 x 600mm [24 x 24in]

9100906

### Passive Platform



Passive Vibration Isolation Platform 18 x 24in [610 x 460mm]

9100904 for VH3300 and Rockwell Testers

9100905 for VH3100 and VH1000 series

For more sample holders and supports please contact our technical sales team.



# Vickers-Knoop Hardness Testers

## Wilson® VH3100-3300 Vickers-Knoop Hardness Tester

The Wilson Fully Automated Hardness Testing System provides a fully integrated platform for your complete Vickers and Knoop hardness testing needs. From leading edge modular frame, stage, and optic designs to a fully featured User Interface, our VH3100 and VH3300 Testers can be built to meet your Application needs today, tomorrow, and into the future.



### Ease of use

- Focus on a fast and simple operation to satisfy the needs of novice operators, while maintaining the flexibility and complexity of features required by expert users with DiaMet operation software.

### Flexibility

- With a 6 position vertical turret (Buehler patent), the VH3300 offers the flexibility to configure the tester for the complete 10gf - 50kgf load range or just a section of this.
- The zero-offset overview optics housed in the turret and is both illuminated and calibrated.
- Designed for Vickers testing to conform to international standards ASTM E384 & E92; ISO 6507, 9385, 4546.

### Increase up-time & reduce service costs

- Collision Resistant System - prevents indenter or objective damage.
- All components and software are completely designed, manufactured and integrated by Buehler.

### Dimensions

13.39in [340mm]W x 23.62in [600mm]D

**Vertical Test Capacity** - VH3100 choose: 4.92in [125mm], 6.69in [170mm] or 8.46in [215mm]

VH3300 choose: 4.1in [105mm] or 6.1in [155mm]

**Horizontal Test Capacity** - 9.23in [235mm]

## System Configurations

Start by selecting either the VH3100 or VH3300 and continue on to create a customized Vickers-Knoop Hardness tester

### Main Unit



#### Wilson VH3100

- 3+1 position virtual turret
- 0.050 - 10kgf load range
- Includes DiaMet workstation and 24" monitor

W3111



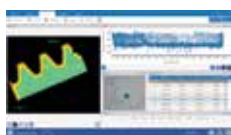
#### Wilson VH3300

- 3+3 position motorized turret
- 0.010 - 50kgf load range\*
- Includes DiaMet workstation and 24" monitor

\*depending on configuration

W3210

### Software Options



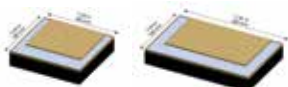
#### DiaMet Full-Automatic software package

W3100A03

#### DiaMet Enterprise software package

W3100A15

### Motorized Stages



#### Standard size

- 180 x 180mm

W3100C02

#### Large size

- 300 x 180mm

W3100C03

#### Standard size

- 180 x 180mm

W3200C02

#### Large size

- 300 x 180mm

W3200C03



# Vickers-Knoop Hardness Testers

## System Configurations *(Continued)*

### Wilson VH3100

### Wilson VH3300

#### Vertical Test Capacity



W3100D01 - height 125mm  
W3100D02 - height 170mm  
W3100D03 - height 215mm

W3200D01 - height 105mm  
W3200D02 - height 155mm

#### Load Cell

select one for VH3100,  
select between one and  
three for VH3300

W3100E02 - 100N loadcell

W3210E01 - 10N loadcell  
W3200E02 - 100N loadcell  
W3200E04 - 500N loadcell

Scales	HK0.01	HK0.025	HK0.05	HK0.1	HK0.2	HK0.3	HK0.5	HK1	HK2								
	HV0.01	HV0.025	HV0.05	HV0.1	HV0.2	HV0.3	HV0.5	HV1	HV2	HV3	HV5	HV10	HV20	HV30	HV50		

Wilson VH3100	Loadcell W3100E02																	
Wilson VH3300	W3210E01																	
											W3200E02							
											W3200E04							

#### Overview Camera



- Separate overview camera
- Includes Scan & Stitch function in the DiaMet software

W3110F01

- Turret integrated overview
- Includes Scan & Stitch function in the DiaMet software


W3200F01

#### Additional Accessories

For Indenters select one Indenter per Load Cell.


For Long Working Distance Objectives select up to two for VH3100, select two or three for VH3300

Objectives



Part Number	Native Mag.	Max. Field of View
W5XLWD	5x	3600µm
W10XLWD	10x	1800µm
W20XLWD	20x	900µm
W40XLWD	40x	450µm
W50XLWD	50x	360µm
W100XLWD	100x	180µm

Indenter Holder\*



\*for VH3100 Only

Standard holder  
W3100G01

SnapGrip Holder  
W3100G02


Vickers Indenter



Vickers Indenter, ISO & ASTM Certified

W9100687

Knoop Indenter



Knoop Indenter, ISO & ASTM Certified

W9100684

Please select your sample holder on page 78

Please select your sample holder on page 78



# Vickers-Knoop Hardness Testers

## Wilson® VH1102-1202 Vickers-Knoop Hardness Tester

The VH1102 and VH1202 offer a versatile, affordable, and reliable solution for accurate micro-hardness testing, both for quality control and for metallurgical research applications. The VH1X02-series allows its operator to take measurements using the digital eyepiece in standalone mode or by using an optional integrated high-resolution camera and the powerful DiaMet™ software.



### Best in Class Optics

- This high quality optical system, with proprietary components, provides an unparalleled image.
- The optional digital camera is integrated inside the housing, keeping it safe from dust and dirt as well as preventing it from getting misaligned.

### Automatic Load Selection

- Designed for Vickers and Knoop testing to conform to international standards ISO 6507, ISO 4545 and ASTM E384
- The wide load range with 9 individual load steps, offer testing capabilities from 10gf up to 2kgf

VH1102 Standalone Tester  
**Part Number** - W1102D01 for Vickers  
W1102D02 for Knoop

Description	
Hardness scales	HV or HK
Main-load	0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2kgf
Objectives	10x and 50x Long Working Distance
Sample Support	Flat anvil & manual XY Stage

VH1202 Standalone Tester  
**Part Number** - W1202D01

Description	
Hardness scales	HV & HK
Main-load	0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2kgf
Objectives	5x, 10x and 50x Long Working Distance
Sample Support	Flat anvil & manual XY Stage

### Dimensions

9.8in [250mm]W x 20.4in [520mm]D x 26.3in [670mm]H

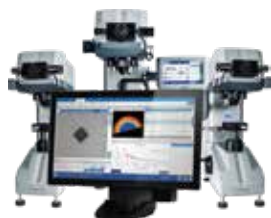
**Vertical Test Capacity** - 5.1in [130mm]

with XY-stage 3.7in [95mm]

**Horizontal Test Capacity** - 5.1in [130mm]

## VH1102-1202 with DiaMet Automation Software

DiaMet workstation and 24" monitor included with VH1102-1202 Hardness Tester



Testers	DiaMet Basic Manual (Analog)	DiaMet Basic Manual (Digital)	DiaMet Semi Auto	DiaMet Full Auto	DiaMet Enterprise
VH1102 Vickers	W1102D31	W1102D33	W1102D35	W1102D37	W1102D45
VH1102 Knoop	W1102D32	W1102D34	W1102D36	W1102D38	W1102D46
VH1202 Vickers & Knoop	W1202D31	W1202D33	W1202D35	W1202D37	W1202D45





# Vickers-Knoop Hardness Testers

## Wilson® VH1150 Macro Vickers Hardness Tester

The Wilson VH1150 is the ultimate evolution of the deadweight Vickers hardness tester with a unique load range, 300gf - 50kgf, combined in one machine. The automatic load selection eliminates the need for a hard to operate manual selector knob, and opens new possibilities in semi-automation applications. Functions like multi-scale conversion, shape correction and USB data export, make hardness testing easier and help you focus on your actual process control.



### Experience the flexibility of a segment leading wide load range

- The manual load selector knob is replaced with a durable motor to change the loads automatically.
- The fast & quiet motorized turret is integrated as part of completely automatic test cycle. One push of the start button is all it takes.

### Versatile

- Designed for Vickers, testing conforms to international standards ISO 6507 and ASTM E384.
- Segment leading load range - 0.3 - 50 kgf load range over ten individual load steps.

### VH1150 Standalone Tester Part Number - W1151D01

Description	
Hardness scales	HV
Main-load	0.3 - 0.5 - 1 - 2 - 3 - 5 - 10 - 20 - 30 - 50kgf
Objectives	10x and 20x Long Working Distance
Sample Support	Flat anvil & manual XY Stage

### Dimensions

9in [230mm]W x 25in [625mm]D x 30in [760mm]H

**Vertical Test Capacity** - 8.2in [210mm]

with standard flat anvil

**Horizontal Test Capacity** - 6.3in [160mm]

## VH1150 with DiaMet Automation Software

DiaMet workstation and 24" monitor included with VH1150 Hardness Tester



Testers	DiaMet Basic Manual (Analog)	DiaMet Basic Manual (Digital)	DiaMet Semi Auto	DiaMet Full Auto	DiaMet Enterprise
VH1150	W1151D31	W1151D33	W1151D35	W1151D37	W1151D45

### Accessories

#### Indenters for VH1102-1202-1150

W9100687	Vickers indenter, includes ASTM & ISO certificate
W9100684	Knoop indenter, includes ASTM & ISO certificate

#### Manual Stages

9170506	XY-stage with analog metric micrometers
9170507	XY-stage with digital micrometers

#### Objectives for VH1102-1202-1150

W5XLWD	5x Long Working Distance objective
W10XLWD	10x Long Working Distance objective
W20XLWD	20x Long Working Distance objective
W40XLWD	40x Long Working Distance objective
W50XLWD	50x Long Working Distance objective
W100XLWD	100x Long Working Distance objective



# Universal Hardness Testers

## Wilson® UH4000 Series Hardness Testers

The UH4000 series universal hardness tester is designed for high volume production labs and production floor. It is available in two different configurations, the UH4250 and UH4750. Universal hardness testers are designed to perform several hardness scales with one machine, in most cases for higher loads (>5kgf).

The UH4000 series testers contain all standardized and usual hardness testing methods between 0.5-250kgf and 3-750kgf, according to ISO 6506, 6507, 6508 and 4545 and ASTM E18, E10 & E92. Additionally, plastics and carbon testing can be performed according to ISO2039 and DIN51917.



### Ease of use

- Focus on a fast and simple operation to satisfy the needs of novice operators, while maintaining the flexibility and complexity of features required by expert users with DiaMet operation software.

### Flexibility

- The optional clamping tool will ensure stability during the test process.
- 8 position turret to have all objectives and indenters you need.
- Laser for easy test location targeting and a ringlight for best Brinell measurement accuracy

### Increase up-time & reduce service costs

- Steel casting provides full protection for production environments.

### Dimensions

28in [704mm]W x 21in [534mm]H x 39.2in [995mm]D

**Maximum Specimen Height** - 11.8in [300mm]

**Test Stage Dimensions** - T-slot stage with 12mm slot width,  
11.8in [300mm] x 15.7in [400mm]

## System Configurations

Start by selecting either the UH4250 or UH4750 and continue on to create a customized Universal Hardness tester

### Main Unit



#### Wilson UH4250

- Load Range 0.5-250kgf, Standard Monitor 24" W4250
- Load Range 0.5-250kgf, Touchscreen 19.5" W4251



#### Wilson UH4750

- Load Range 3 - 750kgf, Standard Monitor 24" W4750
- Load Range 3 - 750kgf, Touchscreen 19.5" W4751

### Configure Turret

Select up to 8 different items



### Objectives

- |          |                                         |
|----------|-----------------------------------------|
| W4100X2  | 2.5x Objective, optional with Ringlight |
| W4100X5  | 5x Objective                            |
| W4100X10 | 10x Objective                           |
| W4100X20 | 20x Objective                           |
| W4100X40 | 40x Objective                           |
| W4100X50 | 50x Objective                           |



### Laser

- |        |                   |
|--------|-------------------|
| W4100L | Positioning Laser |
|--------|-------------------|

### Indenters

- |           |                                            |
|-----------|--------------------------------------------|
| W4100K    | Knoop Indenter with turret adapter         |
| W4100V    | Vickers Indenter with turret adapter       |
| W4100B1   | Brinell Indenter 1mm with turret adapter   |
| W4100B2   | Brinell Indenter 2.5mm with turret adapter |
| W4100B5   | Brinell Indenter 5mm with turret adapter   |
| W4100B10  | Brinell Indenter 10mm with turret adapter  |
| W4100R120 | Rockwell Diamond Cone Indenter             |
| W4100R16  | Rockwell Indenter 1/16" Ball               |
| W4100R8   | Rockwell Indenter 1/8" Ball                |
| W4100R4   | Rockwell Indenter 1/4" Ball                |
| W4100R2   | Rockwell Indenter 1/2" Ball                |



## Additional Accessories

### Ring Light



Ringlight for 2.5x objective (improves reading of soft Brinell indents)  
W4100RL

### Auto Clamping Device



The unique clamping device for the UH4000 series hardness testers ensures that workpieces will be fixed properly during testing. The device is designed to adapt different types of clamping forks.  
Clamping width: 35mm [1.37in]  
W4100CL

### Workbench



Workbench with Drawers 1000 x 700 x 800mm [30 x 27 x 31in] with spindle hole  
944872

### Anvils

All anvils fit on testers with 25mm pinhole.



V anvil for max. 45mm diameter  
cylindric workpieces  
740096



V anvil for max. 85mm diameter  
cylindric workpieces  
740095



10mm spot anvil for small  
workpieces  
740160



Auto-leveling anvil Planoflex -  
flat 60mm diameter  
740587



Test anvil flat 80mm diameter  
740191



Test anvil flat 190mm diameter  
740101



# Rockwell Hardness Testers

## Wilson® Rockwell® 574

The 574 Series Rockwell Hardness Testers offer quality, durability, and an industry leading Gauge Repeatability and Reproducibility (GR&R) making this hardness testing instrument best in class. This system is available in Regular, Superficial or Twin Scale models and capable of testing in all of the regular and superficial Rockwell hardness scales and can accommodate a wide variety of applications.



### Dimensions

11.53in [292mm]W x 22.3in [566mm]D x 36.83in [934mm]H

**Vertical Test Capacity** - 11.43in [289mm] without accessories

**Horizontal Test Capacity** - 6.12in [155mm] at the bottom; 6.93in [175mm] at the top

### Segment Leading GR&R Performance

- High precision depth measurement system for accurate and repeatable testing.
- Auto preload brake and automated main load test cycle ensure repeatability.

### Ease of Use

- Powerful auto-braking system on preload ensures a seamless operation.
- Built in USB port offers rapid data transfer to Microsoft® Excel® or other applications.

### Robust

- Proven robust design with all stainless steel internal components.

**574R Regular** - for all Regular test scales

**Part Number** - WH574R

Description	
Pre-load	10kgf
Main-load	60, 100, 150kgf
Hardness scales	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV

**574T Twin** - for all Regular and Superficial test scales

**Part Number** - WH574T

Description	
Pre-load	3, 10kgf
Main-load	15, 30, 45, 60, 100, 150kgf
Hardness scales	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y





## Wilson® Rockwell® 2000

The Rockwell 2000 Series Hardness Testers achieve the highest level of depth measurement accuracy and resolution available and as a result has the best GR&R performance in the industry. This instrument is offered in two sizes, 10 - 14 in vertical capacity, to accommodate varying sample sizes and is available in three different variations of Rockwell Regular, Superficial, or Twin hardness scales.



### Dimensions-

13.5in [343mm]W x 23.2in [590mm]D x 48.5 [1232mm]H

### Vertical Test Capacity -

Size 2: 10in [254mm]

Size 3: 14in [356mm]

Horizontal Test Capacity - 8.5in [216mm]

### Industry Leading GR&R Performance

- Load cell force application ensures fast, precise, and reliable testing. Highly accurate "in-line" depth measuring scale.

### Ease of Use

- One button start - tester controls load application speed and dwell times.
- A flexible and user friendly LCD control panel for method set up and configuration.

### Flexible

- Available in two sizes ranging from 10 - 14 in (254 - 356 mm) to accommodate varying sample sizes.
- Available in three different variations: Regular, Superficial, or Twin hardness scales.

2002R & 2003R Regular - for all Regular test scales

**Part Numbers** - Size 2: WH2002R, Size 3: WH2003R

### Description

Pre-load	10kgf
Main-load	60, 100, 150kgf
Hardness scales	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV

2002S & 2003S Superficial - for all Superficial test scales

**Part Numbers** - Size 2: WH2002S, Size 3: WH2003S

### Description

Pre-load	3kgf
Main-load	15, 30, 45kgf
Hardness scales	15N, 30N, 45N, 15T, 30T, 45T, 5W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y

2002T & 2003T Twin - for all Regular and Superficial test scales

**Part Numbers** - Size 2: WH2002T, Size 3: WH2003T

### Description

Pre-load	3, 10kgf
Main-load	15, 30, 45, 60, 100, 150kgf
Hardness scales	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y



# Rockwell Hardness Testers Accessories

## Rockwell® Indenters

All indenters fit on Wilson R574 and RB2000 testers. The indenter shaft length is 11,1mm and 6,34mm in diameter.



Part Number	Description
9100401	Rockwell indenter C scale , 120° diamond cone, ASTM certified
9100402	Rockwell indenter C, D, A, N scales, 120° diamond cone, ASTM certified
9100431	Rockwell indenter C, A, D scales, 120° diamond cone, ISO and ASTM certified
9100432	Rockwell indenter N scales, 120° diamond cone, ISO and ASTM certified
9100434	Rockwell indenter C,A,D,N scales, 120° diamond cone, ISO and ASTM certified
900003405	Rockwell indenter A scale for Carbides, 120° diamond cone, ASTM certified
900002015	Rockwell indenter N scale, 120° diamond cone, ASTM certified
9100405	Rockwell indenter 1/16" WC ball with 4 spare balls, ASTM and ISO certified
9100406	Rockwell indenter 1/8" WC ball with 4 spare balls, ASTM and ISO certified
9100407	Rockwell indenter 1/4" WC ball with 1 spare ball, ASTM and ISO certified
9100408	Rockwell indenter 1/2" WC ball with 1 spare ball, ASTM and ISO certified
9100422	1/16" Diameter WC Balls, 5 pcs, ASTM and ISO certified
9100423	1/8" Diameter WC Balls, 5 pcs, ASTM and ISO certified
9100424	1/4" Diameter WC Balls, 3 pcs, ASTM and ISO certified
9100425	1/2" Diameter WC Ball, 1 pcs, ASTM and ISO certified

\* C, D and A scales refer to regular Rockwell scales, N scales refer to superficial Rockwell scales

\*\* WC = tungsten carbide

## Rockwell® Verification Kits

The kits contain recommended indenters and blocks for the dedicated scales.

Part Number	Description
A582143	Rockwell Regular Kit - includes Rockwell C Indenter, 25 HRC, 63 HRC and 80 HRB test blocks
A58239	Rockwell Superficial Kit - includes Rockwell N Indenter, 46 HR30N, 80 HR30N and 70 HR30T test blocks
A582144	Rockwell Twin Kit - includes Rockwell C and N Indenters, 25 HRC, 63 HRC, 80 HRB, 80 HR30N and 70 HR30T test blocks

## Rockwell® Anvils

All anvils fit on testers with 19mm pinhole.

### Flat anvil



2.5" [63mm]  
900001236

### Flat anvil



7.5" [190mm]  
W741246

### V Anvil Shallow



0.5" [12.7mm] stem  
height for cylindrical  
parts < 0.25" [6,3mm]  
900007388

### V Anvil Shallow



1" [25mm] stem  
height for cylindrical  
parts < 0.25" [6,3mm]  
900007195

### V Anvil Standard



For cylindrical parts  
> 0.25" [6,3mm]  
900030797

### Anvil Cylindron Jr.



For cylindrical parts  
0.25-3" [6-76mm]  
900007425

### Anvil Cylindron



For cylindrical parts  
2-8" [50-203mm]  
900007147

### Anvil for Ball Testing



For cylindrical parts  
1/16"-1" [1,6-25mm]  
900001371

### Eyeball Anvil



For pieces with  
slight taper (to  
mount on spindle)  
900007088

### Pedestal spot Anvil



0.5" [12,7mm] stem  
height, 0.27" [7mm]  
spot diameter  
900007387

### Pedestal spot Anvil



1" [25mm] stem  
height, 0.27" [7mm]  
spot diameter  
900007156

### Diamond spot anvil



For HR30T scale,  
0.39" [10mm] spot  
diameter  
900007400



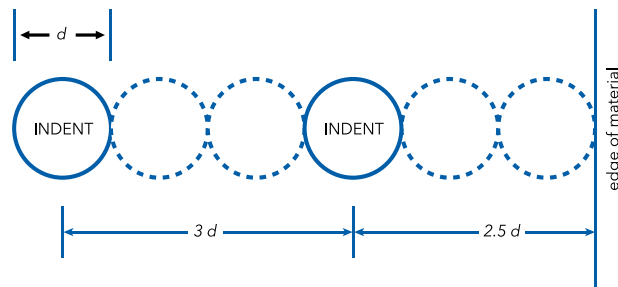
## Proper Indent Spacing

When making indentations on a test block, the hardness of the material immediately surrounding an indentation will usually increase due to the residual stress and work hardening caused by the indentation process. If an indentation is made too close to the edge of a test piece, there may be insufficient material to constrain the deformation around the indentation. Both of these scenarios can lead to inaccurate hardness readings. To prevent incorrect readings, recommended spacing has been defined in the standards for each type of hardness test. To ensure proper spacing is followed, Buehler offers pattern engraving on the surface of test blocks.

### Rockwell & Brinell

**According to ASTM, ISO and JIS Standards:** The distance between the centers of two adjacent indentations shall be at least three times the diameter ( $d$ ) of the indentation.

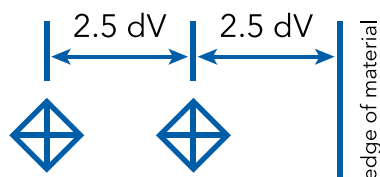
The distance from the center of any indentation to an edge of the test piece shall be at least two and a half times the diameter of the indentation.



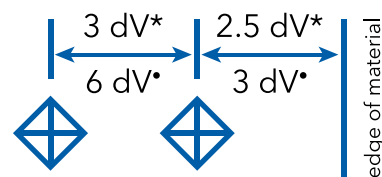
### Vickers

**According to ASTM Standards:** The distance between two indents or an indent and the edge of the test piece shall be at least two and a half times the diagonal ( $dV$ ) of the indentation.

**According to ISO and JIS Standards:** The distance between the centers of two indents shall be at least three times the diagonal ( $dV$ ) of the indent for steel, copper and copper alloys, and at least six times for light metals, lead and tin and their alloys. The distance between the center of an indent and the edge of the test piece shall be at least two and a half times the diagonal ( $dV$ ) for steel, copper and copper alloys, and at least three times for light metals, lead and tin and their alloys.



$dV$  = Vickers Diagonal



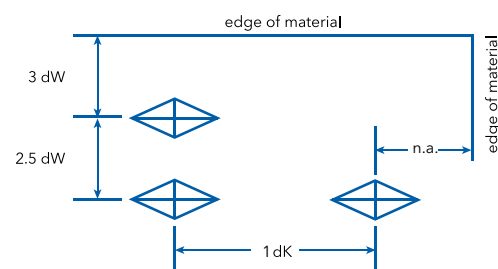
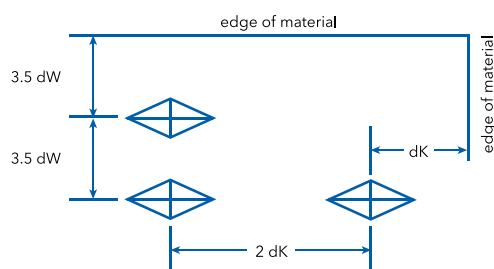
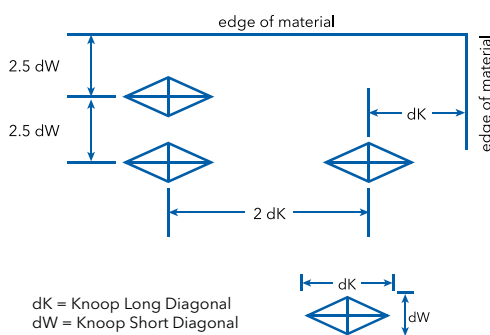
\* For steel, copper and copper alloys  
\* For light metals, lead, tin and their alloys

### Knoop

**According to ASTM Standards:** The distance between two indents shall be at least two times the diagonal ( $dK$ ) of the indentation and two and a half times the width ( $dW$ ) of the indentation. The distance between the center of an indentation and the edge of a test piece shall be at least one diagonal ( $dK$ ) or two and a half times the width ( $dW$ ) of the indentation.

**According to ISO Standards:** The distance between two indents shall be at least two times the diagonal ( $dK$ ) of the indentation and three and a half times the width ( $dW$ ) of the indentation. The distance between the center of an indentation and the edge of a test piece shall be at least one diagonal ( $dK$ ) or three and a half times the width ( $dW$ ) of the indentation.

**According to JIS Standards:** The minimum distance between any indentation and the edge of a test piece shall be at least 3 times the short diagonal ( $dW$ ). The distance between two adjacent indentations shall be at least two and a half times the short diagonal ( $dW$ ), or at least one time the long diagonal ( $dK$ ). If two indentations differ in size, the minimum spacing shall be based on the short diagonal ( $dW$ ) of the larger indentation.





# Brinell Hardness Testers

## Wilson® BH3000

The BH3000 is a durable, 30 kN (3000 kgf) Brinell Hardness Tester ideal for wide range of Brinell loads from 62.5 kgf - 3000 kgf. Designed with rugged construction to withstand harsh environments, the BH3000 combines high rigidity and closed-loop load cell technology to ensure accurate and safe load applications. The standards are ISO 6506, ASTM E10, JIS.



### Ease of use

- Heavy duty clamping and protection

### Accuracy

- Closed-loop system for quick and highly accurate test results.
- Integrated hardness calculator and conversions.

### Flexibility

- Wide load range 613N - 29.42 kN (62.5 kgf - 3000 kgf.).
- Deep reading microscope (order separately).

## BH3000

**Part Number:** WH3000BH

### Description

Hardness scales	HB
Main-load	62.5 - 3000kgf

### Dimensions

10.4in [265mm]W x 23.9in [608mm]D x 39.5in [1000mm]H

**Vertical Test Capacity** - 11in [280mm]

**Horizontal Test Capacity** - 5in [130mm]

## Accessories

WHSCOPE20X	Brinell microscope 20X with LED light source	9110-122	Indenter 5mm Carbide Ball with certificate
WHSCOPE40X	Brinell microscope 40X with LED light source	9110-121	Indenter 2.5mm Carbide Ball with certificate
WHSCOPE60X	Brinell microscope 60X with LED light source	900000485*	10mm Carbide Ball with NVLAP certificate (Qty 2)
WHKINGSC4	King Scan IV - Computer Based Automatic Brinell Measurement System	900000595*	5mm Carbide Ball with NVLAP certificate (Qty 2)
9110-213	Testing table diameter 235mm	900007350*	10mm Ball Retainer, MJ, L, K, KDR, AP, & CLB3
9110-123	Indenter 10mm Carbide Ball with certificate		

*\*Products only available in North America & South America*





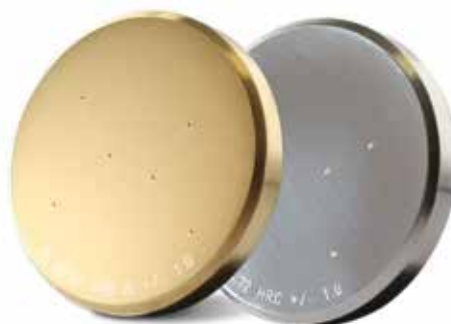
# Wilson® Hardness Test Blocks

Wilson Hardness test blocks set the standard for the industry and are made from the highest quality material to insure the most uniform and repeatable blocks available. A comprehensive variety of scales and blocks are available to meet the wide ranges and hardness scales associated with Rockwell®, Brinell, Knoop and Vickers testing. All Wilson test blocks are calibrated in the Wilson Hardness Calibration Laboratory in Binghamton, NY. The Wilson lab is accredited to ISO-IEC 17025 by A2LA and the testers used in the calibration process undergo a stringent monitoring process using NIST traceable devices. For the ultimate accuracy and performance in tester verification, calibration sets are available for most Rockwell scales.

- We work directly with the steel and brass mills to specify the chemical composition
- Our machining processes (grinding, lapping, polishing) are all done in house, at the site of calibration
- 100% inspection to ensure that every single test block meets the physical requirements of ASTM (thickness, flatness, parallelism, surface roughness)

## Wilson® Rockwell Test Blocks

According to ASTM E18, ISO 6508-3 and JIS B 7730



	Part Number	Nominal Hardness
Rockwell A	9201110	63HRA
	9201150	73HRA
	9201190	83HRA
Rockwell B •	9202050W	40HRB
	9202060W	50HRB
	9202070W	60HRB
	9202080W	70HRB
	9202090W	80HRB
Rockwell C	9202100W	95HRB
	9203111	25HRC
	9203121	30HRC
	9203131	35HRC
	9203141	40HRC
	9203151	45HRC
	9203161	50HRC
	9203171	55HRC
	9203181	60HRC
	9203191	63HRC
Rockwell E •	9205010W	57HRE
	9205020W	63HRE
	9205050W	81HRE
	9205060W	87HRE
Rockwell F •	9205070W	93HRE
	9206020W	63HRF
	9206050W	80HRF
	9206070W	91HRF

	Part Number	Nominal Hardness
Superficial Rockwell 15-N	9212110	72HR15N
	9212150	83HR5N
	9212190	91HR15N
Superficial Rockwell 15-T •	9218020W	64HR15T
	9218050W	74HR15T
	9218070W	80HR15T
	9218090W	87HR15T
Superficial Rockwell 30-N	9213110	46HR30N
	9213130	55HR30N
	9213150	64HR30N
	9213190	80HR30N
Superficial Rockwell 30-T •	9219050W	43HR30T
	9219070W	56HR30T
	9219090W	70HR30T

- Certified using a Tungsten Carbide ball indenter

### Special Order Items

Part Number	Description
9201002	Special value - please provide hardness value and Rockwell scale
9201003	Special value with grid - please provide hardness value and Rockwell scale
9201006	API compliance - special tolerance - please provide hardness value and Rockwell scale



# Wilson® Hardness Test Blocks

## Wilson® Vickers-Knoop Test Blocks

According to ASTM E92, ISO 6507-3 and JIS B 7735



### Vickers Test Blocks

HV0.05	HV0.1	HV0.2	HV0.3	HV0.5	HV1	HV2	HV3	HV5	HV10	HV20	HV30	HV50	Value
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	150
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	200
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	250
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	300
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	350
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	400
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	450
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	500
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	550
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	600
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	700
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	775
930005-	93001-	93002-	93003-	93005-	9301-	9302-	9303-	9305-	9310-	9320-	9330-	9350-	830

Item number example: 93003700 for a 700 HV0.3 test block

not ISO 6507 due to <20µm diagonal length

Macro Vickers blocks (2.4in x 0.35in [60mm x 9mm])

Micro Vickers blocks (1.25in x 0.63in [32mm x 16mm])

### Knoop Test Blocks

According to ASTM E92, ISO 4545-3 and JIS B 7734

Load (kg)	Part Number	Nominal Hardness	Range
HK0.5	94-005-225	225 HK	200-250
	94-005-315	315 HK	290-340
	94-005-440	440 HK	415-465
	94-005-540	540 HK	515-565
	94-005-630	630 HK	605-655
	94-005-730	730 HK	705-755
	94-005-850	850 HK	825-875

### Special Order Items

not applicable for Europe, please contact Buehler Europe etc..

Part Number	Description
93-000-001*	Special block - please provide hardness value and Vickers scale
93-000-002*	Special block - please provide hardness value and Vickers scale
94-000-001*	Special block - please provide hardness value and Knoop scale
93-000-012*	Special block - 2 scales certification - please provide hardness value and Vickers/Knoop scale
93-000-013*	Special block - 3 scales certification - please provide hardness value and Vickers/Knoop scale
93-000-014*	Special block - 4 scales certification - please provide hardness value and Vickers/Knoop scale

\*Specify hardness required and load force for calibration

•Specify additional load force for calibration





## Wilson® Brinell Test Blocks

According to ASTM E10, ISO 6506-3 and JIS B 7736

### Brinell reference blocks up to 250kgf load

Nominal value	Range	HBW2.5-62.5 scale	HBW2.5-187.5 scale	HBW5-250 scale
140 HBW	115-169	WH-140HBW-625	WH-140HBW-1875	WH-140HBW-250
200 HBW	170-224	WH-200HBW-625	WH-200HBW-1875	WH-200HBW-250
250 HBW	225-274	WH-250HBW-625	WH-250HBW-1875	WH-250HBW-250
300 HBW	275-324	WH-300HBW-625	WH-300HBW-1875	
350 HBW	325-375	WH-350HBW-625	WH-350HBW-1875	
400 HBW	375-449		WH-400HBW-1875	
500 HBW	450-525		WH-500HBW-1875	



### Brinell reference blocks up to 3000kgf load

Nominal value	Range	HBW5-750 scale	HBW10-3000 scale
140 HBW	115-169	WH-140HBW-750	WH-140HBW-3000
200 HBW	170-224	WH-200HBW-750	WH-200HBW-3000
225 HBW	212-238		WH-225HBW-3000
250 HBW	225-274	WH-250HBW-750	WH-250HBW-3000
275 HBW	262-288		WH-275HBW-3000
300 HBW	275-324	WH-300HBW-750	WH-300HBW-3000
325 HBW	312-338		WH-325HBW-3000
350 HBW	325-375	WH-350HBW-750	WH-350HBW-3000
375 HBW	362-388		WH-375HBW-3000
400 HBW	375-449	WH-400HBW-750	WH-400HBW-3000
500 HBW	450-525	WH-500HBW-750	WH-500HBW-3000

### Other Brinell scales that use 1mm 2.5mm, 5mm or 10mm ball indenters †

not applicable for Europe, please contact Buehler Europe etc..

Part Number	Description
WHSMLBRIN*	Special block - please provide hardness value and Brinell scale using 1mm or 2.5mm ball indenter

Part Number	Description
WHSPECBRIN*	Special block - please provide hardness value and Brinell scale using 5mm or 10mm ball indenter

† Specify hardness required, load force, and ball indenter size for certification



See Test Block Guide for More Information



# Globally Recognized Accreditation



## Solutions for NADCAP Accreditation

### Buehler Has the Expertise for Direct Verification

As part of the ITW Test & Measurement Group, Buehler maintains its own service department of experienced service engineers and also coordinates direct verification with Instron and an experienced sales and distributor team. We have global presence and global experience in working with customers to meet NADCAP audits.

### DiaMet Hardware Software – Prompts User to Perform Indirect Verification Tests

Buehler developed a special verification software module within the DiaMet hardness software. The verification program will prompt operators to perform indirect verification tests as required. This way, full traceability is guaranteed and is clearly exhibited during audits.

### Calibration and Cleaning Services

Ensure consistent performance of equipment, minimize production downtime and reduce the likelihood of costly repairs with Buehler Calibration Services. Cleaning and calibration of high precision equipment provides repeatable and reliable results. As a valued customer, we appreciate your partnership and are here to support you with repair services and spare parts under warranty and beyond.

### ISO / ASTM Calibrated Hardness Blocks Direct from Buehler

All hardness test blocks used in day to day indirect verification in accordance with ISO & ASTM standards and are calibrated in the Buehler standards laboratory on machines with Direct verification traceability.

## A Solid Partner for Your Metallography Laboratory

### Consultation Available for New Equipment or Improved Processes

Buehler field engineers and laboratory experts are available to provide custom solutions for your application.

Visit [buehler.com/contact-buehler.php](http://buehler.com/contact-buehler.php)

### Buehler carries a complete line of metallography equipment

From sectioning, grinding/polishing, mounting, image analysis to hardness testing.

Visit [www.buehler.com/#products](http://www.buehler.com/#products)

### Service Technicians Available for Calibration

An accredited technician will perform a scheduled calibration in compliance with current ASTM. E10, E18 or E384 using N.I.S.T. traceable standards where applicable.

Visit [buehler.com/contact-buehler.php](http://buehler.com/contact-buehler.php)

### Certified Hardness Reference Blocks

For Rockwell, Brinell, Vickers and Knoop hardness testers produced in our own facility.

Visit [www.buehler.com/hardness-testing.php](http://www.buehler.com/hardness-testing.php)

### Complete Line of Consumables Available

Most are in stock and ready to ship daily. Visit [shop.buehler.com](http://shop.buehler.com).





## Our Global Service Teams are Committed to You

As a valued customer, we appreciate your partnership and are here to support you with repair services and spare parts under warranty and beyond. For regions covered by our distributor network, please contact your area distributor.



### Reduce Unplanned Downtime

#### On-Site Repair Services

Buehler provides on-site or factory expert repairs performed by our certified technicians.

#### In-House Repair Services

Certified technicians will inspect and repair machines on-site or at one of Buehler's Global Service Facilities. Americas repairs are completed directly at Buehler's Headquarters in Lake Bluff, IL.



### Ensure Consistent Results

#### Experienced Technicians

Technicians have collectively over 100 years of experience with average tenure of 10+ years with Buehler.

#### Compliance

Calibration services for hardness testers & microscopes according to ISO 17025. Accredited for direct or indirect verification.



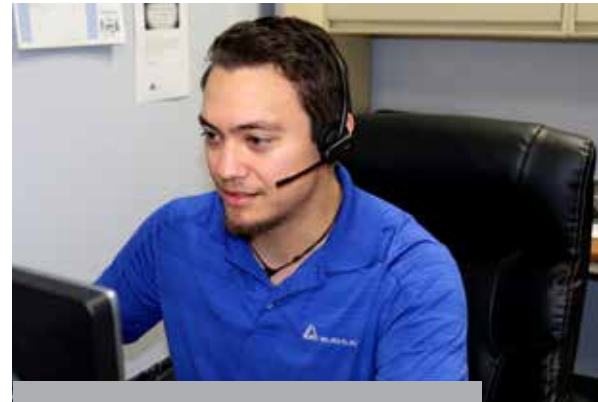
### Protect Your Investment

#### Genuine Spare Parts

Buehler supplies parts for all equipment, including obsolete machines for a minimum of 5 years after discontinuation.

#### Preventative Maintenance

Buehler offers on-site or factory inspection, cleaning and replacement of wear parts to ensure optimal performance.



### Technical Support & Training

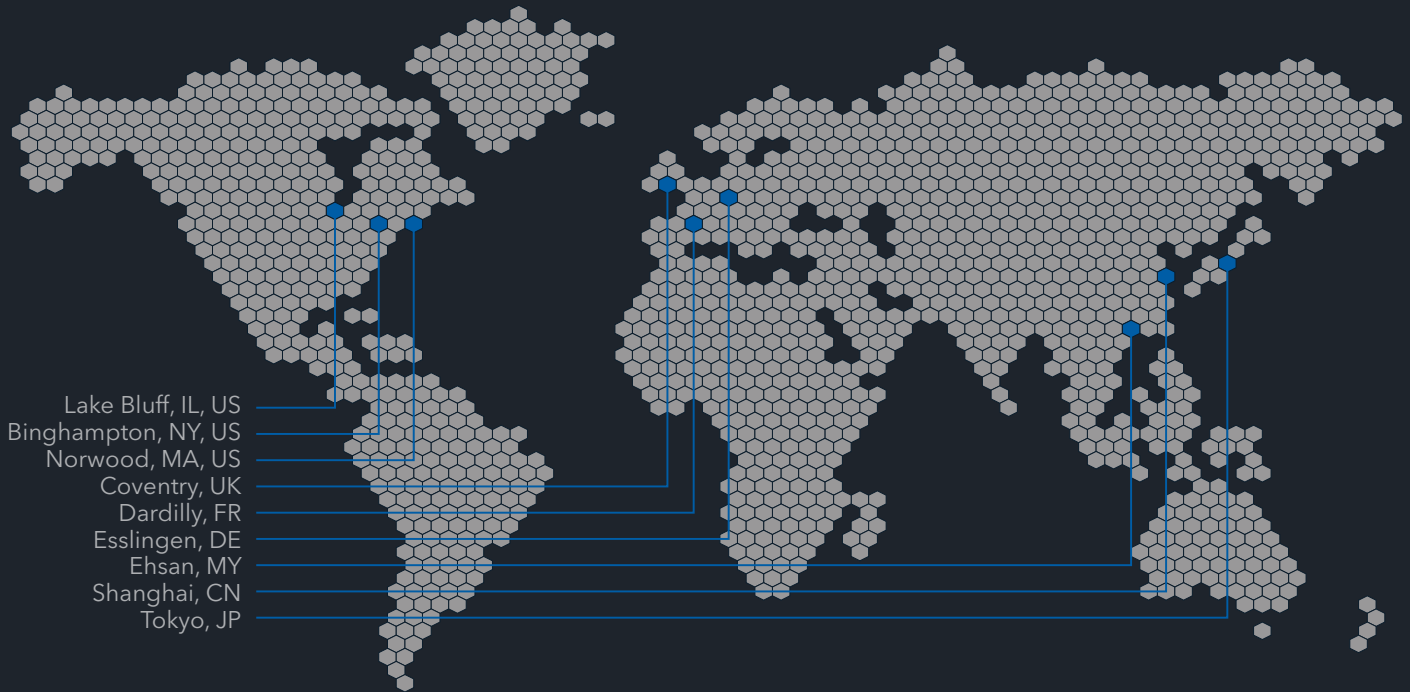
Buehler service technicians are available through our online case management platform eServiceDesk; requests for support can be submitted online at

<https://service.buehler.com>,  
via email to [support@buehler.com](mailto:support@buehler.com),

or by calling into your designated Buehler office. Once the ticket has been generated, our coordinators match the request to a technician highly skilled in troubleshooting your unique case. For software issues, we can often remote into PC's to quickly and efficiently solve issues.



# BUEHLER Worldwide Locations



# BUEHLER

Solutions for Materials Preparation, Testing and Analysis

## **BUEHLER Worldwide Headquarters**

### **BUEHLER North and South America**

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**W:** [www.buehler.com](http://www.buehler.com) | **E:** [info@buehler.com](mailto:info@buehler.com)

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