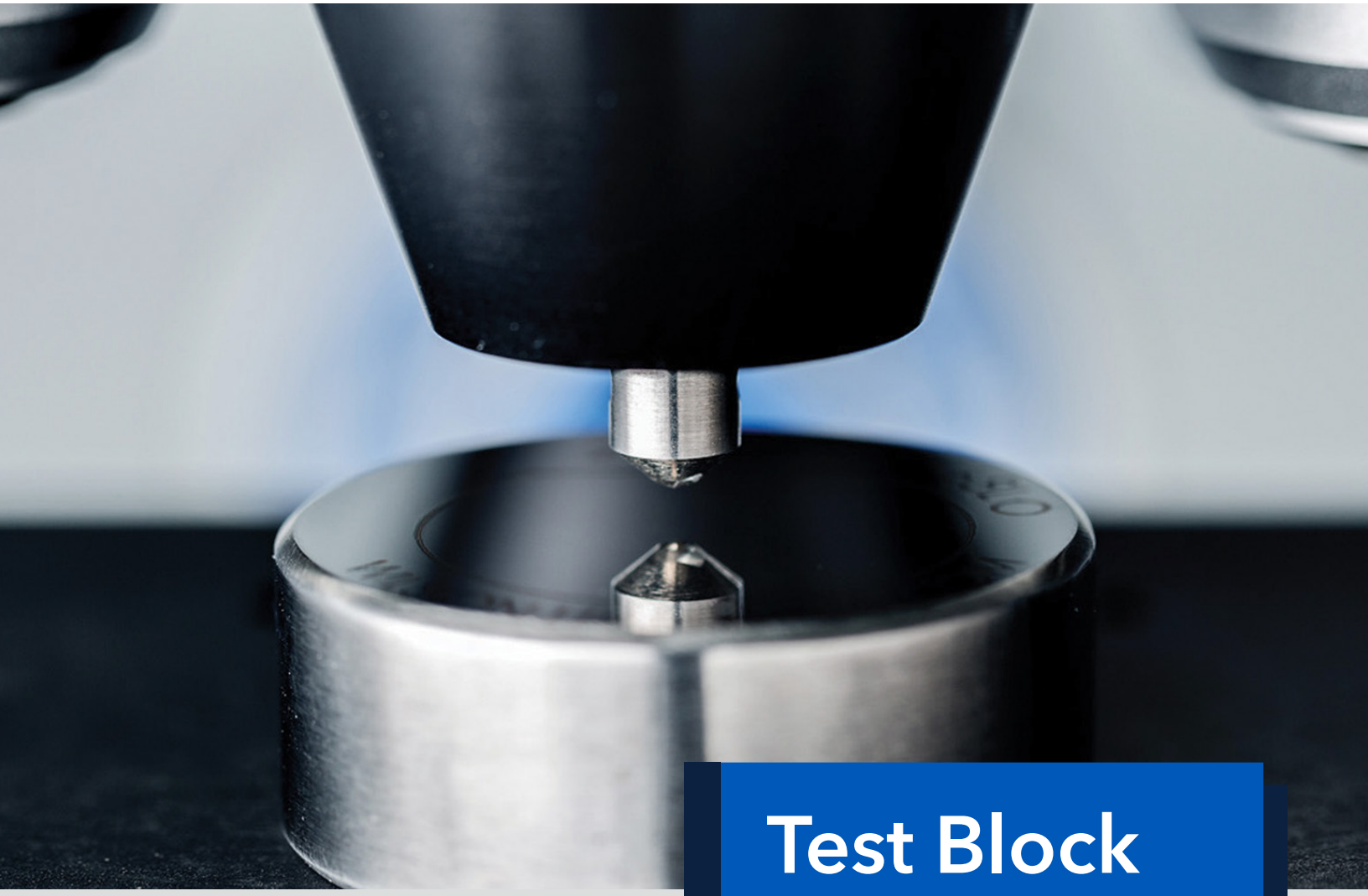
BUEHLER

Strong Partner, Reliable Solutions

Celebrating Over 100 YEARS of Wilson® Hardness



Test Block Application Guide

A complete line of Hardness Test Blocks and Accessories

www.buehler.com

HARDNESS TESTING IS CRITICAL

Hardness testing provides critical information and insight into a material's durability, strength, flexibility and capabilities. It is a commonly used test method in many industries to verify heat treatment, structural integrity and quality of components. Hardness testing ensures the materials utilized in components we use every day contribute to a well engineered, efficient and safe world.

Ensure Accurate Results

Calibrated test blocks are an integral part of hardness testing. They ensure accuracy, integrity and traceability of hardness testing processes. They are used to verify instruments performance and provide a means for performing indirect instrument calibrations.

Leading the Way in Hardness Testing

Buehler, with its Wilson line of hardness testers, is the global leader in hardness testing software, equipment and accessories. Buehler is proud to be the proprietor of 100-year old legacy brands including Wilson Instruments, Reicherter, and Wolpert, the innovators and founders of the hardness testing industry. Today, Buehler provides innovative solutions for hardness testers, DiaMet® software and hardness test blocks.

REICHERTER

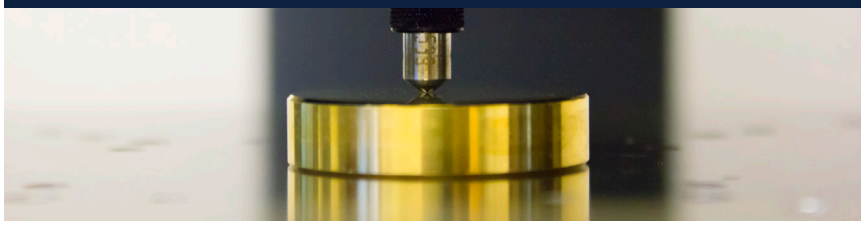
Wilson Instruments

W Testor WOLPERT

Wilson®

Celebrating Over 100 YEARS of Wilson® Hardness

What Sets BUEHLER Apart



Leaders in the Industry

Wilson originally developed the Rockwell testing process and standards. Today, Buehler is continuing to push the materials testing industry forward through active participation in ASTM and ISO committees. Buehler has been named an authorized calibrating agency for certain Master and Secondary standardized test blocks by ASTM.

Consistency of Results

Strict control over the raw materials and tight specifications for heat treating improve the homogeneity and consistency of Buehler's test blocks. These controls ensure that customers can have confidence in the results achieved with Buehler's test blocks.

Wilson Hardness Reference Blocks are certified according to ASTM B294, E10, E18, E92, and E384; ISO 3738-2, 4545-3, 6506-3, 6507-3, and 6508-3; JIS B 7730, B 7734, B 7735, and B 7736 for Brinell, Rockwell, Vickers and Knoop scales.

Globally Recognized Accreditiation

CERT#2237.01 - CALIBRATION

Buehler's Test Block Calibration Laboratory is accredited to ISO / IEC 17025 by the American Association for Laboratory Accreditation (A2LA). A2LA participates in the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). The ILAC MRA creates a global network of testing and calibration laboratories that have been accredited to provide accurate and reliable results. Every test block calibrated by Buehler includes certification to all applicable ASTM, ISO, and JIS standards and provides NIST traceabiltiy for audit compliance.

Advanced Production Capabilities

Extensive Product Offering

Buehler's Test Block Calibration Laboratory has the capability to produce and calibrate test blocks for many different hardness scales.

- **Rockwell**: Regular and Superficial scales
- **Vickers Microindentation**: Loads from 10gf to 1kgf
- **Vickers Macroindentation**: Loads from 1kgf to 100kgf
- **Knoop Microindentation**: Loads from 10gf to 1kgf
- **Brinell**: Loads from 5 kgf to 3000 kgf

Experts in Surface Preparation

Surface preparation is a critical aspect that affects the accuracy and consistency of a finished test block. Buehler's expertise in sample preparation and high quality products have been applied to the in-house processing to continually produce test blocks with the highest quality surface finish.

Advanced Hardness Testing Machines

The Buehler Test Block Calibration Laboratory utilizes state of the art Buehler hardness testing systems for the calibration process. These advanced systems have been built to provide the tightest control and consistency in the calibration process.

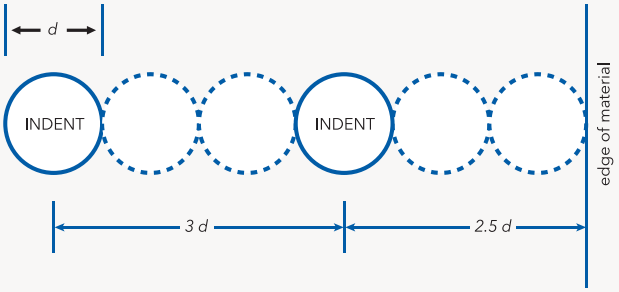
Proper Indent Spacing

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

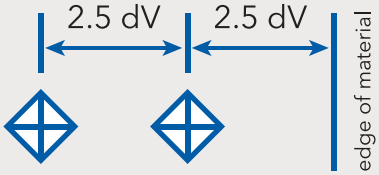
According to ASTM, ISO and JIS Standards: The distance between the centers of two adjacent indentations shall be at least three times the diameter (d) of the indentation.

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.



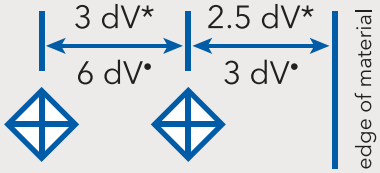
Vickers

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.



dV= Vickers Diagonal

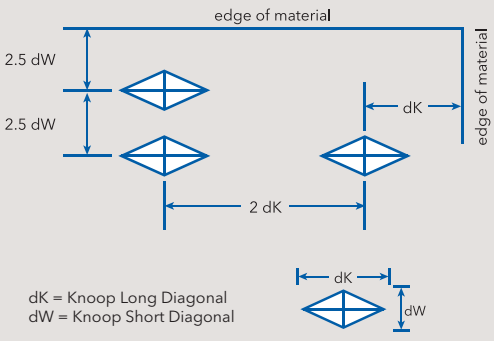
According to ISO and JIS Standards: The distance between the centers of two indents shall be at least three times the diagonal (dV) of the indent for steel, copper and copper alloys, and at least six times for light metals, lead and tin and their alloys. The distance between the center of an indent and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



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

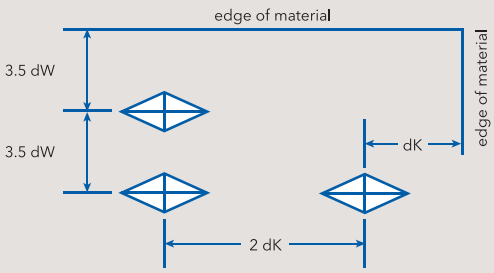
Knoop

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.

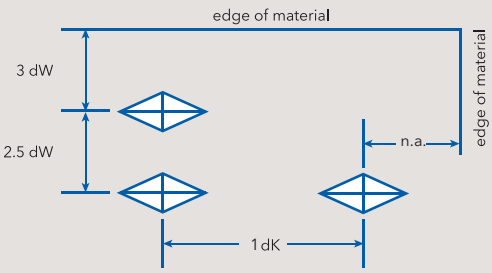


dK = Knoop Long Diagonal
dW = Knoop Short Diagonal

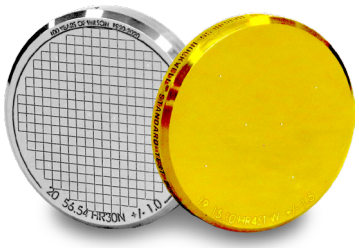
According to ISO Standards: The distance between two indents shall be at least two times the diagonal (dK) of the indentation and three and a half times the width (dW) of the indentation. The distance between the center of an indentation and the edge of a test piece shall be at least one diagonal (dK)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



Test Block Selection



Rockwell Hardness (ASTM E18, ISO 6508, JIS Z 2245)

Daily Verification
- Verify each scale to be used
- Minimum 1 test block within +/- 15 HR of expected hardness
- Alternate: 2 test blocks bracketing the expected hardness (1 higher & 1 lower)

Indirect Verification
- 3 test blocks for each scale
  1 high, 1 medium, 1 low range
  (HR values depend on the scale)
- Minimum 5 HR between blocks
- If all 3 ranges are not available, use available range(s) and also verify a different scale with the same test force using all 3 ranges

Vickers Hardness (ASTM E92 & E384, ISO 6507, JIS Z 2244)
Knoop Hardness (ASTM E384, ISO 4545, JIS Z 2251)

Daily Verification
- Verify each scale to be used (ASTM E92)
- Verify each indenter to be used (ASTM E384)
- Verify each test force to be used (ISO & JIS)
- Minimum 1 test block at approximately the expected hardness, +/- 25 HV/HK recommended

Indirect Verification
- Minimum 2 test blocks total
- Minimum 2 different ranges, at least 100 points between blocks

Low range:	< 240 HV	< 250 HK
Medium range:	240-600 HV	250-650 HK
High range:	> 600 HV	> 650 HK

- Minimum 1 test block per scale
- Verify the highest force using the lowest hardness range (maximum diagonal)
- Verify the lowest force using the highest hardness range (minimum diagonal)

Brinell Hardness (ASTM E10, ISO 6506, JIS Z 2243)

Daily Verification
- Verify each scale (combination of indenter size and test force) to be used
- Minimum 1 test block at approximately the expected hardness, +/- 25 HB recommended

Indirect Verification
- Minimum 2 test blocks total
- Minimum 2 different ranges for each indenter size

Low:	< 225 HBW
High:	> 225 HBW

- Verify the highest force using the lowest hardness range (maximum diameter)
- Verify the lowest force using the highest hardness range (minimum diameter)

ROCKWELL TEST BLOCK ORDERING

Calibrated in our ISO 17025 accredited laboratory in Binghamton, NY, Wilson test blocks are triple-certified to ASTM, ISO, and JIS standards including NIST traceability with every block. Optional grid engraving is available to ensure proper spacing of indentations per Nadcap requirements, and special range blocks are available to meet stringent API specifications.

HRA - 120° DIAMOND, 60 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	28.0	31.0	32.5	35.0	37.0	40.0	41.5	44.0	46.5	50.0	51.0	58.0	61.0	63.0	64.0	65.0	66.5	68.0	69.0	70.0	71.5
Part Number	9201-050			9201-060		9201-070		9201-080		9201-090		9201-100		9201-110		9201-120		9201-130		9201-140	
Nominal	31 HRA			35 HRA		40 HRA		44 HRA		50 HRA		58 HRA		63 HRA		65 HRA		68 HRA		70 HRA	
Range	LOW			LOW		LOW		LOW		LOW		LOW		LOW		LOW		LOW		LOW	
Typical Values	28-32.5			32.5-37		37-41.5		41.5-46.5		46.5-51		51-61		61-64		64-66.5		66.5-69		69-71.5	
Material	BRASS			BRASS		BRASS		BRASS		BRASS		STEEL		STEEL		STEEL		STEEL		STEEL	
9100-489 CAL SET >				LOW																	

HRB W - 1/16" CARBIDE, 100 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	95	100
Part Number	9202-010W			9202-020W		9202-030W		9202-040W		9202-050W		9202-060W		9202-070W		9202-080W		9202-090W		9202-100W	
Nominal	0 HRBW			10 HRBW		20 HRBW		30 HRBW		40 HRBW		50 HRBW		60 HRBW		70 HRBW		80 HRBW		95 HRBW	
Range	LOW			LOW		LOW		LOW		LOW		LOW		MID		MID		MID		HIGH	
Typical Values	-5 - 5			5 - 15		15 - 25		25 - 35		35 - 45		45 - 55		55 - 65		65 - 75		75 - 85		85 - 100	
Material	BRASS			BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		STEEL	
9100-491W CAL SET >												LOW				MID				HIGH	

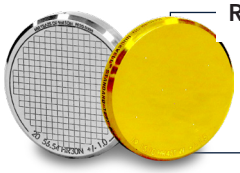
HRC - 120° DIAMOND, 150 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	10	13	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	50	52.5	55	57.5	60	62	63	64	65	68	70	75
Part Number	9203-101			9203-111		9203-121		9203-131		9203-141		9203-151		9203-161		9203-171		9203-181		9203-191		9203-201		9203-211	
Nominal	13 HRC			25 HRC		30 HRC		35 HRC		40 HRC		45 HRC		50 HRC		55 HRC		60 HRC		63 HRC		65 HRC		70 HRC	
Range	LOW			LOW		LOW		LOW		MID		MID		MID		MID		HIGH		HIGH		HIGH		HIGH	
Typical Values	10-22.5			22.5-27.5		27.5-32.5		32.5-37.5		37.5-42.5		42.5-47.5		47.5-52.5		52.5-57.5		57.5-62.1		62.1-64.6		64.6-68		68-75	
Material	BRASS			BRASS		BRASS		BRASS		BRASS		STEEL		STEEL		STEEL		STEEL		STEEL		HS STEEL		HS STEEL	
9100-498 CAL SET >				LOW								MID								HIGH					

HRE W - 1/8" Carbide, 100 KGF

	54	57	60	63	65	69	72	75	78	81	84	87	90	93	96	99	102
Part Number	9205-010W		9205-020W		9205-030W		9205-040W		9205-050W		9205-060W		9205-070W		9205-080W		
Nominal	57 HREW		63 HREW		69 HREW		75 HREW		81 HREW		87 HREW		93 HREW		99 HREW		
Range	LOW		LOW		LOW		LOW		LOW		MID		MID		HIGH		
Typical Values	54-60		60-65		65-72		72-78		81-84		84-90		90-96		96-102		
Material	BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		
Certification	ASTM		ASTM		ASTM		ASTM, ISO, JIS		ASTM, ISO, JIS		ASTM, ISO, JIS		ASTM, ISO, JIS		ASTM, ISO, JIS		
Optional Grid (mm)									5.0		5.0		5.0		4.0		
9100-497W CAL SET >							LOW				MID				HIGH		

Calibration sets include 1 of High, Mid, Low range Test Blocks and a certified class B indenter



Rockwell Test Block Dimensions

	MM	Inch
Brass	60 Φ x 6.6	2.38 Φ x 0.260
Steel	60 Φ x 9.5	2.38 Φ x 0.375

HRA - 120° DIAMOND, 60 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	71.5	73.0	74.5	76.0	77.0	78.0	79.5	81.0	82.0	83.0	84.0	84.0	85.0	87.0	89.0
Part Number	9201-150		9201-160		9201-170		9201-180		9201-190		9201-200		9201-210		
Nominal	73 HRA		76 HRA		78 HRA		81 HRA		83 HRA		84 HRA		87 HRA		
Range	MID		MID		MID		HIGH		HIGH		HIGH		HIGH		
Typical Values	71.5-74.5		74.5-77		77-79.5		79.5-82		82-83		83-85		85-89		
Material	STEEL		STEEL		STEEL		STEEL		STEEL		HS STEEL		HS STEEL		
9100-489 CAL SET >	MID								HIGH						

HR15N - 120° DIAMOND, 15 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	70	72	73.5	75	76.5	78	79	80	81.5	83	84.5	86	87	88	89	90	90.5	91	91.5	92	93	94	96
Part Number	9212-110		9212-120		9212-130		9212-140		9212-150		9212-160		9212-170		9212-180		9212-190		9212-200		9212-210		
Nominal	70 HR15N		75 HR15N		78 HR15N		80 HR15N		83 HR15N		86 HR15N		88 HR15N		90 HR15N		91 HR15N		92 HR15N		94 HR15N		
Range	LOW		LOW		MID		MID		MID		MID		MID		HIGH		HIGH		HIGH		HIGH		
Typical Values	70-73.5		73.5-76.5		76.5-79		79-81.5		81.5-84.5		84.5-87		87-89		89-90.5		90.5-91.5		91.5-93		93-96		
Material	STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		HS STEEL		HS STEEL		
9100-493 CAL SET >	LOW								MID								HIGH						

HR30N - 120° DIAMOND, 30 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	44	46	48	50	52.5	55	57.5	60	62	64	66.5	69	71	73	75.5	78	79	80	81	82	84	86	88
Part Number	9213-110		9213-120		9213-130		9213-140		9213-150		9213-160		9213-170		9213-180		9213-190		9213-200		9213-210		
Nominal	46 HR30N		50 HR30N		55 HR30N		60 HR30N		64 HR30N		69 HR30N		73 HR30N		78 HR30N		80 HR30N		82 HR30N		86 HR30N		
Range	LOW		LOW		MID		MID		MID		MID		MID		HIGH		HIGH		HIGH		HIGH		
Typical Values	44-48		48-52.5		52.5-57.5		57.5-62		62-66.5		66.5-71		71-75.5		75.5-79		79-81		81-84		84-88		
Material	STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		HS STEEL		HS STEEL		
9100-490 CAL SET >	LOW								MID								HIGH						

HR15T W - 1/16" CARBIDE, 15 KGF *- All blocks are ASTM, ISO and JIS certified (9218-010W & 9218-020W ASTM only) - Optional Grid 2.5mm is available*

	53	61	62.5	64	65.5	67	69	71	72.5	74	75.5	77	78.5	80	82	84	85.5	87	89.5	92	93
Part Number	9218-010W		9218-020W		9218-030W		9218-040W		9218-050W		9218-060W		9218-070W		9218-080W		9218-090W		9218-100W		
Nominal	61 HR15TW		64 HR15TW		67 HR15TW		71 HR15TW		74 HR15TW		77 HR15TW		80 HR15TW		84 HR15TW		87 HR15TW		92 HR15TW		
Range	LOW		LOW		LOW		LOW		LOW		LOW		MID		MID		HIGH		HIGH		
Typical Values	53-62.5		62.5-65.5		65.5-69		69-72.5		72.5-75.5		75.5-78.5		78.5-82		82-85.5		85.5-89.5		89.5-93		
Material	BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		BRASS		STEEL		
9100-496W CAL SET >											LOW				MID				HIGH		

ROCKWELL TEST BLOCK ORDERING

HRF W - 1/16" Carbide, 60 KGF

	54 57 60	63 65 69	71 74 76	80 82 86	88 91 94	97 100
Part Number	9206-010W	9206-020W	9206-030W	9206-040W	9206-050W	9206-060W	9206-070W	9206-080W
Nominal	57 HRFW	63 HRFW	69 HRFW	74 HRFW	80 HRFW	86 HRFW	91 HRFW	97 HRFW
Range	LOW	LOW	LOW	LOW	MID	MID	MID	HIGH
Typical Values	54-60	60-65	65-71	72-76	76-82	82-88	88-94	94-100
Material	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS
Certification	ASTM	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS
Optional Grid (mm)	5.0	4.0	4.0	4.0	4.0	3.5	3.5	3.0
9100-499 CAL SET >		LOW				MID		HIGH

HRG W - 1/16" Carbide, 150 KGF

	10 17 25	32 40 49	61 74 80	87 92
Part Number	9207-070W	9207-080W	9207-090W	9207-100W	9207-110W
Nominal	17 HRGW	32 HRGW	49 HRGW	74 HRGW	87 HRGW
Range	LOW	LOW	LOW	MID	HIGH
Typical Values	12-23	27-37	44-54	69-79	82-92
Material	BRASS	BRASS	BRASS	STEEL	STEEL
Certification	ASTM	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS
Optional Grid (mm)		5.0	5.0	4.0	3.5

HRH W - 1/8" Carbide, 60 KGF

	85 87 88.5	91 92 94	96 98 100
Part Number	9208-010W	9208-020W	9208-030W	9208-040W
Nominal	87 HRHW	91 HRHW	94 HRHW	98 HRHW
Range	LOW	LOW	LOW	MID
Typical Values	85-88.5	88.5-92	92-96	96-100
Material	BRASS	BRASS	BRASS	STEEL
Certification	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS
Optional Grid (mm)		5.0	5.0	4.0

HRK W - 1/8" Carbide, 150 KGF

	17 21 25	30 34 38	42.5 47 51	55 60 65	69 73 77	81 85.5 90	95
Part Number	9209-010W	9209-020W	9209-030W	9209-040W	9209-050W	9209-060W	9209-070W	9209-080W	9209-090W
Nominal	21 HRKW	30 HRKW	38 HRKW	47 HRKW	55 HRKW	65 HRKW	73 HRKW	81 HRKW	90 HRKW
Range	LOW	LOW	LOW	LOW	LOW	MID	MID	MID	HIGH
Typical Values	17-25	25-34	34-42.5	42.5-51	51-60	60-69	69-77	77-85.5	85.5-95
Material	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS
Certification	ASTM	ASTM	ASTM	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS
Optional Grid (mm)								5.0	5.0

HR30T W - 1/16" Carbide, 30 KGF

	12 15 18.5	22 25.5 29	32.5 36 39.5	43 46.5 50	53 56 59.5	63 66.5 70	75 80 83
Part Number	9219-010W	9219-020W	9219-030W	9219-040W	9219-050W	9219-060W	9219-070W	9219-080W	9219-090W	9219-100W
Nominal	15 HR30TW	22 HR30TW	29 HR30TW	36 HR30TW	43 HR30TW	50 HR30TW	56 HR30TW	63 HR30TW	70 HR30TW	80 HR30TW
Range	LOW	LOW	LOW	LOW	LOW	LOW	MID	MID	HIGH	HIGH
Typical Values	12-18.5	18.5-22.5	22.5-32.5	32.5-39.5	39.5-46.5	46.5-53	53-59.5	59.5-66.5	66.5-75	75-83
Material	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	BRASS	STEEL
Certification	ASTM	ASTM	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS	ASTM, ISO, JIS
Optional Grid (mm)	3.5	3.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
9100-492W CAL SET >						LOW		MID		HIGH

ROCKWELL TEST BLOCK ORDERING

HR45N - 120 Diamond°, 45 KGF *- All blocks are ASTM, ISO and JIS certified - Optional Grid 2.5mm is available*

	22	25	28	31	34	37	40	43	46	49	52	55	58	61	64	67	69.5	70	71	72	73.5	78	79
Part Number	9214-110		9214-120		9214-130		9214-140		9214-150		9214-160		9214-170		9214-180		9214-190		9214-200		9214-210		
Nominal	25 HR45N		31 HR45N		37 HR45N		43 HR45N		49 HR45N		55 HR45N		61 HR45N		67 HR45N		70 HR45N		72 HR45N		78 HR45N		
Range	LOW		LOW		MID		MID		MID		MID		MID		HIGH		HIGH		HIGH		HIGH		
Typical Values	22-28		28-34		34-40		40-46		46-52		52-58		58-64		64-69.5		69.5-71		71-73.5		73.5-79		
Material	STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		STEEL		HS STEEL		HS STEEL		
9100-494 CAL SET >	LOW								MID								HIGH						

HR45T W - 1/16" Carbide, 45 KGF *- All blocks are ASTM, ISO and JIS certified*

	7	12.5	18	23	28	34	38.5	43	48	53	60	67	77
Part Number	9220-050W		9220-060W		9220-070W		9220-080W		9220-090W		9220-100W		
Nominal	12.5 HR45TW		23 HR45TW		34 HR45TW		43 HR45TW		53 HR45TW		67 HR45TW		
Range	LOW		LOW		MID		MID		HIGH		HIGH		
Typical Values	7-18		18-28		28-38.5		38.5-48		48-60		60-77		
Material	BRASS		BRASS		BRASS		BRASS		BRASS		STEEL		
Optional Grid (mm)	3.5		3.5		3.0		3.0		2.5		2.5		
9100-495W CAL SET>			LOW				MID				HIGH		

Special Order Items	
Part Number	Description
9201002	Special value - please provide Rockwell Scale and hardness value
9201003G	Add for block grid/ engraving service
9201006API	Add for API compliance service
9210007	API compliance with grid service
9201008	Add for steel ball indenter

HRA CARBIDE - 120° DIAMOND, 60 KGF *- All blocks are ASTM & ISO certified*

	84	85	86	87	88	89	90	91	91.5	92	92.5	93	93.5
Part Number	9009901-85		9009901-87		9009901-89		9009901-91		9009901-92		9009901-93		
Nominal	85 HRA		87 HRA		89 HRA		91 HRA		92 HRA		93 HRA		
Range	LOW		LOW		LOW		HIGH		HIGH		HIGH		
Typical Values	84-86		86-88		88-90		90-91.5		91.5-92.5		92.5-93.5		
Material	CARBIDE		CARBIDE		CARBIDE		CARBIDE		CARBIDE		CARBIDE		
A58911 CAL SET >					LOW				HIGH				

HRD - 120° DIAMOND, 150 KGF

All HRD blocks are ASTM, ISO, JIS certified. Optional 2.5 mm grid available.

Part Number	9204-120	9204-150	9204-170	9204-190
Nominal	48 HRD	59 HRD	67 HRD	73 HRD
Range	LOW	MID	MID	HIGH
Typical Values	46-49.5	57-61	65-69	72-74
Material	STEEL	STEEL	STEEL	STEEL

HRW W - 1/8" CARBIDE, 15/30/45 KGF

Use special order part numbers. Specify scale and requested hardness value.

Scale	HR15W W	HR30W W	HR45W W
Indenter	1/8" Carbide	1/8" Carbide	1/8" Carbide
Test Force	15 KGF	30 KGF	45 KGF
Nominal	76-95	50-95	30-84
Material	BRASS	BRASS	BRASS
Certification	ASTM	ASTM	ASTM

1/4" & 1/2" Carbide Scales

All blocks are ASTM only, Brass material and Steel. Use special order part numbers. Specify scale and requested hardness value when ordering.

Scale	HRL W	HRM W	HRP W	HR15X W	HR30X W	HR45X W	HRR W	HRS W	HRV W	HR15Y W	HR30Y W	HR45Y W
Indenter	1/4" CARBIDE	1/4" CARBIDE	1/4" CARBIDE	1/4" CARBIDE	1/4" CARBIDE	1/4" CARBIDE	1/2" CARBIDE	1/2" CARBIDE	1/2" CARBIDE	1/2" CARBIDE	1/2" CARBIDE	1/2" CARBIDE
Test Force	60 KGF	100 KGF	150 KGF	15 KGF	30 KGF	45 KGF	60 KGF	100 KGF	150 KGF	15 KGF	30 KGF	45 KGF
Nominal	105-125	86-122	63-116	85-97	70-96	53-88	110-118	101-109	92-102	90-98	85-98	50-60

VICKERS TEST BLOCK ORDERING

Vickers Test Blocks - *According to ASTM E92 & E384, ISO 6507-3 and JIS B 7735*

Block Type	Test Force	Hardness Value
93	**005**	**250**

Example: 250 HV 0.5 Test Block
Item # - 93 005 250

	MM	Inch
Micro Block	32 Φ x 16	1.25 Φ x 0.625
Macro Block	60 Φ x 9.5	2.38 Φ x 0.375

Block Type	
93	Vickers

Vickers Test Blocks are NIST traceable and certified to:
ASTM E92 & ASTM E384
ISO 6507-3 & JIS B 7735

Notes:
* ASTM certification only due to d < 20 µm
** ASTM only for HV > 225 due to d < 20 µm
*** ASTM only for HV > 450 due to d < 20 µm

Test Force		
0001	10gf	*
00025	25gf	*
0005	50gf	**
001	100gf	***
002	200gf	
003	300gf	
005	500 gf	
010	1000gf	1kgf
020		2kgf
030		3kgf
050		5kgf
100		10kgf
200		20kgf
300		30kgf
500		50kgf

Micro Block
Macro Block

Hardness Value		
150	125-175HV	Low
200	175-225HV	Low
250	225-275HV	Low
300	275-325HV	Mid
350	325-375HV	Mid
400	375-425HV	Mid
450	425-475HV	Mid
500	475-525HV	Mid
550	525-575HV	Mid
600	575-625HV	High
700	675-725HV	High
775	750-800HV	High
830	800-850HV	High

Brass
Steel

KNOOP TEST BLOCK ORDERING

According to ASTM E92 & E384, ISO 4545-3 and JIS B 7734
Available in full range of HK Scales and with special certifications.

Load (kgf)	Part Number	Nominal Hardness	Range
500gf 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

Knoop loads & scales available:			
10gf	HK0.01	200gf	HK0.2
25gf	HK0.025	300gf	HK0.3
50gf	HK0.05	500gf	HK0.5
100gf	HK0.1	1000gf	HK1

Special Order Items

Not applicable for Europe, please contact Buehler Europe

Part Number	Description
93-000-001*	Special block - Vickers Micro (10gf - 1000gf) - provide hardness value and Vickers scale
93-000-002*	Special block - Vickers Macro (1kgf - 50kgf) - provide hardness value and Vickers scale
94-000-001*	Special block - Knoop (10gf - 1000gf) - provide hardness value and Knoop scale
93-000-012•	Multi-calibration block - 2 scales - provide hardness value and Vickers / Knoop scales
93-000-013•	Multi-calibration block - 3 scales - provide hardness value and Vickers / Knoop scales
93-000-014•	Multi-calibration block - 4 scales - provide hardness value and Vickers / Knoop scales

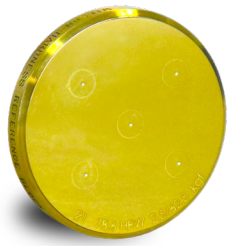
**Specify hardness required and load force for calibration*

•Specify additional load force for calibration

BRINELL TEST BLOCK ORDERING

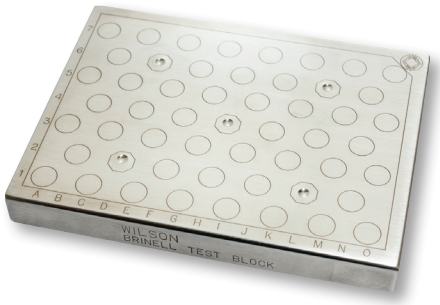
According to ASTM E10, ISO 6506-3 and JIS B 7736

Small Brinell reference blocks (1-mm & 2.5-mm scales)



Nominal value	Range	HBW 1/30 scale	HBW2.5-62.5 scale	HBW2.5-187.5 scale
140 HBW	115-169	WH-140HBW-30	WH-140HBW-625	WH-140HBW-1875
200 HBW	170-224	WH-200HBW-30	WH-200HBW-625	WH-200HBW-1875
250 HBW	225-274	WH-250HBW-30	WH-250HBW-625	WH-250HBW-1875
300 HBW	275-324	WH-300HBW-30	WH-300HBW-625	WH-300HBW-1875
350 HBW	325-375		WH-350HBW-625	WH-350HBW-1875
400 HBW	375-449	WH-400HBW-30		WH-400HBW-1875
500 HBW	450-525	WH-500HBW-30		WH-500HBW-1875

Large Brinell reference blocks (5-mm & 10-mm scales)



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

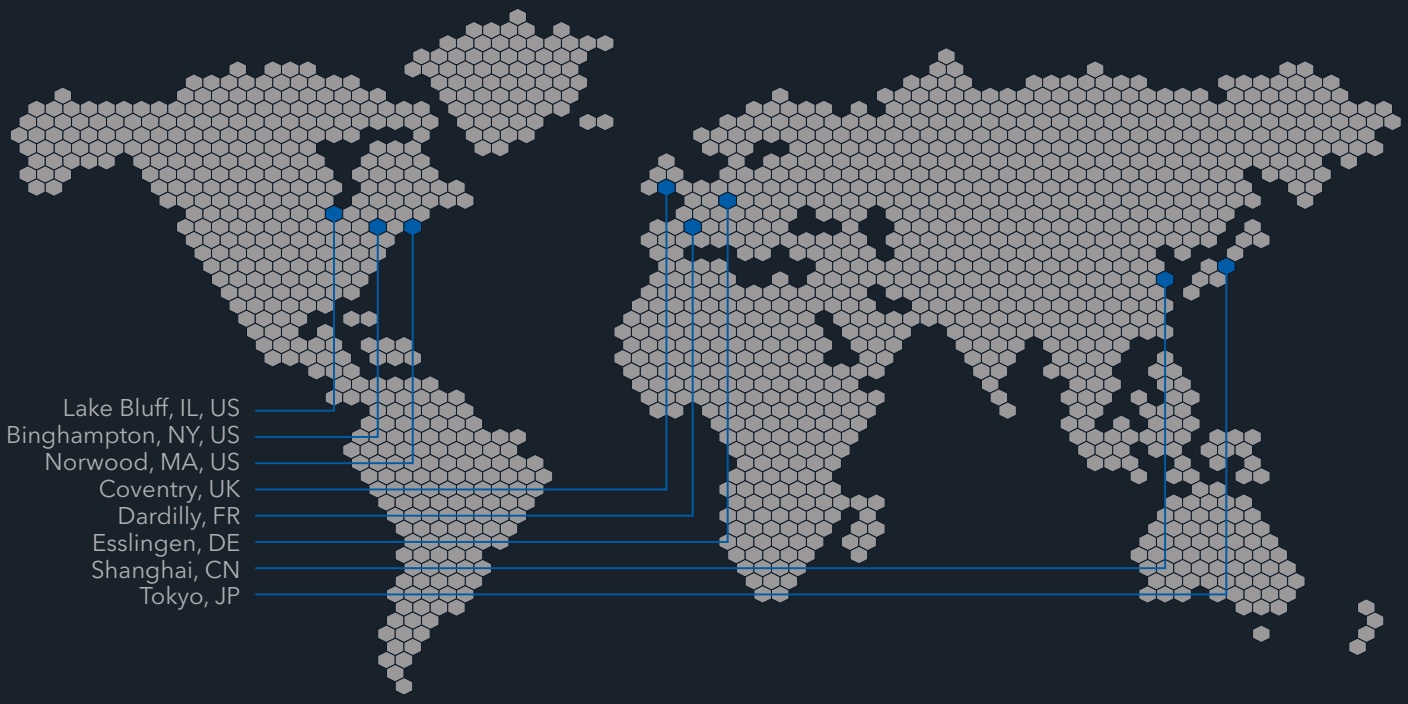
Special Order Items

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

Part Number	Description
WHSMLBRIN	Special block - please provide Brinell scale and hardness value. Scales available: HBW 1/30 HBW 1/15 HBW 1/10 HBW 2.5/187.5 HBW 2.5/62.5 HBW 2.5/31.25 HBW 2.5/15.625

Part Number	Description
WHSPECBRIN	Special block - please provide Brinell scale and hardness value. Scales available: HBW 10/3000 HBW 10/1500 HBW 10/1000 HBW 10/500 HBW 5/750 HBW 5/250 HBW 5/125

Buehler Worldwide Locations



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