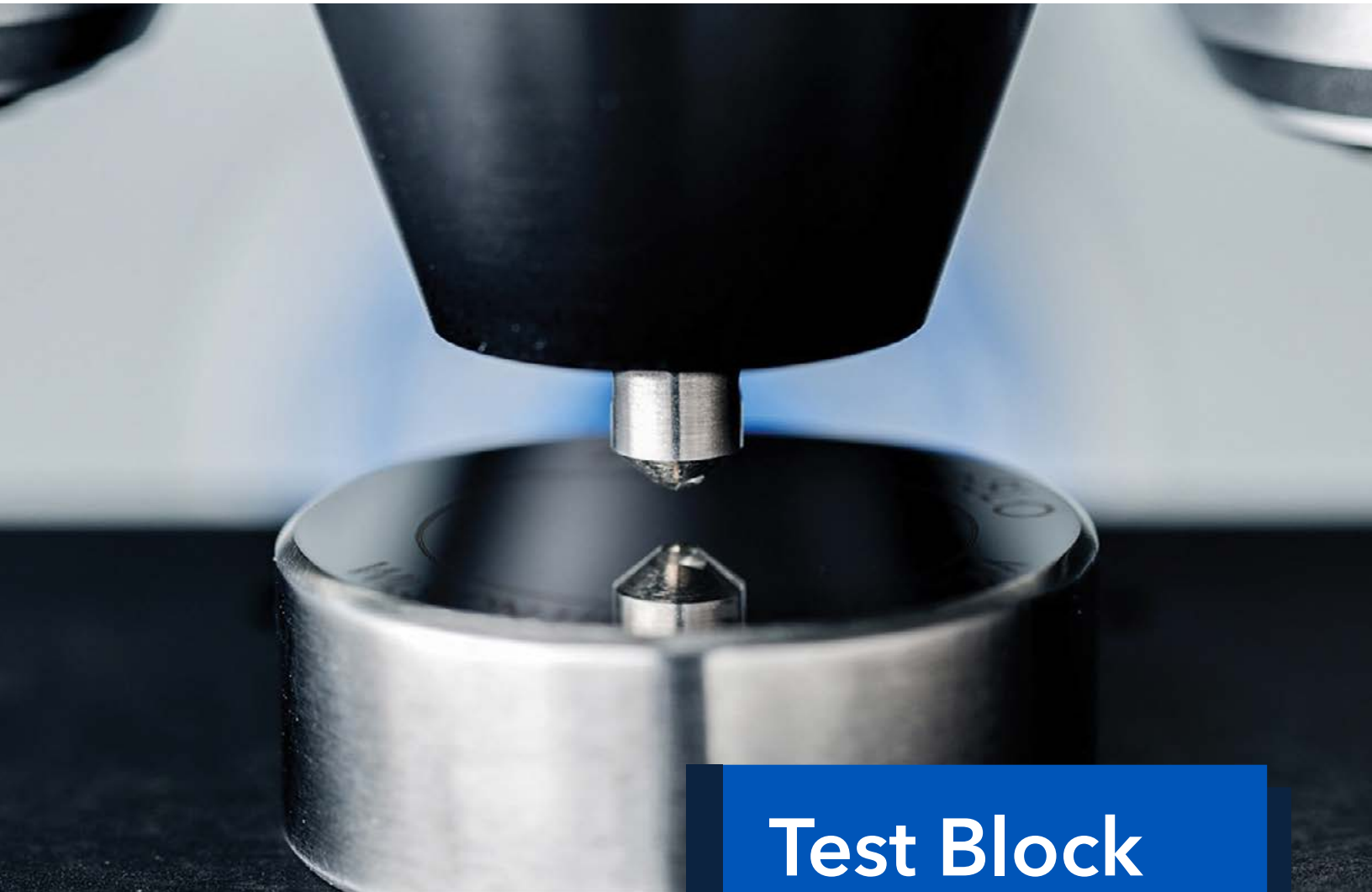




BUEHLER

Strong Partner, Reliable Solutions

■ Celebrating Over **100** YEARS of  **Wilson**® Hardness ■



A complete line of Hardness
Test Blocks and Accessories

Test Block Application Guide



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, Reichert, 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.



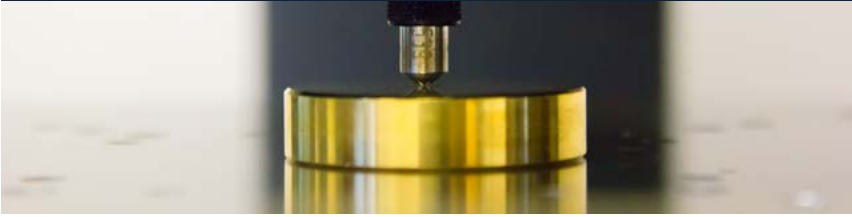
*Wilson
Instruments*



 **Wilson®**



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 Accreditation

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 traceability for audit compliance.



CERT#2237.01 - CALIBRATION

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

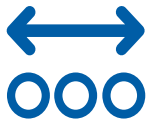
Experts in Surface Preparation

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.





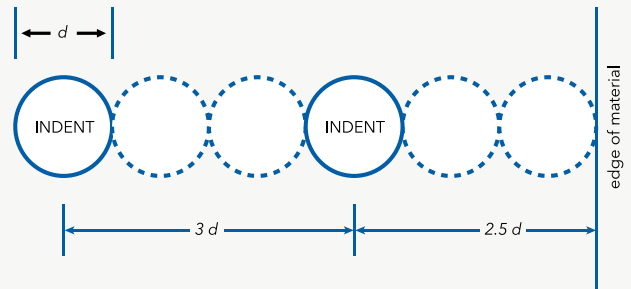
Proper Indent Spacing

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.

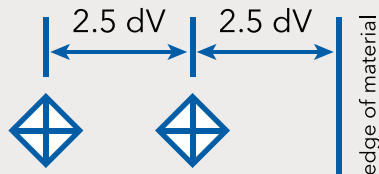
The distance from the center of any indentation to an edge of the test piece shall be at least two and a half times the diameter of the indentation.



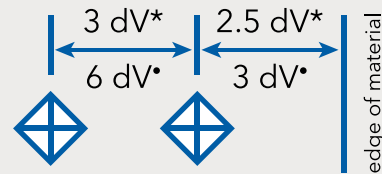
Vickers

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.

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

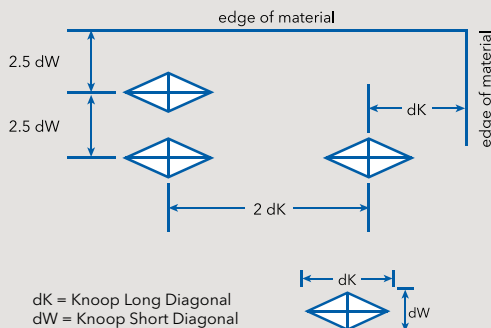
* For light metals, lead, tin and their alloys

Knoop

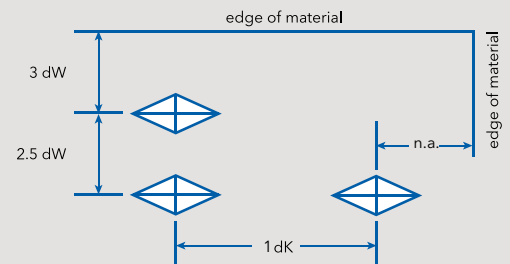
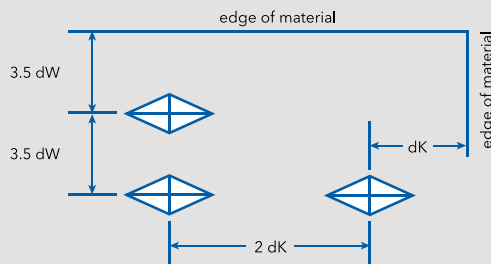
According to ASTM Standards: The distance between two indents shall be at least two times the diagonal (dK) of the indentation and two and a half times the width (dW) of the indentation. The distance between the center of an indentation and the edge of a test piece shall be at least one diagonal (dK)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

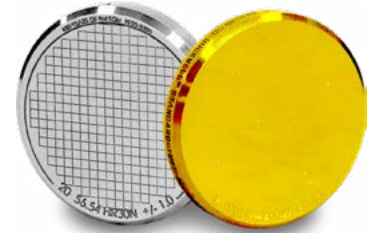


dK = Knoop Long Diagonal
 dW = Knoop Short Diagonal





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
- Recommended ranges

100-475	± 25 HV/HK
475-850	± 50 HV/HK
> 850	± 100 HV/HK

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 3.0mm 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 - 54	54 - 61	61 - 64	63 - 67	66 - 70	68 - 72											
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 3.0mm is available

	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	95	100
Part Number	9202-020W	9202-030W	9202-040W	9202-050W	9202-060W	9202-070W	9202-080W	9202-090W	9202-100W										
Nominal	10 HRBW	20 HRBW	30 HRBW	40 HRBW	50 HRBW	60 HRBW	70 HRBW	80 HRBW	95 HRBW										
Range	LOW	LOW	LOW	LOW	LOW	MID	MID	MID	HIGH										
Typical Values	0 - 15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65	65 - 75	75 - 86	86 - 100										
Material	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 3.0mm is available

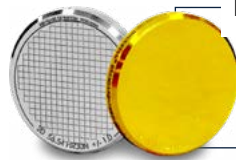
	10	13	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	50	52.5	55	57.5	60	62	63	64	65	68	70	75
Part Number	9203-101	9203-111	9203-121	9203-131	9203-141	9203-151	9203-161	9203-171	9203-181	9203-191	9203-201	9203-211													
Nominal	13 HRC	25 HRC	30 HRC	35 HRC	40 HRC	45 HRC	50 HRC	55 HRC	60 HRC	63 HRC	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	STEEL	STEEL	STEEL	STEEL	STEEL	STEEL	STEEL	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 - 61	59 - 65	65 - 72	72 - 78	78 - 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 3.0mm 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	71-75	74-78	76-80	79-83	81-85	82-86	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 3.0mm 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	70-74	73-77	76-80	78-82	81-85	84-88	86-90	88-92	89-91.5	91.5-94	92-96												
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 3.0mm 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	66-71	71-75	75-78	78-81	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					

HR15TW - 1/16" CARBIDE, 15 KGF - All blocks are ASTM, ISO and JIS certified (9218-010W & 9218-020W ASTM only) - Optional Grid 3.0mm 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	53-63	62-66	65-69	68-72	71-75	75-79	78-82	81-85	84-90	90-93											
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	71-76	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	85-89	88-92	92-96	96-100					
Material	BRASS	BRASS	BRASS	BRASS					
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	25-35	34-43	42-52	50-60	60-70	68-78	76-86	85-95										
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	18.5-25	25-31	33-39	40-46	46-52	53-59	59-66	66-75	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	3.0	3.0	3.0	3.0											
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	64-70	68-72	70-74	73-78												
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	38-48	48-58	58-77							
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
9201007	API compliance with grid service
9201008	Add for calibration using 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	86-88.5	88.5 - 90.5	90.5-91.5	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 3.0mm 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	46-50	57-61	65-69	71-75
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

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 $d < 20 \mu m$
- ** ASTM only for HV > 225 due to $d < 20 \mu m$
- *** ASTM only for HV > 450 due to $d < 20 \mu m$

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
500 475-550HV Mid
600 550-650HV High
700 650-750HV High
775 750-800HV High
830 800-860HV 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
Typical ranges for custom blocks are +/- 50 HV/HK

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	



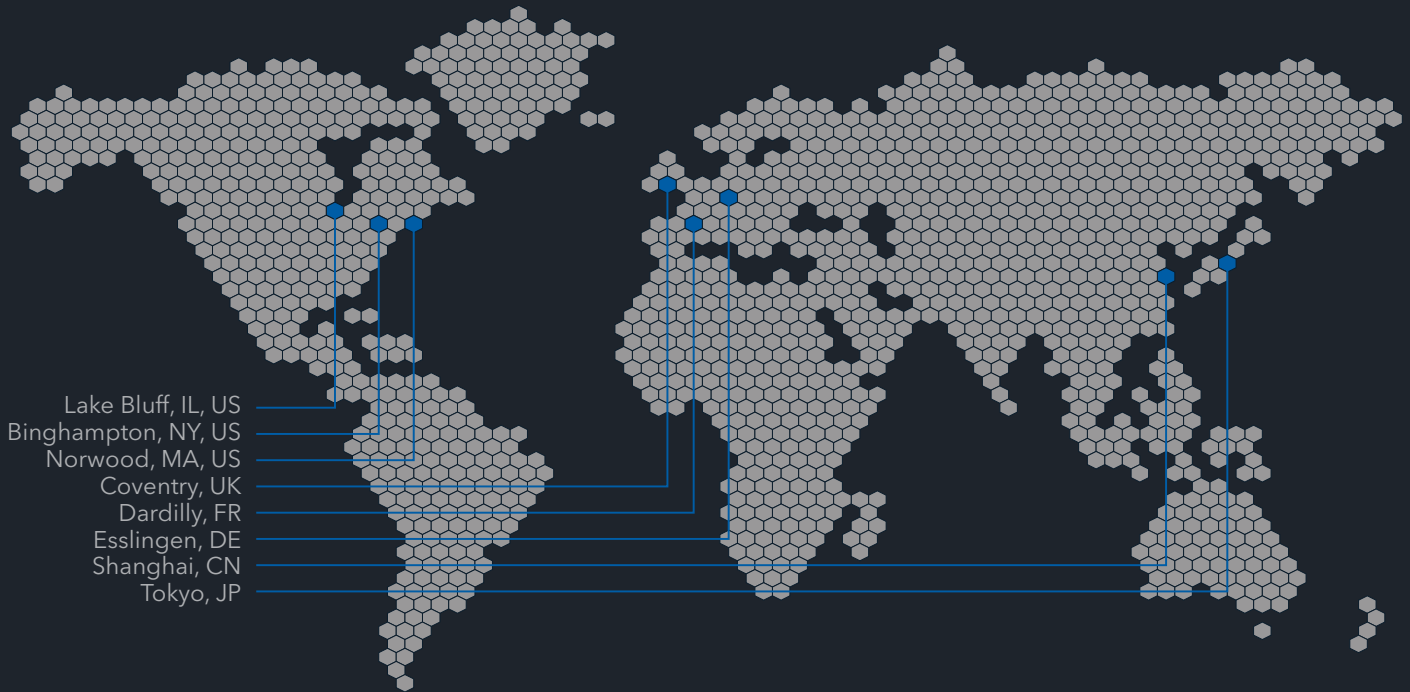
Special Order Items

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

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