



**National Voluntary
Laboratory Accreditation Program**



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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CALIBRATION LABORATORIES

NVLAP LAB CODE 200301-0
 Scope Revised: 2012-01-12

NVLAP Code: 20/A01 ANSI/NCSL Z540-1-1994; Part 1 Compliant

DIMENSIONAL

NVLAP Code: 20/D05
 Length

Range	Best Uncertainty (\pm) ^{note 1}	Remarks
Field Service Calibration of Strain – ASTM E83 and ISO 9513		
(0.1 to 0.3) in	(0.000074 + 0.000024L) in	Gage Length
(0.3 to 4.0) in	(0.0008 + 0.0002L) in	Gage Length
(4 to 12) in	0.0083 in	Gage Length
(12 to 72) in	0.017 in	Gage Length
(0 to 1) in	(0.000015 + 0.000165L) in	Displacement
(0 to 2) in	(0.00003 + 0.000165L) in	Displacement
(0 to 10) in	(0.0003 + 0.00015L) in	Displacement
(10 to 40) in	(0.0003 + 0.0002L) in	Displacement

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Material Testing System Crosshead Displacement or Actuator Stroke – ASTM E2309 or Internal Method

<i>Range</i>	<i>Best Uncertainty</i> (±) ^{note 1}	<i>Remarks</i>
(0 to 10) in	(0.0003 + 0.00015L) in	Digital Linear Encoders
(10 to 40) in	(0.0003 + 0.00020L) in	Digital Linear Encoders

Material Testing System Crosshead/Actuator Speed – ASTM E2658 or Internal Method

Up to 50 in/min	(0.0003 + 0.00015L) in	Displacement Component using Linear Encoders
Up to 50 in/min	10 milliseconds	Time Component by Comparison to Time Base Oscillator

Linearity of C.O.D Gauges - ASTM E399

<i>Range</i>	<i>Best Uncertainty</i> (±)	<i>Remarks</i>
(0.01 to 0.32) in	(0.000025 + 0.000116L) in	Displacement

DC/LF ELECTROMAGNETICS

NVLAP Code: 20/E06
DC Voltage Measure

(0 to 300) mV	0.096 mV	HP 3478A
(0 to 3) V	0.14 mV	HP 3478A

MECHANICAL

NVLAP Code: 20/M06
Alignment

Field Alignment of Material Testing Systems – ASTM E1012, NADCAP AC7101 and NADCAP AC7122

<i>Range</i>	<i>Best Uncertainty</i> (±)	<i>Remarks</i>
Any % Bend Value	1.0 % of Indicated % Bend	Specimen Alignment
Up to 2000 micro-strain	0.66% of Reading	Specimen Alignment

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Force

In-house Application of Force – ASTM E74, ISO 376, and Internally Developed Methods

Range in lbf	Best Uncertainty (\pm) in % <small>note 1, 2, 3</small>	Remarks
0.1 to 130 000	0.005	Primary Standard
130 000 to 240 000	0.01	Secondary Standard
240 000 to 1 000 000	0.05	Secondary Standard

Field Service Calibration of Force – ASTM E4 and ISO 7500-1

Range	Best Uncertainty (\pm) <small>note 1</small>	Remarks
1 gram to 500 ton (0.01 N to 5 MN)	0.125 % of applied force	Compression
1 gram to 500 ton (0.01 N to 5 MN)	0.125 % of applied force	Tension

NVLAP Code: 20/M13

Hardness

Wilson - In-house calibration of Rockwell Test Blocks note 30

Field Service Indirect verification of Rockwell Hardness testing Machines

Hardness Scale and Range	Best Uncertainty (\pm) in Rockwell Points <small>notes 1, 4, 5, 6, 7, 8, 9, 10</small>	Remarks
HRA Carbide		ASTM B294 Section A.1 & ISO 3738-2
93	0.07	
91	0.11	
85	0.17	
HRA Steel Scale		ASTM E18 Annex A4 & ISO 6508-3
83	0.10	
73	0.27	
63	0.15	
HRB Scale		ASTM E18 Annex A4 & ISO 6508-3
95	0.17	
70	0.31	
40	0.48	

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<i>Hardness Scale and Range</i>	<i>Best Uncertainty (\pm) in Rockwell Points</i> <small>notes 1, 4,5,6,7,8,9,10</small>	<i>Remarks</i>
HRC Scale		ASTM E18 Annex A4 & ISO 6508-3
63	0.16	
45	0.18	
25	0.18	
HRD Scale		ASTM E18 Annex A4 & ISO 6508-3
73	0.05	
59	0.13	
43	0.14	
HRE Scale		ASTM E18 Annex A4 & ISO 6508-3
92	0.11	
87	0.24	
81	0.14	
HRF Scale		ASTM E18 Annex A4 & ISO 6508-3
98	0.11	
91	0.16	
80	0.13	
HRG Scale		ASTM E18 Annex A4 & ISO 6508-3
77	0.18	
56	0.28	
23	0.45	
HRH Scale		ASTM E18 Annex A4 & ISO 6508-3
100	0.16	
97	0.22	
91	0.16	
HRK Scale		ASTM E18 Annex A4 & ISO 6508-3
91	0.20	
75	0.21	
57	0.39	

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<i>Hardness Scale and Range</i>	<i>Best Uncertainty (±)in Rockwell Points</i> <small>notes 1, 4,5,6,7,8,9,10</small>	<i>Remarks</i>
HRL Scale		ASTM E18 Annex A4 & ISO 6508-3
124	0.05	
116	0.10	
106	0.15	
HRM Scale		ASTM E18 Annex A4 & ISO 6508-3
120	0.07	
105	0.13	
90	0.30	
HR15N Scale		ASTM E18 Annex A4 & ISO 6508-3
91	0.08	
83	0.09	
71	0.09	
HR30N Scale		ASTM E18 Annex A4 & ISO 6508-3
80	0.15	
64	0.23	
46	0.16	
HR45N Scale		ASTM E18 Annex A4 & ISO 6508-3
70	0.13	
49	0.12	
24	0.19	
HRP Scale		ASTM E18 Annex A4 & ISO 6508-3
108	0.15	
99	0.23	
88	0.26	
HRR Scale		ASTM E18 Annex A4 & ISO 6508-3
121	0.12	
119	0.12	
116	0.12	

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<i>Hardness Scale and Range</i>	<i>Best Uncertainty (\pm) in Rockwell Points</i> <small>notes 1, 4,5,6,7,8,9,10</small>	<i>Remarks</i>
HRS Scale		ASTM E18 Annex A4 & ISO 6508-3
114	0.12	
109	0.15	
106	0.16	
HR15T Scale		ASTM E18 Annex A4 & ISO 6508-3
90	0.05	
83	0.27	
76	0.17	
HR30T Scale		ASTM E18 Annex A4 & ISO 6508-3
70	0.20	
56	0.20	
43	0.29	
HR45T Scale		ASTM E18 Annex A4 & ISO 6508-3
67	0.10	
41	0.33	
23	0.21	
HRV Scale		ASTM E18 Annex A4 & ISO 6508-3
106	0.17	
98	0.21	
95	0.22	
HR15W Scale		ASTM E18 Annex A4 & ISO 6508-3
94	0.08	
88	0.07	
84	0.11	
HR30W Scale		ASTM E18 Annex A4 & ISO 6508-3
88	0.09	
75	0.13	
69	0.24	

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<i>Hardness Scale and Range</i>	<i>Best Uncertainty (±) in Rockwell Points</i> <small>notes 1, 4,5,6,7,8,9,10</small>	<i>Remarks</i>
HR45W Scale		ASTM E18 Annex A4 & ISO 6508-3
82	0.08	
69	0.23	
50	0.11	
HR15X Scale		ASTM E18 Annex A4 & ISO 6508-3
97	0.08	
95	0.08	
90	0.10	
HR30X Scale		ASTM E18 Annex A4 & ISO 6508-3
93	0.11	
88	0.16	
80	0.12	
HR45X Scale		ASTM E18 Annex A4 & ISO 6508-3
90	0.08	
82	0.11	
71	0.18	
HR15Y Scale		ASTM E18 Annex A4 & ISO 6508-3
97	0.12	
95	0.15	
92	0.10	
HR30Y Scale		ASTM E18 Annex A4 & ISO 6508-3
94	0.09	
91	0.19	
83	0.41	
HR45Y Scale		ASTM E18 Annex A4 & ISO 6508-3
91	0.10	
86	0.18	
75	0.11	

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Wilson - In-house calibration of Rockwell Diamond Testing Indenters

Rockwell Regular and Superficial diamond indenters for testing machines

<i>Measured Quantity</i>	<i>Best Uncertainty (±) note 1,14</i>	<i>Remarks</i>
Cone Angle	2.1 minutes	ASTM E18
Tip Radius	2.9 microns	ASTM E18
Concentricity of Axis	2.1 minutes	ASTM E18
Polished Flank	5 microns	ASTM E18
Local Deviation From A True Radius	0.5 Micron	ASTM E18
Straightness of the Generatric Line of the Diamond Cone	0.5 Micron	ASTM E18
Indenter Performance	0.1 Rockwell Units	ASTM E18

Wilson - In-house calibration of Rockwell Ball Indenters

Calibration of Steel and Carbide indenters for standardizing and testing machines

<i>Measured Quantity</i>	<i>Best Uncertainty (±) in µin note 1, 15, 16, 17</i>	<i>Remarks</i>
Hardness	2.1 HV	ASTM E18
Indenter Performance	0.1 Rockwell Units	ASTM E18

Wilson - In-house calibration of Vickers and Knoop Indenters

Calibration of Knoop & Vickers indenters for standardizing and testing machines Angular Measurement

<i>Measured Quantity</i>	<i>Best Uncertainty (±) notes 1, 18, 19</i>	<i>Remarks</i>
Knoop 130° Angle	31 seconds	ASTM E92 & ASTM E384
Knoop 172° 30' Angle	32 seconds	ASTM E92 & ASTM E384
Vickers 148° 6' 42" Angle	20 seconds	ASTM E92 & ASTM E384

Indenter Offset determined on indent

0.001 mm Vickers ASTM E92, 0.0005 mm Vickers ASTM E384, 0.001 Knoop ASTM E384	0.17 microns	ASTM E92 & ASTM E384 (Measured by Standardizing Optics)
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Wilson - In-house calibration of Vickers and Knoop Test Blocks^{note30}

Calibration of Brinell, Knoop & Vickers Standardized Test Blocks^{note30}

<i>Measured Quantity</i>	<i>Best Uncertainty (±)</i> ^{notes 1, 20,21,22}	<i>Remarks</i>
Brinell Hardness		ASTM E10 ISO 6506-3
Applied Forces of 10 kgf to 3000 kgf Ball Diameter of 1 mm to 10 mm	HB	
Low Hardness:		
94 HBW 10/500	0.97	
100 HBW 2.5/62.5	0.91	
111 HBW 10/3000	1.29	
139 HBW 2.5/62.5	1.63	
140 HBW 10/1000	1.79	
Mid Hardness:		
183 HBW 10/3000	2.36	
199 HBW 2.5/187.5	2.72	
200 HBW 2.5/187.5	1.45	
200 HBW 10/1500	1.35	
High Hardness:		
315 HBW 10/3000	2.14	
326 HBW 5/750	3.37	
462 HBW 10/3000	4.28	
Vickers Hardness		
Applied Forces 10 gf to 120 kgf	HV	ASTM E384 or E92
Low Hardness:		
129 HV/0.1	1.35	
212 HV/10	1.41	

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<i>Measured Quantity</i>	<i>Best Uncertainty</i> (\pm) ^{notes 1, 20,21,22}	<i>Remarks</i>
217 HV/0.5	2.12	
255 HV/15	1.72	
261 HV/100	1.61	
Mid Hardness:		
321 HV/5	3.79	
388 HV/0.5	4.06	
395 HV/0.1	5.73	
441 HV/100	2.76	
High Hardness:		
598 HV/30	5.78	
611 HV/5	3.27	
694 HV/0.5	4.84	
697 HV/100	5.06	
705 HV/0.2	7.72	
719 HV/30	3.46	
Knoop Indentation Hardness		
Applied Forces of 10 gf to 1 kgf	HK	ASTM E384
Low Hardness:		
112 HK/0.01	3.86	
142 HK/0.1	2.11	
238 HK/0.5	3.34	
Mid Hardness:		
319 HK/0.2	3.45	
516 HK/1	4.64	
524 HK/0.1	5.47	
High Hardness:		
637 HK/0.1	9.09	

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<i>Measured Quantity</i>	<i>Best Uncertainty (±) notes 1, 20,21,22</i>	<i>Remarks</i>
700 HK/0.025	11.92	
741 HK/0.1	5.95	

Field Service Calibration of Brinell, Knoop and Vickers hardness testing machines

Brinell Microscope

<i>Measured Quantity</i>	<i>Best Uncertainty (±) note 1,11,12,13</i>	<i>Remarks</i>
10X to 100 X Magnification	1.6 micron	ASTM E10
Vickers and Knoop Microscope 30X to 1000 X Magnification	0.9 microns	ASTM E92 and E384

Indirect Verification of Brinell, Knoop & Vickers Testing Machines

Brinell Hardness Applied Forces of 10 kgf to 3000 kgf Ball Diameter of 1 mm to 10 mm	HBW	ASTM E10
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Low Hardness:

94 HBW 10/500	1.12
100 HBW 2.5/62.5	0.98
111 HBW 10/3000	1.41
139 HBW 2.5/62.5	1.74
140 HBW 10/1000	1.92

Mid Hardness:

183 HBW 10/3000	2.42
199 HBW 2.5/187.5	2.82
200 HBW 2.5/187.5	1.62
200 HBW 10/1500	1.60

High Hardness:

315 HBW 10/3000	2.59
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<i>Measured Quantity</i>	<i>Best Uncertainty</i> (\pm) <small>notes 1, 20,21,22</small>	<i>Remarks</i>
326 HBW 5/750	3.97	
462 HBW 10/3000	4.95	
Vickers Hardness		
Applied Forces 10 gf to 120 kgf	HV	ASTM E384 or E92
Low Hardness:		
129 HV/0.1	1.61	
212 HV/10	1.44	
217 HV/0.5	2.41	
255 HV/15	1.77	
261 HV/100	1.75	
Mid Hardness:		
321 HV/5	3.87	
388 HV/0.5	4.21	
395 HV/0.1	6.36	
441 HV/100	2.81	
High Hardness:		
598 HV/30	5.79	
611 HV/5	3.49	
694 HV/0.5	5.53	
697 HV/100	5.50	
705 HV/0.2	9.06	
719 HV/30	3.64	
Knoop Indentation Hardness		
Applied Forces of 10 gf to 1 kgf	HK	ASTM E384
Low Hardness:		
112 HK/0.01	5.15	
142 HK/0.1	2.26	
238 HK/0.5	3.78	

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<i>Measured Quantity</i>	<i>Best Uncertainty (±) ^{notes 1, 20,21,22}</i>	<i>Remarks</i>
Mid Hardness:		
319 HK/0.2	3.50	
516 HK/1	4.79	
524 HK/0.1	5.82	
High Hardness:		
637 HK/0.1	9.54	
700 HK/0.025	12.83	
741 HK/0.5	6.17	
Direct Verification of Wilson 2000 Series Rockwell Testing Machines		
Testing Time Cycle	0.13 seconds	ASTM E18 Annex A1
Indenter Contact Velocity		
Preliminary Force Dwell		
Additional Force Application		
Total Force Dwell		
Elastic Recovery Dwell		
Test Force (3 kg to 150 kg)	0.125 %	ASTM E18 Annex A1
Depth Measuring Device	0.05 microns	ASTM E18 Annex A1
Test Machine Level	0.0005 in/ft elevation	Instron Internal Procedure
Measurement Hysteresis	.01 HR	ASTM E18 Annex A1
		99 to 101 Rockwell Points for all Rockwell Hardness Scales Except Rockwell Ball Scales Noted Below
		129 to 131 Rockwell Points for Rockwell Ball Scales: HRB, HRE, HRF, HRG, HRH & HRK Only

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Shore - In-house calibration of Durometers

Durometers

<i>Parameter</i>	<i>Range in D.P.</i> <small>note 23</small>	<i>Best Uncertainty (±) in D.P.</i> <small>notes 1, 23, 25, 27</small>	<i>Remarks</i>
SI Durometers			
Type A	0 to 100	0.27	ASTM D2240 and DIN 53505
Type B	0 to 100	0.27	ASTM D2240
Type C	0 to 100	0.36	ASTM D2240
Type D	0 to 100	0.36	ASTM D2240 and DIN 53505
Type DO	0 to 100	0.36	ASTM D2240
Type M	0 to 100	0.50	ASTM D2240
Type O	0 to 100	0.27	ASTM D2240
Type OO	0 to 100	0.27	ASTM D2240

Round Style Durometers

Type A	0 to 100	1.16	ASTM D2240
Type B	0 to 100	1.16	ASTM D2240
Type C	0 to 100	1.16	ASTM D2240
Type D	0 to 100	1.16	ASTM D2240
Type DO	0 to 100	1.16	ASTM D2240
Type M	0 to 100	1.24	ASTM D2240
Type O	0 to 100	1.16	ASTM D2240
Type OO	0 to 100	1.20	ASTM D2240
Type OOO	0 to 100	1.20	ASTM D2240
Type OOOS	0 to 100	1.16	ASTM D2240
Type T	0 to 100	1.16	Shore Calibration Laboratory Specifications

Quad Style Durometers

Type A	0 to 100	5.78	ASTM D2240
Type B	0 to 100	5.78	ASTM D2240
Type C	0 to 100	5.78	ASTM D2240
Type D	0 to 100	5.78	ASTM D2240
Type DO	0 to 100	5.78	ASTM D2240
Type O	0 to 100	5.78	ASTM D2240

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<i>Parameter</i>	<i>Range in D.P.</i> ^{note 23}	<i>Best Uncertainty (±) in D.P.</i> ^{notes 1, 23,25, 27}	<i>Remarks</i>
Type OO	0 to 100	5.78	ASTM D2240
Type T	0 to 100	5.78	Shore Calibration Laboratory Specifications

Durotronic Style Durometers

Type A	0 to 100	0.42	ASTM D2240
Type B	0 to 100	0.42	ASTM D2240
Type C	0 to 100	0.40	ASTM D2240
Type D	0 to 100	0.40	ASTM D2240
Type DO	0 to 100	0.40	ASTM D2240
Type O	0 to 100	0.50	ASTM D2240
Type M	0 to 100	0.60	ASTM D2240

Pencil Style Durometers

Type A	0 to 100	5.78	ASTM D2240
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Shore - In-house calibration of IRHD

<i>Range</i>	<i>Best Uncertainty (±)</i> ^{notes 1, 28}	<i>Remarks</i>
10 to 100 IRHD	See Below	ASTM D1415 Type S2 & ISO 48 Method N
0.295 N	0.002 N	Minor Force on Ball
5.4 N	0.006 N	Major Force on Ball
5.7 N	0.006 N	Total Force on Ball
8.3 N	0.016 N	Force on Foot
6.0 mm	0.02 mm	Inside Diameter of Foot
20.0 mm	0.0204 mm	Outside Diameter of Foot
2.5 mm	0.0015 mm	Diameter of Ball

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Shore - In-house calibration of Test Blocks

Rubber Test Blocks

<i>Parameter</i>	<i>Range in D.P. note 23</i>	<i>Best Uncertainty (±) in D.P. notes 1, 2, 23, 29</i>	<i>Remarks</i>
Type A (S1)	30 to 90	0.27	Shore Calibration Laboratory Specifications
Type DO (S1)	50 to 80	0.36	Shore Calibration Laboratory Specifications
Type M (S1)	30 to 90	0.50	Shore Calibration Laboratory Specifications
Type O (S1)	40 to 90	0.27	Shore Calibration Laboratory Specifications
Type OO (S1)	80	0.27	Shore Calibration Laboratory Specifications

Shore - In-house calibration of Durocalibrator

Shore Durocalibrator

<i>Parameter</i>	<i>Range in D.P. note 23</i>	<i>Best Uncertainty (±) in D.P. notes 1, 23, 24, 25, 26</i>	<i>Remarks</i>
Type A	0 to 100	0.13	ASTM D2240
Type D	10 to 100	0.31	ASTM D2240
Type AD (Combined)	0 to 100	0.13	ASTM D2240

Shore - In-house calibration of Type 3 Operating Stands

<i>Range in mm/s</i>	<i>Best Uncertainty (±) in mm/s note 1</i>	<i>Remarks</i>
0 to 3.2	0.031	ASTM D2240

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THERMODYNAMIC

NVLAP Code: 20/T08
Field Calibration of Temperature

In situ Temperature Measurement Type T Thermocouple

Range	Best Uncertainty (\pm) ^{note 1}	Remarks
-200 °C to -150 °C	1.3 °C	Type T Thermocouple with Fluke 714
-150 °C to -100 °C	1.2 °C	Type T Thermocouple with Fluke 714
-100 °C to -50 °C	1.1 °C	Type T Thermocouple with Fluke 714
-50 °C to 0 °C	1.1 °C	Type T Thermocouple with Fluke 714

In situ Temperature Measurement Type K Thermocouple

0 °C to 100 °C	0.7 °C	Type K Thermocouple with Fluke 714
100 °C to 200 °C	1.2 °C	Type K Thermocouple with Fluke 714
200 °C to 300 °C	2.1 °C	Type K Thermocouple with Fluke 714
300 °C to 400 °C	2.6 °C	Type K Thermocouple with Fluke 714
400 °C to 500 °C	3.2 °C	Type K Thermocouple with Fluke 714
500 °C to 600 °C	3.7 °C	Type K Thermocouple with Fluke 714
600 °C to 700 °C	4.7 °C	Type K Thermocouple with Fluke 714
700 °C to 800 °C	4.8 °C	Type K Thermocouple with Fluke 714
800 °C to 900 °C	5.3 °C	Type K Thermocouple with Fluke 714

Thermocouple Simulation

Type K	1.3 °C	Sensor substitution method using Fluke 714
Type J	0.9 °C	Sensor substitution method using Fluke 714
Type B	2.6 °C	Sensor substitution method using Fluke 714
Type E	0.9 °C	Sensor substitution method using Fluke 714
Type T	0.9 °C	Sensor substitution method using Fluke 714
Type R	2.4 °C	Sensor substitution method using Fluke 714
Type S	2.4 °C	Sensor substitution method using Fluke 714
Type U	0.9 °C	Sensor substitution method using Fluke 714
Type L	0.8 °C	Sensor substitution method using Fluke 714

2011-04-01 through 2012-03-31

Effective dates

For the National Institute of Standards and Technology



CALIBRATION LABORATORIES

NVLAP LAB CODE 200301-0

Scope Revised: 2012-01-12

1. Represents an expanded uncertainty using a coverage factor, $k = 2$, at an approximate level of confidence of 95 %.
2. Uncertainty of the voltage ratio is < 0.1 microvolt per volt.
3. Uncertainties of the measured value are determined by the statistics of the test and the artifact tested but are typically better than ± 0.05 % for class AA instruments, ± 0.25 % for class A instruments, and ± 0.1 % for class A1 instruments.
4. The standardized test blocks used for verification are calibrated at the Wilson Hardness Calibration Laboratory in accordance with ASTM E18 Annex A4 using NIST Rockwell HRC standard reference materials (SRM) 2810, 2811, and 2812. All Rockwell Ball hardness scales are traceable to Wilson hardness levels through laboratory standardizing machines. All other Rockwell diamond hardness scales are traceable to NIST through a NIST Reference Diamond. The standardizing machines are directly verified according to ASTM E18 using devices that are traceable to NIST either directly or through a NVLAP -approved laboratory.
5. The HRC Hardness scale is traceable to the NIST Rockwell HRC standard reference materials (SRM) 2810, 2811, 2812.
6. Standardized Rockwell test blocks calibrated by ball penetrators are traceable to traditional Wilson Hardness Levels.
7. Standardized Rockwell test blocks calibrated for the HRA carbide hardness scale are directly traceable to the Cemented Carbide Producers Association (CCPA) through standard reference materials.
8. Standardized Rockwell test blocks calibrated for the HRA steel, HRD and HRN hardness scales are traceable to N.I.S.T.
9. The standardizing machines are directly verified according to ASTM E18 using devices that are traceable to NIST—either directly or through a NVLAP-approved laboratory.
10. The stated measurement uncertainty is expanded with a coverage factor of $k = 2$, representing a level of confidence of approximately 95 %. The measurement uncertainty reported is the actual measurement uncertainty for the calibration standards used during customer machine indirect verification. All standardized test blocks are calibrated using Laboratory Standardizing Machines at the Wilson Hardness Calibration Laboratory.
11. The calibration shall be in accordance with ASTM E10 for Brinell measuring microscope verification.
12. The calibration shall be in accordance with ASTM E384 for micro-indentation measuring device verification.
13. Direct verification of hardness testing machines shall be in accordance with ASTM E18. Measurement uncertainty reported is the actual measurement uncertainty of the calibration standards used during direct verification.
14. The calibration shall be in accordance with ASTM E18.
15. The calibration shall be in accordance with ASTM E18 for Rockwell calibrations or ASTM E10 for Brinell calibrations.

2011-04-01 through 2012-03-31

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National Voluntary Laboratory Accreditation Program



CALIBRATION LABORATORIES

NVLAP LAB CODE 200301-0

Scope Revised: 2012-01-12

16. Ball Diameter, Roundness, Chemical Composition, Density & Surface Finish are subcontracted calibration from an accredited laboratory recognized by the ILAC agreement.
17. Ball hardness is measured internally by Instron or subcontracted calibration from an accredited laboratory recognized by the ILAC agreement.
18. The calibration shall be in accordance with ASTM E384 for Knoop and Vickers micro-indentation indenters.
19. The calibration shall be in accordance with ASTM E92 for Vickers heavy load testing indenters & standardizing indenters.
20. The calibration shall be in accordance with ASTM E10 for Brinell test block calibrations.
21. The calibration shall be in accordance with ASTM E92 for Vickers heavy load test block calibrations.
22. The calibration shall be in accordance with ASTM E384 for Knoop and Vickers micro-indentation test block calibrations.
23. D.P. = Durometer Points
24. Durocalibrator calibrates A, B, O & T type durometers.
25. Durocalibrator calibrates C, D, & DO type durometers.
26. Durocalibrator calibrates A, B, C, D, DO, O & T type durometers.
27. Shore T scale specified is certified to Shore Hardness Calibration Laboratory Procedures.
28. IRHD = International Rubber Hardness Degree
29. Best measurement uncertainty stated for rubber test blocks on scope assumes perfect test block uniformity. Actual test block non-uniformity will be calculated in overall measurement uncertainty calculation for each test block. The combined measurement uncertainty for each test block is reported on the calibration certificate.
30. Calibration is performed at our block production facility located at 33 Lewis Road, Binghamton, NY 13905.

2011-04-01 through 2012-03-31

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