THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

NEWAGE TESTING INSTRUMENTS, INC.

Feasterville, PA

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 18th day of May 2009.

President
For the Accreditation Council
Certificate Number: 1734.01
Valid to: March 31, 2011

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

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CALIBRATION

Valid To: March 31, 2011 Certificate Number: 1734.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Mechanical

Parameter/Equipment	Range	Best Uncertainty[2, 4] (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers[3]	HRA: > 80 HRA (70 to 79) HRA (60 to 69) HRA HRBW: > 80 HRBW (51 to 79) HRBW (10 to 50) HRBW HRC: > 60 HRC (40 to 59) HRC (20 to 39) HRC HRD: > 70 HRD (50 to 69) HRD (40 to 49) HRD HREW: > 80 HREW (75 to 78) HREW (65 to 74) HREW	 0.21 HRA 0.2 HRA 0.43 HRA 0.5 HRBW 0.67 HRBW 1.1 HRBW 0.32 HRC 0.33 HRC 0.39 HRC 0.16 HRD 0.19 HRD 0.2 HRD 0.57 HREW 0.58 HREW 0.48 HREW	ASTM E18, ISO 6508

Parameter/Equipment	Range	Best Uncertainty[2, 4] (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers[3] (cont)	HRFW: > 87 HRFW (70 to 86) HRFW (40 to 69) HRFW HRGW: > 80 HRGW (40 to 79) HRGW (10 to 39) HRGW HRHW: > 93 HRHW (88 to 92) HRHW (60 to 87) HRHW HRKW: > 70 HRKW (30 to 69) HRKW (10 to 29) HRKW HRRW: > 96 HRRW (60 to 95) HRRW HR15N: > 90 HR15N (80 to 89) HR15N (60 to 79) HR15N HR15TW: > 88 HR15TW (80 to 87) HR15TW (60 to 79) HR15TW HR30N: > 77 HR30N (60 to 76) HR30N (40 to 59) HR30N HR30TW: > 70 HR30TW (55 to 69) HR30TW (30 to 54) HR30TW	 0.55 HRFW 0.52 HRFW 0.62 HRFW 0.3 HRGW 0.77 HRGW 0.82 HRGW 0.41 HRHW 0.45 HRHW 0.58 HRHW 0.66 HRKW 0.67 HRKW 0.69 HRKW 0.22 HRRW 0.42 HRRW 0.22 HR15N 0.24 HR15N 0.48 HR15N 0.34 HR15TW 0.38 HR15TW 0.45 HR15TW 0.29 HR30N 0.3 HR30N 0.42 HR30N 0.32 HR30TW 0.55 HR30TW 0.58 HR30TW	ASTM E18, ISO 6508

Parameter/Equipment	Range	Best Uncertainty[2, 4] (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers[3] (cont)	HR45N: > 67 HR45N (50 to 66) HR45N (20 to 49) HR45N HR45TW: > 50 HR45TW (18 to 49) HR45TW (1 to 17) HR45TW	 0.17 HR45N 0.2 HR45N 0.48 HR45N 0.42 HR45TW 0.65 HR45TW 0.75 HR45TW	ASTM E18, ISO 6508
Indirect Verification of Leeb Hardness Testers[3]	(0 to 750) LD	8 LD	ASTM A956
Indirect Verification of Brinell Hardness Testers[3]	HBW: (100 to 200) HBW (300 to 400) HBW (500 to 600) HBW	 3 HBW 4 HBW 8 HBW	ASTM E10, E103, ISO 6506
Indirect Verification of Vickers Hardness Testers[3] (> 1 kgf)	Error Repeatability: (100 to 240) HV (> 240 to 600) HV > 600 HV	The greater of 0.5 % of the mean of 5 diagonals or 0.12 μm (5 μin). 5 HV 8 HV 12 HV	ASTM E92, ISO 6507 Repeatability uncertainty is given as a function of the mean of 5 diagonals
Indirect Verification of Microindentation Hardness Testers[3] (Knoop and Vickers)	Vickers (< 1 kgf) (100 to 240) HV (240 to 600) HV > 600 HV Knoop (100 to 250) HK (250 to 650) HK > 650 HK	 5 HV 15 HV 10 HV 9 HK 16 HK 25 HK	ASTM E384, ISO 6507

Parameter/Equipment	Range	Best Uncertainty[2, 4] (±)	Comments
Direct Verification of Rockwell Hardness Testers[3] –			ASTM E18, ISO 6508
Verification of the test force	(3 to 150) kgf	0.05 % of full scale	Verification of the test force is by load cell per the method of ASTM E4
Verification of the depth-measuring device	(0 to 260) μm	0.14 μm	
Direct Verification of Brinell Hardness Testers[3] –			ASTM E10, E103, ISO 6506
Verification of the test force	(125 to 3000) kgf	0.05 % of full scale	Verification of the test force is by load cell per the method of ASTM E4
Verification of the mean diameter of the indenter	(0 to 10) mm	2 μm	By mechanical comparison
Verification of the device for measuring indentation diameter	(0 to 6) mm	0.01 mm	By stage micrometer
Direct Verification of Vickers Hardness Testers[3] –			ASTM E92, ISO 6507
Verification of the test force	(200 to 30 000) gf	0.05 % of full scale	Verification of the test force is by load cell per the method of ASTM E4
Verification of the device for measuring indentation diagonals	(0 to 600) μm	0.63 μm	By mechanical comparison

Parameter/Equipment	Range	Best Uncertainty[2, 4] (±)	Comments
Direct Verification of Microindentation Hardness Testers[3] – (Vickers and Knoop)			ASTM E384, ISO 6507
Verification of the test force	(0 to 1000) gf	0.05 % of full scale	Verification of the test force is by load cell per the method of ASTM E4
Verification of the device for measuring indentation diagonals	(0 to 200) μm	0.63 μm	By mechanical comparison
Direct Verification of Durometer Hardness[3] – Types A, B, C, D, M, O and OO			ASTM D2240, ISO 868 The indenter extension is checked with gage blocks
Verification of indenter extension	(0 to 2.5) mm	0.7 μm	The dimensional characteristics of the indenters are verified with visual system
Verification of the durometer spring force	(258 to 4533) gf	0.05 % of full scale	The durometer spring is verified with deadweights or load cells
Direct Verification of International Hardness Testers[3] – Types IRHD and IRHDM			ASTM D1415 The indenter displacement is checked with gage blocks.
Verification of indenter displacement	(0.85 to 579) mm	0.6 μm	The dimensional characteristics of the indentors are verified with visual system.
Verification of the durometer forces	(0 to 15) gf (0 to 846) gf	0.4 % of full scale 0.03 % of full scale	The durometer forces are verified with balance.

[1] This laboratory offers commercial and field calibration service.

[2] "Best Uncertainty" is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer's device, to the environment and to influences from the circumstances of the specific calibration.

[3] Field calibration service is available for this calibration and this laboratory meets A2LA *R104 – General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the uncertainties achievable on a customer's site can normally be expected to be larger than the Best Measurement Capabilities (BMC) that the accredited laboratory has been assigned as Best Uncertainty on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the calibration uncertainty being larger than the BMC.

For Rockwell scales using ball indenters, both steel (S) and tungsten carbide (W) are used. Best measurement capability is reflected with the tungsten carbide balls only.

[4] Indentors are verified by performance only.