



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

UNITED TESTING SYSTEMS, INC.
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CALIBRATION

Valid until: December 31, 2013

Certificate Number: 1404.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations of hardness, force, and torque testing equipment¹:

I. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Rockwell & Rockwell Superficial Hardness Testers ³	HRA:		Indirect verification per ASTM E18 & NIST traceable test blocks
	(80 to 84) HRA	0.23 HRA	
	(70 to 78) HRA	0.21 HRA	
	(20 to 65) HRA	0.42 HRA	
	HRBW		
	(80 to 100) HRBW	0.48 HRB	
	(60 to 79) HRBW	0.66 HRB	
	(40 to 59) HRBW	1.1 HRB	
	HRC		
	(60 to 65) HRC	0.31 HRC	
	(35 to 55) HRC	0.41 HRC	
	(20 to 30) HRC	0.42 HRC	
	HRD		
	(71 to 75) HRD	0.16 HRD	
	(51 to 67) HRD	0.27 HRD	
	(40 to 48) HRD	0.24 HRD	
	HREW		
(93 to 100) HREW	0.56 HRE		
(84 to 90) HREW	0.56 HRE		
(70 to 79) HREW	0.45 HRE		

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Rockwell & Rockwell Superficial Hardness Testers ³ (cont)	HRFW		ASTM E18
	(94 to 100) HRFW	0.45 HRF	
	(80 to 90) HRFW	0.44 HRF	
	(60 to 75) HRFW	0.47 HRF	
	HRGW		
	(80 to 94) HRGW	0.81 HRG	
	(55 to 75) HRGW	0.77 HRG	
	(30 to 50) HRGW	0.85 HRG	
	HRHW		
	(96 to 100) HRHW	0.39 HRH	
	(80 to 94) HRHW	0.46 HRH	
	HRKW		
	(85 to 100) HRKW	0.62 HRK	
	(65 to 80) HRKW	0.64 HRK	
	(40 to 60) HRKW	0.70 HRK	
	HRLW	0.36 HRL	
	HRMW	0.54 HRM	
	HRPW	0.52 HRP	
	HRRW	0.32 HRR	
	HRSW	0.66 HRS	
	HRVW	0.22 HRV	
	HR15N		
	(90 to 92) HR15N	0.29 HR15N	
	(78 to 88) HR15N	0.27 HR15N	
	(70 to 77) HR15N	0.44 HR15N	
	HR30N		
(77 to 82) HR30N	0.27 HR30N		
(55 to 73) HR30N	0.33 HR30N		
(42 to 50) HR30N	0.57 HR30N		
HR45N			
(66 to 72) HR45N	0.25 HR45N		
(37 to 61) HR45N	0.26 HR45N		
(20 to 31) HR45N	0.62 HR45N		



Parameter/Equipment	Range	CMC ² (±)	Comments	
Indirect Verification of Rockwell & Rockwell Superficial Hardness Testers ³ (cont)	HR15TW (87 to 93) HR15TW (81 to 86) HR15TW (74 to 80) HR15TW	0.29 HR15T 0.47 HR15T 0.35 HR15T	ASTM E18	
	HR30TW (70 to 83) HR30TW (57 to 69) HR30TW (43 to 56) HR30TW	0.48 HR30T 0.40 HR30T 0.57 HR30T		
	HR45TW (53 to 73) HR45TW (33 to 52) HR45TW (13 to 32) HR45TW	0.47 HR45T 0.62 HR45T 0.63 HR45T		
	HR15WW	0.45 HR15W		
	HR30WW	0.58 HR30W		
	HR45WW	0.90 HR45W		
	HR15XW	0.26 HR15X		
	HR30XW	0.27 HR30X		
	HR45XW	0.71 HR45X		
	HR15YW	0.96 HR15Y		
	HR30YW	0.47 HR30Y		
	HR45YW	0.27 HR45Y		



Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Indirect Verification of Brinell Hardness Testers ³ at Test Conditions –			
HBW 10/3000/15	(100 to 250) HBW (251 to 600) HBW	12 HBW 13 HBW	Indirect verification method per ASTM E10
HBW 10/1500/15	(60 to 200) HBW (201 to 450) HBW	6.2 HBW 8.3 HBW	
HBW 10/500/15	(50 to 100) HBW (101 to 158) HBW	2.2 HBW 2.8 HBW	
Indirect Verification of Vickers Hardness Testers ³	(100 to 249) HV (250 to 600) HV >600 HV	12 HV 5.3 HV 29 HV	Indirect verification per ASTM E384
Indirect Verification of Knoop Hardness Testers ³	(100 to 249) HK (250 to 600) HK >600 HK	7.0 HK 7.0 HK 17 HK	Indirect verification per ASTM E384
Force ³ – Tension & Compression	(1 to 100) lbf (50 to 1000) lbf	0.23 % IV 0.20 % IV	ASTM E4
	(1000 to 10 000) lbf (10 000 to 30 000) lbf (30 000 to 400 000) lbf	0.029 % IV 0.066 % IV 0.020 % IV	Load cells, dead weights
Direct Verification of Brinell Hardness Testers ³ –			ASTM E10
Verification of the Test Force	(62.5 to 3000) kgf	0.029 % IV	Load cells
Verification of the Device for Measuring Indentation Diameters	(0 to 7) mm	0.061 mm	Stage micrometer

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Torque ³ – Transducers Wrench	(1 to 2500) in·lb (1 to 2500) in·lb	0.18 % IV 0.30 % IV	Manufacturer's specifications, torque arm & weights torque transducers
Tensile Testers ³ – Static Alignment Displacement Crosshead Speed	(0.2 to 100) % bending (0.1 to 20) in Up to 20 in/min	9.1 x 10 ⁻⁵ mV 0.0011 in 0.21 % IV	ASTM E1012 ASTM E2309 Digital indicator & digital timer ASTM E2658
Extensometer ³	(0 to 1) in (0 to 20) in	120 µin 210 µin	ASTM E83

II. Thermodynamic Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature Chambers ³	Up to 1280 °C	1.4 °C	Multimeter & Type K thermocouple

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

² Calibration and Measurement Capability (CMC) 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 or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device 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 actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found 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 actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ In the statement of CMC, “% IV” represents a percentage of indicated value.



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

UNITED TESTING SYSTEMS INC.

Flint, MI

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 22nd day of December 2011.





President & CEO

For the Accreditation Council
Certificate Number 1404.01
Valid to December 31, 2013

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