THE AMERICAN ASSOCIATION FOR LABORATORY 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 18 June 2005*).

Presented this 14th day of November 2007.

Interim President
For the Accreditation Council
Certificate Number: 1404.01
Valid to: December 31, 2009

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

UNITED TESTING SYSTEMS, INC.
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CALIBRATION

Valid until: December 31, 2009 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 equipment[1]:

I. Mechanical

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers	HRC-63 HRC-45 HRC-25	0.32 HRC 0.32 HRC 0.47 HRC	ASTM E18 and NIST traceable test blocks
	HRB-85 HRB-65 HRB-45	0.48 HRB 0.64 HRB 1.0 HRB	ASTM E18
	HRA-83 HRA-73 HRA-63	0.2 HRA 0.27 HRA 0.2 HRA	
	HRE-100 HRE-90 HRE-82	0.32 HRE 0.32 HRE 0.47 HRE	
	HRF-99 HRF-90 HRF-80	0.32 HRF 0.33 HRF 0.47 HRF	

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers (cont)	HR15N-92 HR15N-83 HR15N-72 HR30N-80 HR30N-65 HR30N-47 HR45N-70 HR45N-49 HR45N-25 HR15T-88 HR15T-82 HR15T-75 HR30T-80 HR30T-65 HR30T-45 HR45T-56 HR45T-37 HR45T-17 HR15W-92 HR15W-83 HR15W-72 HR15Y-110 HR15Y-100 HR15Y-90 HR30Y-100 HR30Y-85 HR45W-100 HRD-73 HRD-63 HRD-44 HRG-87 HRG-49 HRG-10	0.20 HR15N 0.20 HR15N 0.20 HR15N 0.27 HR30N 0.27 HR30N 0.42 HR30N 0.27 HR45N 0.27 HR45N 0.42 HR30N 0.28 HR15T 0.27 HR15T 0.92 HR15T 0.27 HR30T 0.27 HR30T 0.42 HR30T 0.27 HR45T 0.27 HR45T 0.58 HR45T 0.20 HR15W 0.22 HR15W 0.22 HR15W 0.27 HR15Y 0.56 HR15Y 0.27 HR15Y 0.42 HR30Y 0.27 HR30Y 0.20 HR45W 0.32 HRD 0.32 HRD 0.47 HRD 0.32 HRG 0.32 HRG 0.47 HRG	ASTM E18

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers (cont)	HRH-63 HRH-25 HRH-46 HRK-100 HRK-80 HRK-60 HRL-100 HRL-80 HRL-60 HRM-108 HRM-100 HRM-90.9 HR15X-92 HR15X-83 HR15X-72 HR45X-98 HR45X-92 HRR-120 HRS-100 HRV-100	0.39 HRH 0.50 HRH 0.32 HRH 0.32 HRK 0.32 HRK 1.25 HRK 0.32 HRL 0.32 HRL 1.25 HRL 0.32 HRM 0.32 HRM 0.47 HRM 0.20 HR15X 0.20 HR15X 0.20 HR15X 0.20 HR45X 0.20 HR45X 0.36 HRR 0.54 HRS 0.33 HRV	ASTM E18
Indirect Verification of Brinell Hardness Testers	(100 to 450) HBW	6.1 HBW	ASTM E10
Indirect Verfication of Vickers Hardness Testers –			
(1 to 50) kgf	(100 to 800) HV	13 HV	ASTM E92
(1 to 1000) gf	(100 to 800) HV	30 HV	ASTM E384
Indirect Verfication of Knoop Hardness Testers –			
(1 to 1000) gf	(92 to 822) HK	11 HK	ASTM E384

Parameter/Equipment	Range	Best Uncertainty[2, 3, 4] (±)	Comments
Force – Tension and Compression	(1 to 100) lbf (50 to 1000) lbf (1000 to 10 000) lbf (10 000 to 30 000) lbf (30 000 to 400 000) lbf	0.2 % IV 0.24 % IV 0.17 % IV 0.2 % IV 0.21 % IV	ASTM E4 Proving rings, load cells, dead weights
Direct Verification of Brinell Hardness Testers – Verification of the test force Verification of the device for measuring indentation diameters	 (62.5 to 3000) kgf (0 to 7) mm	 0.18 % IV 0.16 mm	ASTM E10
Torque – Transducers Wrench	 (1 to 2500) in·lb (1 to 2500) in·lb	 0.23 % FS 0.29 % IV	Manufacturer's specifications torque arm and weights torque transducers
Rockwell Hardness Standardizing Machine – Force Depth	 (3 to 150) kgf (0 to 3000) μm	 0.26 % of applied force 0.08 μm	ASTM E18
Extensometer	(0 to 1) in (0 to 20) in	110 μin 980 μin	ASTM E83
Direct Verification of Durometers – Force Indenter Shape and Extention	 (130 to 4500) gf (0 to 0.25) mm	 1.0 % IV 0.6 mm	ASTM D2240

II. Thermodynamic Quantities

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
Temperature Uniformity – Type K	Up to 1280 °C	1.4 °C	Manufacturer's specification and in-house procedures

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[1] This laboratory offers commercial calibration service and on-site 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 (if the calibration is performed in the field) and to influences from the circumstances of the specific calibration.

[3] On-site calibration service is available for this calibration. 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.

[4] "% FS" represents a percentage of full-scale reading and "% IV" represents a percentage of indicated value.