THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

ALABAMA SCALE & INSTRUMENT – MARSHALL, INC.
d.b.a. ASI Calibration Labs - Texas
Marshall, TX

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 24th day of 2008.

President
For the Accreditation Council
Certificate Number 1876.02
Valid to February 28, 2010
REVISED June 25, 2008

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

ALABAMA SCALE & INSTRUMENT – MARSHALL, INC.
d.b.a. ASI Calibration Labs - Texas
3314 Monigold Road
Marshall, TX 75672
Lawson Hill Phone: 251 660 9999

CALIBRATION

Valid To: February 28, 2010 Certificate Number: 1876.02

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

I. Dimensional

Parameter/Equipment	Range	Best Uncertainty[2, 5] (±)	Comments
Calipers, Verniers[3]	Up to 36 in	290 µin	Gage blocks and rod standards
Height Gages[3]	Up to 36 in	0.16 % of reading	Gage blocks and rod standards
Micrometers[3] –			
Outside	Up to 36 in	(110 + 0.94*L*) µin	Supermic, gage blocks and comparator.
Inside	Up to 36 in	(110 + 16*L*) µin	
Depth	Up to 36 in	(110 + 16*L*) µin	
Dial and Test Indicators[3]	Up to 2 in	250 µin	Gage blocks
Pin Gages	Up to 6 in	(4.7 + 9.1*L*) µin	Supermic., gage blocks and comparator

Parameter/Equipment	Range	Best Uncertainty[2, 5] (±)	Comments
Plain Plug Gages	Up to 6 in	(4.7 + 9.1*L*) µin	Supermic, gage blocks, and comparator
Verification of Length[3] – Rules and Tapes	Up to 360 in Up to 1200 in	(0.012 + 0.00008*L*) in (0.0085 + 0.016*L*) in	Gage blocks, linear standards
Gage Blocks	(0.3125 to 1) in 2 in 3 in 4 in	3.6 µin 4.3 µin 5.1 µin 6.1 µin	Gage block comparator
Long Gage Blocks	(5 to 20) in	(6.4 + 1.2*L*) µin	Comparison of gage blocks using Brown & Sharpe digital probe with amplifier
Thread Measuring Wires	(4 to 120) TPI	13 µin	Gage blocks and Supermic
Length Standards – Setting Rods	Up to 40 in	(6.4 + 1.2*L*) µin	Gage blocks, Brown & Sharpe digital probe with amplifier
Thread Plugs – Standard 60° Screw, Metric Screw Major Diameter Pitch Diameter	 Up to 6 in Up to 6 in	 (7.7 + 4*L*) µin 160 µin	 Supermic with thread measuring wires
Thread Plugs – Pipe Inch (NPT, NPSM, NPSL, ANPT, NPTF) Major Diameter Pitch Diameter	 Up to 6 in Up to 6 in	 (10 + 3.8*L*) µin 170 µin	 Supermic with thread measuring wires

Parameter/Equipment	Range	Best Uncertainty[2, 5] (±)	Comments
Thread Rings – Standard 60° Screw, Metric Screw Pipe Inch (NPT, NPSM, NPSL, ANPT, NPTF) GO / NO-GO	Up to 3 in	300 µin	Master threaded set plug
Ring Gages	(0.001 to 10) in	(20 + 5*L*) µin	Supermicrometer and gage blocks
Surface Plates – Repeatability Only	(18 in × 24 in) to (72 in × 96 in)	50 µin	Repeat-o-meter

II. Mechanical

Parameter/Equipment	Range	Best Uncertainty[2, 5] (±)	Comments
Balances[3, 4]	1 mg to 13.2 kg	0.5 *LSD*	Verification with Class 1 weights
Scales and Belt Scales[4]	(0.005 to 200 000) lb	0.5 *LSD*	Verification with Class 6 and Class F weights per NIST HB44
Pressure Gages, Transducers and Transmitters[3]	(-15 to 300) psi (50 to 10 000) psi	0.084 psi 0.2 % of reading	ASME B40, Druck 610 Deadweight tester
Verification of Force[3] – Tension and Compression	(0 to 10 000) lbf	0.1 % of reading	Verification by NIST HB44 and ASTM E4 with Class F weights and load cells

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
Torque[3]	(4 to 50) in·lb (30 to 400) in·lb (80 to 100) in·lb (20 to 250) ft·lb (100 to 1000) ft·lb	0.15 in·lb 1.2 in·lb 2.9 in·lb 0.73 ft·lb 3.1 ft·lb	Torque transducers and indicators
Indirect Verification of Rockwell Hardness Testers	HRB Low (43.31) Middle (65.13) High (82.50) Low (43.31) Middle (65.13) High (82.50)	 1 HRB 0.64 HRB 0.46 HRB Repeatability: 0.24 HRB 0.32 HRB 0.28 HRB	ASTM E18
Indirect Verification of Rockwell Hardness Testers[3]	HRC Low (27.53) Middle (45.60) High (62.48) Low (27.53) Middle (45.60) High (62.48)	 0.38 HRC 0.33 HRC 0.31 HRC Repeatability: 0.21 HRC 0.28 HRC 0.2 HRC	ASTM E18

III. Thermodynamics

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
Temperature – Measure	(-200 to 850) °C	0.46 °C + 9.25 x 10^{-5}/ °C	Omega CL-27 with Pt 100 Ω RTD
Temperature – Measuring Equipment Ice Point	(Ambient + 5 to 100) °C (100 to 300) °C 0 °C	0.42 °C 0.78 °C 0.2 °C	Hart Scientific 9100 dry block ASTM E563-02

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
RTD – Simulation			
Pt 385, 100 Ω	(-200 to 800) °C	0.49 °C	Fluke 725
Pt 385, 1000 Ω	(-200 to 630) °C	0.39 °C	
Thermocouple Simulation –			
Type K	(-200 to 0) °C	1.6 °C	Fluke 725
	(0 to 1370) °C	1.2 °C	
Type J	(-200 to 0) °C	1.4 °C	
	(0 to 1200) °C	1.1 °C	
Type T	(-200 to 0) °C	1.6 °C	
	(0 to 400) °C	1.2 °C	
Type E	(-200 to 0) °C	1.3 °C	
	(0 to 950) °C	1.1 °C	
Type N	(-20 to 0) °C	3.0 °C	
	(0 to 500) °C	2.2 °C	
	(500 to 1750) °C	1.8 °C	
Type S	(-20 to 0) °C	3.0 °C	
	(0 to 500) °C	2.2 °C	
	(500 to 1750) °C	1.8 °C	
Relative Humidity – Measure	(0 to 90) % RH	3 % RH	Vaisala HMI41 w HMP42
	(90 to 100) % RH	4.4 % RH	
Ovens, Furnaces, and Environmental Chamber Uniformity	(Ambient +20 to 500) °C	0.5 °C	ASTM E145-01
Infrared Temperature Measuring Equipment	Ambient to 100°C	1.3 °C	Hart Scientific 9132 black body
	(100 to 500) °C	2.0 °C	

IV. Time and Frequency

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
Digital / Mechanical Tachometer	(40 to 99 000) RPM	0.1 % of reading + LSD	Direct reflective pickup tachometer LSD = least significant digit
Timers	15 s to 24 hr	0.53 s	Reference stopwatch
Stopwatches	15 s to 24 hr	0.53 s	NIST synchronized computer clock

[1] This laboratory offers commercial calibration services and field calibration services (where noted).

[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 and to influences from the circumstances of the specific calibration.

[3] Field 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] The uncertainty of scale verification is highly dependent on local conditions such as the resolution of the scale. Any statement of best uncertainty would therefore be misleading. The class of the best weights used by the laboratory is shown in the Comments column.

[5] In the statement of best uncertainty, L is the numerical value of the nominal length of the device measured in inches, TPI is threads per inch, and LSD is least significant digit.