The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

GREENSLADE & CO., INC.

Fort Worth, 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 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 23rd day of November 2010.

President & CEO
For the Accreditation Council
Certificate Number 1032.01
Valid to October 31, 2012

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

GREENSLADE & CO., INC.
2234 Wenneca Avenue
Fort Worth, TX 76102
Larry Borowski Phone: 800 435 2657

CALIBRATION

Valid To: October 31, 2012 Certificate Number: 1032.01

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

I. Dimensional

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Gage Blocks	(0.05 to 6) in	(6.5 + 5.9*L*) µin	Twin head comparator w/ master gage blocks
Plain Cylindrical Ring Gages	(0.04 to 0.5) in (0.5 to 5) in (5 to 10) in	20 µin 47 µin 67 µin	UMM, master rings
Thread Ring Gages, Solid – Minor Diameter Pitch Diameter Flank Angle	 (0.19 to 10) in (0.19 to 10) in 30º to 60º	 290 µin 150 µin 16'	 UMM, cylindrical master rings, optical comparators
Thread Ring Gages, Adjustable	Up to 8 in	200 µin	ANSI B1.2

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Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Thread Plugs –			
Minor Diameter	(0.6 to 10) in	33 µin	UMM, best wire method, optical comparator
Pitch Diameter	(0.6 to 10) in	71 µin	
Flank Angle	30º to 60º	16'	
Thread Measuring Wires – 60° sets	(2 to 120) pitch	8.1 µin	UMM
Fastener Length Gages	Up to 1 in Up to 6 in Up to 12 in	250 µin 250 µin 400 µin	Master gage blocks
Digital and Dial Indicators[3]	Up to 2 in	(260 + 0.6*R*) µin	Master gage blocks
Calipers[3]	Up to 60 in	(760 + 0.6*R*) µin	Master gage blocks
Mircometers[3]	Up to 12 in	(70 + 0.6*R*) µin	Master gage blocks, optical flats
Gage Pins & Plugs	Up to 6 in	29 µin	UMM
Optical Comparators[3] –			
Length	Up to 2 in	830 µin	Glass scale
Radius	Up to 0.5 in	0.0011 in	Glass ball
Angle	Up to 90°	12'	Precision angle blocks
Height Gages	Up to 12 in	(70 + 0.6*R*) µin	Master gage blocks
Length Standards	Up to 16 in	(19 + 5.3*L*) µin	UMM

Parameter/Equipment	Range	CMC[2] (±)	Comments
NPT Rings & Plug Gages – Fixed Points			
1/16 in diameter	27 TPI	950 µin	Protrusion height gage, master rings, master plugs
1.5 in diameter	11.5 TPI	950 µin	

II. Dimensional Testing

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Custom & Special Gauging –			
Length	Up to 16 in	$(19 + 5.3L)$ µin	Measuring microscope, optical comparator, UMM
Angle	Up to 90°	4'	

III. Fastener Industry Specific Gages

Parameter/Equipment	Range	CMC[2] (±)	Comments
Major Diameter Gages	Up to 1 in	200 µin	Master gage blocks
Segment Thread Gage	Up to 0.75 in	330 µin	Master thread plug
Tri-Roll and Adjustable Thread Gages	Up to 1 in	440 µin	Master thread plug
Recess Concentricity Gages	Up to 0.25 in	0.0018 in	Master gage pins & indicator
Tri-Round Gages	Up to 0.5 in	100 µin	Master gage pins

Parameter/Equipment	Range	CMC[2] (±)	Comments
Internal Thread Gage	Up to 2.5 in	100 µin	Master rings
"Dimension-All" Fastener Measuring Gages	Up to 2 in	200 µin	Master gage blocks and gage balls
Protrusion Height Gages	Up to 1 in	200 µin	Master gage blocks and gage balls
Penetration Points	Type I, IA, II; Hexalobular, Torq-set recess Hex, Slot, Square	86 µin 100 µin	Measuring microscope and UMM UMM
Thread Performance – Test Plates[4]	(0 to 0.75) in M1.5 to M20	200 µin	ASME B18.6.4 & 0.5M SAE J81, J933, J1237 hardness tester, electronic bore gages, micrometer, plug gages

IV. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Torque Tools	Up to 600 ft·lb	1 % full scale	Torque transducer and staging fixture
Drill Screw Testers – Time End Load Speed	 Up to 100 s Up to 50 lb Up to 2500 RPM	 0.13 s 0.63 lb 3.4 RPM	 Stopwatch Compression gage Tachometer

[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] Uncertainty is a function of the three characteristics of hardness, thickness, and hole diameter.

[5] In the statement of CMC, L is the numerical value of the nominal length of the device measured in inches. In the statement of CMC, R is the numerical value of the resolution of the device in microinches.