



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: January 31, 2017

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 calibrations¹:

I. Dimensional

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Gage Blocks	(0.05 to 6) in	(6.5 + 5.9L) 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 Up to 60°	290 µin 150 µin 16'	UMM, cylindrical master rings, optical comparators
Thread Ring Gages, Adjustable ⁶	Up to 8 in	W (Set Plug Tolerance)	Set using master set plug gages ANSI/ASME B1.2-1983

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Thread Plugs – Major Diameter Pitch Diameter Flank Angle	(0.06 to 10) in (0.06 to 10) in Up to 60°	33 μin 71 μin 16'	UMM, best wire method, optical comparator
Thread Measuring Wires – 60° Sets	(2 to 120) pitch	8.1 μin	UMM
Digital and Dial Indicators ³	Up to 2 in	(260 + 0.6R) μin	Gage blocks
Calipers ³	Up to 60 in	(760 + 0.6R) μin	Gage blocks
Mircrometers ³	Up to 60 in	(70 + 0.6R) μin	Gage blocks, optical flats
Gage Pins & Plugs	Up to 10 in	29 μin	UMM
Optical Comparators ³ – Length Radius Angle	Up to 2 in Up to 0.5 in Up to 90°	830 μin 0.0011 in 12'	Glass scale Gage ball Precision angle blocks
Height Gages ³	Up to 60 in	(70 + 0.6R) μin	Gage blocks
NPT Rings & Plug Gages – Fixed Points	0.0625 (27 TPI) 0.125 (27 TPI) 0.25 (18 TPI) 0.375 (18 TPI) 0.5 (14 TPI) 0.75 (14 TPI) 1 (11.5 TPI) 1.25 (11.5 TPI) 1.5 (11.5 TPI) 2 (11.5 TPI) 3 (8 TPI)	950 μin 950 μin 950 μin 950 μin 950 μin 950 μin 950 μin 950 μin 950 μin 950 μin 950 μin	Height gages, master rings, master plugs TPI = threads per inch

II. Dimensional Testing⁷

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Length ⁵ (1D, 2D)	Up to 22 in	(19 + 5.3L) μin	UMM, measuring microscope, optical comparator
Angle	Up to 90°	16'	Measuring microscope, optical comparator

III. Fastener Industry Specific Gages

Parameter/Equipment	Range	CMC ² (±)	Comments
Major Diameter Gages	Up to 2 in	200 μin	Master gage blocks
Segment Thread Gage	Up to 2 in	330 μin	Master thread plug
Tri-Roll and Adjustable Thread Gages	Up to 3.375 in	440 μin	Master thread plug
Recess Concentricity Gages	Up to 1.0 in	0.0018 in	Master gage pins & indicator
Tri-Round Gages	Up to 0.5 in	100 μin	Master gage pins
Fastener Length Gages	Up to 1 in Up to 6 in Up to 12 in	250 μin 250 μin 400 μin	Master gage blocks

Parameter/Equipment	Range	CMC ² (±)	Comments
Internal Thread Gage	Up to 8 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 2 in	200 μin	Master gage blocks and gage balls
Penetration Points/Penetration Plugs	Type I, IA, II; 6-lobe, Offset cruciform Hex, Slot, Square	86 μin 100 μin	Measuring microscope and UMM UMM
Thread Performance – Test Plates ⁵	Up to 0.75 in M1.5 to M20	200 μin	Hardness tester, electronic bore gages, micrometer, plug gages

IV. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Torque Tools	Up to 600 lbf	1.2 % of rdg	Torque transducer and staging fixture
Drill Screw Testers – Time End Load Speed	Up to 100 s Up to 50 lbf Up to 4000 RPM	0.71 s 0.63 lbf 5.8 RPM	Stopwatch Compression gage Tachometer

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Rockwell Hardness Testers ³	HRBW: (40 to 59) HRBW (60 to 79) HRBW (80 to 100) HRBW HRC: (20 to 30) HRC (35 to 55) HRC (60 to 65) HRC	1.4 HRBW 0.94 HRBW 0.65 HRBW 0.76 HRC 0.56 HRC 0.31 HRC	Indirect verification per ASTM E18
Pressure ³	0 to 60 psi > 60 to 300 psi > 300 to 1000 psi > 1000 to 5000 psi	0.22 psi 0.46 psi 3.1 psi 8.1 psi	Master pressure gage
Scales ³	0 to 0.25 lb > 0.25 to 5 lb > 5 to 50 lb > 50 to 250 lb	0.000003 lb 0.000074 lb 0.00084 lb 0.0041 lb	Handbook 44 Class F Weights

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

² Calibration and Measurement Capability Uncertainty (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. CMCs 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, L is the numerical value of the nominal length of the device measured in inches and R is the numerical value of the resolution of the device in microinches.

⁵ Uncertainty is a function of the three characteristics of hardness, thickness, and diameter of the hole.

⁶ Adjustable thread rings are set to applicable specifications using calibrated master set plug gages.

⁷ This laboratory meets R205 – *Specific Requirements: Calibration Laboratory Accreditation Program* for the types of dimensional tests listed above and is considered equivalent to that of a calibration.



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 R205 – *Specific Requirements: Calibration Laboratory Accreditation Program*. 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 17th day of September 2014.



A handwritten signature in blue ink, reading "Jim C. Bunt".

Senior Director of Quality and Communications
For the Accreditation Council
Certificate Number 1032.01
Valid to January 31, 2017
Revised on October 18, 2016

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