



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

A & A Calibration, Inc.
12916 Farmington Rd.
Livonia, MI 48150

has been assessed by ANAB
and meets the requirements of international standard

ISO/IEC 17025:2005

while demonstrating technical competence in the field of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations to which this accreditation applies.

L1137-1
Certificate Number


ANAB Approval

Certificate Valid: 11/28/2018-11/23/2019
Version No. 002 Issued: 11/28/2018



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 April 2017).



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

A & A Calibration, Inc.

12916 Farmington Rd
Livonia, MI 48150
Pete Huben
734-261-8830

CALIBRATION

Valid to: **November 23, 2019**

Certificate Number: **L1137-1**

Length – Dimensional Metrology

Parameter / Equipment	Range ²	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method and/or Equipment
Gage Blocks			Comparison made with Master Gage Blocks
Steel	(0.005 to 4) in	(2.3 + 1.7L) μin	
Chrome Carbide	(0.005 to 4) in	(2.3 + 1.3L) μin	
Tungsten Carbide	(0.005 to 4) in	(2.5 + 0.8L) μin	
Ceramic	(0.005 to 4) in	(2.3 + 1.4L) μin	
Long	(5 to 20) in	(2.3 + 2L) μin	
Pin Gages (to Class Z)	(0.01 to 1) in	39 μin	Laser Micrometer
Plug Gages	(0.01 to 1) in	14 μin	Comparator and Gage Blocks
	(1 to 6) in	(5.6 + 5.4L) μin	
Thread Wires	(0.01 to 0.25) in	14 μin	Universal Supermicrometer
Flush Pins	(0.125 to 5) in	84 μin	Roll Check, Gage Blocks, and Plug Gages
Ring Gages	(0.124 to 2) in	13 μin	Universal Supermicrometer
	(2 to 10) in	(11 + 5L) μin	Ring Gage Comparator and Gage Blocks
Steel Rules	(0.0325 to 72) in	(370 + 10L) μin	Glass Scale with DRO



Length – Dimensional Metrology

Parameter / Equipment	Range ²	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method and/or Equipment
Length Standards	(0.25 to 2) in	28 μin	Supermicrometer
	(2 to 38) in	(22 + 6L) μin	Reference Bar and Surface Plate Mu-Checker
Pitch Micrometer Standard	(1 to 4) in	80 μin	Roll Check, Gage Blocks, and Plug Gages
Angle Blocks (Shop Grade)	0.25° to 45°	9.9 arc seconds	Gage Blocks, Sine Plate, Surface Plate, and Mu-Checker
CMM Spheres ²			
Diameter	(0.25 to 2) in <i>D</i>	20 μin	Supermicrometer
Sphericity (run out)	(0.25 to 2) in <i>D</i>	4.1 μin	Sphericity Gage
Tooling Balls	(0.25 to 2) in <i>D</i>	20 μin	Supermicrometer
Parallels Steel, Granite	(0.0625 to 10) in	(27 + 7L) μin	Gage Blocks, Surface Plate, and Mu-Checker
Radius Gages	(0.005 to 1) in	320 μin	Optical Comparator
Roughness Specimens Roughness Average (Ra)	(0.1 to 200) μin	2.7 μin	Profilometer
Micrometers			
Outside Micrometer ¹	50 μin to 24 in	(63 + 18L) μin	Gage Blocks
Inside Micrometer	(1.5 to 72) in	(237 + 16L) μin	Reference Bar, Surface Plate
Depth Micrometer ¹	50 μin to 12 in	(105 + 6L) μin	Gage Blocks
Interchangeable Anvil Thread Micrometer	50 μin to 2 in	140 μin	Optical Comparator, Gage Blocks
Micrometer Heads	50 μin to 1 in	50 μin	Universal Supermicrometer
Indicators			
Dial ¹	500 μin to 1 in	320 μin	Micrometer Head
Digital ¹	50 μin to 1 in	92 μin	Micrometer Head
Test ¹	50 μin to 0.06 in	83 μin	Mahr Indicator



Length – Dimensional Metrology

Parameter / Equipment	Range ²	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method and/or Equipment
High Resolution	10 μin to 0.002 in	15 μin	Universal Supermicrometer
Calipers			
Digital ¹	500 μin to 60 in	(613 + 22L) μin	Ring Gages, Gage Blocks
Dial, Vernier ¹	(0.001 to 60) in	(727 + 15L) μin	
Bore Gages (2 point)	100 μin to 1 in	130 μin	Micrometer Head
Height Gages ¹	500 μin to 40 in	(612 + 5L) μin	Reference Bar, Surface Plate, and Gage Blocks
Chamfer Gages	200 μin to 2 in	390 μin	Modified Ring Gages, Steel Surface Plate
Precision Levels	up to 0.007 TIR	223 μin	Surface Plate, Digital Indicator
Bore Gages (3 point)	(0.25 to 6) in	(96 + 14L) μin	Ring Gages
Protractors (Digital)	0.01° to 90°	0.03 degrees	Sine Plate, Gage Blocks
Protractors (Mechanical)	1° to 90°	6 arc minutes	Optical Comparator
Profilometers Roughness Average (Ra)	(1 to 200) μin	2.3 μin	Roughness Specimen

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Force Gages	(0.01 to 10) lbf	0.03 lbf	ASTM E617 Class 6 Masses
	(0.1 to 100) lbf	0.3 lbf	
	(0.2 to 200) lbf	0.6 lbf	
Dial Mikrokators Force	(1 to 40) ozf	1.8 ozf	Force Gage
Torque Wrenches	(0.4 to 250) lbf·ft	1.4 % of reading	Torque Transducer



Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Torque Transducers	(5 to 100) lbf·in	0.14 lbf·in + 0.03% of reading	Torque Arms, ASTM E617 Class 6 Masses
	(100 to 1 000) lbf·in	0.1 lbf·in + 0.049% of reading	
	(8 to 250) lbf·ft	0.05 lbf·ft + 0.046% of reading	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. L = Length in inches; D = Diameter in inches.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L1137-1.

Vice President

