



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Washington Calibration, Inc.
1725 West 3rd Street
Tempe, AZ 85281

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 02 February 2023
Certificate Number: L2152-1



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

Washington Calibration, Inc.

1725 West 3rd Street
Tempe, AZ 85281
Rey Feliz
480-820-0506

CALIBRATION

Valid to: **February 2, 2023**

Certificate Number: **L2152-1**

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method, and/or Equipment
Gage Blocks	(0.005 to 4) in	(4 + 1.1L) μin	Gage Blocks, Edmunds Gage Block Comparator
	(5 to 20) in	(7.3 + 1.5L) μin	
	(0.5 to 100) mm	(0.11 + 0.001L) μm	
Height Masters	Up to 40 in	(38 + 1.3L) μin	Reference Bar Gage Blocks
Length Standards	(0.05 to 10) in	(25 + 1.7L) μin	Supermicrometer
	(11 to 60) in	(45 + 1.1L) μin	Gage Blocks, Height Transfer Standards
Feeler Gages (Leaf-Style)	(0.001 to 0.5) in	28 μin	Supermicrometer
Ring Gages	(0.04 to 11) in	(9.5 + 3.2L) μin	ID Comparator
Plain Plug & Pin Gages	(0 to 10) in	(19 + 2.5L) μin	Supermicrometer
Pin Gages Class Z & ZZ	0 to 0.9 in	54 μin	Laser Micrometer
Thread Plugs	Major Diameter (0.06 to 6) in	(36 + 11L) μin	Supermicrometer Gage Blocks
	Pitch Diameter (0.06 to 6) in	(23 + 12L) μin	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method, and/or Equipment
Thread Measuring Wires	Unified 60° (4 to 80) TPI Acme 29° (1 to 20) TPI	23 μin	Supermicrometer Gage Blocks
Caliper Masters	Up to 48 in	(38 + 1.3L) μin	Gage Blocks Reference Bar
Surface Plates ¹ Flatness Repeatability	Up to 14 ft x 14 ft ± 0.001 in	(16 + 0.87X) μin 31 μin	Autocollimator Repeat-Gage
Surface Roughness Standards	(15 to 130) μin	3 μin	Profilometer
2 Pt. Bore Gages	Up to 5 in	63 μin	Supermicrometer
3 Pt. Bore Gages (0.000 1 Resolution)	Up to 5.5 in	71 μin	Ring Gages
(0.000 2 Resolution)		190 μin	
(0.000 5 Resolution)		290 μin	
Calipers ¹ (0.001 Resolution) (0.0005 Resolution)	(0 to 120) in (0 to 60) in	(580 + 0.2L) μin (290 + 0.3L) μin	Gage Blocks
Indicators ¹ (0.001 Resolution) (0.000 5 Resolution) (0.000 1 Resolution) (0.000 05 Resolution)	(0 to 4) in	580 μin	Supermicrometer
		290 μin	
	(0 to 2) in	63 μin	
		39 μin	
Supermicrometer ¹ Linearity	(0 to 2) in	11 μin	Gage Blocks Force Gage Optical Flats
Micrometers, Outside ¹ (0.001 Resolution) (0.000 1 Resolution) (0.000 05 Resolution)	(0 to 40) in	580 μin	Gage Blocks Optical Flats
		(58 + 1L) μin	
		(29 + 1.9L) μin	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Reference Standard, Method, and/or Equipment
Micrometers, Inside ¹ (0.001 Resolution)	(0.5 to 120) in	(580 + 0.6L) μin	Gage Blocks
Micrometers, Depth ¹ (0.001 Resolution) (0.000 1 Resolution) (0.000 05 Resolution)	(0 to 12) in	580 μin (71 + 0.5L) μin (46 + 1.1L) μin	Gage Blocks
Height Gages ¹ (0.001 Resolution) (0.0005 Resolution)	(0 to 40) in	(580 + 0.1L) μin (290 + 0.3L) μin	Reference Bar Gage Blocks
Profilometers	(0.1 μin Resolution)	2.1 μin	SRM Reference Patches
	(1 μin Resolution)	2.2 μin	
Steel Rules	(0 to 72) in	(280 + 3L) μin	Optical Comparator
	(0 to 72) in	2 900 μin	Optical Loupe & Standard Rule
Tape Measures	(0 to 40) ft	(2 900 + 0.5L) μin	Optical Loupe & Standard Rule
Optical Comparators ¹ Magnification	10X, 20X 31.25X, 50X, 62.5X, 100X	170 μin	Precision Ball Standard Magnification Overlay
Linearity	(0 to 12) in	88 μin	Stage Micrometer
Angularity and Squareness	0° to 360°	0.01°	Steel Square

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Rockwell Hardness Testers ¹	HRA High Middle Low	0.56 HRA 0.74 HRA 0.65 HRA	Indirect Verification Method per ASTM E18
	HRBW High Middle Low	0.45 HRBW 0.48 HRBW 0.7 HRBW	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Rockwell Hardness Testers ¹	HRC High Middle Low	0.34 HRC 0.34 HRC 0.34 HRC	Indirect Verification Method per ASTM E18
	HRE High Middle Low	0.27 HRE 0.99 HRE 1.26 HRE	
	HRF High Middle Low	0.54 HRF 0.56 HRF 1.45 HRF	
	HRH High Middle Low	0.76 HRH 0.49 HRH 0.98 HRH	
	HR15N High Middle Low	0.5 HR15N 0.19 HR15N 1 HR15N	
	HR30N High Middle Low	0.69 HR30N 0.78 HR30N 0.16 HR30N	
	HR45N High Middle Low	0.7 HR45N 0.58 HR45N 1.03 HR45N	
	HR15TW High Middle Low	0.27 HR15TW 0.22 HR15TW 1.1 HR15TW	
	HR30TW High Middle Low	0.7 HR30TW 0.63 HR30TW 0.26 HR30TW	
	HR15Y High Low	0.97 HR15Y 0.55 HR15Y	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Microhardness Testers Indirect Verification of Microhardness Testers ¹ Knoop	HK 300 grf	5.1 HK	Indirect Verification Method per ASTM E384
	HK 200 grf	9.1 HK	
	HK 100 grf	13.8 HK	
Vickers	HV 500 grf	14 HV	
	HV 200 grf	18.5 HV	
	HV 100 grf	8.7 HV	
Class F Weights	25 kg	290 mg	Double Substitution Method – Tolerances per NIST Handbook 105-1
	10 kg	130 mg	
	5 kg	58 mg	
	3 kg	35 mg	
	2 kg	24 mg	
	1 kg	13 mg	
	500 g	8.2 mg	
	300 g	6.7 mg	
	200 g	2.3 mg	
	100 g	1.2 mg	
	50 g	0.69 mg	
	30 g	0.52 mg	
	20 g	0.4 mg	
	10 g	0.29 mg	
	5 g	0.21 mg	
3 g	0.17 mg		

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class F Weights	2 g	0.15 mg	Double Substitution Method – Tolerances per NIST Handbook 105-1
	1 g	0.12 mg	
	500 mg	0.093 mg	
	300 mg	0.081 mg	
	200 mg	0.07 mg	
	100 mg	0.058 mg	
	50 mg	0.049 mg	
	30 mg	0.044 mg	
	20 mg	0.041 mg	
	10 mg	0.035 mg	
	5 mg	0.033 mg	
	3 mg	0.029 mg	
	2 mg	0.029 mg	
	1 mg	0.029 mg	
	50 lb	529 μ lb	
	30 lb	287 μ lb	
	25 lb	287 μ lb	
	20 lb	287 μ lb	
	10 lb	128 μ lb	
	5 lb	53 μ lb	
3 lb	29 μ lb		
2 lb	29 μ lb		
1 lb	18 μ lb		

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class F Weights	0.5 lb / 8 oz	5.1 μ lb	Double Substitution Method – Tolerances per NIST Handbook 105-1
	0.3 lb	2.6 μ lb	
	0.2 lb	2.6 μ lb	
	0.1 lb	1.5 μ lb	
	0.05 lb	0.88 μ lb	
	0.03 lb	0.64 μ lb	
	0.02 lb	0.64 μ lb	
	0.01 lb	0.46 μ lb	
	0.005 lb	0.033 μ lb	
	0.003 lb	0.026 μ lb	
	0.002 lb	0.026 μ lb	
	0.001 lb	0.021 μ lb	
	4 oz	42 μ oz	
	2 oz	24 μ oz	
	1 oz	18 μ oz	
	0.5 oz	10 μ oz	
	0.3 oz	10 μ oz	
	0.25 oz	10 μ oz	
	0.2 oz	7 μ oz	
	0.125 oz	6 μ oz	
	0.1 oz	5 μ oz	
	0.062 5 oz	5 μ oz	
	0.05 oz	4 μ oz	
	0.031 25 oz	4 μ oz	
	0.03 oz	4 μ oz	
	0.015 oz	3 μ oz	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class F Weights	0.02 oz	3 μ oz	Double Substitution Method – Tolerances per NIST Handbook 105-1
	0.01 oz	3 μ oz	
Torque Wrenches	(4 to 50) ozf·in	0.2 ozf·in	Torque Calibration System
	(25 to 1 000) lbf·in	0.007 6 + 0.003 3 lbf·in / lbf·in	
	(25 to 1 000) lbf·ft	0.36 + 0.002 9 lbf·ft / lbf·ft	

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 or mm where applicable, X = length in inches.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2152-1.



R. Douglas Leonard Jr., VP, PILR SBU