SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

MESS SERVICIOS METROLOGICOS S. DE R.L. DE C.V.
Acceso III, Número 16A Nave 10
Parque Industrial Benito Juárez
Querétaro, Qro. 76120, México
Oscar Morales Phone: 52 442 476 0646, 52 442 196 4938

CALIBRATION

Valid To: May 31, 2019 Certificate Number: 3047.01

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
Coordinate Measuring Machines (CMM) Verification[3] –			
E_L - Length Measurement Error	Up to 2000 mm Up to 12 000 mm	(0.50 + 1.1*L*) µm (0.40 + 1.2*L*) µm	ASME B89.4.10360-2 and ISO 10360-2 with gage blocks, step gage, laser interferometer, and master sphere
Rotary Table (4th axis) – Four-Axis Errors (FR, FT, FA)	Distance Between Sphere: Up to 500 mm and CMM Resolution >= 0.1 µm	1 µm	ISO 10360-3
Scanning Probing Errors (Tij)	Spheres with Nominal Diameter: 25 mm	0.12 µm	ISO 10360-4
Surface Finish Measuring Machines (Profilometers)[3]	Ra: (0.3 to 3.2) µm Rz: (1.5 to 10) µm Pt: (0.36 to 2.6) µm Rsm: (15 to 100) µm	0.048 µm 0.080 µm 0.080 µm 0.080 µm	ISO 12179 using roughness standards, optical flat

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Surface Geometry Analyzers (Contours Instruments)[3]	Angle: 90º X = Up to 1 mm X = (1 to 10) mm X = (10 to 200) mm Z = (1 to 50) mm Radius: (2.5 to 6.5) mm	1.5’ 1.3 µm 1.6 µm (1.7 + 4.5*L*) µm (0.12 + 5*L*) µm (1.7 + 4.5*L*) µm	ISO 12179 using gage blocks, master spheres, contour standards
Roughness Standards	Ra: Up to 3.2 µm Rz: Up to 10 µm Pt: Up to 2 µm Rsm: Up to 100 µm	0.020 µm 0.022 µm 0.033 µm 0.075 µm	ISO 4287, ISO 4288 using Taylor Hobson Form Talysurf PGI 200 surface form and texture instrument
Gage Blocks –			ASME B89.1.9 using ISO Grade K master gage blocks and NMX-CH-3650-IMNC electromechanical comparator
Steel:			
Deviation of Central Length	(0.50 to 10) mm (>10 to 25) mm (>25 to 50) mm (>50 to 75) mm (>75 to 100) mm	0.024 µm 0.030 µm 0.044 µm 0.062 µm 0.081 µm	
Variation in Length	(0.50 to 10) mm (>10 to 25) mm (>25 to 50) mm (>50 to 75) mm (>75 to 100) mm	0.022 µm 0.023 µm 0.025 µm 0.028 µm 0.031 µm	
Ceramic:			
Deviation of Central Length	(0.50 to 10) mm (>10 to 25) mm (>25 to 50) mm (>50 to 75) mm (>75 to 100) mm	0.024 µm 0.031 µm 0.048 µm 0.067 µm 0.087 µm	
Variation in Length	(0.50 to 10) mm (>10 to 25) mm (>25 to 50) mm (>50 to 75) mm (>75 to 100) mm	0.022 µm 0.023 µm 0.024 µm 0.026 µm 0.029 µm	

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Articulated Arm Coordinate Measuring Machines (AACMM) Verification[3] –			ASME B89.4.22 with:
Volumetric Performance	Radius: Up to 1500 mm	(4.5 + 7*L*) µm	Length standards, step gages
Effective Diameter Performance	Sphere Diameter: 30 mm (Nominal)	2.0 µm	Master sphere
Micrometer	Up to 1000 mm	(0.85 + 16*L*) µm	NMX-CH-099-IMNC, gage blocks
Calipers	Up to 1000 mm	(9.0 + 20*L*) µm	NMX-CH-002-IMNC, gage blocks
Roundness Measuring Machines[3] –			ISO 4291 with:
Sensitivity (Displacement Error)	(0.4 to 10) µm (160 to 500) µm	65 nm + 46 nm/µm 0.090 µm	Slope table standard Gage blocks
Radial Error	Sphere Radius: (6 to 25) mm	0.050 µm	Roundness standard
Axial Error	Optical Flat Radius: (15 to 70) mm	0.040 µm	Optical flat
Optical Comparators[3] – Vision Systems & Measuring Microscopes			JIS B 7184 with:
Axis – Error of Indication	X and Y Axis: (Up to 300) mm (300 to 500) mm	 (1.1 + 3.5*L*) µm (3.0 + 4.5*L*) µm	 Glass scales
Axis – Error of Indication	Z Axis: (Up to 300) mm	(2.4 + 3.2*L*) µm	Gage blocks
Angle[6]	Up to 180º	1.3’	Angular reticule
Universal Length Machine[3]	Up to 100 mm (>100 to 2000) mm	(0.25 + 2*L*) µm (0.25 + 1.6*L*) µm	Gage blocks Laser interferometer

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Contour Standards	X, Z Length: Up to 160 mm Radius: Up to 80 mm	(3.0 + 15*L*) µm (3.0 + 15*L*) µm	VDI/VDE 2629-1 using Taylor Hobson Form Talysurf PGI 200 surface form and texture instrument
Roundness Standards	Radius: Up to 150 mm	46 nm	ISO 4291:1985 using roundness/ cylindrical profile measuring instrument
Length Standards	Up to 1500 mm	(1.7 + 7.0*L*) µm	CMM used as comparator (substitution method), step gages

II. Dimensional Testing/Calibration[1]

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Length – 3D Length Measurements (Size, Position and Geometric/Form)[4]	CMM: X = Up to 2400 mm Y = Up to 1200 mm Z = Up to 1000 mm	(2.5 + 9*L*) µm	CMM, part drawings, customer requirements
Length – 3D Length Measurements[4]	Up to 1200 mm Up to 2700 mm Up to 3700 mm	34 µm 55 µm 91 µm	AACMM, part drawings, customer requirements
Profile and Roughness[4]	Profile: Z = Up to 50 mm, Length: Up to 500 mm Roughness: Z = Up to 5 mm	2.0 µm 0.10 µm	Profile and roughness machine, part drawings, customer requirements
Geometry/Form (Roundness, Cylindricity Straightness, Flatness & Parallelism)[4]	Probe Arm Range: Diameter = Up to 400 mm, Height Z = Up to 500 mm	0.15 µm	Roundness machine, part drawings and customer requirements

III. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Force Measuring Devices[3] –			ISO 7500-1, ISO 376 using:
Tension and Compression	(0.2 to 50) N (>50 to 100) N (>100 to 200) N (>200 to 1600) N	0.013 % of rdg 0.0081 % of rdg 0.0063 % of rdg 0.0057 % of rdg	Mass standards
	(0.1 to 1.1) kN (0.2 to 2.2) kN (1 to 10) kN (10 to 100) kN (89 to 890) kN	0.04 % of rdg 0.029 % of rdg 0.029 % of rdg 0.0052 % of rdg 0.046 % of rdg	Load cells and digital indicators
Torque Instruments	(0.2 to 2) N·m (1 to 10) N·m (2.5 to 25) N·m (15 to 150) N·m (40 to 400) N·m (150 to 1500) N·m	0.13 % of rdg 0.12 % of rdg 0.13 % of rdg 0.27 % of rdg 0.27 % of rdg 0.32 % of rdg	ISO 6789 using torque transducers and digital indicators

MECHANICAL

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following test on materials (metals, plastic, etc)[7]:

Parameter	**Range**	**Test Method(s)**
Tension and Compression Force, Yield Strength	(0.2 to 100) kN (25 to 250) kN	ASTM E8/E8M, ASTM E9, part drawings

[1] This laboratory offers commercial dimensional testing/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] 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.

[5] In the statement of CMC, *L* is the numerical value of the nominal length of the device measured in meters.

[6] Applicable to optical comparators.

[7] Also using customer specified test methods based on the parameters listed above.

Accredited Laboratory

A2LA has accredited

MESS SERVICIOS METROLOGICOS S. DE R.L. DE C.V.

Queretaro, MEXICO

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 29th day of June 2017.

President and CEO
For the Accreditation Council
Certificate Number 3047.01
Valid to May 31, 2019

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