



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board/AClass
500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

Hexagon Universal Calibration Services
48443 Alpha Drive, Suite 100
Wixom, MI 48393

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

ISO/IEC 17025:2005

while demonstrating technical competence in the field(s) of

CALIBRATION

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

AC-1167

Certificate Number

AClass Approval

Certificate Valid 04/28/2011-06/11/2013
Version No. 003 Issued: 12/02/2011



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 January 2009*).



SCOPE OF ACCREDITATION TO
ISO/IEC 17025:2005 & ANSI/NC SL Z540-1-1994

Hexagon Universal Calibration Services

48443 Alpha Drive, Suite 100, Wixom, MI 48393
Mike Blake Phone: 248-449-9508

CALIBRATION

Valid to: June 11, 2013

Certificate Number: AC-1167

I. Dimensional

Table with 5 columns: PARAMETER / EQUIPMENT, RANGE, CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)], REFERENCE STANDARD OR EQUIPMENT, METHOD(S). Rows include Linear Displacement Accuracy (CMM), Linear Accuracy (Boring Mills, Lathes, Machining Centers, Layout Machines), Straightness and Squareness, etc.



PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Angle ²	10 degrees	(0.2 + 0.2 % of the max measured error in arc seconds + 0.05M) Arc Seconds	Laser	JIS B 7440 ASME B5.54
	200 Arc Seconds	(0.21 + 0.5 % of the max. measured error) Arc seconds	Electronic Level	
Flatness ³	To 20 x 30 ft	Expressed uncertainty is calculated on site and is expressed in µin	Electronic Levels	GGG-P-463C
Volumetric Performance (CMM)	To 42 in	(100 + 13L) µin L= ball bar length in inches	Ball Bar; ANSI/ASME B89.4.1	B89.4.1b
Repeatability	(0 to 2) in	43 µin	Master Sphere	B89.4.1b
Circular Interpolation: Boring Mills, Machining Centers	(50 to 600) mm	(3.7 + 0.02L + 0.4 % V) µm L = Length of ball bar in mm V = Measured radial variation in microns	Renishaw dynamic ball bar	Renishaw Ball Bar Guide ASME B5.54
Rotational Positioning: Boring Mills, Machining Centers, Rotary Tables	360 °	(1.7 + 0.2 % of the measured error) Arc seconds	Renishaw RX10 and Laser	Renishaw RX10 User Guide
Electronic Level Calibration	+/- 1 000 Arc seconds	1.3 Arc seconds	5 in Sine Plate and 5 piece gage block set	Mahr Federal CP-131

Notes:

1. Calibration and Measurement Capabilities (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of k=2.
2. This Laboratory offers on-site service for all parameters. (*Except Electronic Level Calibration).
3. F = Distance the optics traveled during the test in feet. M = Distance optics travel during test in meters. L=Length in inches.
4. Calibration and Measurement Capability 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 of ideal equipment. Best uncertainties represent expanded uncertainties expressed at approximately a 95% confidence level, usually using a coverage factor of k=2.
5. If the either of the associated closures for the plate flatness measurement exceed the calculated uncertainty than this larger value is expressed as the measurement uncertainty.
6. This scope is part of and must be included with the Certificate of Accreditation No. AC-1167



Vice President

