



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

Productivity Quality, Inc./Advanced Inspection Services, LLC
15150 25th Ave N, Suite 200
Plymouth, MN 55447

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 & TESTING

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

ACT-1608

Certificate Number

AClass Approval

Certificate Valid: 01/15/2012-01/15/2014
Version No. 002 Issued: 01/20/2012



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

Productivity Quality, Inc. / Advanced Inspection Services, LLC

15150 25th Ave N. Suite 200, Plymouth, MN 55447
Mark Tobias Phone: 763-249-8139

CALIBRATION & TESTING

Valid to: January 15, 2014

Certificate Number: ACT-1608

I. Dimensional Calibration

Table with 5 columns: PARAMETER / EQUIPMENT, RANGE, CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)], REFERENCE STANDARD OR EQUIPMENT, METHOD(S). Rows include Micrometers, Calipers, Indicator Gages, Electronic Indicator Gages/LVDT, Height Gages, Height Masters, Step Gages, Micrometer Length Standards, and Plug Gages.





PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Thread Plug and Setting Gages ² Major Diameter Pitch Diameter	Up to 12 in Up to 12 in	(11 + 1.2D) μin (70 + 0.3D) μin	Universal Measuring Machine w/ Thread Wires	ANSI ASME B1.2 ANSI ASME B1.16M
Ring Gages/ Internal Diameter ²	(0.040 to 0.100) in (0.100 to 10) in (10 to 20) in	(3 + 1D) μin (4 + 2.9D) μin (4 + 1.6D) μin	Universal Measuring Machine and Ring Gage Comparator	ANSI B89.1.6
Gage Blocks	(0.01 to 4) inch	(1.2 + 0.8L) μin	Gage Block Comparator w/ Master Gage Blocks	ASME B89.1.9
Optical Comparators ²	Up to 12 in	(65+ 0.2L) μin	Glass scales	5.4 58 Mfg Procedure
Machine Tools ² Linearity Volume	Up to 3 200 in Up to 24 in	(3 + 1.4L) μin 170 μin	Laser Interferometer Ball Bar System	ASME B5.54
Video Measuring Systems ² (X/Y) (Z)	Up to 30 in Up to 4 in	(47 + 0.3L) μin 73 μin	Glass grid Z step gage	5.4 17 Mfg Procedure
Horizontal Measuring Machine ²	Up to 0.0002 in (0.0002 to 2) in (2 to 8) in	3 μin (3 + 0.7L) μin (2 + 1.1L) μin	Gage Blocks	5.4 66 Mfg Procedure
Coordinate Measuring Machines (CMM) ² Linear Displacement Accuracy Volumetric Performance Sphere Repeatability	Up to 26 in Up to 3 200 in Up to 36 in (0.750 to 1.00) in	(27 + 0.7L) μin (3 + 1.4L) μin (15 + 1.1L) μin 3.6 μin	Step Gage Laser Interferometer Ball Bar Sphere	ASME B89.4.1 ASME B89.4.1 ASME B89.4.1 ASME B89.4.1





PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Surface Finish Analyzers ²	120 µin at 0.03 in cut-off	2.2 µin	Master Specimens	ASME B46.1
Surface Plates ^{2,6} Flatness Repeatability	(0 to 140) in (0 to 140) in	66 µin 19 µin	Renishaw Laser Repeat-O-Meter	GGG-P-463

II. Mechanical Calibration

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Rockwell Hardness Testers ²	HRB: Low Middle High HRC: Low Middle High	0.71 HRB 0.71 HRB 0.71 HRB 0.71 HRC 0.71 HRC 0.71 HRC	Hardness Test Blocks	ASTM E18





III. Dimensional Testing

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Length ³ - One Dimension	Up to 24 in Up to 12 in Up to 3.2 in Up to 0.008 in Up to 0.03 in Up to 2 in	(590 + 0.1L) μin (512 + 0.2L) μin 125 μin 120 μin 310 μin 119 μin	Dial Height Gage Calipers Micrometers Dial Indicator Dial Indicator Drop Indicator	Blue Print or Customer Specification
Vision (Z)	Up to 2 in Up to 10 in	(196 + 2.0L) μin (135 + 0.4L) μin	Tool makers Microscope OGP Quest 300	
Two Dimensions (Vision) (X & Y)	Up to 17 in Up to 27 in	(72 + 1.3L) μin (151 + 2.9L) μin	OGP Quest 300 OGP Flash 500	
Three Dimensions	Up to 47 in	(28 + 3.7L) μin	PMM-C 12107	
Three Dimensional Length ^{2,3}	8 ft spherical volume Up to 708 in	(654 + 4.6L) μin (1 360 + 12.1L) μin	Romer Absolute CMM Leica Laser Tracker (MR) w/ T-probe	Blue Print or Customer Specification
Depth	Up to 6 in	590 μin	Depth Micrometer	Blue Print or Customer Specification
Form Roundness	Up to 100 μin (100 to 500) μin	7.4 μin 53.4 μin	Mitutoyo RA2200 AH Roundness Tester	Blue Print or Customer Specification
Cylindricity	Up to 100 μin (100 to 500) μin	56 μin 77 μin	Mitutoyo RA2200 AH Roundness Tester	
Surface Finish (RA) ³	Up to 120 μin	3.7 μin	Mitutoyo SJ 401 Surface Roughness Tester	





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Notes:

1. *Calibration and Measurement Capabilities (Expanded Uncertainties) are based on approximately a 95% confidence interval, using a coverage of $k=2$.*
2. *This organization performs on-site calibrations. Since field (on-site) conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected in the field (on-site) than what is reported on the accredited scope.*
3. *These parameters have been verified and authorized for accredited calibration at the satellite site maintained at 2322 Alpine Rd., Eau Claire, WI 54703. Phone 715-874-4696.*
4. *The use of (L) represents length in inches.*
5. *The use of (D) represents diameter in inches.*
6. *The CMC for Surface Plates represents the maximum closure error acceptable for Surface Plate Calibrations.*
7. *This scope is part of and must be included with the Certificate of Accreditation No. ACT-1608.*

A handwritten signature in black ink, appearing to read "Karl Greenaway".

Vice President

