National Voluntary Laboratory Accreditation Program

CALIBRATION LABORATORIES **NVLAP LAB CODE 200920-0**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Midwest Calibration & Repair	**Parameter(s) of Accreditation**
30447 Stacy Ponds Drive Stacy, MN 55079-5001 Mr. Charles Hogstad Phone: 651-462-5742 Fax: 651-462-8065 E-mail: chuck@midwestcalibration.com URL: http://www.midwestcalibration.com	Dimensional, Mechanical This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (NVLAP Code: 20/A01)

CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) [Notes 1,2]

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) [Note 3,5]	Remarks
DIMENSIONAL			
NVLAP Code: 20/D03 **GAGE BLOCKS**	0 in to 4 in	Where L is the measured value in inches. 3.7 µin + 1.8L µin	Comparison to Steel Masters
NVLAP Code: 20/D05 **LENGTH & DIAMETER, STEP GAGES**	0.50 in to 39.000 in	Where L is the measured value in inches. 4.9 µin + 2.1L µin	Mahr 828 CiM
Micrometers	0 in to 5 in	28 µin + 16L µin	Gage Blocks – Field Service Calibration Available [Note 4]
Calipers	0 in to 36 in	280 µin + 3.3L µin	Gage Blocks – Field Service Calibration Available [Note 4]
Drop Indicators	0 in to 0.002 in	18 µin	Gage Blocks – Field Service Calibration Available [Note 4]
	> 0.002 in to 2 in	70 µin	
Test Indicators	0.00005 in resolution	38 µin	Gage Blocks – Field Service Calibration Available [Note 4]
	0.0005 in resolution	300 µin	

2012-10-01 through 2013-09-30
Effective dates

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Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) [Note 3,5]	Remarks
Height Gages	0 in to 24 in	59 µin + 2.4L µin	Gage Blocks – Field Service Calibration Available [Note 4]
Height Masters	0 in to 24 in	22 µin + 1.2L µin	Mahr Amplifier/Transfer Stand – Field Service Calibration Available
Outside Diameters	0.10 in to 5.000 in	7.2 µin + 1.2L µin	Mahr 828 CiM
Z,ZZ Class Pins	0.011 in to 1.000 in	32 µin	Fowler Mini Horizontal – Field Service Calibration Available
NVLAP Code: 20/D07 MEASURING WIRES			
Thread Wires	4 TPI to 80 TPI	10 µin	Mahr 828 CiM
NVLAP Code: 20/D11 SPHERICAL DIAMETER; PLUG/RING GAGES		Where L is the measured value in inches.	
Plain Rings	0.050 in to 5 in	6.2 µin + 1.4L µin	Mahr 828 CiM
NVLAP Code: 20/D14 THREADED PLUGS & RING GAGES			
Threaded Plugs	0 in to 5 in pitch diameter 0 in to 5 in major diameter	68 µin 19 µin	Mahr 828 CiM
Straight Adjustable Thread Rings	0 in to 2 in	270 µin	Set to various set plugs
Tapered Thread Plugs	0 in to 3 in pitch diameter 0 in to 3 in major diameter 0 in to 0.5 in standoff	73 µin 31 µin 70 µin	Mahr 828 CiM/Alameda Block Drop Indicator

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)[Notes 1,2]

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) [Note 3,5]	Remarks
MECHANICAL			
NVLAP Code: 20/M15 **TORQUE**	5 in-lbf to 50 in-lbf	0.84 %	CDI Torque Unit – Field Service Calibration Available [Note 4]
	40 in-lbf to 400 in-lbf	0.41 %	
	25 ft-lbf to 250 ft-lbf	0.43 %	
END			

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Notes

Note 1: A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

Note 2: Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

Note 3: The uncertainty associated with a measurement in a CMC is an expanded uncertainty using a coverage factor, $k = 2$, with a level of confidence of approximately 95 %. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

Note 3a: The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

Note 3b: As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

Note 3c: As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions.* However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.1.h. of NIST Handbook 150, Procedures and General Requirements.

Note 4: Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

Note 5: Uncertainty values listed with percent (%) are percent of reading or generated value unless otherwise noted.

Note 6: NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

Note 7: See NIST Handbook 150 for further explanation of these notes.

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