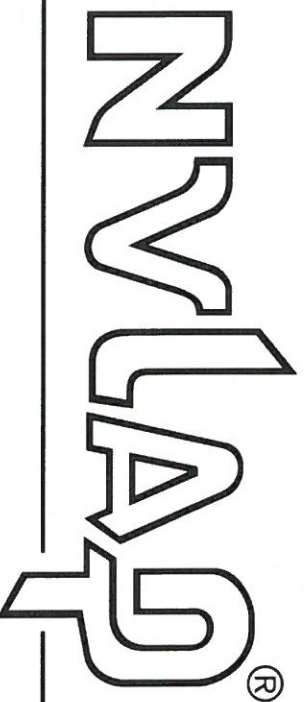


United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200420-0

State of Ohio Metrology Laboratory
Reynoldsburg, OH

*is accredited by the National Voluntary Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

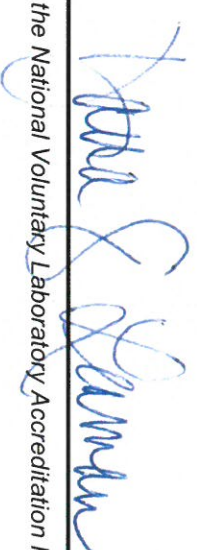
Calibration Laboratories

*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).*

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Effective Dates




For the National Voluntary Laboratory Accreditation Program



CALIBRATION LABORATORIES

NVLAP LAB CODE 200420-0

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

<p>State of Ohio Metrology Laboratory 8995 East Main Street Reynoldsburg, OH 43068-3399 Mr. Daniel Walker Phone: 614-728-6290 Fax: 614-728-6424 E-mail: Daniel.Walker@agri.ohio.gov URL: http://www.agri.ohio.gov/divs/weights/weights.aspx</p>	<p>Fields of Calibration Dimensional Time and Frequency Mechanical</p> <p>This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (NVLAP Code: 20/A01)</p>
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
DIMENSIONAL			
SURVEYING RODS and TAPES (20/D13)			
Rigid Rules, 72 inch	6 in to 12 in	0.0041 in	
	6 in to 18 in	0.0058 in	
	6 in to 24 in	0.0058 in	
	6 in to 36 in	0.0079 in	
	6 in to 48 in	0.0092 in	
	6 in to 60 in	0.010 in	
	6 in to 72 in	0.011 in	
Rigid Rules, 18 inch	1 in to 2 in	0.0041 in	
	1 in to 3 in	0.0041 in	
	1 in to 4 in	0.0041 in	
	1 in to 5 in	0.0041 in	
	1 in to 6 in	0.0041 in	
	1 in to 7 in	0.0041 in	
	1 in to 8 in	0.0041 in	
	1 in to 9 in	0.0041 in	
	1 in to 10 in	0.0041 in	
	1 in to 11 in	0.0041 in	
	1 in to 12 in	0.0041 in	
	1 in to 13 in	0.0058 in	
	1 in to 14 in	0.0058 in	
	1 in to 15 in	0.0058 in	
1 in to 16 in	0.0058 in		

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[Signature]

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
Tape to Bench	1 in to 17 in	0.0058 in	
	1 in to 18 in	0.0058 in	
	0 ft to 10 ft	0.0052 in	
	0 ft to 30 ft	0.0074 in	
	0 ft to 40 ft	0.0091 in	
	0 ft to 60 ft	0.010 in	
	0 ft to 70 ft	0.012 in	
	0 ft to 80 ft	0.013 in	
	0 ft to 100 ft	0.014 in	
TIME AND FREQUENCY			
STOPWATCHES AND TIMERS (20/F05)			
	0 h to 24 hr	0.30 s	WWV Comparison
MECHANICAL			
MASS DETERMINATION (20/M08)			
Metric	50 kg	69 mg	Echelon II
	30 kg	33 mg	
	25 kg	30 mg	
	20 kg	30 mg	
	10 kg	6.7 mg	
	5 kg	2.9 mg	
	3 kg	2.4 mg	
	2 kg	2.1 mg	
	1 kg	0.25 mg	
	500 g	0.73 mg	
	300 g	0.28 mg	
	200 g	0.28 mg	
	100 g	41 µg	
	50 g	48 µg	
	30 g	43 µg	
	20 g	16 µg	
10 g	18 µg		
5 g	6.8 µg		
3 g	8.0 µg		

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
Avoirdupois	2 g	7.5 µg	Echelon II
	1 g	6.0 µg	
	500 mg	6.3 µg	
	300 mg	4.1 µg	
	200 mg	3.8 µg	
	100 mg	3.4 µg	
	50 mg	2.2 µg	
	30 mg	1.8 µg	
	20 mg	2.4 µg	
	10 mg	2.1 µg	
	5 mg	2.0 µg	
	3 mg	1.8 µg	
	2 mg	1.7 µg	
	1 mg	1.8 µg	
	1000 lb	1.3 g	
	500 lb	0.68 g	
	250 lb	0.27 g	
	50 lb	19 mg	
	30 lb	16 mg	
	25 lb	12 mg	
	20 lb	4.2 mg	
	10 lb	3.6 mg	
	5 lb	1.9 mg	
	3 lb	1.8 mg	
	2 lb	1.3 mg	
	1 lb	0.57 mg	
	0.5 lb	0.24 mg	
	0.3 lb	52 µg	
	0.2 lb	36 µg	
	0.1 lb	19 µg	
0.05 lb	18 µg		
0.03 lb	10 µg		
0.02 lb	11 µg		
0.01 lb	3.0 µg		
0.005 lb	2.9 µg		

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks	
Metric	0.003 lb	3.7 µg		
	0.002 lb	2.6 µg		
	0.001 lb	2.2 µg		
	8 oz	0.24 mg		
	4 oz	70 µg		
	2 oz	53 µg		
	1 oz	33 µg		
	½ oz	18 µg		
	¼ oz	6.2 µg		
	1/8 oz	4.5 µg		
	1/16 oz	2.8 µg		
	1/32 oz	3.2 µg		
	1/64 oz	2.9 µg		
	500 kg	1.8 g		Echelon III – Double Substitution
	200 kg	0.75 g		
	1000 kg	23 g	Echelon III – Modified Substitution	
	500 kg	9.1 g		
	300 kg	7.7 g		
	200 kg	3.3 g		
	100 kg	2.5 g		
	50 kg	0.64 g		
	25 kg	0.35 g		
	20 kg	0.27 g		
	10 kg	0.14 g		
	5 kg	60 mg		
	3 kg	36 mg		
	2 kg	24 mg		
	1 kg	12 mg		
	500 g	8.4 mg		
	300 g	7.2 mg		
	200 g	4.8 mg		
	100 g	2.4 mg		

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks	
Avoirdupois	50 g	1.2 mg		
	30 g	0.72 mg		
	20 g	0.48 mg		
	10 g	0.24 mg		
	5 g	0.18 mg		
	3 g	0.15 mg		
	2 g	0.13 mg		
	1g	0.11 mg		
	500 mg	87 µg		
	300 mg	74 µg		
	200 mg	65 µg		
	100 mg	52 µg		
	50 mg	43 µg		
	30 mg	35 µg		
	20 mg	32 µg		
	10 mg	26 µg		
	5 mg	21 µg		
	3 mg	17 µg		
	2 mg	15 µg		
	1 mg	12 µg		
	5000 lb	12 g		Echelon III – Double Substitution
	4000 lb	11 g		
	2500 lb	9.6 g		
	2000 lb	8.5 g		
	5000 lb	34 g		Echelon III – Modified Substitution
	4000 lb	28 g		
	3500 lb	26 g		
	3000 lb	24 g		
2500 lb	24 g			
2000 lb	22 g			
1000 lb	5.9 g			
500 lb	3.0 g			

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Weight Carts	250 lb	1.7 g	NIST HB 105-8
	100 lb	0.54 g	
	50 lb	0.28 g	
	30 lb	0.18 g	
	25 lb	0.15 g	
	20 lb	0.13 g	
	10 lb	54 mg	
	5 lb	27 mg	
	3 lb	17 mg	
	2 lb	11 mg	
	1 lb	8.4 mg	
	0.5 lb	5.4 mg	
	0.3 lb	3.2 mg	
	0.2 lb	2.1 mg	
	0.1 lb	1.1 mg	
	0.05 lb	0.54 mg	
	0.03 lb	0.32 mg	
	0.02 lb	0.22 mg	
	0.01 lb	0.18 mg	
	0.005 lb	0.16 mg	
	0.003 lb	0.13 mg	
	0.002 lb	0.11 mg	
	0.001 lb	86 µg	
	8 oz	5.4 mg	
	4 oz	2.8 mg	
	2 oz	1.3 mg	
	1 oz	0.65 mg	
	½ oz	0.34 mg	
	¼ oz	0.20 mg	
	1/8 oz	0.16 mg	
	1/16 oz	0.13 mg	
	1/32 oz	0.11 mg	
	1/64 oz	84 µg	
6000 lb	0.25 lb		

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
	5500 lb 5000 lb 4500 lb 4000 lb 3500 lb 3000 lb	0.20 lb 0.20 lb 0.17 lb 0.17 lb 0.15 lb 0.15 lb	
VOLUME (20/M12)			
Volume Transfer	1000 gal 500 gal 100 gal 50 gal 25 gal 5 gal 5 gal 5 gal	32 in ³ 27 in ³ 2.5 in ³ 2.5 in ³ 1.9 in ³ 0.26 in ³ 0.47 in ³ 0.22 in ³	Test Measure; 3 in neck Test Measure; 4 in neck Prover; Bottom Drain "J"
Liquefied Petroleum Gas	100 gal	6.7 in ³	Volume Transfer Method
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 with a level of confidence of approximately 95 %, typically using a coverage factor of $k = 2$. However, laboratories may report a coverage factor different than $k = 2$ to achieve the 95 % level of confidence. 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: 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.

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