United States Department of Commerce

National Institute of Standards and Technology

Certificate of Metrological Traceability For:

Oklahoma

This laboratory has demonstrated evidence of an unbroken chain of metrological traceability of its standards to the international system of units (SI), documented measurement uncertainties, uses documented measurement procedures, successfully completed training and proficiency tests, documented calibration intervals, submitted a quality management system, and demonstrated suitable measurement assurance for the Scope listed on this certificate.

The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

2015

Scope

Mass Echelon I
30 kg to 1 mg

Mass Echelon II
1200 kg to 1 mg
2500 lb to 1 µlb

Mass Echelon III
3000 kg to 1 mg
6000 lb to 0.001 lb

Weight Carts
5500 lb to 2000 lb

Volume Gravimetric, I
100 gal to 1 fl oz

Volume Transfer, II
375 gal to 5 gal

Carol T. Hockert, Chief
NIST Office of Weights and Measures

Effective Dates: 2015-01-01 to 2015-12-31

(Rev.: March 2013)

NVLAP® **National Voluntary Laboratory Accreditation Program**

CALIBRATION LABORATORIES **NVLAP LAB CODE 200396-0**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Oklahoma Bureau of Standards 2800 North Lincoln Boulevard Oklahoma City, OK 73105-4298 Mr. Jeremy Nading Phone: 405-522-5459 Fax: 405-522-5457 E-mail: jeremy.nading@ag.ok.gov URL: http://www.state.ok.us/lab-bos.htm	**Parameter(s) of Accreditation** Mechanical This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. ((20/A01)

CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
MECHANICAL			
MASS DETERMINATION (20/M08)			
Metric	30 kg	1.2 mg	Echelon I
	20 kg	0.99 mg	
	10 kg	0.39 mg	
	5 kg	0.20 mg	
	3 kg	0.12 mg	
	2 kg	0.08 mg	
	1 kg	0.09 mg	
	500 g	44 µg	
	300 g	28 µg	
	200 g	20 µg	
	100 g	15 µg	
	50 g	8.1 µg	
	30 g	5.2 µg	
	20 g	3.8 µg	
	10 g	3.2 µg	
	5 g	1.8 µg	
	3 g	1.3 µg	
	2 g	1.10 µg	
	1 g	1.10 µg	
	500 mg	0.60 µg	
	300 mg	0.39 µg	
	200 mg	0.29 µg	
	100 mg	0.25 µg	
	50 mg	0.19 µg	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
	30 mg	0.16 µg	
	20 mg	0.15 µg	
	10 mg	0.18 µg	
	5 mg	0.14 µg	
	3 mg	0.13 µg	
	2 mg	0.11 µg	
	1 mg	0.14 µg	
	1200 kg	9.6 g	Echelon II
	750 kg	6.6 g	
	500 kg	1.5 g	
	250 kg	0.46 g	
	200 kg	0.45 g	
	100 kg	0.44 g	
	50 kg	41 mg	
	30 kg	9.5 mg	
	20 kg	7.2 mg	
	10 kg	2.9 mg	
	5 kg	1.3 mg	
	3 kg	0.8 mg	
	2 kg	0.59 mg	
	1 kg	0.29 mg	
	500 g	0.16 mg	
	300 g	0.11 mg	
	200 g	95 µg	
	100 g	41 µg	
	50 g	35 µg	
	30 g	23 µg	
	20 g	17 µg	
	10 g	11 µg	
	5 g	6.3 µg	
	3 g	5.4 µg	
	2 g	4.7 µg	
	1 g	2.1 µg	
	500 mg	2.1 µg	
	300 mg	1.2 µg	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
	200 mg	1.1 µg	
	100 mg	0.7 µg	
	50 mg	0.49 µg	
	30 mg	0.47 µg	
	20 mg	0.37 µg	
	10 mg	0.42 µg	
	5 mg	0.37 µg	
	3 mg	0.32 µg	
	2 mg	0.25 µg	
	1 mg	0.25 µg	
Avoirdupois	2500 lb	0.019 lb	Echelon II
	2000 lb	0.013 lb	
	1000 lb	0.0025 lb	
	500 lb	0.0011 lb	
	300 lb	0.0011 lb	
	200 lb	0.0011 lb	
	100 lb	87 µlb	
	50 lb	17 µlb	
	25 lb	13 µlb	
	20 lb	6.6 µlb	
	10 lb	2.9 µlb	
	5 lb	1.9 µlb	
	3 lb	1.4 µlb	
	2 lb	0.71 µlb	
	1 lb	0.40 µlb	
	0.5 lb	0.31 µlb	
	0.3 lb	0.26 µlb	
	0.2 lb	0.11 µlb	
	0.1 lb	0.09 µlb	
	0.05 lb	0.071 µlb	
	0.03 lb	0.044 µlb	
	0.02 lb	0.033 µlb	
	0.01 lb	0.019 µlb	
	0.005 lb	0.017 µlb	
	0.003 lb	0.015 µlb	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
	0.002 lb	0.0075 µlb	
	0.001 lb	0.0071 µlb	
	0.0005 lb	0.0044 µlb	
	0.0003 lb	0.0049 µlb	
	0.0002 lb	0.0031 µlb	
	0.0001 lb	0.0017 µlb	
	0.00005 lb	0.0020 µlb	
	0.00003 lb	0.0018 µlb	
	0.00002 lb	0.0014 µlb	
	0.00001 lb	0.0011 µlb	
	0.000005 lb	0.00082 µlb	
	0.000003 lb	0.00073 µlb	
	0.000002 lb	0.00073 µlb	
	0.000001 lb	0.00073 µlb	
Metric	3000 kg	65 g	Echelon III
	2500 kg	64 g	
	2000 kg	62 g	
	1500 kg	50 g	
	1200 kg	20 g	
	1000 kg	13 g	
	750 kg	12 g	
	500 kg	5.6 g	
	250 kg	4.3 g	
	200 kg	3.9 g	
	100 kg	1.8 g	
	50 kg	1.5 g	
	30 kg	0.51 g	
	25 kg	0.16 g	
	20 kg	0.15 g	
	10 kg	0.14 g	
	5 kg	8.1 mg	
	3 kg	6.9 mg	
	2 kg	6.4 mg	
	1 kg	6.1 mg	
	500 g	6.0 mg	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
	300 g	3.8 mg	
	200 g	0.28 mg	
	100 g	0.17 mg	
	50 g	0.13 mg	
	30 g	0.13 mg	
	20 g	0.13 mg	
	10 g	0.11 mg	
	5 g	0.11 mg	
	3 g	0.11 mg	
	2 g	0.11 mg	
	1 g	0.11mg	
	500 mg	0.11 mg	
	300 mg	0.11 mg	
	200 mg	67 µg	
	100 mg	67 µg	
	50 mg	48 µg	
	30 mg	48 µg	
	20 mg	48 µg	
	10 mg	48 µg	
	5 mg	40 µg	
	3 mg	35 µg	
	2 mg	35 µg	
	1 mg	29 µg	
Avoirdupois	6000 lb	0.15 lb	Echelon III
	5500 lb	0.14 lb	
	5000 lb	0.14 lb	
	4500 lb	0.14 lb	
	4000 lb	0.11 lb	
	3500 lb	0.11 lb	
	3000 lb	0.068 lb	
	2500 lb	0.033 lb	
	2000 lb	0.031 lb	
	1500 lb	0.029 lb	
	1250 lb	0.013 lb	
	1000 lb	0.012 lb	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
	500 lb	0.0086 lb	
	300 lb	0.0053 lb	
	250 lb	0.0040 lb	
	200 lb	0.0040 lb	
	125 lb	0.0033 lb	
	100 lb	0.0011 lb	
	50 lb	0.00033 lb	
	30 lb	0.00033 lb	
	25 lb	0.00031 lb	
	20 lb	0.00031 lb	
	15 lb	0.00031 lb	
	10 lb	18 µlb	
	5 lb	15 µlb	
	4 lb	15 µlb	
	3 lb	14 µlb	
	2 lb	13 µlb	
	1 lb	8.4 µlb	
	0.5 lb	8.4 µlb	
	0.3 lb	0.53 µlb	
	0.2 lb	0.35 µlb	
	0.1 lb	0.29 µlb	
	0.05 lb	0.29 µlb	
	0.03 lb	0.29 µlb	
	0.02 lb	0.24 µlb	
	0.01 lb	0.24 µlb	
	0.005 lb	0.24 µlb	
	0.003 lb	0.24 µlb	
	0.002 lb	0.24 µlb	
	0.001 lb	0.24 µlb	
	5500 lb	0.16 lb	Weight Carts
	5000 lb	0.16 lb	
	4500 lb	0.16 lb	
	4000 lb	0.13 lb	
	3500 lb	0.13 lb	
	3000 lb	0.11 lb	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) Note 3	Remarks
	2500 lb 2000 lb	0.086 lb 0.085 lb	
VOLUME and DENSITY (20/M12)			
Volume	375 gal 300 gal 250 gal 200 gal 150 gal 100 gal 50 gal 30 gal 25 gal 20 gal 15 gal 10 gal 5 gal	13 in^3 10 in^3 8.4 in^3 6.7 in^3 5.1 in^3 3.4 in^3 1.7 in^3 1.0 in^3 0.88 in^3 0.71 in^3 0.53 in^3 0.36 in^3 0.21 in^3	Volume Transfer
	100 gal 25 gal 5 gal 1 gal 0.5 gal 1 qt 1 pt 0.5 pt 1 gill 2 oz 1 oz	1.4 in^3 0.86 in^3 0.077 in^3 0.026 in^3 0.026 in^3 0.026 in^3 0.013 in^3 0.0071 in^3 0.0071 in^3 0.0014 in^3 0.0014 in^3	Gravimetric 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.

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

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United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200396-0

Oklahoma Bureau of Standards
Oklahoma City, OK

is accredited by the National Voluntary Laboratory 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 Communique dated January 2009).

2015-01-01 through 2015-12-31
Effective dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)