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.ag.ok.gov/lab/bos.htm	**Fields of Calibration** 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	Expanded Uncertainty [Note 3]	Remarks
MECHANICAL			
MASS DETERMINATION (20/M08)			
Metric	30 kg	1.8 mg	Echelon I Automated
	25 kg	1.5 mg	
	20 kg	1.2 mg	
	10 kg	0.57 mg	
	5 kg	0.27 mg	
	3 kg	0.12 mg	
	2 kg	96 µg	
	1 kg	34 µg	
	500 g	17 µg	
	300 g	10 µg	
	200 g	7.1 µg	
	100 g	4.3 µg	
	50 g	2.3 µg	
	30 g	1.5 µg	
	20 g	1.2 µg	
	10 g	1.1 µg	
Avoirdupois	50 lb	1.5 mg	Echelon I Automated
	25 lb	0.76 mg	
Metric	30 kg	8.9 mg	Echelon I
	20 kg	7.2 mg	
	10 kg	0.98 mg	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	5 kg	0.59 mg	
	3 kg	0.45 mg	
	2 kg	0.41 mg	
	1 kg	62 µg	
	500 g	33 µg	
	300 g	22 µg	
	200 g	17 µg	
	100 g	16 µg	
	50 g	8.1 µg	
	30 g	5.2 µg	
	20 g	3.9 µg	
	10 g	3.3 µg	
	5 g	1.7 µg	
	3 g	1.2 µg	
	2 g	0.91 µg	
	1 g	0.85 µg	
	500 mg	0.48 µg	
	300 mg	0.33 µg	
	200 mg	0.28 µg	
	100 mg	0.28 µg	
	50 mg	0.18 µg	
	30 mg	0.18 µg	
	20 mg	0.15 µg	
	10 mg	0.18 µg	
	5 mg	0.15 µg	
	3 mg	0.13 µg	
	2 mg	0.13 µg	
	1 mg	0.15 µg	
	1200 kg	13.0 g	Echelon II
	750 kg	9.5 g	
	500 kg	1.2 g	
	250 kg	0.49 g	
	200 kg	0.49 g	
	100 kg	0.48 g	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	50 kg	35 mg	
	30 kg	13 mg	
	20 kg	11 mg	
	10 kg	3.0 mg	
	5 kg	1.5 mg	
	3 kg	0.97 mg	
	2 kg	0.80 mg	
	1 kg	0.28 mg	
	500 g	0.16 mg	
	300 g	0.11 mg	
	200 g	98 µg	
	100 g	40 µg	
	50 g	37 µg	
	30 g	24 µg	
	20 g	18 µg	
	10 g	13 µg	
	5 g	7.1 µg	
	3 g	5.7 µg	
	2 g	5.1 µg	
	1 g	2.1 µg	
	500 mg	2.5 µg	
	300 mg	1.7 µg	
	200 mg	1.3 µg	
	100 mg	0.81 µg	
	50 mg	0.69 µg	
	30 mg	0.53 µg	
	20 mg	0.40 µg	
	10 mg	0.43 µg	
	5 mg	0.40 µg	
	3 mg	0.33 µg	
	2 mg	0.26 µg	
	1 mg	0.25 µg	
Avoirdupois	2500 lb	0.022 lb	Echelon II
	2000 lb	0.022 lb	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	1000 lb	0.0025 lb	
	500 lb	0.0011 lb	
	300 lb	0.0011 lb	
	200 lb	0.0011 lb	
	100 lb	76 µlb	
	50 lb	27 µlb	
	25 lb	13 µlb	
	20 lb	6.0 µlb	
	10 lb	3.1 µlb	
	5 lb	1.9 µlb	
	3 lb	2.6 µlb	
	2 lb	0.63 µlb	
	1 lb	0.39 µlb	
	0.5 lb	0.48 µlb	
	0.3 lb	0.22 µlb	
	0.2 lb	0.12 µlb	
	0.1 lb	0.10 µlb	
	0.05 lb	0.082 µlb	
	0.03 lb	0.048 µlb	
	0.02 lb	0.058 µlb	
	0.01 lb	0.022 µlb	
	0.005 lb	0.020 µlb	
	0.003 lb	0.020 µlb	
	0.002 lb	0.0082 µlb	
	0.001 lb	0.0089 µlb	
	0.0005 lb	0.0060 µlb	
	0.0003 lb	0.0040 µlb	
	0.0002 lb	0.0034 µlb	
	0.0001 lb	0.0022 µlb	
	0.00005 lb	0.0021 µlb	
	0.00003 lb	0.0018 µlb	
	0.00002 lb	0.0013 µlb	
	0.00001 lb	0.00087 µlb	
	0.000005 lb	0.00058 µlb	
	0.000003 lb	0.00055 µlb	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	0.000002 lb	0.00055 µlb	
	0.000001 lb	0.00055 µlb	
Metric	3000 kg	72 g	Echelon III
	2500 kg	68 g	
	2000 kg	65 g	
	1500 kg	42 g	
	1200 kg	32 g	
	1000 kg	16 g	
	750 kg	14 g	
	500 kg	6.1 g	
	250 kg	4.9 g	
	200 kg	4.5 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	
	300 g	3.8 mg	
	200 g	0.27 mg	
	100 g	0.16 mg	
	50 g	0.13 mg	
	30 g	0.13 mg	
	20 g	0.12 mg	
	10 g	0.11 mg	
	5 g	0.11 mg	
	3 g	0.11 mg	
	2 g	0.11 mg	
	1 g	0.10 mg	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	500 mg	0.11 mg	
	300 mg	0.11 mg	
	200 mg	60 µg	
	100 mg	60 µg	
	50 mg	38 µg	
	30 mg	38 µg	
	20 mg	38 µg	
	10 mg	43 µg	
	5 mg	34 µg	
	3 mg	27 µg	
	2 mg	27 µg	
	1 mg	25 µg	
Avoirdupois	6000 lb	0.15 lb	Echelon III
	5500 lb	0.15 lb	
	5000 lb	0.15 lb	
	4500 lb	0.14 lb	
	4000 lb	0.12 lb	
	3500 lb	0.12 lb	
	3000 lb	0.074 lb	
	2500 lb	0.041 lb	
	2000 lb	0.035 lb	
	1500 lb	0.030 lb	
	1250 lb	0.014 lb	
	1000 lb	0.013 lb	
	500 lb	0.010 lb	
	300 lb	0.0053 lb	
	250 lb	0.0040 lb	
	200 lb	0.0040 lb	
	125 lb	0.0032 lb	
	100 lb	0.0011 lb	
	50 lb	0.00034 lb	
	30 lb	0.00032 lb	
	25 lb	0.00032 lb	
	20 lb	0.00031 lb	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	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	8.5 µlb	
	0.5 lb	8.5 µlb	
	0.3 lb	0.53 µlb	
	0.2 lb	0.35 µlb	
	0.1 lb	0.29 µlb	
	0.05 lb	0.28 µlb	
	0.03 lb	0.27 µlb	
	0.02 lb	0.23 µlb	
	0.01 lb	0.23 µlb	
	0.005 lb	0.23 µlb	
	0.003 lb	0.23 µlb	
	0.002 lb	0.23 µlb	
	0.001 lb	0.23 µlb	
	5500 lb	0.17 lb	Weight Carts
	5000 lb	0.17 lb	
	4500 lb	0.17 lb	
	4000 lb	0.14 lb	
	3500 lb	0.14 lb	
	3000 lb	0.12 lb	
	2500 lb	0.090 lb	
	2000 lb	0.088 lb	
VOLUME and DENSITY (20/M12)			
Volume	375 gal	12 in^3	Volume Transfer
	300 gal	10 in^3	
	250 gal	8.1 in^3	
	200 gal	6.5 in^3	
	150 gal	4.9 in^3	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	100 gal	3.3 in^3	
	50 gal	1.7 in^3	
	30 gal	1.0 in^3	
	25 gal	0.86 in^3	
	20 gal	0.69 in^3	
	15 gal	0.52 in^3	
	10 gal	0.35 in^3	
	5 gal	0.21 in^3	
	100 gal	0.90 in^3	Gravimetric Method
	25 gal	0.82 in^3	
	5 gal	0.074 in^3	
	1 gal	0.014 in^3	
	0.5 gal	0.014 in^3	
	1 qt	0.014 in^3	
	1 pt	0.0071 in^3	
	0.5 pt	0.0038 in^3	
	1 gill	0.0038 in^3	
	2 fl oz	0.011 in^3	
	1 fl oz	0.011 in^3	
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.5 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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