



CALIBRATION LABORATORIES

NVLAP LAB CODE 200495-0
Scope Revised: 2015-06-03

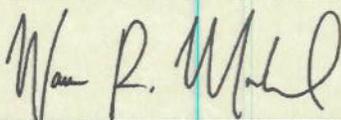
SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

<p>North Carolina Standards Laboratory 4040 District Drive / 1051 Mail Service Center Raleigh, NC 27699-1051 Ms. Sharon Woodard Phone: 919-733-4411 x213 Fax: 919-733-8804 E-mail: sharon.woodard@ncagr.gov URL: http://www.ncagr.gov/standard</p>	<p>Fields of Calibration Dimensional Mechanical Thermodynamic</p> <p>This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (20/A01)</p>
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) <small>Note 3</small>	Remarks
DIMENSIONAL			
LENGTH and DIAMETER, STEP GAGES (20/D05)			
Lottery Ball Pass Through Gauge	Lottery Ball	7.5 μ m	
MECHANICAL			
MASS DETERMINATION (20/M08)			
Metric	30 kg 20 kg 10 kg 5 kg 3 kg 2 kg 1 kg 500 g 300 g 200 g 100 g 50 g 30 g 20 g 10 g 5 g 3 g	8.1 mg 5.7 mg 4.0 mg 0.55 mg 0.34 mg 0.25 mg 64 μ g 33 μ g 22 μ g 17 μ g 14 μ g 8.2 μ g 5.5 μ g 4.4 μ g 3.7 μ g 2.1 μ g 1.4 μ g	Echelon I

2015-04-01 through 2016-03-31
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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) <small>Note 3</small>	Remarks
Metric	2 g	1.1 μ g	Echelon II
	1 g	1.0 μ g	
	500 mg	0.89 μ g	
	300 mg	0.73 μ g	
	200 mg	0.69 μ g	
	100 mg	0.71 μ g	
	50 mg	0.47 μ g	
	30 mg	0.37 μ g	
	20 mg	0.31 μ g	
	10 mg	0.29 μ g	
	5 mg	0.18 μ g	
	3 mg	0.16 μ g	
	2 mg	0.12 μ g	
	1 mg	0.14 μ g	
	30 kg	8.1 mg	
	20 kg	5.7 mg	
	10 kg	4.0 mg	
	5 kg	0.55 mg	
	3 kg	0.34 mg	
	2 kg	0.25 mg	
	1 kg	64 μ g	
	500 g	33 μ g	
	300 g	22 μ g	
	200 g	17 μ g	
	100 g	14 μ g	
	50 g	8.2 μ g	
	30 g	5.5 μ g	
	20 g	4.4 μ g	
	10 g	3.7 μ g	
	5 g	2.1 μ g	
	3 g	1.4 μ g	
	2 g	1.1 μ g	
	1 g	1.0 μ g	
500 mg	0.89 μ g		

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) <small>Note 3</small>	Remarks	
Metric	300 mg	0.73 μ g	Echelon III	
	200 mg	0.69 μ g		
	100 mg	0.71 μ g		
	50 mg	0.47 μ g		
	30 mg	0.37 μ g		
	20 mg	0.31 μ g		
	10 mg	0.29 μ g		
	5 mg	0.18 μ g		
	3 mg	0.16 μ g		
	2 mg	0.12 μ g		
	1 mg	0.14 μ g		
	1000 kg	20 g		
	500 kg	3.5 g		
	250 kg	1.6 g		
	200 kg	1.6 g		
	100 kg	1.2g		
	50 kg	0.30 g		
	30 kg	0.13 g		
	25 kg	0.13 g		
	20 kg	0.13 g		
	10 kg	80 mg		
	5 kg	30 mg		
	3 kg	12 mg		
	2 kg	12 mg		
	1 kg	6.5 mg		
	500 g	4.0 mg		
	300 g	2.9 mg		
	200 g	1.2 mg		
	100 g	0.60 mg		
	50 g	0.36 mg		
	30 g	0.31 mg		
	20 g	0.31 mg		
10 g	0.25 mg			
5 g	0.17 mg			

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3}	Remarks
	3 g	0.11 mg	
	2 g	89 µg	
	1 g	59 µg	
	500 mg	45 µg	
	300 mg	36 µg	
	200 mg	31 µg	
	100 mg	24 µg	
	50 mg	19 µg	
	30 mg	17 µg	
	20 mg	14 µg	
	10 mg	12 µg	
	5 mg	9.9 µg	
	3 mg	8.8 µg	
	2 mg	7.7 µg	
	1 mg	6.6 µg	
Lottery Balls	Lottery Ball	43 mg	Echelon III
Avoirdupois	2500 lb	23 g	Echelon III
	2000 lb	18 g	
	1000 lb	2.9 g	
	500 lb	1.6 g	
	100 lb	0.57 g	
	50 lb	0.13 g	
	30 lb	80 mg	
	25 lb	62 mg	
	20 lb	62 mg	
	10 lb	18 mg	
	5 lb	12 mg	
	4 lb	6.5 mg	
	3 lb	6.5 mg	
	2 lb	4.4 mg	
	1 lb	3.6 mg	
	0.5 lb	3.2 mg	
	0.3 lb	1.1 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
Weight Carts	0.2 lb	0.67 mg	Echelon III
	0.1 lb	0.48 mg	
	0.05 lb	0.37 mg	
	0.03 lb	0.25 mg	
	0.02 lb	0.18 mg	
	0.01 lb	0.14 mg	
	0.005 lb	0.12 mg	
	0.003 lb	60 µg	
	0.002 lb	46 µg	
	0.001 lb	36 µg	
	4 oz	1.1 mg	
	2 oz	0.67 mg	
	1 oz	0.37 mg	
	1/2 oz	0.25 mg	
	1/4 oz	0.18 mg	
	1/8 oz	0.14 mg	
	1/16 oz	60 µg	
	1/32 oz	46 µg	
	6000 lb	130 g	
	5500 lb	100 g	
5000 lb	110 g		
4500 lb	89 g		
4000 lb	73 g		
3000 lb	72 g		
VOLUME and DENSITY (20/M12)			
Volume	2000 gal	100 in ³	Transfer Method
	1500 gal	76 in ³	
	1200 gal	52 in ³	
	1000 gal	52 in ³	
	500 gal	25 in ³	
	200 gal	2.9 in ³	
	100 gal	1.8 in ³	

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

Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) ^{Note 3}	Remarks
Test Measure	60 gal	1.6 in ³	
	50 gal	1.1 in ³	
	25 gal	0.74 in ³	
	15 gal	0.34 in ³	
	10 gal	0.23 in ³	
	5 gal	0.36 in ³	4 in neck
	5 gal	0.16 in ³	3 in neck
	1 gal	0.35 in ³	
	650 L	2.0 in ³	
	500 L	2.0 in ³	
	40 L	0.68 in ³	
	20 L	0.37 in ³	
	500 gal	32 in ³	LPG Transfer Method
	104 gal	5.0 in ³	
	103 gal	5.8 in ³	
	100 gal	3.9 in ³	
	50 gal	2.8 in ³	
	25 gal	1.1 in ³	
	100 gal	0.71 in ³	Gravimetric Method
	75 gal	2.8 in ³	
	50 gal	0.63 in ³	
	25 gal	0.52 in ³	
	15 gal	0.33 in ³	
	10 gal	0.35 in ³	
	5 gal	0.27 in ³	4 in neck
	5 gal	0.25 in ³	3 in neck
	5 gal	0.10 in ³	2 in neck
	1 gal	0.091 in ³	
10 ft ³	1.5 in ³		
0.5 ft ³	0.051 in ³		

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Measured Parameter or Device Calibrated	Range	Uncertainty (k=2) ^{Note 3}	Remarks
Prover	20 L	3.3 mL	
	400 L	31 mL	
	250 L	100 mL	
Graduated Cylinder	2 L	1.7 mL	
Flask	100 mL	0.049 mL	
	1 qt	0.39 mL	
	1 gill	0.065 mL	
Slicker Standard	100 gal	0.75 in ³	
	50 gal	0.47 in ³	
	25 gal	0.17 in ³	
	15 gal	0.17 in ³	
	5 gal	0.040 in ³	
	1 gal	0.020 in ³	
	1.0 ft ³	0.17 in ³	
Small Volume Prover	20 L	1.1 mL	Gravimetric Method
	10 L	1.6 mL	
	5 L	0.83 mL	
	30 gal	1.5 in ³	
	20 gal	0.66 in ³	
	15 gal	0.78 in ³	
THERMODYNAMIC			
LABORATORY THERMOMETERS, DIGITAL AND ANALOG (20/T03)			
Liquid in Glass and Digital	-30 °C to 95 °C	0.11 °C	Comparison to PRT
	95 °C to 230 °C	0.11 °C	
	-22 °F to 203 °F	0.20 °F	Comparison to PRT
	203 °F to 446 °F		

2015-04-01 through 2016-03-31

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

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3}	Remarks
RESISANCE THERMOMETRY (20/T07)			
	-30 °C to 95 °C	0.0066 °C	Comparison
	95 °C to 230 °C	0.018 °C	
	-22 °F to 203 °F	0.012 °F	Comparison
	203 °F to 446 °F	0.032 °F	
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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