



# National Voluntary Laboratory Accreditation Program



## CALIBRATION LABORATORIES

**NVLAP LAB CODE 200414-0**

Scope Revised: 2012-11-09

## SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

<b>Maine Department of Agriculture Metrology Laboratory</b> 28 State House Station Div. QA&R Augusta, ME 04333-0028 Mr. Ronald E. Dyer Phone: 207-287-3841 Fax: 207-287-5576 E-mail: <a href="mailto:ron.dyer@maine.gov">ron.dyer@maine.gov</a> URL: <a href="http://www.maine.gov/agriculture/qar/metrology.html">www.maine.gov/agriculture/qar/metrology.html</a>	<b>Parameter(s) of Accreditation</b> Mechanical  This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (NVLAP Code: 20/A01)
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## CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)<sup>Notes 1,2</sup>

Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <sup>Note 3</sup>	Remarks
<b>MECHANICAL</b>			
<b>NVLAP Code: 20/M08</b> <b>MASS</b> Metric	30 kg 25 kg 20 kg 10 kg 5 kg 4 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 2 g 1 g 500 mg	14 mg 9.4 mg 9.3 mg 1.7 mg 0.90 mg 0.90 mg 0.60 mg 0.42 mg 94 µg 47 µg 30 µg 21 µg 16 µg 10 µg 8.2 µg 7.5 µg 7.4 µg 3.9 µg 2.7 µg 2.2 µg 2.0 µg 1.5 µg	Echelon I

2012-07-01 through 2013-06-30

Effective dates

For the National Institute of Standards and Technology



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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
	300 mg	1.3 $\mu$ g	
	200 mg	1.3 $\mu$ g	
	100 mg	1.4 $\mu$ g	
	50 mg	0.91 $\mu$ g	
	30 mg	0.80 $\mu$ g	
	20 mg	0.72 $\mu$ g	
	10 mg	0.78 $\mu$ g	
	5 mg	0.54 $\mu$ g	
	3 mg	0.47 $\mu$ g	
	2 mg	0.45 $\mu$ g	
	1 mg	0.50 $\mu$ g	
Avoirdupois	1000 lb	1.2 g	Echelon I
	500 lb	0.57 g	
	100 lb	40 mg	
	50 lb	16 mg	
	30 lb	9.8 mg	
	25 lb	6.9 mg	
	20 lb	3.8 mg	
	10 lb	1.6 mg	
	5 lb	0.84 mg	
	3 lb	0.56 mg	
	2 lb	95 $\mu$ g	
	1 lb	65 $\mu$ g	
	0.5 lb	39 $\mu$ g	
	0.3 lb	28 $\mu$ g	
	0.2 lb	24 $\mu$ g	
	0.1 lb	22 $\mu$ g	
	0.05 lb	10 $\mu$ g	
	0.03 lb	7.6 $\mu$ g	
	0.02 lb	6.7 $\mu$ g	
	0.01 lb	7.1 $\mu$ g	
	0.005 lb	3.9 $\mu$ g	
	0.003 lb	1.8 $\mu$ g	
	0.002 lb	1.8 $\mu$ g	
	1000 $\mu$ lb	1.7 $\mu$ g	

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Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <small>Note 3</small>	Remarks
	500 $\mu$ lb	1.5 $\mu$ g	
	300 $\mu$ lb	1.3 $\mu$ g	
	200 $\mu$ lb	1.3 $\mu$ g	
	100 $\mu$ lb	1.5 $\mu$ g	
	50 $\mu$ lb	0.88 $\mu$ g	
	30 $\mu$ lb	0.71 $\mu$ g	
	20 $\mu$ lb	0.66 $\mu$ g	
	10 $\mu$ lb	0.72 $\mu$ g	
	5 $\mu$ lb	0.47 $\mu$ g	
	3 $\mu$ lb	0.39 $\mu$ g	
	2 $\mu$ lb	0.36 $\mu$ g	
	1 $\mu$ lb	0.42 $\mu$ g	
Metric	30 kg	14 mg	Echelon II
	25 kg	13 mg	
	20 kg	13 mg	
	10 kg	1.7 mg	
	5 kg	1.0 mg	
	4 kg	0.82 mg	
	3 kg	0.61 mg	
	2 kg	0.54 mg	
	1 kg	0.11 mg	
	500 g	69 $\mu$ g	
	300 g	58 $\mu$ g	
	200 g	54 $\mu$ g	
	100 g	23 $\mu$ g	
	50 g	19 $\mu$ g	
	30 g	19 $\mu$ g	
	20 g	18 $\mu$ g	
	10 g	11 $\mu$ g	
	5 g	8.4 $\mu$ g	
	3 g	7.9 $\mu$ g	
	2 g	7.7 $\mu$ g	
	1 g	3.2 $\mu$ g	
	500 mg	2.9 $\mu$ g	
	300 mg	2.8 $\mu$ g	

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Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <small>Note 3</small>	Remarks
Avoirdupois	200 mg	2.8 µg	Echelon II
	100 mg	1.8 µg	
	50 mg	1.4 µg	
	30 mg	1.3 µg	
	20 mg	1.3 µg	
	10 mg	1.0 µg	
	5 mg	0.86 µg	
	3 mg	0.82 µg	
	2 mg	0.81 µg	
	1 mg	0.68 µg	
	4 oz	58 µg	
	2 oz	25 µg	
	1 oz	23 µg	
	1/2 oz	16 µg	
Metric	1/4 oz	10 µg	Echelon III
	1/8 oz	5.6 µg	
	1/16 oz	6.8 µg	
	1/32 oz	5.6 µg	
	0.3 oz	10 µg	
	0.2 oz	8.7 µg	
	0.1 oz	6.7 µg	
	0.05 oz	5.9 µg	
	100 kg	0.90 g	
	75 kg	0.63 g	
	50 kg	0.57 g	
	30 kg	89 mg	
	25 kg	88 mg	
	20 kg	88 mg	

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Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <small>Note 3</small>	Remarks
	300 g	4.5 mg	
	200 g	4.5 mg	
	100 g	0.25 mg	
	50 g	0.24 mg	
	30 g	0.14 mg	
	20 g	0.14 mg	
	10 g	54 µg	
	5 g	53 µg	
	3 g	53 µg	
	2 g	53 µg	
	1 g	52 µg	
	500 mg	52 µg	
	300 mg	52 µg	
	200 mg	52 µg	
	100 mg	48 µg	
	50 mg	48 µg	
	30 mg	48 µg	
	20 mg	48 µg	
	10 mg	33 µg	
	5 mg	33 µg	
	3 mg	33 µg	
	2 mg	33 µg	
	1 mg	33 µg	
Avoirdupois	1000 lb	2.2 g	Echelon III
	500 lb	1.7 g	
	250 lb	0.90 g	
	100 lb	0.10 g	
	50 lb	89 mg	
	30 lb	87 mg	
	25 lb	31 mg	
	20 lb	30 mg	
	10 lb	6.8 mg	
	5 lb	6.7 mg	
	3 lb	6.6 mg	
	2 lb	6.6 mg	

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Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <small>Note 3</small>	Remarks
	1 lb	6.5 mg	
	0.5 lb	6.5 mg	
	0.3 lb	0.88 mg	
	0.2 lb	0.88 mg	
	0.1 lb	0.18 mg	
	0.05 lb	0.18 mg	
	0.03 lb	0.18 mg	
	0.02 lb	0.18 mg	
	0.01 lb	66 µg	
	0.005 lb	66 µg	
	0.003 lb	66 µg	
	0.002 lb	66 µg	
	0.001 lb	48 µg	
	4 oz	0.45 mg	
	2 oz	0.44 mg	
	1 oz	0.17 mg	
	1/2 oz	83 µg	
	1/4 oz	82 µg	
	1/8 oz	82 µg	
	1/16 oz	82 µg	
	1/32 oz	85 µg	
	0.3 oz	82 µg	
	0.2 oz	82 µg	
	0.1 oz	82 µg	
	0.05 oz	82 µg	
Weight Carts	5000 lb	0.29 lb	Echelon III
	4000 lb	0.29 lb	
	3000 lb	0.29 lb	
	2500 lb	0.29 lb	
	2000 lb	0.29 lb	
<b>NVLAP Code: 20/M12</b> <b>VOLUME</b> Gravimetric	120 gal	1.9 in <sup>3</sup>	
	100 gal	1.6 in <sup>3</sup>	
	50 gal	1.4 in <sup>3</sup>	

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Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <small>Note 3</small>	Remarks
	30 gal	0.59 in <sup>3</sup>	
	25 gal	0.50 in <sup>3</sup>	
	20 gal	0.50 in <sup>3</sup>	
	15 gal	0.45 in <sup>3</sup>	
	10 gal	0.36 in <sup>3</sup>	
	5 gal	0.14 in <sup>3</sup>	
	1 gal	0.044 in <sup>3</sup>	
	2 qt	0.15 mL	
	1 qt	0.15 mL	
	1 pint	0.11 mL	
	1/2 pint	0.084 mL	
	1 gill	0.060 mL	
	200 L	17 mL	
	100 L	8.2 mL	
	60 L	6.2 mL	
	50 L	6.2 mL	
	20 L	2.2 mL	
	19 L	2.2 mL	
	10 L	0.76 mL	
	5 L	0.49 mL	
	2 L	0.15 mL	
	1 L	0.15 mL	
Volume Transfer	1500 gal	54 in <sup>3</sup>	
	1000 gal	37 in <sup>3</sup>	
	500 gal	18 in <sup>3</sup>	
	300 gal	15 in <sup>3</sup>	
	200 gal	13 in <sup>3</sup>	
	150 gal	7.4 in <sup>3</sup>	
	100 gal	4.1 in <sup>3</sup>	
	50 gal	3.2 in <sup>3</sup>	
	30 gal	1.3 in <sup>3</sup>	
	25 gal	1.1 in <sup>3</sup>	
	20 gal	1.3 in <sup>3</sup>	

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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
	10 gal	0.60 in <sup>3</sup>	
	5 gal	0.37 in <sup>3</sup>	
	5000 L	980 mL	
	3000 L	620 mL	
	2000 L	420 mL	
	1000 L	220 mL	
	500 L	120 mL	
	200 L	32 mL	
	100 L	18 mL	
	60 L	12 mL	
	50 L	7.9 mL	
	19 L	4.9 mL	
Volume Transfer (LPG)	300 gal	0.093 gal	
	200 gal	0.065 gal	
	100 gal	0.040 gal	
	50 gal	0.028 gal	
	30 gal	0.011 gal	
	25 gal	0.011 gal	
	20 gal	0.011 gal	

**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:** 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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