



**CALIBRATION LABORATORIES**

**NVLAP LAB CODE 200446-0**

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

<p><b>WSDA Weights and Measures Program Metrology Laboratory</b>  <b>Physical Address:</b> 2747 29th Avenue, SW  Tumwater, WA 98512-6104  <b>Mailing Address:</b> P.O. Box 42560  Olympia, WA 98504-2560  Mr. Dan Wright  Phone: 360-753-5042 Fax: 360-586-4728  E-mail: <a href="mailto:dwright@agr.wa.gov">dwright@agr.wa.gov</a></p>	<p><b>Parameter(s) of Accreditation</b>  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)** <sup>Notes 1,2</sup>

Measured Parameter or Device Calibrated	Range	Uncertainty ( $k=2$ ) <sup>Note 3</sup>	Remarks
<b>TIME and FREQUENCY</b>			
NVLAP Code: 20/F05 <b>STOPWATCHES and TIMERS</b> Stopwatches and Timers	≤ 24 h	0.076 s	WWV Comparison
<b>MECHANICAL</b>			
NVLAP Code: 20/M08 <b>MASS</b> 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	15 mg 11 mg 7.0 mg 1.0 mg 0.68 mg 0.51 mg 86 µg 51 µg 42 µg 39 µg 19 µg 11 µg 7.7 µg 6.4 µg 6.6 µg 3.7 µg	Echelon I



2013-01-01 through 2013-12-31

*Effective dates*

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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
Metric	3 g	2.5 µg	Echelon II
	2 g	2 µg	
	1 g	2 µg	
	500 mg	1.3 µg	
	300 mg	1.0 µg	
	200 mg	0.92 µg	
	100 mg	1.0 µg	
	50 mg	0.72 µg	
	30 mg	0.58 µg	
	20 mg	0.54 µg	
	10 mg	0.62 µg	
	5 mg	0.45 µg	
	3 mg	0.39 µg	
	2 mg	0.36 µg	
	1 mg	0.42 µg	
	30 kg	17 mg	
	20 kg	14 mg	
	10 kg	12 mg	
	5 kg	1.4 mg	
	3 kg	0.98 mg	
	2 kg	0.77 mg	
	1 kg	0.25 mg	
	500 g	0.18 mg	
	300 g	0.17 mg	
	200 g	0.17 mg	
	100 g	26 µg	
	50 g	16 µg	
	30 g	13 µg	
	20 g	14 µg	
	10 g	11 µg	
	5 g	5.0 µg	
	3 g	4.2 µg	
	2 g	3.8 µg	
1 g	4.3 µg		
500 mg	3.5 µg		

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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
Avoirdupois	300 mg	3.6 $\mu$ g	Echelon II
	200 mg	3.0 $\mu$ g	
	100 mg	3.3 $\mu$ g	
	50 mg	2.6 $\mu$ g	
	30 mg	2.3 $\mu$ g	
	20 mg	2.3 $\mu$ g	
	10 mg	2.3 $\mu$ g	
	5 mg	2.3 $\mu$ g	
	3 mg	2.2 $\mu$ g	
	2 mg	2.2 $\mu$ g	
	1 mg	2.3 $\mu$ g	
	500 lb	950 mg	
	50 lb	17 mg	
	30 lb	10 mg	
	20 lb	7.0 mg	
	10 lb	4.1 mg	
	5 lb	1.1 mg	
	3 lb	0.74 mg	
	2 lb	92 $\mu$ g	
	1 lb	83 $\mu$ g	
	0.5 lb	76 $\mu$ g	
	0.3 lb	60 $\mu$ g	
	0.2 lb	50 $\mu$ g	
	0.1 lb	57 $\mu$ g	
	0.05 lb	29 $\mu$ g	
	0.03 lb	18 $\mu$ g	
	0.02 lb	13 $\mu$ g	
0.01 lb	9.0 $\mu$ g		
0.005 lb	4.5 $\mu$ g		
0.003 lb	2.7 $\mu$ g		
0.002 lb	1.9 $\mu$ g		
0.001 lb	1.0 $\mu$ g		
4 oz	340 $\mu$ g		
2 oz	26 $\mu$ g		
1 oz	21 $\mu$ g		

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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
Metric	1/2 oz	20 µg	Echelon III
	1/4 oz	15 µg	
	1/8 oz	7.2 µg	
	1/16 oz	9.7 µg	
	30 kg	73 mg	
	20 kg	49 mg	
	10 kg	27 mg	
	5 kg	13 mg	
	3 kg	7.9 mg	
	2 kg	5.8 mg	
	1 kg	2.4 mg	
	500 g	1.2 mg	
	300 g	0.77 mg	
	200 g	0.48 mg	
	100 g	0.24 mg	
	50 g	0.15 mg	
	30 g	0.12 mg	
	20 g	0.10 mg	
	10 g	83 µg	
	5 g	72 µg	
	3 g	36 µg	
	2 g	31 µg	
	1 g	24 µg	
	500 mg	19 µg	
	300 mg	17 µg	
	200 mg	15 µg	
	100 mg	13 µg	
	50 mg	11 µg	
	30 mg	9.7 µg	
	20 mg	9.2 µg	
	10 mg	8.2 µg	
	5 mg	7.7 µg	
	3 mg	7.4 µg	
2 mg	7.2 µg		
1 mg	7.2 µg		

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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
Avoirdupois	1000 lb	2.8 g	Echelon III
	500 lb	1.6 g	
	50 lb	51 mg	
	30 lb	28 mg	
	25 lb	28 mg	
	20 lb	18 mg	
	10 lb	8.9 mg	
	5 lb	5.8 mg	
	3 lb	3.9 mg	
	2 lb	1.2 mg	
	1 lb	0.77 mg	
	0.5 lb	0.56 mg	
	0.3 lb	0.25 mg	
	0.2 lb	0.16 mg	
	0.1 lb	0.13 mg	
	0.05 lb	0.11 mg	
	0.03 lb	84 µg	
	0.02 lb	73 µg	
	0.01 lb	68 µg	
	0.005 lb	32 µg	
	0.003 lb	24 µg	
	0.002 lb	36 µg	
	0.001 lb	18 µg	
	4 oz	0.39 mg	
	2 oz	0.15 mg	
	1 oz	0.10 mg	
	1/2 oz	84 µg	
	1/4 oz	73 µg	
	1/8 oz	36 µg	
	1/16 oz	26 µg	
	1/32 oz	20 µg	
		4000 lb Weight Cart	
	3000 lb Weight Cart	0.26 lb	

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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>NVLAP Code: 20/M12 VOLUME and DENSITY</b> Volume	5 gal	2.5 mL	Gravimetric Method	
	1 gal	0.34 mL		
	1/2 gal	0.28 mL		
	1 qt	0.26 mL		
	1 gill	0.054 mL		
	2 fl oz	0.054 mL		
	500 mL	0.061 mL		
	100 mL	0.054 mL		
	1000 gal	0.30 gal		Volume Transfer Method
	750 gal	0.22 gal		
	500 gal	0.14 gal		
	300 gal	0.085 gal		
	200 gal	0.050 gal		
	100 gal	0.025 gal		
	50 gal	0.013 gal		
	15 gal	0.0033 gal		
	10 gal	0.0024 gal		
	5 gal	0.0013 gal		
	200 gal	0.051 gal	Volume Transfer Method, LPG	
	100 gal	0.027 gal		
20 gal	0.0045 gal			
<b>END</b>				

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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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