# National Voluntary Laboratory Accreditation Program

**CALIBRATION LABORATORIES** **NVLAP LAB CODE 105003-0**

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

| **Minnesota Metrology Laboratory** | **Parameter(s) of Accreditation** |
|---|---|
| 14305 Southcross Drive W #150<br>Burnsville, MN 55306<br>Mr. Steven Harrington<br>Phone: 651-215-1777 Fax: 952-435-4040<br>E-mail: steven.harrington@state.mn.us | Mechanical<br><br>This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (NVLAP Code: 20/A01) |

**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)** [Notes 1,2]

| Measured Parameter or Device Calibrated | Range | Uncertainty ($k$=2) [Note 3] | Remarks |
|---|---|---|---|
| **MECHANICAL** | | | |
| **NVLAP Code: 20/M08**<br>**MASS** | | | |
| Metric | 30 kg | 16 mg | Echelon I |
| | 20 kg | 11 mg | |
| | 10 kg | 0.44 mg | |
| | 5 kg | 0.22 mg | |
| | 3 kg | 0.13 mg | |
| | 2 kg | 0.085 mg | |
| | 1 kg | 0.07 mg | |
| | 500 g | 0.02 mg | |
| | 300 g | 0.02 mg | |
| | 200 g | 0.01 mg | |
| | 100 g | 0.01 mg | |
| | 50 g | 5.0 µg | |
| | 30 g | 5.0 µg | |
| | 20 g | 2.5 µg | |
| | 10 g | 2.5 µg | |
| | 5 g | 2.5 µg | |
| | 3 g | 2.5 µg | |
| | 2 g | 2.5 µg | |
| | 1 g | 2.5 µg | |
| | 500 mg | 0.8 µg | |
| | 300 mg | 0.55 µg | |
| | 200 mg | 0.55 µg | |
| | 100 mg | 0.35 µg | |
| | 50 mg | 0.35 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 | 0.35 µg | |
| | 20 mg | 0.35 µg | |
| | 10 mg | 0.35 µg | |
| | 5 mg | 0.35 µg | |
| | 3 mg | 0.35 µg | |
| | 2 mg | 0.35 µg | |
| | 1 mg | 0.35 µg | |
| | 500 kg | 1.1 g | Echelon II |
| | 250 kg | 870 mg | |
| | 50 kg | 80 mg | |
| | 30 kg | 34 mg | |
| | 20 kg | 25 mg | |
| | 10 kg | 12 mg | |
| | 5 kg | 6 mg | |
| | 3 kg | 6 mg | |
| | 2 kg | 0.7 mg | |
| | 1 kg | 0.7 mg | |
| | 500 g | 0.7 mg | |
| | 300 g | 0.7 mg | |
| | 200 g | 0.7 mg | |
| | 100 g | 0.03 mg | |
| | 50 g | 0.016 mg | |
| | 30 g | 0.016 mg | |
| | 20 g | 0.015 mg | |
| | 10 g | 0.015 mg | |
| | 5 g | 0.015 mg | |
| | 3 g | 0.015 mg | |
| | 2 g | 0.015 mg | |
| | 1 g | 0.015 mg | |
| | 500 mg | 3 µg | |
| | 300 mg | 3 µg | |
| | 200 mg | 3 µg | |
| | 100 mg | 3 µg | |
| | 50 mg | 3 µg | |
| | 30 mg | 3 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 |
|---|---|---|---|
| | 20 mg | 3 µg | |
| | 10 mg | 3 µg | |
| | 5 mg | 3 µg | |
| | 3 mg | 3 µg | |
| | 2 mg | 3 µg | |
| | 1 mg | 3 µg | |
| Avoirdupois | 2500 lb | 3.8 g | Echelon II |
| | 2000 lb | 3.4 g | |
| | 1500 lb | 3.4 g | |
| | 1000 lb | 1.2 g | |
| | 500 lb | 770 mg | |
| | 250 lb | 620 mg | |
| | 100 lb | 85 mg | |
| | 50 lb | 15 mg | |
| | 30 lb | 15 mg | |
| | 25 lb | 15 mg | |
| | 20 lb | 15 mg | |
| | 10 lb | 6.1 mg | |
| | 5 lb | 0.8 mg | |
| | 3 lb | 0.7 mg | |
| | 2 lb | 0.7 mg | |
| | 1 lb | 0.7 mg | |
| | 0.5 lb | 0.7 mg | |
| | 0.3 lb | 0.7 mg | |
| | 0.2 lb | 0.03 mg | |
| | 0.1 lb | 0.02 mg | |
| | 0.05 lb | 0.02 mg | |
| | 0.03 lb | 0.015 mg | |
| | 0.02 lb | 0.015 mg | |
| | 0.01 lb | 0.015 mg | |
| | 0.005 lb | 3 µg | |
| | 0.003 lb | 3 µg | |
| | 0.002 lb | 3 µg | |
| | 0.001 lb | 3 µg | |
| | 8 oz | 0.7 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 |
|---|---|---|---|
| | 4 oz | 12 µg | |
| | 2 oz | 7 µg | |
| | 1 oz | 7 µg | |
| | 1/2 oz | 7 µg | |
| | 1/4 oz | 7 µg | |
| | 1/8 oz | 7 µg | |
| | 1/16 oz | 7 µg | |
| | 1/32 oz | 7 µg | |
| Metric | 500 kg | 3.1 g | Echelon III |
| | 250 kg | 1.6 g | |
| | 50 kg | 220 mg | |
| | 30 kg | 140 mg | |
| | 25 kg | 140 mg | |
| | 20 kg | 100 mg | |
| | 10 kg | 50 mg | |
| | 5 kg | 25 mg | |
| | 3 kg | 15 mg | |
| | 2 kg | 10 mg | |
| | 1 kg | 6 mg | |
| | 500 g | 4.6 mg | |
| | 300 g | 4.2 mg | |
| | 200 g | 1 mg | |
| | 100 g | 0.45 mg | |
| | 50 g | 0.25 mg | |
| | 30 g | 0.25 mg | |
| | 20 g | 0.25 mg | |
| | 10 g | 0.12 mg | |
| | 5 g | 0.1 mg | |
| | 3 g | 0.07 mg | |
| | 2 g | 0.07 mg | |
| | 1 g | 0.07 mg | |
| | 500 mg | 0.07 mg | |
| | 300 mg | 0.07 mg | |
| | 200 mg | 0.07 mg | |
| | 100 mg | 0.07 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 |
|---|---|---|---|
| | 50 mg | 0.07 mg | |
| | 30 mg | 0.07 mg | |
| | 20 mg | 0.07 mg | |
| | 10 mg | 0.07 mg | |
| | 5 mg | 0.07 mg | |
| | 3 mg | 0.07 mg | |
| | 2 mg | 0.07 mg | |
| | 1 mg | 0.07 mg | |
| Avoirdupois | 2500 lb | 5 g | Echelon III |
| | 2000 lb | 3 g | |
| | 1500 lb | 2.3 g | |
| | 1000 lb | 1.6 g | |
| | 500 lb | 1.1 g | |
| | 250 lb | 740 mg | |
| | 100 lb | 190 mg | |
| | 50 lb | 110 mg | |
| | 30 lb | 75 mg | |
| | 25 lb | 75 mg | |
| | 20 lb | 75 mg | |
| | 10 lb | 15 mg | |
| | 5 lb | 10 mg | |
| | 3 lb | 6 mg | |
| | 2 lb | 6 mg | |
| | 1 lb | 6 mg | |
| | 0.5 lb | 6 mg | |
| | 0.3 lb | 0.07 mg | |
| | 0.2 lb | 0.07 mg | |
| | 0.1 lb | 0.07 mg | |
| | 0.05 lb | 0.07 mg | |
| | 0.03 lb | 0.07 mg | |
| | 0.02 lb | 0.07 mg | |
| | 0.01 lb | 0.07 mg | |
| | 0.005 lb | 0.07 mg | |
| | 0.003 lb | 0.07 mg | |
| | 0.002 lb | 0.07 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 |
|---|---|---|---|
| | 0.001 lb | 0.07 mg | |
| | 8 oz | 6 mg | |
| | 4 oz | 0.07 mg | |
| | 2 oz | 0.07 mg | |
| | 1 oz | 0.07 mg | |
| | 1/2 oz | 0.07 mg | |
| | 1/4 oz | 0.07 mg | |
| | 1/8 oz | 0.07 mg | |
| | 1/16 oz | 0.07 mg | |
| | 1/32 oz | 0.07 mg | |
| **NVLAP Code: 20/M12 VOLUME and DENSITY** | | | |
| Volume | 100 gal | 22 ml | Gravimetric Method |
| | 50 gal | 12 ml | |
| | 30 gal | 8.0 ml | |
| | 25 gal | 7.0 ml | |
| | 20 gal | 6.0 ml | |
| | 10 gal | 3.0 ml | |
| | 5 gal | 2.0 ml | |
| | 1 gal | 0.30 ml | |
| | 1/2 gal | 0.20 ml | |
| | 1/4 gal | 0.10 ml | |
| | 1 qt | 0.20 ml | |
| | 1/2 qt | 0.10 ml | |
| | 1/4 qt | 0.10 ml | |
| | 20 000 ml | 2.0 ml | |
| | 2 000 ml | 0.20 ml | |
| | 1 000 ml | 0.10 ml | |
| | 100 ml | 0.010 ml | |
| | 10 ml | 0.0050 ml | |
| | 1 500 gal | 40 $in^3$ | Volume Transfer Method |
| | 1 200 gal | 32 $in^3$ | |
| | 1 000 gal | 28 $in^3$ | |
| | 500 gal | 14 $in^3$ | |

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| Measured Parameter or Device Calibrated | Range | Uncertainty ($k$=2) [Note 3] | Remarks |
|---|---|---|---|
| | 200 gal | 5.6 $in^3$ | |
| | 100 gal | 3.0 $in^3$ | |
| | 50 gal | 4.4 $in^3$ | |
| | 25 gal | 2.2 $in^3$ | |
| | 20 gal | 2.0 $in^3$ | |
| | 5 gal | 0.62 $in^3$ | |
| | 100 gal | 9.0 $in^3$ | Volume Transfer, LPG |
| | 25 gal | 2.4 $in^3$ | |
| **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 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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