



CALIBRATION LABORATORIES

NVLAP LAB CODE 200408-0

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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

| MECHANICAL | | | |
|--|---|--|---------------------|
| NVLAP Code: 20/M06 FORCE | $\leq 20\ 000\ \text{lbF}$ | 18 lbf | Wheel Load Weighers |
| NVLAP Code: 20/M08 MASS 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 2 g 1 g 500 mg 300 mg | 18 mg 9.9 mg 1.1 mg 0.42 mg 0.38 mg 0.24 mg 0.064 mg 0.037 mg 0.026 mg 0.022 mg 0.023 mg 0.014 mg 0.011 mg 9.6 μg 10 μg 5.6 μg 3.7 μg 3.0 μg 2.7 μg 1.4 μg 0.94 μg | Echelon I |

2012-10-01 through 2013-09-30

Effective dates

For the National Institute of Standards and Technology



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

| | | | | |
|--|--------|----------|-----------|------------|
| | 200 mg | 0.72 µg | Echelon I | |
| | 100 mg | 0.64 µg | | |
| | 50 mg | 0.40 µg | | |
| | 30 mg | 0.32 µg | | |
| | 20 mg | 0.28 µg | | |
| | 10 mg | 0.32 µg | | |
| | 5 mg | 0.20 µg | | |
| | 3 mg | 0.17 µg | | |
| | 2 mg | 0.17 µg | | |
| | 1 mg | 0.19 µg | | |
| | 30 kg | 24 mg | | Echelon II |
| | 20 kg | 17 mg | | |
| | 10 kg | 3.1 mg | | |
| | 5 kg | 1.7 mg | | |
| | 3 kg | 1.2 mg | | |
| | 2 kg | 0.62 mg | | |
| | 1 kg | 0.20 mg | | |
| | 500 g | 0.095 mg | | |
| | 300 g | 0.051 mg | | |
| | 200 g | 0.050 mg | | |
| | 100 g | 0.033 mg | | |
| | 50 g | 0.023 mg | | |
| | 30 g | 0.017 mg | | |
| | 20 g | 0.016 mg | | |
| | 10 g | 0.012 mg | | |
| | 5 g | 6.5 µg | | |
| | 3 g | 4.4 µg | | |
| | 2 g | 3.7 µg | | |
| | 1 g | 3.2 µg | | |
| | 500 mg | 2.6 µg | | |
| | 300 mg | 1.4 µg | | |
| | 200 mg | 1.2 µg | | |
| | 100 mg | 1.8 µg | | |
| | 50 mg | 1.5 µg | | |
| | 30 mg | 1.0 µg | | |
| | 20 mg | 1.1 µg | | |
| | 10 mg | 0.76 µg | | |

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

| | | | |
|-------------|-------------|----------|------------|
| Avoirdupois | 5 mg | 1.3 µg | Echelon II |
| | 3 mg | 0.31 µg | |
| | 2 mg | 0.54 µg | |
| | 1 mg | 0.42 µg | |
| | 50 lb | 21 mg | Echelon II |
| | 25 lb | 13 mg | |
| | 20 lb | 3.0 mg | |
| | 10 lb | 1.4 mg | |
| | 5 lb | 1.0 mg | |
| | 3 lb | 0.82 mg | |
| | 2 lb | 0.20 mg | |
| | 1 lb | 0.099 mg | |
| | 0.5 lb | 0.063 mg | |
| | 0.3 lb | 0.061 mg | |
| | 0.2 lb | 0.040 mg | |
| | 0.1 lb | 0.027 mg | |
| | 0.05 lb | 0.019 mg | |
| | 0.03 lb | 0.021 mg | |
| | 0.02 lb | 0.014 mg | |
| | 0.01 lb | 8.0 µg | |
| | 0.005 lb | 4.9 µg | |
| | 0.003 lb | 5.3 µg | |
| | 0.002 lb | 4.0 µg | |
| | 0.001 lb | 3.0 µg | |
| | 0.0005 lb | 1.5 µg | |
| | 0.0003 lb | 1.8 µg | |
| | 0.0002 lb | 2.0 µg | |
| | 0.0001 lb | 1.6 µg | |
| | 0.00005 lb | 1.0 µg | |
| | 0.00003 lb | 1.2 µg | |
| | 0.00002 lb | 0.80 µg | |
| | 0.00001 lb | 1.3 µg | |
| | 0.000005 lb | 0.30 µg | |
| | 0.000003 lb | 0.55 µg | |
| | 0.000002 lb | 0.41 µg | |
| | 0.000001 lb | 0.41 µg | |
| | 8 oz | 0.063 mg | |

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**National Voluntary
Laboratory Accreditation Program**



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| | | | |
|--------|----------|-----------|-------------|
| Metric | 4 oz | 0.055 mg | Echelon II |
| | 2 oz | 0.032 mg | |
| | 1 oz | 0.018 mg | |
| | 1/2 oz | 0.021 mg | |
| | 1/4 oz | 0.016 mg | |
| | 1/8 oz | 0.0061 mg | |
| | 1/16 oz | 0.0044 mg | |
| | 1/32 oz | 0.0041 mg | |
| | 500 kg | 1.8 g | Echelon III |
| | 250 kg | 1.1 g | |
| | 50 kg | 0.30 g | |
| | 25 kg | 0.13 mg | |
| | 20 kg | 70 mg | |
| | 10 kg | 24 mg | |
| | 5 kg | 3.1 mg | |
| | 3 kg | 2.9 mg | |
| 2 kg | 2.7 mg | | |
| 1 kg | 2.4 mg | | |
| 500 g | 2.7 mg | | |
| 300 g | 2.5 mg | | |
| 200 g | 0.13 mg | | |
| 100 g | 0.058 mg | | |
| 50 g | 0.044 mg | | |
| 30 g | 0.051 mg | | |
| 20 g | 0.032 mg | | |
| 10 g | 0.032 mg | | |
| 5 g | 0.029 mg | | |
| 3 g | 0.048 mg | | |
| 2 g | 0.040 mg | | |
| 1 g | 0.032 mg | | |
| 500 mg | 3.8 µg | | |
| 300 mg | 3.1 µg | | |
| 200 mg | 3.0 µg | | |
| 100 mg | 3.3 µg | | |
| 50 mg | 3.2 µg | | |
| 30 mg | 3.0 µg | | |
| 20 mg | 3.0 µg | | |

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| | | | |
|-------------|----------|----------|-------------|
| Avoirdupois | 10 mg | 2.9 µg | Echelon III |
| | 5 mg | 3.1 µg | |
| | 3 mg | 2.8 µg | |
| | 2 mg | 2.8 µg | |
| | 1 mg | 2.8 µg | |
| | 5000 lb | 70 g | Echelon III |
| | 1000 lb | 1.1 g | |
| | 500 lb | 1.1 g | |
| | 100 lb | 0.21 g | |
| | 50 lb | 58 mg | |
| | 25 lb | 27 mg | |
| | 20 lb | 23 mg | |
| | 10 lb | 2.3 mg | |
| | 5 lb | 2.6 mg | |
| | 3 lb | 2.5 mg | |
| | 2 lb | 2.2 mg | |
| | 1 lb | 2.0 mg | |
| | 0.5 lb | 1.8 mg | |
| | 0.3 lb | 0.073 mg | |
| | 0.2 lb | 0.072 mg | |
| 0.1 lb | 0.045 mg | | |
| 0.05 lb | 0.037 mg | | |
| 0.03 lb | 0.045 mg | | |
| 0.02 lb | 0.037 mg | | |
| 0.01 lb | 0.025 mg | | |
| 0.005 lb | 0.036 mg | | |
| 0.003 lb | 0.040 mg | | |
| 0.002 lb | 0.032 mg | | |
| 0.001 lb | 0.024 mg | | |
| 8 oz | 1.8 mg | | |
| 4 oz | 0.082 mg | | |
| 2 oz | 0.066 mg | | |
| 1 oz | 0.042 mg | | |
| 1/2 oz | 0.035 mg | | |
| 1/4 oz | 0.031 mg | | |

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| | | | |
|--|----------|------------------------|---------------------|
| | 1/8 oz | 0.032 mg | Echelon III |
| | 1/16 oz | 0.047 mg | |
| | 1/32 oz | 0.038 mg | |
| NVLAP Code: 20/M12 VOLUME AND DENSITY | 2000 gal | 92 in ³ | Volume Transfer |
| | 1500 gal | 67 in ³ | |
| | 1000 gal | 48 in ³ | |
| | 750 gal | 27 in ³ | |
| | 500 gal | 19 in ³ | |
| | 100 gal | 2.9 in ³ | |
| | 50 gal | 2.1 in ³ | |
| | 5 gal | 0.27 in ³ | Volume Gravimetric |
| | 25 gal | 0.42 in ³ | |
| | 15 gal | 0.39 in ³ | |
| | 5 gal | 0.11 in ³ | |
| | 1 gal | 0.042 in ³ | |
| | 1/2 gal | 0.041 in ³ | |
| | 1 qt | 0.020 in ³ | |
| | 1 pt | 0.015 in ³ | |
| | 1/2 pt | 0.0048 in ³ | |
| | 30 gal | 0.79 in ³ | Small Volume Prover |
| | 20 gal | 0.44 in ³ | |
| | 15 gal | 0.35 in ³ | |
| | 5 gal | 0.043 in ³ | |
| | 2 liter | 0.65 mL | Volume Gravimetric |
| | 1 liter | 0.35 mL | |
| | 100 mL | 0.074 mL | |
| 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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