National Voluntary Laboratory Accreditation Program

CALIBRATION LABORATORIES **NVLAP LAB CODE 200869-0**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Pennsylvania Standards Laboratory	**Fields of Calibration**
2221 Forster Street, Room G-44A Harrisburg, PA 17125-0001 Tangela Isaac Phone: 717-783-1201 Fax: 717-346-3820 E-mail: tisaac@pa.gov	Dimensional Time and Frequency Mechanical This laboratory is compliant to ANSI/NCSLI Z540-1-1994; Part 1. (NVLAP Code: 20/A01)

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

Measured Parameter or Device Calibrated	**Range**	**Expanded Uncertainty** [Note 3]	**Remarks**
DIMENSIONAL			
SURVEYING RODS and TAPES (20/D13)			
Surveying Tapes	0 ft to 16 ft	0.0091 in	Bench Method
	0 ft to 30 ft	0.016 in	
	0 ft to 45 ft	0.023 in	
	0 ft to 60 ft	0.030 in	
	0 ft to 75 ft	0.037 in	
	0 ft to 84 ft	0.044 in	
	0 ft to 90 ft	0.044 in	
	0 ft to 100 ft	0.052 in	
	0 ft to 105 ft	0.052 in	
	0 ft to 120 ft	0.059 in	
	0 ft to 135 ft	0.066 in	
	0 ft to 150 ft	0.074 in	
	0 ft to 165 ft	0.081 in	
	0 ft to 180 ft	0.088 in	
	0 ft to 184 ft	0.096 in	
	0 ft to 195 ft	0.096 in	
	0 ft to 200 ft	0.10 in	
TIME and FREQUENCY			
STOPWATCHES and TIMERS (20/F05)			
Stopwatches	0 h to 24 h	0.17 s	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
MECHANICAL			
FORCE (20/M06)			
Force Gauge	30 lbf	0.066 lbf	
	25 lbf	0.066 lbf	
	20 lbf	0.064 lbf	
	15 lbf	0.065 lbf	
	10 lbf	0.065 lbf	
	0 lbf to 5 lbf	0.061 lbf	
MASS DETERMINATION (20/M08)			
Metric	30 kg	23 mg	Echelon II
	25 kg	23 mg	
	20 kg	9.1 mg	
	10 kg	3.1 mg	
	5 kg	1.7 mg	
	3 kg	1.4 mg	
	2 kg	1.3 mg	
	1 kg	0.29 mg	
	500 g	0.16 mg	
	300 g	0.11 mg	
	200 g	90 µg	
	100 g	46 µg	
	50 g	26 µg	
	30 g	26 µg	
	20 g	21 µg	
	10 g	11 µg	
	5 g	10 µg	
	3 g	6.1 µg	
	2 g	6.0 µg	
	1 g	4.7 µg	
	500 mg	4.6 µg	
	300 mg	3.2 µg	
	200 mg	2.3 µg	
	100 mg	2.4 µg	
	50 mg	1.7 µg	
	30 mg	1.6 µg	
	20 mg	1.3 µg	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	10 mg	1.2 µg	
	5 mg	1.2 µg	
	3 mg	1.2 µg	
	2 mg	4.0 µg	
	1 mg	3.6 µg	
Avoirdupois			Echelon II
	1000 lb	0.89 g	
	500 lb	0.62 g	
	200 lb	0.53 g	
	100 lb	75 mg	
	50 lb	21 mg	
	30 lb	18 mg	
	25 lb	15 mg	
	20 lb	12 mg	
	10 lb	3.9 mg	
	5 lb	1.8 mg	
	3 lb	1.7 mg	
	2 lb	0.37 mg	
	1 lb	0.17 mg	
	0.5 lb	100 µg	
	0.3 lb	81 µg	
	0.2 lb	47 µg	
	0.1 lb	28 µg	
	0.05 lb	25 µg	
	0.03 lb	16 µg	
	0.02 lb	13 µg	
	0.01 lb	4.9 µg	
	0.005 lb	4.1 µg	
	0.003 lb	2.3 µg	
	0.002 lb	2.1 µg	
	0.001 lb	3.3 µg	
	8 oz	100 µg	
	4 oz	140 µg	
	2 oz	76 µg	
	1 oz	37 µg	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	1/2 oz	37 µg	
	1/4 oz	22 µg	
	1/8 oz	22 µg	
	1/16 oz	9.2 µg	
	1/32 oz	7.9 µg	
Metric	2500 kg	48 g	Echelon III
	1000 kg	15 g	
	750 kg	12 g	
	500 kg	6.1 g	
	250 kg	3.1 g	
	200 kg	2.6 g	
	100 kg	1.5 g	
	50 kg	600 mg	
	30 kg	360 mg	
	25 kg	310 mg	
	20 kg	250 mg	
	10 kg	130 mg	
	5 kg	31 mg	
	3 kg	19 mg	
	2 kg	13 mg	
	1 kg	7.9 mg	
	500 g	6.7 mg	
	300 g	6.3 mg	
	200 g	2.4 mg	
	100 g	1.3 mg	
	50 g	0.62 mg	
	30 g	0.39 mg	
	20 g	0.27 mg	
	10 g	0.18 mg	
	5 g	0.15 mg	
	3 g	0.13 mg	
	2 g	0.12 mg	
	1 g	0.12 mg	
	500 mg	48 µg	
	300 mg	40 µg	
	200 mg	52 µg	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	100 mg	29 µg	
	50 mg	25 µg	
	30 mg	22 µg	
	20 mg	19 µg	
	10 mg	16 µg	
	5 mg	15 µg	
	3 mg	13 µg	
	2 mg	13 µg	
	1 mg	12 µg	
Avoirdupois	5000 lb	46 g	Echelon III
	3000 lb	24 g	
	2500 lb	22 g	
	2000 lb	14 g	
	1000 lb	5.5 g	
	500 lb	2.9 g	
	250 lb	1.6 g	
	200 lb	1.4 g	
	100 lb	0.54 g	
	50 lb	0.28 g	
	30 lb	0.18 g	
	25 lb	0.15 g	
	20 lb	130 mg	
	10 lb	28 mg	
	5 lb	15 mg	
	4 lb	13 mg	
	3 lb	10 mg	
	2 lb	7.3 mg	
	1 lb	6.5 mg	
	0.5 lb	5.7 mg	
	0.3 lb	1.7 mg	
	0.2 lb	1.1 mg	
	0.1 lb	0.57 mg	
	0.05 lb	0.32 mg	
	0.03 lb	0.21 mg	
	0.02 lb	0.18 mg	
	0.01 lb	0.14 mg	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	0.005 lb	0.12 mg	
	0.003 lb	0.12 mg	
	0.002 lb	0.12 mg	
	0.001 lb	0.12 mg	
	12 oz	6.2 mg	
	8 oz	5.7 mg	
	6 oz	5.4 mg	
	4 oz	1.4 mg	
	2 oz	0.72 mg	
	1 oz	0.37 mg	
	1/2 oz	0.20 mg	
	1/4 oz	0.15 mg	
	1/8 oz	0.13 mg	
	1/16 oz	0.12 mg	
	1/32 oz	0.12 mg	
	0.5 oz	0.20 mg	
	0.3 oz	0.24 mg	
	0.2 oz	0.22 mg	
	0.1 oz	0.19 mg	
	0.05 oz	0.16 mg	
	0.02 oz	0.14 mg	
	0.01 oz	0.13 mg	
Troy Ounce	200 oz t	73 mg	
	100 oz t	37 mg	
	50 oz t	20 mg	
	20 oz t	9.7 mg	
	10 oz t	9.7 mg	
	5 oz t	6.2 mg	
	2 oz t	1.4 mg	
	1 oz t	0.74 mg	
	0.5 oz t	0.38 mg	
	0.25 oz t	0.23 mg	
	0.2 oz t	0.22 mg	
	0.1 oz t	0.19 mg	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	0.05 oz t	0.16 mg	
	0.025 oz t	0.14 mg	
	0.02 oz t	0.14 mg	
	0.01 oz t	0.13 mg	
	0.005 oz t	0.12 mg	
Grain	1000 gr	1.6 mg	
	500 gr	0.80 mg	
	200 gr	0.34 mg	
	100 gr	0.23 mg	
	50 gr	0.19 mg	
	20 gr	0.16 mg	
	10 gr	100 µg	
	5 gr	77 µg	
	2 gr	59 µg	
	1 gr	52 µg	
	0.5 gr	38 µg	
	0.2 gr	29 µg	
	0.1 gr	24 µg	
			Echelon III
Wheel Load Weighers	30 001 lb to 40 000 lb	85 lb	Calibrated in Pairs
	20 001 lb to 30 000 lb	81 lb	
	10 001 lb to 20 000 lb	61 lb	
	0 lb to 10 000 lb	50 lb	
	15 001 lb to 20 000 lb	47 lb	Calibrated Singly
	10 001 lb to 15 000 lb	44 lb	
	5001 lb to 10 000 lb	37 lb	
	0 lb to 5000 lb	31 lb	
Weight Carts	6000 lb	140 g	Echelon III
	5500 lb	130 g	
	5000 lb	120 g	
	4500 lb	120 g	
	4000 lb	110 g	
	3500 lb	100 g	

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	3000 lb	99 g	
VOLUME and DENSITY (20/M12)			
Volume	1500 gal	45 in^3	Transfer Method
	1000 gal	31 in^3	
	500 gal	16 in^3	
	200 gal	6.2 in^3	
	100 gal	3.1 in^3	
	60 gal	1.9 in^3	
	50 gal	1.6 in^3	
	25 gal	0.96 in^3	
	10 gal	0.36 in^3	
	5 gal	0.37 in^3	4 in neck
	5 gal	0.20 in^3	3 in neck
	5000 L	0.65 L	
	3000 L	0.39 L	
	2000 L	0.27 L	
	1000 L	0.13 L	
	500 L	62 mL	
	250 L	32 mL	
	200 L	30 mL	
	120 L	20 mL	
	100 L	16 mL	
	60 L	11 mL	
	50 L	9.7 mL	
	40 L	8.3 mL	
	20 L	6.3 mL	
Large Volume	120 gal	1.8 in^3	Gravimetric Method
	100 gal	1.7 in^3	Ball Valve
	100 gal	1.7 in^3	Butterfly Valve
	75 gal	1.6 in^3	
	60 gal	1.1 in^3	
	50 gal	1.0 in^3	Ball Valve
	50 gal	0.89 in^3	Butterfly Valve
	25 gal	0.54 in^3	Ball Valve

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3	Remarks
	25 gal	0.40 in^3	Butterfly Valve
	20 gal	0.41 in^3	
	15 gal	0.40 in^3	
	500 L	36 mL	
	250 L	18 mL	
	200 L	16 mL	
	100 L	8.8 mL	
	60 L	6.6 mL	
	50 L	6.6 mL	
	40 L	5.4 mL	
Bottom Drain Prover	10 gal	0.33 in^3	
	5 gal	0.19 in^3	
Slicker Standard	10 gal	0.16 in^3	
	5 gal	0.12 in^3	
	1 gal	0.030 in^3	
Test Measure	10 gal	0.31 in^3	
	5 gal	0.15 in^3	
	5 gal (Imperial)	0.18 in^3	
Slicker Standard	20 L	2.1 mL	
	10 L	1.1 mL	
	5 L	0.55 mL	
Test Measure	20 L	2.5 mL	
END			

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program

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.5 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.

2025-03-21 through 2026-03-31
Effective dates

For the National Voluntary Laboratory Accreditation Program