



**National Voluntary
Laboratory Accreditation Program**



CALIBRATION LABORATORIES

NVLAP LAB CODE 200115-0

Scope Revised: 2012-01-12

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3}	Remarks
DIMENSIONAL			
NVLAP Code: 20/D03 GAGE BLOCKS			
Master Set Calibration			
Steel	0.010 in to 0.09375 in	3.6 μ in	
	0.100 in to 1.000 in	3.0 μ in	
	2.000 in	3.0 μ in	
	3.000 in	3.0 μ in	
	4.000 in	3.5 μ in	
Chrome Carbide	0.050 in to 0.09375 in	3.0 μ in	
	0.100 in to 1.000 in	3.0 μ in	
	2.000 in	3.0 μ in	
	3.000 in	3.0 μ in	
	4.000 in	5.0 μ in	
Tungsten Carbide	0.050 in to 0.09375 in	3.0 μ in	
	0.100 in to 1.000 in	3.0 μ in	
	2.000 in	3.0 μ in	
	3.000 in	3.0 μ in	
	4.000 in	5.0 μ in	
Long Block Calibration			
Steel	5 in	4.4 μ in	
	6 in	4.4 μ in	
	7 in	5.3 μ in	

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3}	Remarks
Master Set Calibration Steel	8 in	5.3 μin	
	10 in	6.6 μin	
	12 in	7.5 μin	
	16 in	10.3 μin	
	20 in	11.8 μin	
	0.3 mm to 0.9 mm	0.08 μm	
	1.0 mm to 24.5 mm	0.08 μm	
	25 mm	0.08 μm	
	50 mm	0.08 μm	
	75 mm	0.08 μm	
Long Block Calibration Steel	100 mm	0.09 μm	
	125 mm	0.10 μm	
	150 mm	0.11 μm	
	175 mm	0.12 μm	
	200 mm	0.13 μm	
	250 mm	0.17 μm	
	300 mm	0.19 μm	
	400 mm	0.27 μm	
500 mm	0.30 μm		
ELECTROMAGNETICS – DC/LOW FREQUENCY			
NVLAP Code: 20/E05 DC RESISTANCE and CURRENT Resistance	0.1 Ω to 1.0 Ω	0.35 $\mu\Omega/\Omega$	In air
	1.0 Ω to 10 Ω	0.3 $\mu\Omega/\Omega$	In oil
	10 Ω to 100 Ω	0.35 $\mu\Omega/\Omega$	
	100 Ω to 1 k Ω	0.5 $\mu\Omega/\Omega$	
	1 k Ω to 10 k Ω	0.6 $\mu\Omega/\Omega$	
	10 k Ω to 100 k Ω	0.5 $\mu\Omega/\Omega$	
	100 k Ω to 1 M Ω	1.0 $\mu\Omega/\Omega$	In air
	1 M Ω to 10 M Ω	5.0 $\mu\Omega/\Omega$	

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NVLAP Code: 20/E06 DC VOLTAGE			
Fixed Points			
Single Measurement	10 V 1.018 V	0.013 $\mu\text{V/V}$ 0.11 $\mu\text{V/V}$	Josephson Array
Over Extended Time	10 V 1.018 V	0.06 $\mu\text{V/V}$ 0.23 $\mu\text{V/V}$	Zener Reference Comparison
Over Extended Time	10 V	0.3 $\mu\text{V/V}$	Zener Reference Comparison
Variable Points	Up to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	4.0 $\mu\text{V/V}$ 0.8 $\mu\text{V/V}$ 0.5 $\mu\text{V/V}$ 0.8 $\mu\text{V/V}$ 2.5 $\mu\text{V/V}$	Zener and Divider
TIME and FREQUENCY			
NVLAP Code: 20/F01 FREQUENCY DISSEMINATION			
Frequency Dissemination	100 kHz 1 MHz 5 MHz 10 MHz	1×10^{-12} 1×10^{-12} 1×10^{-12} 1×10^{-12}	NIST FMS System
MECHANICAL			
NVLAP Code: 20/M06 FORCE			
Tension and Compression	10 lbf to 20 lbf > 20 lbf to 40 lbf > 40 lbf to 50 lbf > 50 lbf to 400 lbf > 400 lbf to 1000 lbf	% of Full Scale 0.017 % 0.006 % 0.0058 % 0.0043 % 0.0042 %	Primary Standard (Deadweight)
	100 lbf to 1000 lbf 1000 lbf to 11 000 lbf	0.020 % 0.011 %	Secondary Standards (Load Cells)

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	10 000 lbf to 100 000 lbf	0.010 %	
	100 000 lbf to 400 000 lbf	0.11%	
NVLAP Code: 20/M08 MASS Metric	1 kg	110 µg	Mass Dissemination
	500 g	51 µg	
	200 g	31 µg	
	100 g	27 µg	
	50 g	14 µg	
	20 g	6.4 µg	
	10 g	4.4 µg	
	5 g	4.1 µg	
	2 g	3.6 µg	
	1 g	3.5 µg	
	0.5 g	2.0 µg	
	0.2 g	1.1 µg	
	0.1 g	0.96 µg	
	0.05 g	1.0 µg	
	0.02 g	0.92 µg	
	0.01 g	0.90 µg	
	0.005 g	1.0 µg	
	0.002 g	0.91 µg	
	0.001 g	0.90 µg	
Balances Field calibrations Available ^{Note 4}	1 mg to 60 g	0.10 mg	Using ASTM Class 1 Weights
	> 60 g to 80 g	0.12 mg	
	> 80 g to 200 g	0.50 mg	
	> 200 g to 500 g	0.80 mg	
	500 g to 1 kg	4.0 mg	
	> 1 kg to 6 kg	30 mg	
	> 6 kg to 10.1 kg	40 mg	
	> 10.1 kg to 32 kg	300 mg	

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THERMODYNAMIC			
NVLAP Code: 20/T05 PRESSURE Deadweight Pressure Gauge – Direct Pressure Comparison	0.4 psi to 18 psi	0.0032 %	Air
	18 psi to 700 psi	0.0044 %	
	700 psi to 4000 psi	0.0037 %	Oil
	4000 psi to 40 000 psi	0.0078 %	
NVLAP Code: 20/T07 RESISTANCE THERMOMETRY Calibration of PRTs	0 °C	5.7 mK	Comparison to Reference SPRT
	232 °C	7.1 mK	
	420 °C	9.5 mK	
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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