National Voluntary Laboratory Accreditation Program

CALIBRATION LABORATORIES **NVLAP LAB CODE 200938-0**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Navy Primary Standards Laboratory	**Field(s) of Accreditation**
NAVAIR North Island Code 4.12.9 Bldg. 469S P.O. Box 357058 San Diego, CA 92135-7058 Mr. Al Teruel Phone: 619-545-7912 Fax 619-545-9861	Dimensional Electromagnetics – DC/Low Frequency Optical Radiation Thermodynamic

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

Measured Parameter or Device Calibrated	**Range**	**Expanded Uncertainty** [Note 3,5,7]	**Remarks**
DIMENSIONAL			
ANGULAR (20/D01)			
Angle Measurements	1” to 30” 1’ to 30’ 1° to 45°	0.66” 0.66” 0.66”	Angle Blocks NPSL 17-55MD-02 Angle blocks using Autocollimators
GAGE BLOCKS (20/D03)			
English Gage Block Sets Metric Gage Block Sets	0.01 in to 20 in 0.5 mm to 100 mm	(3.0 + 0.65*L*) µin (0.77 + 0.65*L*) µin	Comparison against NIST Calibrated Gage Blocks NPSL 17-55MD-01
OPTICAL REFERENCE PLANES (20/D08)			
Optical Flats	1 in to 12 in	0.45 µin	Master Optical Flats NPSL 17-55MD-03
ELECTROMAGNETICS – DC/LOW FREQUENCY			
DC RESISTANCE AND CURRENT (20/E05)			
Resistance	1 Ω 10 Ω 100 Ω	1.6 µΩ/Ω 1.6 µΩ/Ω 1.7 µΩ/Ω	NPSL 17-55AR-01 Thomas 1 Ω resistor with MI 6020Q System

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3,5,7	Remarks
	1 kΩ 10 kΩ	1.7 μΩ/Ω 2.3 μΩ/Ω	
DC VOLTAGE (20/E06)			
DC Voltage – Source	1 V 1.018 V 10 V	2.0 μV/V 0.53 μV/V 0.28 μV/V	NPSL 17-55AE-01 AJVS 2. 734B Zeners
LF CAPACITANCE (20/E10)			
Capacitance (at 1 kHz, 5 kHz, and 10 Hz)	0.1 pF to 115 pF	0.00020 %	NPSL 17-55AC-01
LF INDUCTANCE (20/E11)			
Inductance			NPSL 17-55AL-01
100 Hz	100 μH 200 μH 500 μH 1 mH 2 mH 5 mH 10 mH 20 mH 50 mH 100 mH 200 mH 500 mH 1 H 2 H 5 H 10 H	0.30 % 0.061 % 0.037 % 0.036 % 0.035 % 0.035 % 0.036 % 0.035 % 0.035 % 0.035 % 0.035 % 0.035 % 0.035 % 0.035 % 0.035 % 0.035 %	Standard reference resistor and 1993 RLC Digi-Bridge
1 kHz	100 μH 200 μH 500 μH 1 mH	0.10 % 0.061 % 0.035 % 0.035 %	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3,5,7	Remarks
	2 mH	0.035 %	
	5 mH	0.035 %	
	10 mH	0.035 %	
	20 mH	0.035 %	
	50 mH	0.035 %	
	100 mH	0.035 %	
	200 mH	0.035 %	
	500 mH	0.035 %	
	1 H	0.058 %	
	2 H	0.057 %	
	5 H	0.10 %	
	10 H	0.20 %	
OPTICAL RADIATION			
PHOTOMETRIC (20/O02)			
Radiance			
1×10^{-11} W/cm^2/sr to 1×10^{-8} W/cm^2/sr	690 nm 810 nm	2.0 % 2.0 %	NPSL 17-55SI-01
1×10^{-11} W/cm^2/sr to 1×10^{-7} W/cm^2/sr	820 nm	2.0 %	
Luminance	1.7 cd/m^2 to 6.9 cd/m^2	0.83 %	
THERMODYNAMIC			
PRESSURE (20/T05)			
Pressure – Piston Area Determination	0.2 psi to 25 psi 2.0 psi to 700 psi 100 psi to 3000 psi 8 psi to 400 psi 31 psi to 20 000 psi 60 psi to 40 000 psi	0.0019 % 0.0062 % 0.0045 % 0.0028 % 0.0040 % 0.0082 %	NPSL 17-55MP-01 NPSL 17-55MP-04

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Note 3,5,7	Remarks
VACUUM AND LOW PRESSURE GAGES (20/T09)			
Pressure Gages Only			
Absolute	0.3 inHg to 110 inHg	0.0003 inHg + 0.0015 %	Schwien Super Mercury Manometer
Differential	0.1 inHg to 110 inHg	0.0003 inHg + 0.0015 %	NPSL 17-55MP-02
Gage	0.1 inHg to 110 inHg	0.0003 inHg + 0.0015 %	
Absolute	0 kPa to 15 kPa	0.025 Pa + 0.0030 %	FPG
Differential	1 kPa to 15 kPa	0.020 Pa + 0.0030 %	NPSL 17-55MP-03
Gage	2 kPa to 15 kPa	0.020 Pa + 0.0030 %	
Vacuum			
Absolute	0.3 inHg to 30 inHg	0.00030 inHg + 0.0015 %	Schwien Super Mercury Manometer NPSL 17-55MP-02
Absolute	0 kPa to 15 kPa	0.025 Pa + 0.0030 %	FPG
Differential	1 kPa to 15 kPa	0.020 Pa + 0.0030 %	NPSL 17-55MP-03
Gage	2 kPa to 15 kPa	0.020 Pa + 0.0030 %	
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 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.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 7: Where L is the numerical value of the measurand in the same units shown in the range.

Note 8: 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 9: See NIST Handbook 150 for further explanation of these notes..

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