



**National Voluntary  
Laboratory Accreditation Program**



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

**SWFLANT Metrology Laboratory Operated by Lockheed Martin**

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**CALIBRATION LABORATORIES**

**NVLAP LAB CODE 200403-0**

*NVLAP Code:* 20/A01                      ANSI/NCSL Z540-1-1994; Part 1                      Compliant

**DIMENSIONAL**

*NVLAP Code:* 20/D03  
Gage Blocks - Steel and Chrome Carbide

<i>Range in inches</i>	<i>Best Uncertainty (±) in μinch</i> <sup>notes 1, 2</sup>	<i>Remarks</i>
0.01 to <0.05	3.4	Mechanical Comparison
0.05 to <0.1	3.4	Mechanical Comparison
0.1 to <0.125	3.2	Mechanical Comparison
0.125 to <0.14	3.0	Mechanical Comparison
0.14 to <0.20	2.9	Mechanical Comparison
0.20 to <0.25	2.8	Mechanical Comparison
0.25 to <0.5	2.9	Mechanical Comparison
0.5 to <0.75	3.4	Mechanical Comparison
0.75 to <1.0	3.1	Mechanical Comparison
1.0	3.2	Mechanical Comparison
2.0	4.7	Mechanical Comparison
3.0	5.5	Mechanical Comparison
4.0	6.6	Mechanical Comparison
5.0 to <12.0	8.4	Mechanical Comparison
12.0 to <20.0	14.9	Mechanical Comparison
20.0	18.3	Mechanical Comparison

2009-04-01 through 2010-03-31

*Effective dates*

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## CALIBRATION LABORATORIES

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**NVLAP Code:** 20/D07

Measuring Wires

<b>Range in inches</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu</math>inch <sup>note 1</sup></b>	<b>Remarks</b>
0.007227 (80 TPI) to 0.14434 (4 TPI)	12.4	Universal Measuring Machine with Master Set Calibration

**NVLAP Code:** 20/D11

Spherical Diameter, Plug/Ring Gages

<b>Range in inches</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu</math>inch <sup>notes 1, 2</sup></b>	<b>Remarks</b>
Ring Gages		
0.25 to <1.0	10.1	Comparison to Gage Blocks
1.0 to <6.0	10.1	Comparison to Gage Blocks
6.0 to <11.0	19.1	Comparison to Gage Blocks
Plug Gages		
0.125 to <0.250	6.6	Comparison to Gage Blocks
0.250 to <0.500	5.7	Comparison to Gage Blocks
0.500 to <3.000	11.3	Comparison to Gage Blocks
3.000 to <6.000	12.6	Comparison to Gage Blocks
6.000 to <11.000	18.1	Comparison to Gage Blocks

**NVLAP Code:** 20/D14

Threaded Plug and Ring Gages

Threaded Plug Gages, 60° Unified

<b>Range</b>	<b>Thread Size TPI</b>	<b>Best Uncertainty (<math>\pm</math>) <sup>notes 1, 2</sup></b>	<b>Remarks</b>
Pitch Diameter	4 to <11	45.8 $\mu$ in	Three Wire Method
Pitch Diameter	11 to <24	45.8 $\mu$ in	Three Wire Method
Pitch Diameter	24 to <48	39.9 $\mu$ in	Three Wire Method
Pitch Diameter	48 to <80	42.0 $\mu$ in	Three Wire Method

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	<i>Diameter in inches</i>		
Major Diameter	0.240 to <0.375	38.3 μin	Universal Measuring Machine
Major Diameter	0.375 to <0.625	40.9 μin	Universal Measuring Machine
Major Diameter	0.625 to <4.0	41.6 μin	Universal Measuring Machine
Major Diameter	4.0 to <5.0	41.6 μin	Universal Measuring Machine
Half Angle	60° (11 TPI)	3.1 arc minutes	Optical Comparator Inspection

Threaded Ring Gages, Solid, 60° Unified

<i>Range</i>	<i>Thread Size TPI</i>	<i>Best Uncertainty (±) note 1</i>	<i>Remarks</i>
Pitch Diameter	5 to <10	80.9 μin	Universal Measuring Machine
Pitch Diameter	10 to <12	73.2 μin	Universal Measuring Machine
	<i>Diameter in inches</i>		
Minor Diameter	0.750 to <1.75	260 μin	Measured with Bore Micrometer
Minor Diameter	1.75 to <2.00	273 μin	Measured with Bore Micrometer
<i>Range</i>		<i>Best Uncertainty (±) note 1</i>	<i>Remarks</i>
Half Angle	60° (11 TPI)	4.1 arc minutes	Optical Inspection of Thread Casting

## ELECTROMAGNETICS - DC/LOW FREQUENCY

NVLAP Code: 20/E02  
AC Current

<i>Current</i>	<i>Best Uncertainty (±) in ppm note 1</i>					
	<i>Frequency in Hertz</i>					
	<i>10</i>	<i>20</i>	<i>40</i>	<i>1 k</i>	<i>5 k</i>	<i>10 k</i>
20 mA	276	115	71	73	90	87
200 mA	276	115	71	73	90	87
2 A			102	103	103	101
10 A			168	211	211	234

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*NVLAP Code:* 20/E05

DC Current

<b>Range (<math>\pm</math>)</b>	<b>Best Uncertainty (<math>\pm</math>) in ppm <sup>note 1</sup></b>	<b>Remarks</b>
200 $\mu$ A	28	
2.0 mA	21	
20 mA	22	
200 mA	22	
2.0 A	51	
3.0 A	120	
5.0 A	120	
10.0 A	121	

DC Resistance

<b>Range in ohms</b>	<b>Best Uncertainty (<math>\pm</math>) in ppm <sup>note 1</sup></b>	<b>Remarks</b>
1.0 M	12.0	Using 242D System
10.0 M	12.0	Using 242D System
100.0 M	17.5	Using 242D System
0.01	66	Using Measurements International Bridge Model 6242A
0.1	12.9	Using Measurements International Bridge Model 6242A
1.0	2.4	Using Measurements International Bridge Model 6242A
10.0	2.4	Using Measurements International Bridge Model 6242A
100.0	2.4	Using Measurements International Bridge Model 6242A
0.1 k	1.0	Using Measurements International Bridge Model 6242A
1.0 k	0.9	Using Measurements International Bridge Model 6242A
10.0 k	1.4	Using Measurements International Bridge Model 6242A
100.0 k	3.6	Using Measurements International Bridge Model 6242A

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## CALIBRATION LABORATORIES

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1000.0 k

16.1

Using Measurements International Bridge  
Model 6242A

**NVLAP Code:** 20/E06  
DC Voltage - Generation

<b>Range (<math>\pm</math>)</b>	<b>Best Uncertainty (<math>\pm</math>) in ppm<sup>note 1</sup></b>	<b>Remarks</b>
0.1 V	4.9	
0.2 V	2.2	
1.0 V	1.1	
2.0 V	1.2	
10.0 V	1.2	
20.0 V	1.8	
100.0 V	1.1	
200.0 V	1.8	
1000.0 V	4.2	

DC Voltage – Measurement

0.1 V	9.1
0.2 V	7.4
1.0 V	3.9
2.0 V	3.7
10.0 V	3.0
20.0 V	4.5
100.0 V	4.8
200.0 V	4.7
1000.0 V	4.8

**NVLAP Code:** 20/E09  
LF AC Voltage

**Best Uncertainty ( $\pm$ ) in ppm<sup>note 1</sup>**  
**Frequency in Hertz**

<b>Range</b>	<b>10</b>	<b>20</b>	<b>40</b>	<b>50</b>	<b>300</b>	<b>1 k</b>	<b>20 k</b>	<b>50 k</b>	<b>100 k</b>	<b>300 k</b>	<b>500 k</b>	<b>1 M</b>
20 mV	104	83	78			78	78	188	303	407	579	517
200 mV	44	34	30			26	26	49	99	151	129	220

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2 V	32	27	28	16	16	23	18	111	117	94
20 V	32	27	26	16	17	18	22	117	128	94
200 V	44	32	26	19	20	49	37			
300 V					30					
600 V							43	60		
1000 V			29	29	29	26	27	49		

## TIME AND FREQUENCY

**NVLAP Code:** 20/F01  
Frequency Dissemination

<b>Range</b>	<b>Best Uncertainty (<math>\pm</math>)<sup>note 1</sup></b>	<b>Remarks</b>
1 MHz, 5 MHz, 10 MHz	$5.0 \times 10^{-12}$	Comparison using FMAS System

**NVLAP Code:** 20/F02  
Time Dissemination

<b>Range</b>	<b>Best Uncertainty (<math>\pm</math>)<sup>note 1</sup></b>	<b>Remarks</b>
N/A	1 $\mu$ sec	UTC(USNO) Transfer

## MECHANICAL

**NVLAP Code:** 20/M06  
Force

<b>Nominal Force in lbf</b>	<b>Best Uncertainty (<math>\pm</math>)<sup>note 1</sup> in % full scale (fs)</b>	<b>Remarks</b>
50 to 500	0.46	Proving Rings
200 to 2000	0.11	Proving Rings
500 to 5000	0.078	Proving Rings
1000 to 10 000	0.088	Proving Rings
2500 to 25 000	0.071	Proving Rings
10 000 to 100 000	0.12	Proving Rings

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Force - Torque

Calibration of strain gage torque standards, increasing torque, non-adjustable, defined scale instruments

<i>Range in lbf-ft</i>	<i>Best Uncertainty (<math>\pm</math>)<sup>note 1</sup> in % full scale (fs)</i>	<i>Remarks</i>
10 to 100	0.107	Moment arm and dead weights
100 to 6500	0.097	Moment arm and dead weights

*NVLAP Code:* 20/M08  
Mass

<i>Range</i>	<i>Best Uncertainty (<math>\pm</math>) in mg<sup>note 1</sup></i>	<i>Remarks<sup>note 3</sup></i>
20 kg	27	Echelon III
10 kg	16	Echelon III
5 kg	17	Echelon III
100 g	0.32	Echelon III
50 g	0.20	Echelon III
10 g	0.058	Echelon III
1 g	0.018	Echelon III

## THERMODYNAMICS

*NVLAP Code:* 20/T03  
Laboratory Thermometers

<i>Nominal Temperature in °F</i>	<i>Best Uncertainty (<math>\pm</math>) in °F<sup>note 1</sup></i>	<i>Remarks</i>
32.0 to <160.0	0.56	Liquid in Glass
32.0 to <160.0	0.84	Bi-metallic

*NVLAP Code:* 20/T05  
Pressure Gage

<i>Nominal Force in psi</i>	<i>Best Uncertainty (<math>\pm</math>)<sup>note 1</sup></i>	<i>Remarks</i>
10 to 70	234 ppm	Ruska 2465A-754
80 to 100	150 ppm	Ruska 2465A-754
100 to 2000	184 ppm	Ruska 2481-700

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