



**National Voluntary  
Laboratory Accreditation Program**



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

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**CALIBRATION LABORATORIES**

**NVLAP LAB CODE 200605-0**

*NVLAP Code:* 20/A01

ANSI/NCSL Z540-1-1994; Part 1

Compliant

**DIMENSIONAL**

*NVLAP Code:* 20/D03

Gage Blocks

<i>Range</i>	<i>Best Uncertainty (±) <sup>note 1</sup></i>	<i>Remarks</i>
0.05 in	2.5 μin	
0.100 in to 0.19 in	2.0 μin	
0.200 in to 0.950 in	2.0 μin	
1 in to 2 in	2.6 μin	
3 in	3.1 μin	
4 in	4.0 μin	
1 mm	63 nm	
2.5 mm to 4.5 mm	51 nm	
5 mm to 24.5 mm	51 nm	
25 mm to 50 mm	65 nm	
75 mm	78 nm	
100 mm	102 nm	
Long Gage Blocks		
5 in to 20 in	(3.0 + 1.3 L) μin <sup>note 2</sup>	
150 mm to 500 mm	(0.08 + 0.0013L) μm <sup>note 3</sup>	

2009-04-01 through 2010-03-31

*Effective dates*

*Sally S. Bruce*

*For the National Institute of Standards and Technology*



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## CALIBRATION LABORATORIES

NVLAP LAB CODE 200605-0

**NVLAP Code:** 20/D05  
Length & Diameter - Indicators

<b>Range in inches</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu\text{in}</math> <sup>note 1</sup></b>	<b>Remarks</b>
up to 0.100	21	M&TE
0.100 to 0.250	82	M&TE
0.250 to 2	82	M&TE

**NVLAP Code:** 20/D05  
Length - Air Amplifiers

<b>Range in inches</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu\text{in}</math> <sup>note 1</sup></b>	<b>Remarks</b>
0.0003 to 0.003	12	M&TE Dimensionair®

**NVLAP Code:** 20/D05  
Length

<b>Range in inches</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu\text{in}</math> <sup>note 1</sup></b>	<b>Remarks</b>
0.0003 to 0.003	13	M&TE All Mahr Federal Inc. AMR Kits

**NVLAP Code:** 20/D05  
Length

<b>Range</b>	<b>Best Uncertainty (<math>\pm</math>) <sup>note 1</sup></b>	<b>Remarks</b>
< 400 arc seconds	0.40 arc seconds	M&TE Electronic Levels System
0 in to 1 in	58 $\mu\text{in}$	M&TE 400 B3 & B4 Calibrators

**NVLAP Code:** 20/D05  
Length & Diameter - Outside Micrometers

<b>Range in inches</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu\text{in}</math> <sup>note 1</sup></b>	<b>Remarks</b>
0 to 1	58	M&TE
1 to 2	58	M&TE
2 to 3	58	M&TE

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## CALIBRATION LABORATORIES

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3 to 4	58	M&TE
4 to 5	58	M&TE
5 to 6	58	M&TE

**NVLAP Code:** 20/D05

Length – Field Service Calibration

<b>Range</b>	<b>Best Uncertainty (<math>\pm</math>) <sup>note 1</sup></b>	<b>Remarks</b>
Universal Length Measuring Machines 0.5 in to 12 in	5.0 $\mu$ in (0.127 $\mu$ m)	Gage Blocks
Universal Height Measuring Machines 5 mm to 700 mm	80 $\mu$ in (2.0 $\mu$ m)	Calibrated Step Gage
Universal Calibrators 0.5 in	9.0 $\mu$ in (229 $\mu$ m)	Gage Blocks
Comparators 0.002 in	3.1 $\mu$ in (0.079 $\mu$ m)	Gage Blocks

**NVLAP Code:** 20/D09

Roundness

<b>Range</b>	<b>Best Uncertainty (<math>\pm</math>) in <math>\mu</math>in <sup>note 1</sup></b>	<b>Remarks</b>
0.124 in to 2 in Dia. with a roundness <100 $\mu$ in	1 $\mu$ in	
0.124 in to 14.5 in Dia. with a roundness $\leq$ 0.004 in	3.5 $\mu$ in (0.089 $\mu$ m)	
0.124 in to 14.5 in Dia. with a roundness > 0.004 to 0.40 in	25 $\mu$ in (0.64 $\mu$ m)	

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## CALIBRATION LABORATORIES

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*NVLAP Code:* 20/D11  
Spherical Diameter; Plug

<i>Range in inches</i>	<i>Best Uncertainty (±) in μin <sup>note 1</sup></i>	<i>Remarks</i>
up to 1	6	
1 to 2	7	
2 to 4	10	
4 to 10	(10 + 1L)	

*NVLAP Code:* 20/D11  
Ring Gages

<i>Range in inches</i>	<i>Best Uncertainty (±) in μin <sup>note 1</sup></i>	<i>Remarks</i>
0.125 to 5.0	7	Mahr 828 CIM
up to 1	6	
1 to 2	7	
2 to 4	10	
4 to 14	(10 + 1L)	

*NVLAP Code:* 20/D11  
Air Rings

<i>Range in inches</i>	<i>Best Uncertainty (±) in μin <sup>note 1</sup></i>	<i>Remarks</i>
< 2	18	M&TE
2 to 4	25	M&TE

*NVLAP Code:* 20/D11  
Air Plugs

<i>Range in inches</i>	<i>Best Uncertainty (±) in μin <sup>note 1</sup></i>	<i>Remarks</i>
< 1	12	M&TE
≥ 1 to 2	26	M&TE
> 2 to 3	28	M&TE
> 3 to 4	32	M&TE
> 4 to 5	33	M&TE

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**CALIBRATION LABORATORIES**

**NVLAP LAB CODE 200605-0**

*NVLAP Code:* 20/D12  
Surface Texture

<i>Range</i>	<i>Best Uncertainty (±) in μin <sup>note 1</sup></i>	<i>Remarks</i>
20 μin R <sub>a</sub> to 300 μin R <sub>a</sub>	2	

*NVLAP Code:* 20/D12  
Surface Finish / Contour Measuring Machines – Field Service Calibration

<i>Range</i>	<i>Best Uncertainty (±) <sup>note 1</sup></i>	<i>Remarks</i>
R <sub>a</sub> 100 μin to 150 μin	1.18 μin (0.03 μm)	Surface Finish Standard
W <sub>t</sub> <60 μin/in.	3.15 μin (0.08 μm)	Straight Edge
Displacement 180 μin to 240 μin	3.0 μin (0.076 μm)	Step Height Standard
Probe Calibration Steps 1 mm to 70 mm	15.8 μin (0.40 μm)	Gage Blocks
Gage Pin Radius 2 mm to 4 mm	5.12 μin (0.13 μm)	Calibrated Gage Pin
Sphere Radius >4mm to 25 mm	5.12 μin (0.13 μm)	Calibrated Sphere (2 ball master)

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## CALIBRATION LABORATORIES

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*NVLAP Code:* 20/D15

Precision Geometry / Form Measuring Machines

<i>Range</i>	<i>Best Uncertainty (±) <sup>note 1</sup></i>	<i>Remarks</i>
<b>Concentricity</b>		
≤ 14.5 in Dia. and ≤ 13.75 in. Hgt. with a concentricity of ≤ 0.004 in	12 μin (0.3 μm)	
≤ 14.5 in Dia. and ≤ 13.75 in. Hgt with a concentricity of > 0.004 in to 0.040 in to 0.0040 in	27 μin (0.69 μm)	
<b>Cylindricity</b>		
≤ 1.0 in Hgt. and ≤ 14.5 in Dia. with a cylindricity of ≤ 0.0001 in	5 μin (0.13 μm)	
≤ 4.0 in Hgt. and ≤ 14.5 in Dia. with a cylindricity of ≤ 0.004 in	15 μin (0.38 μm)	
> 4.0 in to 13.75 in Hgt. and ≤ 14.5 in Dia. with a cylindricity of ≤ 0.004 in	25 μin (0.64 μm)	
≤ 4.0 in Hgt. and ≤ 14.5 in Dia. with a cylindricity of > 0.004 in to 0.040 in to 0.040 in	29 μin (0.74 μm)	
≥ 4.0 in to 13.75 in Hgt. and ≤ 14.5 in Dia. with a cylindricity of > 0.004 in to 0.040 in A	35 μin (0.89 μm)	
<b>Flatness</b>		
≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a flatness of ≤ 0.004 in	3 μin (0.08 μm)	
≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a flatness of > 0.004 in to 0.040 in	25 μin (0.64 μm)	
<b>Parallelism</b>		
≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a parallelism of ≤ 0.004 in	4 μin (0.10 μm)	
≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a parallelism of > 0.004 in to 0.040 in	25 μin (0.64 μm)	

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## CALIBRATION LABORATORIES

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### Perpendicularity

≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a Perpendicularity of ≤ 0.004 in	5 μin (0.13 μm)
≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a perpendicularity of > 0.004 in to 0.040 in	25 μin (0.64 μm)

### Runout

≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a runout of ≤ 0.004 in	4 μin (0.1 μm)
≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a runout of > 0.004 in to 0.040 in	25 μin (0.64 μm)

### Total Runout

≤ 14.5 in Dia. ≤ 13.75 in Hgt. with a total runout of ≤ 0.004 in	330 μin (8.4 μm)
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**NVLAP Code:** 20/D15

Geometry / Form Measuring Machines – Field Service Calibration

<b>Range</b>	<b>Best Uncertainty (±) <sup>note 1</sup></b>	<b>Remarks</b>
Radial Departure <50 μin	1.85 μin (0.047 μm)	Precision Sphere
Axial Deviation <50 μin	1.2 μin (0.03 μm)	Optical Flat
Coning Error <10 μin / in	1.17 μin (0.03 μm)	Precision Sphere
Probe Calibration <0.040 in	26.4 μin (0.67 μm)	Gage Blocks

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Straightness <2 $\mu\text{m}$ / 100 mm	5.9 $\mu\text{in}$ (0.15 $\mu\text{m}$ )	Straight Edge
Z Axis Parallelism <10 $\mu\text{m}$ / m	87.4 $\mu\text{in}$ (2.22 $\mu\text{m}$ )	Cylindrical Square
X Axis Perpendicular <10 $\mu\text{m}$ / m	281 $\mu\text{in}$ (7.74 $\mu\text{m}$ )	Straight Edge

1. Represents an expanded uncertainty using a coverage factor,  $k = 2$ , at an approximate level of confidence of 95 %.
2. L in inches
3. L in mm

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