National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Mahr Federal Inc.
1139 Eddy Street
Providence, RI 02940
Mr. Richard Long
Phone: 401-784-3475 Fax: 401-784-3238
E-mail: richard.long@mahr.com

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

Range	*Best Uncertainty (±)* [note 1,4]	*Remarks*
0.05 in	2.5 µin	See note 4 regarding uncertainties
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 [note 2]	
150 mm to 500 mm	(0.08 + 0.0013*L*) µm [note 3]	

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

CALIBRATION LABORATORIES **NVLAP LAB CODE 200605-0**

NVLAP Code: 20/D05
Length & Diameter - Indicators

Range in inches	***Best Uncertainty (±) in µin*** [note 1]	***Remarks***
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

Range in inches	***Best Uncertainty (±) in µin*** [note 1]	***Remarks***
0.0003 to 0.003	12	M&TE Dimensionair®

NVLAP Code: 20/D05
Length

Range in inches	***Best Uncertainty (±) in µin*** [note 1]	***Remarks***
0.0003 to 0.003	13	M&TE All Mahr Federal Inc. AMR Kits

NVLAP Code: 20/D05
Length

Range	***Best Uncertainty (±)*** [note 1]	***Remarks***
< 400 arc seconds	0.40 arc seconds	M&TE Electronic Levels System
0 in to 1 in	58 µin	M&TE 400 B3 & B4 Calibrators

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

Range in inches	***Best Uncertainty (±) in µin*** [note 1]	***Remarks***
0 to 1	58	M&TE
1 to 2	58	M&TE

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

2 to 3	58	M&TE
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

Range	***Best Uncertainty (±)*** [note 1]	***Remarks***
Universal Length Measuring Machines		
0.5 in to 12 in	5.0 µin (0.127 µm)	Gage Blocks
Universal Height Measuring Machines		
5 mm to 700 mm	80 µin (2.0 µm)	Calibrated Step Gage
Universal Calibrators		
0.5 in	9.0 µin (229 µm)	Gage Blocks
Comparators		
0.002 in	3.1 µin (0.079 µm)	Gage Blocks

NVLAP Code: 20/D09
Roundness

Range	***Best Uncertainty (±) in µin*** [note 1]	***Remarks***
0.124 in to 2 in Dia. with a roundness <100 µin	1 µin	
0.124 in to 14.5 in Dia. with a roundness ≤ 0.004 in	3.5 µin (0.089 µm)	
0.124 in to 14.5 in Dia. with a roundness > 0.004 to 0.40 in	25 µin (0.64 µm)	

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

CALIBRATION LABORATORIES **NVLAP LAB CODE 200605-0**

NVLAP Code: 20/D11
Spherical Diameter; Plug

Range in inches	*Best Uncertainty (±) in µin* [note 1]	*Remarks*
up to 1	6	
1 to 2	7	
2 to 4	10	
4 to 10	(10 + 1*L*)	

NVLAP Code: 20/D11
Ring Gages

Range in inches	*Best Uncertainty (±) in µin* [note 1]	*Remarks*
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 + 1*L*)	

NVLAP Code: 20/D11
Air Rings

Range in inches	*Best Uncertainty (±) in µin* [note 1]	*Remarks*
< 2	18	M&TE
2 to 4	25	M&TE

NVLAP Code: 20/D11
Air Plugs

Range in inches	*Best Uncertainty (±) in µin* [note 1]	*Remarks*
< 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

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

CALIBRATION LABORATORIES **NVLAP LAB CODE 200605-0**

NVLAP Code: 20/D12
Surface Texture

Range	***Best Uncertainty (±) in µin*** [note 1]	***Remarks***
20 µin R_a to 300 µin R_a	2	

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

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

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

CALIBRATION LABORATORIES **NVLAP LAB CODE 200605-0**

NVLAP Code: 20/D15
Precision Geometry / Form Measuring Machines

Range	***Best Uncertainty (±)*** [note 1]	***Remarks***
Concentricity		
≤ 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)	
Cylindricity		
≤ 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)	
Flatness		
≤ 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)	
Parallelism		
≤ 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)	

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

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)

NVLAP Code: 20/D15
Geometry / Form Measuring Machines – Field Service Calibration

Range	***Best Uncertainty (±)*** [note 1]	***Remarks***
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	26.4µin (0.67 µm)	Gage Blocks

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology

CALIBRATION LABORATORIES **NVLAP LAB CODE 200605-0**

Straightness		
<2 µm / 100 mm	5.9 µin (0.15 µm)	Straight Edge
Z Axis Parallelism		
<10 µm / m	87.4 µin (2.22 µm)	Cylindrical Square
X Axis Perpendicular		
<10 µm /m	281 µin (7.74 µm)	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
4. Add 1.5 µin/38.1 nm for chrome carbide, 2.3 µin/58.4 nm for tungsten carbide to the uncertainty listed. The uncertainty listed is for steel gage blocks.

2011-04-01 through 2012-03-31

Effective dates

Sally S. Bruce

For the National Institute of Standards and Technology