

# Scope of Accreditation For Berg Engineering & Sales Company, Inc.

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In recognition of a successful assessment to ISO/IEC 17025:2005, accreditation is granted to **Berg Engineering & Sales Company, Inc.** to perform the following Calibrations:

Accreditation granted through: **February 4, 2014**

## Calibration

### Length - Dimensional Metrology – Hand Tools and Precision Gages 1D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) <sup>2</sup>	Remarks
Ultrasonic Corrosion Thickness Gauge	(0.03 to 2) in (0.06 to 8) in	0.0015 in	ASTM E797
Ultrasonic Precision Thickness Gauge	(0.007 to 0.5) in (0.1 to 4) in	0.11 in	

### Length - Dimensional Metrology – Hand Tools and Precision Gages 2D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) <sup>2</sup>	Remarks
XY Stage (X Value)	(0 to 5) mm	5.9 μm	Compared to Stage Micrometer
XY Stage (Y Value)	(0 to 5) mm	5.9 μm	
Brinell Scope	(0 to 7) mm	0.058 mm	

### Length - Dimensional Metrology – Artifacts and Standards 1D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) <sup>2</sup>	Remarks
Optical Measuring Scope	(0 to 7) mm	0.058 mm	Compared to Stage Micrometer

**Length - Dimensional Metrology – Other**

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Ultrasonic Velocity Gauge	(0.18 to 0.24) in / $\mu$ s	0.11 in / $\mu$ s	ASTM E494
Ultrasonic Flaw Detector (Vertical Linearity)	(0.01 to 1 100) in	1 % of Full Scale	ASTM E317
Ultrasonic Flaw Detector (Horizontal Linearity)	(0.01 to 1 100) in	0.59 % of Full Scale	

**Electricity and Magnetism – Current**

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Magnetic Inspection Unit	(500 to 10 000) A	2.8 A	ASTM E1444

**Electricity and Magnetism – Magnetic Properties**

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Magnetic Inspection Unit Gauss Meter	(0 to 30) g	0.15 g	ASTM E1444

**Time and Frequency – Frequency / Period**

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Magnetic Inspection Unit Shot Duration	(0 to 3) s	0.42 s	ASTM E1444

**Amount of Substance – Other – Conductivity and pH**

<b>Calibration Parameter/Equipment <sup>3</sup></b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Electromagnetic (Eddy Current) Conductivity Meter	(0 to 100) % IACS	0.02 % IACS	ASTM E1004

**Luminous Intensity**

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
UV / Black	(1 to 10 000) $\mu$ W / cm <sup>2</sup>	1.9 $\mu$ W / cm <sup>2</sup>	ASTM E1444
White Light	(1 to 1 999) FC	0.77 FC	

**Mass – Hardness**


Calibration Parameter/Equipment	Range	Calibration and Measurement Capability(+/-) <sup>2</sup>	Remarks
Indirect Verification of Rockwell Hardness Testers <sup>1</sup>	HRA Low Middle High	0.26 HRA 0.21 HRA 0.16 HRA	Indirect Method ASTM E18
	HRB Low Middle High	0.98 HRB 0.95 HRB 0.58 HRB	
	HRC Low Middle High	0.77 HRC 0.35 HRC 0.31 HRC	
	HRF Low Middle High	0.64 HRF 0.51 HRF 0.48 HRF	
	HR15N Low Middle High	0.44 HR15N 0.53 HR15N 0.26 HR15N	
	HR15T Low Middle High	0.63 HR15T 0.43 HR15T 0.33 HR15T	
	HR30T Low Middle High	0.50 HR30T 0.46 HR30T 0.36 HR30T	
	HR30N Low Middle High	0.44 HR30N 0.38 HR30N 0.31 HR30N	
	HR45N Low Middle High	0.57 HR45N 0.26 HR45N 0.26 HR45N	
Portable Rockwell Hardness Tester	HRC Low Middle High	0.77 HRC 0.35 HRC 0.33 HRC	Indirect Method ASTM E110
Indirect Verification of Brinell Hardness Tester	(500 to 3 000) kg	5.9 BHN	Indirect Method ASTM E10
Brinell Optical Scanning System	(140 to 700) BHN	0.00804 mm	
Direct Verification of Brinell Hardness Tester	(1 to 3 000) kgf	6.7 kgf	

<b>Calibration Parameter/Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability(+/-) <sup>2</sup></b>	<b>Remarks</b>
Leebs Hardness Tester	(200 to 765) LD	20 LD	Indirect Method ASTM A956
Leebs Hardness Test Block	(500 to 800) LD	19 LD	
Portable Hardness Gauge UCI Method	(20 to 66) HRC	0.29 HRC	Indirect Method ASTM A1038
Vickers Micro Hardness Tester	(200 to 700) HV	4.38 HV	Indirect Method ASTM E384
Knoop Micro Hardness Tester	(200 to 700) HK	3.82 HK	

**Notes:**

- 1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
- 2) Calibration and Measurement Capability represents expanded uncertainties at approximately the 95% confidence level using a coverage factor of k=2.
- 3) IACS unit of measure is defined as Eddy Current electrical conductivity in percentage to the International Annealed Copper Standard whereas  $0.58 \times 10^8$  S/m is equivalent to 100% IACS.

Approved by: \_\_\_\_\_


  
 R. Douglas Leonard  
 Chief Technical Officer

 Date: December 20, 2010

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