

Scope of Accreditation

For

Berg Engineering & Sales Company, Inc.

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Rolling Meadows, IL 60008
Stephen Berg
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In recognition of a successful assessment to ISO/IEC 17025:2005 to the following Calibration and Measurement Capabilities, accreditation has been granted to **Berg Engineering & Sales Company, Inc.** for the following:

Accreditation granted through: **February 4, 2020**

Calibration

Electrical – Current

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Magnetic Inspection Unit	(500 to 10 000) A	12.3 A + 2.9% of reading	Current Shunts

Electrical – Magnetic Properties

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Magnetic Inspection Unit Gauss Meter	(0 to 75) G	5 G + 8.6% of reading	Gauss meter

Electrical – Other

Calibration Parameter/Equipment ²	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Electromagnetic (Eddy Current) Conductivity Meters ³	8% IACS 9% IACS 49% IACS 88% IACS 101 % IACS	0.25 % IACS + 0.95% of reading	Eddy Current Conductivity Standards
Electromagnetic (Eddy Current) Flaw Detector Horizontal Linearity	X Gain – 40 dB Freq – 200 kHz Spot X – 88	0.065 Div	Aluminum and 4340 Carbon Steel reference materials
Electromagnetic (Eddy Current) Flaw Detector Vertical Linearity	Y Gain – 40 dB Freq – 200 kHz Spot Y – 88 11	0.62 Div	Aluminum and 4340 Carbon Steel reference materials

Length - Hand Tools and Precision Gages 1D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Ultrasonic Corrosion Thickness Gauge	(0.03 to 2) in (0.06 to 8) in	0.001 4 in	ASTM E797
Ultrasonic Precision Thickness Gauge	(0.007 to 0.5) in (0.1 to 4) in	0.11 in	
XY Stage (X Value)	(0 to 5) mm	5.9 μ m	Stage Micrometer
XY Stage (Y Value)	(0 to 5) mm	5.9 μ m	
Brinell Scope	(0 to 7) mm	0.058 mm	
Optical Measuring Scope	(0 to 7) mm	0.058 mm	
Optical Measuring Scales 100X 500X	(0 to 10) mm	4.1 μ m 4.8 μ m	

Length – Hand Tools and Precision Gages 2D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Profilometer (Ra) ³	16.1 μ in 119.5 μ in	3.5 μ in 12 μ in	Roughness Standard ASME-B46.1

Length - Other

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Ultrasonic Velocity Gauge	(0.18 to 0.24) in / μ s	0.11 in / μ s	ASTM E494
Ultrasonic Flaw Detector (Vertical Linearity)	(0.01 to 1 100) in	1 % of reading	ASTM E317
Ultrasonic Flaw Detector (Horizontal Linearity)	(0.01 to 1100) in	0.59 % of reading	

Mass – Hardness

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Indirect Verification of Rockwell Hardness Testers ¹	HRA Low Middle High	0.43 HRA 0.22 HRA 0.21 HRA	Indirect Method ASTM E18
	HRBW Low Middle High	1.1 HRBW 0.95 HRBW 0.58 HRBW	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Indirect Verification of Rockwell Hardness Testers ¹	HRC Low Middle High	0.43 HRC 0.38 HRC 0.33 HRC	Indirect Method ASTM E18
	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	
	HR15Tw Low Middle High	0.63 HR15Tw 0.41 HR15Tw 0.33 HR15Tw	
	HR30TW Low Middle High	0.61 HR30TW 0.46 HR30TW 0.36 HR30TW	
	HR30N Low Middle High	0.44 HR30N 0.36 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	0.43 HRC 0.39 HRC 0.34 HRC	Indirect Method ASTM E110
Indirect Verification of Brinell Hardness Tester	(500 to 3 000) kg	4.8 BHN	Indirect Method ASTM E10
Brinell Optical Scanning System	(140 to 700) BHN	0.009 mm	
Direct Verification of Brinell Hardness Tester	(1 to 3 000) kgf	6.7 kgf	
Leeb Hardness Tester	(200 to 765) LD	19 LD	Indirect Method ASTM A956
Leeb Hardness Test Block	(500 to 800) LD	19 LD	
Portable Hardness Gauge UCI Method	(20 to 66) HRC	0.58 HRC	Indirect Method ASTM A1038
Indirect Verification of Vickers Hardness Testers	(200 to 772) HV	12 HV	Indirect Method ASTM E384
Indirect Verification of Knoop Hardness Testers	(200 to 734) HK	14 HK	

Photometry and Radiometry - Detectors

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Spectral Irradiance (UV-A) (315 to 400) nm Black Light	(10 to 10 000) $\mu\text{W} / \text{cm}^2$	9.4 $\mu\text{w}/\text{cm}^2 + 8.8\%$ of reading	UVA Detector and display unit using laboratory developed method
Illuminance responsivity (Illuminant A – CIE) White Light (380 to 760) nm	(2 to 400) fc	1.7 fc + 9.3% of reading	White light Detector and display unit using laboratory developed method
Luminance responsivity White Light (380 to 760) nm	(100 to 57 500) fL	1.3 fL + 7.9% of reading	Illuminance probe and display unit using laboratory developed method

Time and Frequency – Frequency / Period

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Magnetic Inspection Unit Shot Duration	(0 to 3) S	670 mS	ASTM E1444

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and remarks. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

- 1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
- 2) IACS unit of measure is defined as Eddy Current electrical conductivity in percentage to the International Annealed Copper Standard whereas $0.58 \times 10^8 \text{ S/m}$ is equivalent to 100% IACS.
- 3) Fixed points are approximate nominal values

Approved by:



 R. Douglas Leonard
Chief Technical Officer

 Date: February 27, 2017

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