SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

HURST METALLURGICAL RESEARCH LABORATORY, INC.
2111 West Euless Blvd. (Highway 10)
Euless, TX 76040-6707
Mahesh J. Madhani Phone: (817) 283 4981
service@hurstlab.com www.hurstlab.com

MECHANICAL

Valid To: May 31, 2021 Certificate Number: 3152.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on metals:

Test	Test Method(s)
Failure Investigation Using all or part of the following test methods	ASM Handbook, Volumes 11 and 12, 9th Edition
Metallographic Sample Preparation	ASM Handbook, Volume 9, 9th Edition; ASTM B665, E3, E340, E768, E1920
Metallurgical Tests	
Macroetch Evaluation	ASTM E381; MIL-STD-867
Etching	ASTM E407
Metallographic Evaluation	ASM Handbook, Volume 9, 9th Edition; ASTM A247
Coating Thickness by Microscope	ASTM B487
Coating Weight	ASTM A90/A90M, A428/A428M, B137; MIL-A-8625; MIL-DTL-16232
Case Depth	ASTM E384, E407; SAE J423
Presence of Carburization/Decarburization	ASTM E384, E407, E1077, F2328; SAE J121, J419
Grain Size	ASTM E112, E1181, E1382
Grain Flow	ASTM E340
Discontinuity/Defects	ASTM F788, F812; SAE J122
Inclusions/Second Phase Particles	ASTM E45, E1245; SAE J422
Degree of Banding	ASTM E1268
Detrimental Intermetallic Phase in Duplex SS	ASTM A923
Permeability of Feebly Magnetic Materials	ASTM A342/A342M (Test Method 3)
Measuring Adhesion by Tape Test	ASTM D3359
Qualitative Adhesion Testing of Metallic Coatings	ASTM B571

Test	Test Method(s)
Corrosion Testing	
Intergranular Attack in Austenitic Stainless Steels	ASTM A262 (Practices A, B, E, and F)
Intergranular Attack in Ferritic Stainless Steels	ASTM A763 (Practices W, X, and Y)
Intergranular Attack in Wrought Ni Rich, Cr Bearing Alloys	ASTM G28 (Methods A and B)
Exfoliation Corrosion Susceptibility in Al Alloys	ASTM G34
Examination and Evaluation of Pitting Corrosion (Visual and Metallographic)	ASTM G46
Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys	ASTM G48 (Method A)
Intergranular Corrosion Resistance of Heat Treatable Aluminum Alloys	ASTM G110
Chemical Passivation/Free Iron	ASTM A380/A380M, A967/A967M
Degree of Rusting (Visual and Imaging Software)	ASTM D610
Mechanical Tests	
Tensile/Tension	ASTM A48/A48M, A370, B557, E8/E8M, E517, F606/F606M, E646; SAE J429
Flattening	ASTM A370
Hardness	
Rockwell (A, B, C, E, F) and Superficial (15N, 15T, 30N, 30T, 45N, 45T)	ASTM E18; SAE J417; NACE MR0175/ISO 15156
Brinell (500 kgf, 1500 kgf, 3000 kgf)	ASTM E110; SAE J417
Knoop/Micro Vickers (200 gf, 500 gf)	ASTM B578, E384; SAE ARP 1820, J417
Macro Vickers (≥ 1kgf)	ASTM E92
Proof Load	ASTM A370, F606/F606M; SAE J429, J995
Charpy, V-notch Impact	ASTM A370, E23
Bend Test	ASTM A370, E190, E290
Chemical Analysis/Alloy Identification	
Optical Emission Spectroscopy (OES)	
Carbon and Alloy Steels (Fe, C, Mn, P, S, Si, Cu, Ni, Cr, Mo, Mg, Sn, Al, Ti, V, Nb, Co, W, As, Zr, B, Pb, Ta)	ASTM E415
Stainless Steels (Fe, C, Mn, P, S, Si, Cu, Ni, Cr, Mo, Al, Ti, V, Nb, Co, W, As, B, Pb, Ta)	ASTM E1086
Aluminum Alloys (Al, Si, Fe, Cu, Sn, Mn, Mg, Pb, Zn, Cr, Ni, Ti, B, Be, V)	ASTM E1251
Tool Steel (Fe, C, Mn, P, S, Si, Ni, Cr, Mo, Cu, W, Co, V, Al, Ti, Sn, Mg, Nb, As, Zr, B, Pb, Ta)	ASTM A751; HMRL CHE-2[1]
Nickel Alloys (Ni, C, W, Si, Fe, Zr, Mn, S, Mo, Mg, Cu, Co, Al, B, P, Ti, Nb, V, Cr)	ASTM E3047

Test	Test Method(s)
Weld Evaluations	
Weld/Welder Qualification Tests	ANSI/AWS B2.1, B2.2, B4.0, C1.1, C1.4, D1.1, D1.2, D1.3, D1.4, D1.5, D1.6, D1.9, D3.6M, D9.1, D14.1, D15.1, D17.1, D17.2; API STD 1104; ASME B&PV Code Section VIII and Section IX

Dimensional Testing[2]

Parameter	Range	CMC[3] (±)	Technique / Method
Length[4] –			
One Dimensional	Up to 6 in Up to 8 in	0.00029 in 0.00040 in	Digital caliper
	Up to 1 in	0.000047 in	Digital micrometer
	Up to 1 in	0.00090 in	Point micrometer
Two Dimensional	Up to 0.6 in	0.00060 in	Microscope with image analysis software
	Up to 3 in	0.00060 in	Optical stereoscope with image analysis software
Angle[4]	(0 to 360)°	0.001°	Microscope with image analysis software
	(0 to 360)°	0.001°	Optical stereoscope with image analysis software

[1] Hurst Lab Procedure (internal).

[2] This laboratory does not offer commercial dimensional testing services.

[3] Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine measurements of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific measurement performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific measurement.

[4] This test is not equivalent to that of a calibration.

Accredited Laboratory

A2LA has accredited

HURST METALLURGICAL RESEARCH LABORATORY, INC.

Euless, TX

for technical competence in the field of

Mechanical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 21st day of June 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3152.01
Valid to May 31, 2021

For tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.