



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

HURST METALLURGICAL RESEARCH LABORATORY, INC.

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MECHANICAL

Valid To: May 31, 2023

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

Using the methods listed on this scope in accordance with the ASM Handbook, Volume 11

**Metallurgical Tests**

Metallographic Sample Preparation

ASM Handbook, Volume 9, 9<sup>th</sup> Edition;

ASTM B665, E3, E768, E1920

Etch Inspection - Macro

ASTM E381, E340; MIL-STD-867

Etching - Micro

ASTM E407

Etch Inspection Rehardening/Overt tempering

AMS2649

Metallographic Evaluation

ASM Handbook, Volume 9, 9<sup>th</sup> Edition

Microstructure - Cast Iron

ASTM A247, E2567

Grain Size

ASTM E112, E1181, E1382

Surface Discontinuities/Defects

ASTM F788, F812; SAE J122

Inclusions/Second Phase Particles

ASTM E45, E1245; SAE J422

Degree of Banding - Macro/Micro

ASTM E1268

Detrimental Intermetallic Phase in Duplex SS

ASTM A923

Case Depth-Carburization/Decarburization

ASTM E384, E407, E1077, F2328; SAE J121, J419, J423

Magnetic Permeability

ASTM A342/A342M (Test Method 3)

Ferrite Percent/Number

**Coatings and Platings**

Adhesion Testing of Metallic Coatings

ASTM B571

Measuring Adhesion by Tape Test

ASTM D3359

Coating Thickness - Optical

ASTM B487

Coating-Electroplated Microhardness

ASTM B578

Coating Weight

ASTM A90/A90M, A428/A428M, B137; MIL-A-8625; MIL-DTL-16232

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**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 Nickel Rich, Chromium 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 Image Analysis Software	ASTM D610

**Mechanical Tests**

Tensile/Tension	ASTM A48/A48M, A370, B557, E8/E8M, E517, F606/F606M, E646
Hardness	
Superficial (15N, 15T, 30N, 30T, 45N, 45T)	ASTM E18; NACE MR0175/ISO 15156
Rockwell (A, B, C, E, F)	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
Vickers ( $\geq$ 1kgf)	ASTM E92; NACE MR0175/ISO 15156
Proof Load	ASTM A370, F606/F606M; SAE J429, J995
Charpy, V-notch Impact	ASTM A370, E23
Bend Test	ASTM A370, E190, E290
Flattening	ASTM A370, API 1104
Nick Break	API 1104; AWS B4.0

**Welder and Welding Procedure Qualification Testing**

API STD 1104; 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; ASME B&PV Code Section VIII and Section IX

**Chemical Analysis/Alloy Identification****Optical Emission Spectroscopy (OES)**

Carbon and Alloy Steels (Al, As, B, C, Co, Cr, Cu, Fe, Mg, Mn, Mo, Nb, Ni, P, Pb, S, Si, Sn, Ti, V, W, Ta, Zr)	ASTM E415
Stainless Steels (Al, As, B, Fe, C, Co, Cr, Cu, Mn, Mo, N, Nb, Ni, O, P, Pb, S, Si, Ta, Ti, V, W, Zr)	ASTM E1086



**Test****Test Method(s)****Chemical Analysis/Alloy Identification  
Optical Emission Spectroscopy (OES)  
(continued)**

Aluminum Alloys (Al, B, Be, Bi, Cr, Cu, Fe, Mn, Mg, Ni, Pb, Si, Sn, Ti, V, Zn, Zr, Sr)	ASTM E1251
Tool Steel (Al, As, B, C, Co, Cr, Cu, Fe, Mg, Mn, Mo, N, Nb, Ni, P, Pb, S, Si, Sn, Ta, Ti, V, W, Zr)	ASTM A751; HMRL CHE-2 <sup>1</sup>
Nickel Alloys (Al, B, C, Cd, Co, Cr, Cu, Fe, Mn, Mo, Mg, Ni, P, S, Se, Si, Ti, Nb, Ta, V, W, Zr)	ASTM E3047
Cast Iron (C, Cr, Cu, Mn, Mo, Ni, P, S, Si, Sn, Ti, V)	ASTM E1999
High Manganese Steel (Al, C, Cr, Mn, Mo, Ni, P, Si)	ASTM E2209
Titanium and Titanium Alloys (Al, B, C, Cr, Cu, Fe, Mn, Mo, N, Nb, Ni, O, Si, Sn, Pa, Ru, V, Yt, Zr,)	ASTM E2994
Copper and Copper Alloys (Ag, Be, Cr, Fe, Ni, O, P, Pb, Sb, Si, Sn, Zn)	HMRL CHE-2 <sup>1</sup>

**Dimensional Testing<sup>2</sup>**

Parameter	Range	CMC <sup>3</sup> (±)	Technique / Method
Length <sup>4</sup> –  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
	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 <sup>4</sup>	(0 to 360)°	0.001°	Microscope with image analysis software
	(0 to 360)°	0.001°	Optical stereoscope with image analysis software

<sup>1</sup> Hurst Lab Procedure (internal).

<sup>2</sup> This laboratory does not offer commercial dimensional testing services.

<sup>3</sup> 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.

<sup>4</sup> This test is not equivalent to that of a calibration.





## Accredited Laboratory

A2LA has accredited

# HURST METALLURGICAL RESEARCH LABORATORY, INC.

*Eules, 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 12<sup>th</sup> day of April 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 3152.01  
Valid to May 31, 2023

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