SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

HOWMET RESEARCH CENTER
1500 S. Warner St.
Whitehall, MI 49461-1895
Thomas S. Jones Phone: 231 981 3851

CHEMICAL

Valid To: March 31, 2017 Certificate Number: 2208.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on carbon, clay, ceramics and related products, coatings, contaminants, Ti, Ni, Co, Al, LAS, Stainless, metals and alloys, ores and minerals, surface coatings, petroleum products, plastics and polymers, sand (foundry, glass, and agents), and trace element analysis in dyes and inks, lubricants, rubbers, plastics and related materials:

Test	Test Methods
Physical Testing – Particle Size	
Sieve Analysis of Metal Powders	ASTM B214
Physical Testing – Density	
Density of Metal Powders and Compounds (Scott Volumeter Density)	ASTM B329
Porosity, Apparent Density, and Bulk Density	ASTM C830
Physical Testing – Wax/Resin Properties	
Ash	ASTM D482
Chemical Analysis – Spectrometric	
Spark-AES[1] Cr, Cu, Fe, Mg, Si, Ti, Zn, Al, B, Hf, Mn, Mo, Nb, Ni, P, Ta, V, W, Zr, Co, Re	ASTM E415, E1086, E1251; MCL III-016
X-Ray Fluorescence (XRF)[1] Cr, Fe, Mn, Mo, Nb, Ni, Si, Ta, Ti, W, Zr, Co, Al, Hf, Re, V	ASTM E322, E539, E1085 E2465
Inductively Coupled Plasma (ICP)[1] B, Ca, Co, Cr, Cu, Fe, Hf, Mg, Mn, Mo, Nb, Ni, P, Re, Si Ta, Ti, V, W, Y, Zr, Al	ASTM E1479, E2371, E2594; MCL III-027, 180, 185
Graphite Furnace Atomic Absorption (GFAA)[1] Bi, Ag, Se, Pb, Pt, Sn, Cd, Sb, Te, Tl	ASTM E1184, E1834
Flame Atomic Absorption[1] Cu, Zn	MCL III-026

Chemical Analysis – Combustion	
Carbon and Sulfur (Leco)[1] C, S	ASTM E1019
Oxygen and Nitrogen (Leco)[1] O, N	ASTM E1019, E1409
Hydrogen (Leco)[1] H	ASTM E1447
Inductively Coupled Plasma Mass Spectrometer (ICP-MS)[1] Ga, As, Se, Ag, Cd, Sn, Sb, Te, Pt, Tl, Pb, Bi, Th, Pd, In, La Ce, Re	MCL III-182
Electron Micro-Probe (EMP)	MCL-III-504, 506

[1] This accreditation also includes an evaluation of the GE S-400 requirements for the test listed above using the GE AC1.1 checklist.

American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

HOWMET RESEARCH CENTER

Whitehall, MI

for technical competence in the field of

Chemical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *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 8 January 2009*).

Presented this 2nd day of April 2015.

President & CEO
For the Accreditation Council
Certificate Number 2208.02
Valid to March 31, 2017

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