



SCOPE OF ACCREDITATION TO ISO 17034:2016

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REFERENCE MATERIAL PRODUCER

Valid To: May 31, 2021

Certificate Number: 2848.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this Reference Material Producer for the production of certified reference materials and reference materials of the following category:

Category	Concentration Ranges	Uncertainty	Method	Analytical Technique
<b>Certified Reference Materials</b>				
<b>High Purity Metals – Spectrochemical Solutions</b>				
Single Element Standards	0.001 to 50 000 µg/mL	< 0.5 % Relative	NIST High Performance ICP-OES	ICP-OES, ICP-MS
Multi Element Standards	0.001 to 50 000 µg/mL	+/-0.5 % Relative	ICP-OES Aqueous QD, ICP-MS-Aqueous QD	ICP-OES, ICP-MS
<b>Ion Chromatography Standards (Anions and Cations)</b>				
Single-Ion Standards	0.001 to 10 000 µg/mL	+/- 0.5 % Relative	IC Aqueous QD	IC
Multi-Ion Standards	0.001 to 10 000 µg/mL	+/- 0.5 % Relative	IC Aqueous QD	IC
<b>Petroleum Products – Fuel and Lubricants</b>				
Acid Number	0.1 to 3.0 mg KOH/g	2 to 30 % Relative	ASTM D664 ASTM D974	Titrimetry
Base Number	6 to 70 mg KOH/g	+/- 4 to 11 % Relative	ASTM D2896 ASTM D4739	Titrimetry
Chlorine (Cl)	1 to 50 000 µg/mL	+/-1 % Relative	ICP-OES-Aqueous QD, XRF QD	ICP-OES, XRF
FT-IR Standard	1 to 100 ABS/cm	+/-10 to 25 % Relative	ASTM E2412	FT-IR

Category	Concentration Ranges	Uncertainty	Method	Analytical Technique
<b>Certified Reference Materials</b>				
<b>Petroleum Products – Fuel and Lubricants (cont)</b>				
Lead (Pb)	0.001 to 5.0 g/gal	+/-1 % Relative	ICP-OES-Aqueous QD, XRF QD	ICP-OES, XRF
Moisture (H <sub>2</sub> O)	0.001 to 1.0 %	5 % Relative	ASTM D6304	Karl Fischer, Titrimetry
C6.2 Viscosity	0.3 to 1000 cSt	0.32 % Relative	ASTM D445	Viscometry
Sulfur (S)	0.010 to 50 000 µg/g	+/-1 % Relative	ASTM D4294	XRF
Single Element Standards	0.001 to 300 000 µg/g	1 % Relative	ASTM D5185	ICP-OES, XRF
Multi Element Standards	0.001 to 50 000 µg/g	1 % Relative	ASTM D5185	ICP-OES, XRF
<b>Wear Metals in Oils</b>				
Single Element Standards	0.001 to 300 000 µg/g	1 % Relative	ASTM D5185	ICP-OES
Multi Element Standards in Petroleum Products	0.001 to 50 000 µg/g	+/-1 % Relative	ASTM D5185	ICP-OES

<b>Reference Materials, Quality Control Reference Materials</b>				
<b>Petroleum Products - Fuels and Lubricants</b>				
Particle Count Reference Materials	0 to 100 000 particles	N/A	ASTM D7596	Particle Counting

Category and Sub-category of Certified Reference Material	Concentration Ranges and Associated Uncertainty	Measurement Technique
<b>Category A: Chemical Composition</b>		
Ferrous metals: (Solids, Chips, Pins, Powder) <ul style="list-style-type: none"> <li>• Steels</li> <li>• Carbon steels</li> <li>• Low alloy steels</li> <li>• High alloy steels</li> <li>• Cast steels</li> <li>• Specialty steels</li> <li>• Irons</li> <li>• White irons</li> <li>• Cast irons</li> <li>• Ductile irons</li> <li>• Gray iron</li> <li>• Nodular iron</li> </ul>	Elemental Composition: Al to Zr Range: (0.000001 to 100.00000) % Uncertainty: (0.01 to 1) %	Measurement by one or more qualified laboratories using two or more methods of demonstrable accuracy

Category and sub-category of Certified Reference Material	Concentration Ranges and Associated Uncertainty	Measurement Technique
Nonferrous metals: (Solids, Chips, Pins, Powder) <ul style="list-style-type: none"> <li>• Aluminum alloys</li> <li>• Copper base alloys</li> <li>• Cobalt base alloys</li> <li>• Magnesium base alloys</li> <li>• Nickel base alloys</li> <li>• Titanium base alloys</li> <li>• Zinc base alloys</li> <li>• Zirconium base alloys</li> </ul>	Elemental Composition: Al to Zr Range: (0.000001 to 100.00000) % Uncertainty: (0.01 to 1) %	Measurement by one or more qualified laboratories using two or more methods of demonstrable accuracy
Special alloys: (Solids, Chips, Pins, Powder)	Elemental Composition: Al to Zr Range: (0.000001 to 100.00000) % Uncertainty: (0.01 to 1) %	Measurement by one or more qualified laboratories using two or more methods of demonstrable accuracy
<b>Category A: Inorganic Certified Reference Materials</b>		
Ores and minerals: <ul style="list-style-type: none"> <li>• Iron ore</li> <li>• Iron ore sinter</li> <li>• Bauxite</li> </ul>	Elemental Composition: Al to Zr Range: (0.000001 to 100.00000) % Uncertainty: (0.01 to 1) %	Measurement by one or more qualified laboratories using two or more methods of demonstrable accuracy
Metal producing materials & byproducts: <ul style="list-style-type: none"> <li>• Ferroalloys</li> <li>• Silico-calcium</li> <li>• Slag</li> <li>• Alumina</li> </ul>	Elemental Composition: Al to Zr Range: (0.000001 to 100.00000) % Uncertainty: (0.01 to 1) %	Measurement by one or more qualified laboratories using two or more methods of demonstrable accuracy

Category and sub-category of Reference Material	Concentration Ranges and Associated Uncertainty	Measurement Technique
<b>Category A: Chemical Composition</b>		
Ferrous metals: (Solids, Chips, Pins, Powder) <ul style="list-style-type: none"> <li>• Steels</li> <li>• Carbon steels</li> <li>• Low alloy steels</li> <li>• High alloy steels</li> <li>• Cast steels</li> <li>• Specialty steels</li> <li>• Irons</li> <li>• White irons</li> <li>• Cast irons</li> <li>• Ductile irons</li> <li>• Gray iron</li> <li>• Nodular iron</li> </ul>	Elemental Composition	Measurement by RM producer on a representative subset of samples

Category and sub-category of Reference Material	Concentration Ranges and Associated Uncertainty	Measurement Technique
Nonferrous metals: (Solids, Chips, Pins, Powder) <ul style="list-style-type: none"> <li>• Aluminum alloys</li> <li>• Copper base alloys</li> <li>• Cobalt base alloys</li> <li>• Magnesium base alloys</li> <li>• Nickel base alloys</li> <li>• Titanium base alloys</li> <li>• Zinc base alloys</li> <li>• Zirconium base alloys</li> </ul>	Elemental Composition	Measurement by RM producer on a representative subset of samples
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<b>Category A: Inorganic Reference Materials</b>		
Ores and minerals: <ul style="list-style-type: none"> <li>• Iron ore</li> <li>• Iron ore sinter</li> <li>• Bauxite</li> </ul>	Elemental Composition	Measurement by RM producer on a representative subset of samples
Metal producing materials & byproducts: <ul style="list-style-type: none"> <li>• Ferroalloys</li> <li>• Silico-calcium</li> <li>• Slag</li> <li>• Alumina</li> </ul>	Elemental Composition	Measurement by RM producer on a representative subset of samples





## *Accredited Reference Material Producer*

A2LA has accredited

**LGC STANDARDS**

*Manchester, NH*

This accreditation covers the specific materials listed on the agreed upon Scope of Accreditation.

This producer meets the requirements of ISO 17034:2016 *General Requirements for the Competence of Reference Material Producers*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 3<sup>rd</sup> day of December 2019.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2848.02  
Valid to May 31, 2021



*For reference materials to which this accreditation applies, please refer to the reference material producer's Scope of Accreditation.*