



SCOPE OF ACCREDITATION TO ISO 17034:2016

LGC STANDARDS
276 Abby Road
Manchester, NH 03103
Chuck Goudreau Phone: 603 622 7660
E-mail: chuck.goudreau@lgcgroup.com

REFERENCE MATERIAL PRODUCER

Valid To: September 30, 2019

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 |
|--|----------------------|------------------------|---------------------------------------|----------------------|
| Certified Reference Materials | | | | |
| High Purity Metals – Spectrochemical Solutions | | | | |
| Single Element Standards | 1 to 50 000 µg/mL | < 0.5 % Relative | NIST High Performance ICP-OES | ICP-OES, ICP-MS |
| Multi Element Standards | 1 to 50 000 µg/mL | +/-0.5 % Relative | ICP-OES Aqueous QD, ICP-MS-Aqueous QD | ICP-OES, ICP-MS |
| Ion Chromatography Standards (Anions and Cations) | | | | |
| Single-Ion Standards | 1 to 10 000 µg/mL | +/- 0.5 % Relative | IC Aqueous QD | IC |
| Multi-Ion Standards | 1 to 10 000 µg/mL | +/- 0.5 % Relative | IC Aqueous QD | IC |
| Petroleum Products – Fuel and Lubricants | | | | |
| 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 |
|--|----------------------|-----------------|----------------------------|--------------------------|
| Certified Reference Materials | | | | |
| Petroleum Products – Fuel and Lubricants (cont) | | | | |
| Lead (Pb) | 0.001 to 5.0 g/gal | +/-1 % Relative | ICP-OES-Aqueous QD, XRF QD | ICP-OES, XRF |
| Moisture (H ₂ O) | 0.1 to 1.0 % | 5 % Relative | ASTM D6304 | Karl Fischer, Titrimetry |
| C6.2 Viscosity | 0 to 1000 cSt | 0.32 % Relative | ASTM D445 | Viscometry |
| Sulfur (S) | 1 to 50 000 µg/g | +/-1 % Relative | ASTM D4294 | XRF |
| Single Element Standards | 1 to 300 000 µg/g | 1 % Relative | ASTM D5185 | ICP-OES, XRF |
| Multi Element Standards | 1 to 50 000 µg/g | 1 % Relative | ASTM D5185 | ICP-OES, XRF |
| Wear Metals in Oils | | | | |
| Single Element Standards | 1 to 300 000 µg/g | 1 % Relative | ASTM D5185 | ICP-OES |
| Multi Element Standards in Petroleum Products | 1 to 50 000 µg/g | +/-1 % Relative | ASTM D5185 | ICP-OES |

| Reference Materials, Quality Control Reference Materials | | | | |
|---|------------------------|-----|------------|-------------------|
| Petroleum Products - Fuels and Lubricants | | | | |
| 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 |
|---|--|--|
| Category A: Chemical Composition | | |
| Ferrous metals: (Solids, Chips, Pins, Powder) <ul style="list-style-type: none"> • Steels • Carbon steels • Low alloy steels • High alloy steels • Cast steels • Specialty steels • Irons • White irons • Cast irons • Ductile irons • Gray iron • Nodular iron | 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"> • Aluminum alloys • Copper base alloys • Cobalt base alloys • Magnesium base alloys • Nickel base alloys • Titanium base alloys • Zinc base alloys • Zirconium base alloys | 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 |
| Category A: Inorganic Certified Reference Materials | | |
| Ores and minerals: <ul style="list-style-type: none"> • Iron ore • Iron ore sinter • Bauxite | 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"> • Ferroalloys • Silico-calcium • Slag • Alumina | 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 |
|---|---|--|
| Category A: Chemical Composition | | |
| Ferrous metals: (Solids, Chips, Pins, Powder) <ul style="list-style-type: none"> • Steels • Carbon steels • Low alloy steels • High alloy steels • Cast steels • Specialty steels • Irons • White irons • Cast irons • Ductile irons • Gray iron • Nodular iron | 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"> • Aluminum alloys • Copper base alloys • Cobalt base alloys • Magnesium base alloys • Nickel base alloys • Titanium base alloys • Zinc base alloys • Zirconium base alloys | Elemental Composition | Measurement by RM producer on a representative subset of samples |
| Special alloys: (Solids, Chips, Pins, Powder) | Elemental Composition | Measurement by RM producer on a representative subset of samples |
| Category A: Inorganic Certified Reference Materials | | |
| Ores and minerals: <ul style="list-style-type: none"> • Iron ore • Iron ore sinter • Bauxite | Elemental Composition | Measurement by RM producer on a representative subset of samples |
| Metal producing materials & byproducts: <ul style="list-style-type: none"> • Ferroalloys • Silico-calcium • Slag • Alumina | 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 30th day of August 2017.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2848.02
Valid to September 30, 2019
Revised on August 30, 2019



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