Reference Material Certificate

122/07

Aluminium Base (Type of Standard)
Al pure (99.95-99.8% Al), Set 120

Certified Values

Element	Mass content [%]	Uncertainty [%]
Silicon (Si)	0.0512	± 0.0030
Iron (Fe)	0.0578	± 0.0025
Copper (Cu)	0.0206	± 0.0009
Manganese (Mn)	0.0197	± 0.0007
Magnesium (Mg)	0.0162	± 0.0010
Chromium (Cr)	0.0196	± 0.0007
Nickel (Ni)	0.0197	± 0.0008
Zinc (Zn)	0.0191	± 0.0009
Titanium (Ti)	0.0191	± 0.0010
Silver (Ag)	0.0203	± 0.0009
Arsenic (As)	0.0066	± 0.0007
Boron (B)	(0.0002)	
Barium (Ba)	0.0031-0.0037	± 0.0004
Beryllium (Be)	0.00045	± 0.00005
Bismuth (Bi)	0.0089	± 0.0005
Calcium (Ca)	0.0003	± 0.0002
Cadmium (Cd)	0.0048	± 0.0003
Cerium (Ce)	0.0121	± 0.0008
Cobalt (Co)	0.0155	± 0.0005
Gallium (Ga)	0.0261	± 0.0010
Mercury (Hg)	0.0076	± 0.0013
Indium (In)	0.0152	± 0.0010
Lanthanum (La)	0.0189	± 0.0009
Lithium (Li)	0.00040-0.00057	± 0.00005
Molybdenum (Mo)	0.0094	± 0.0006
Sodium (Na)	0.0017-0.0029	± 0.0003
Phosphorus (P)	0.0041	± 0.0007
Lead (Pb)	0.0076	± 0.0005
Antimony (Sb)	0.0082	± 0.0005
Scandium (Sc)	0.0021	± 0.0002
Tin (Sn)	0.0099	± 0.0005
Strontium (Sr)	0.0003	± 0.0001
Tantalum (Ta)	<0.0003	
Thallium (Tl)	0.0139	± 0.0008
Vanadium (V)	0.0177	± 0.0006
Tungsten (W)	0.0083	± 0.0008
Zirconium (Zr)	0.0150	± 0.0009

The uncertainty reported is the result of standard deviation of all results multiplied with a factor of two and represents approximately the 95% confidence interval.

Values in brackets ( ) are not certified but given for information only.

This certified reference material has elements with a range. Individually certified values for those elements are available on S-certificates only.

Manufacturing
This standard is produced using six strand hot top vertical continuous casting out of single melt.

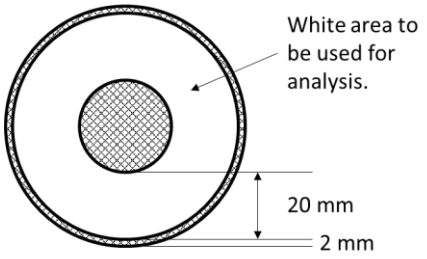
Homogeneity
Homogeneity testing is performed by means of spark emission spectroscopy. Tests involve making multiple measurements on individual samples taken at regular intervals along the entire length of each cast rod. Depending on the mass content of the element, the relative standard deviation of multiple measurements between discs or within one disc is typically found between 0.3% - 1% for alloying and other elements and 0.5% - 5% for trace elements.

Analysis
The values listed in this analysis certificate are the results of multiple analyses performed in our chemical analysis laboratory which is an accredited test facility for aluminium alloys according to the international standard ISO 17025. The analyses are based on established wet chemical procedures.

Description of Sample
This reference material is available in the form of discs (approx. Ø 65 x 25 mm).

Intended use and Stability
This certified reference material is primarily intended for use in spark optical emission spectroscopy. Other applications are X-ray fluorescence spectrometry (XRF) and classical wet chemical procedures. The minimum sample size for wet chemical analysis is 0.2g. The material will remain stable for the period given below (certification validity) if it is stored in a dry and clean environment at room temperature.

Instructions for Use
Calibration measurements should be made within a ring between 2mm and 22mm from the edge of the CRM face. For wet chemical analysis chips have to be prepared by turning or milling of the sample surface.



Traceability
Traceability of the certified mass contents to the SI (Système International d'Unités) is ensured by calibration using certified standard solutions or pure metals or substances of known stoichiometry.

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This certificate is valid until: Jan-2091