Reference Material Certificate

112/01

Aluminium Base (Type of Standard)
Al pure (99.99-99.95% Al), Set 110

Certified Values

Element	Mass content [%]	Uncertainty [%]
Silicon (Si)	0.0010	
Iron (Fe)	0.0005	
Copper (Cu)	0.0002	
Manganese (Mn)	<0.0001	
Magnesium (Mg)	0.0003	
Chromium (Cr)	<0.0001	
Nickel (Ni)	<0.0001	
Zinc (Zn)	<0.0001	
Titanium (Ti)	<0.0001	
Boron (B)	0.0002	
Beryllium (Be)	<0.0001	
Bismuth (Bi)	<0.0001	
Calcium (Ca)	<0.0001	
Cadmium (Cd)	<0.0002	
Cobalt (Co)	<0.0001	
Gallium (Ga)	<0.0001	
Lithium (Li)	<0.00005	
Sodium (Na)	<0.0001	
Phosphorus (P)	<0.0005	
Lead (Pb)	0.0002	
Antimony (Sb)	<0.0001	
Tin (Sn)	<0.0003	
Vanadium (V)	<0.0001	
Zirconium (Zr)	<0.0002	

Manufacturing
This certified reference material for the analysis of aluminum and its alloys is produced using continuous casting out of a single melt.

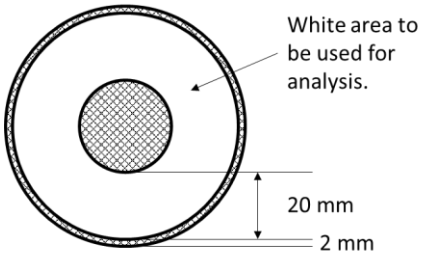
Homogeneity
Homogeneity testing is performed by means of spark emission spectroscopy. Tests involve making multiple measurements on individual samples taken at regular intervals along the entire length of each cast rod. Depending on the mass content of the element, the relative standard deviation of 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. The analyses are based on established wet chemical procedures.

Description of Sample
This reference material is available in the form of discs.

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: Dec-2053