SUISSE TECHNOLOGY PARTNERS

## Reference Material Certificate

# 113/02

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

### Certified Values

| Element | Mass content [%] | Uncertainty [%] |
|---|---|---|
| Silicon (Si) | 0.0012 | ± 0.0002 |
| Iron (Fe) | 0.0040 | ± 0.0004 |
| Copper (Cu) | 0.00020 | ± 0.00005 |
| Manganese (Mn) | <0.0001 | |
| Magnesium (Mg) | 0.0004 | ± 0.0001 |
| Chromium (Cr) | <0.0001 | |
| Nickel (Ni) | <0.0001 | |
| Zinc (Zn) | 0.0002 | ± 0.0001 |
| Titanium (Ti) | <0.0001 | |
| Boron (B) | 0.0100 | ± 0.0005 |
| Beryllium (Be) | <0.0001 | |
| Bismuth (Bi) | 0.0005 | ± 0.0002 |
| Calcium (Ca) | 0.00010 | ± 0.00005 |
| Cadmium (Cd) | <0.0002 | |
| Cobalt (Co) | 0.0005 | ± 0.0002 |
| Gallium (Ga) | <0.0001 | |
| Lithium (Li) | <0.00005 | |
| Sodium (Na) | <0.0001 | |
| Phosphorus (P) | 0.0007 | ± 0.0002 |
| Lead (Pb) | 0.0007 | ± 0.0001 |
| Antimony (Sb) | 0.0007 | ± 0.0002 |
| Tin (Sn) | 0.0005 | ± 0.0002 |
| Vanadium (V) | 0.0006 | ± 0.0001 |
| Zirconium (Zr) | 0.0006 | ± 0.0001 |

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.

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

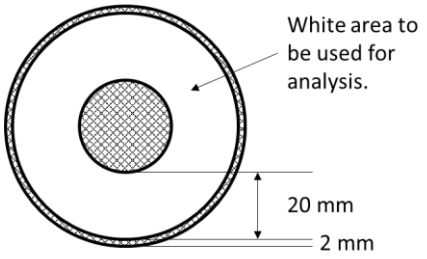
**Homogeneity**
Homogeneity testing is performed by means of spark emission spectroscopy. Tests involve making multiple measurements on individual samples taken at regular intervals along the entire length of each cast rod. Depending on the mass content of the element, the relative standard deviation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

**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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Certificate version 003: 04-Jan-2022
This certificate is valid until: Jul-2070