

**Reference Material Certificate**

**661/02**

Aluminium Base (Type of Standard)  
AlMgSi, Set 660

**Certified Values**

<b>Element</b>	<b>Mass content [%]</b>	<b>Uncertainty [%]</b>
Silicon (Si)	0.619	± 0.020
Iron (Fe)	0.306	± 0.009
Copper (Cu)	0.057	± 0.002
Manganese (Mn)	0.050	± 0.001
Magnesium (Mg)	0.717	± 0.021
Chromium (Cr)	0.052	± 0.002
Nickel (Ni)	0.0032	± 0.0003
Zinc (Zn)	0.113	± 0.004
Titanium (Ti)	0.051	± 0.002
Boron (B)	(0.0001)	
Sodium (Na)	0.0004	± 0.0001
Phosphorus (P)	0.0024	± 0.0003
Lead (Pb)	0.0025	± 0.0003
Vanadium (V)	0.080	± 0.002
Zirconium (Zr)	0.0012	± 0.0002

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.

## 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

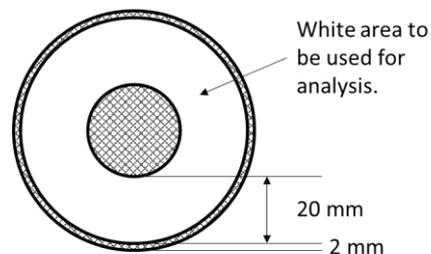
This reference material is available in the form of discs (approx. Ø 60 x 25 mm).

## 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.

Dr. Benedikt Moser  
CTO

Patrik Bachmann  
Head of Inorganic Analytics

Suisse Technology Partners Ltd.  
Querstrasse 5  
8212 Neuhausen am Rheinfall  
Switzerland

Phone: +41 52 551 11 00  
Fax : +41 52 551 11 99  
Email: [refmat@suisse-tp.ch](mailto:refmat@suisse-tp.ch)  
Internet: <https://reference-materials.ch>

Date of certification: 24-Aug-2004  
Certificate version 003: 04-Jan-2022  
This certificate is valid until: Aug-2079