

# Analytical Reference Materials International

## Certificate of Analysis

### Set-Up Standard



Grade: QA 10

Part Number (Q.A. NO.): IARM 220F

Certificate Date: 09/23/2011

Certificate No.: 220F-09232011-SUS-F

#### Interpretation of Data

1. Values listed below reflect analysis results submitted by Rio Tinto Alcan, Centre de recherche et de développement Arvida, Arvida Research and Development Centre using methods and instrumentation that emulate actual methods currently utilized in the analytical community.
2. The chemical compositions are designed to provide drift correction for common alloys. They are not certified with respect to the true composition. This material is tested for superior homogeneity so that reproducibility of spectral response can assure accurate drift correction of calibration curves.

<u>Si</u> (0.0005)	<u>Fe</u> (0.0005)	<u>Cu</u> (0.0004)	<u>Mn</u> (0.0001)	<u>Mg</u> (0.0002)	<u>Cr</u> <0.0001	<u>Ni</u> <0.0001	<u>Zn</u> (0.0002)
<u>Ti</u> <0.0001	<u>Ag</u> ---	<u>As</u> <0.0001	<u>B</u> <0.0001	<u>Ba</u> ---	<u>Be</u> <0.0001	<u>Bi</u> <0.0001	<u>Ca</u> <0.0001
<u>Cd</u> <0.0001	<u>Co</u> <0.0001	<u>Ga</u> <0.0001	<u>Hg</u> <0.0001	<u>In</u> ---	<u>Li</u> <0.0001	<u>Mo</u> <0.0001	<u>Na</u> <0.0001
<u>P</u> (0.0001)	<u>Pb</u> (0.0001)	<u>Sb</u> <0.0001	<u>Sn</u> <0.0001	<u>Sr</u> <0.0001	<u>Tl</u> ---	<u>V</u> <0.0001	<u>Zr</u> <0.0001

("<" less than, "( )" value not certified)

The International Standards Organization (ISO) definitions, expressed in ISO Guide 30-1992 list the following:

**Certifying Body:** Any technically competent body (organization or firm, public or private) that issues a reference material certificate, which provides the information, detailed in ISO Guide 31. The only generally accepted certifying body in the United States for primary standards - Standard Reference Materials (SRM) is the U.S. Department of Commerce, National Institute of Standards & Technology, (NIST), Gaithersburg, MD. All other certifying bodies in the United States produce Reference Materials (RM) or Certified Reference Materials (CRM).

**Drift Samples:** These are aluminum alloy samples with a low concentration of trace elements meant to simulate real production samples. Drift samples are very homogeneous but are not certified. They are used to determine whether the measuring instrument has drifted enough to require standardization.

**Traceability:** The traceability of the certified values is ensured by the comparative use of other internationally recognized certified reference materials produced by NIST, and other suppliers of OES CRMs.

**Methods of Analysis:** Analytical methods used for certification vary from classical wet chemistry to modern instrumental techniques. They include gravimetry, colorimetry, atomic absorption spectroscopy (AAS), inductively coupled plasma (ICP) optical emission spectroscopy, spark emission spectroscopy (OES), spectrochemical comparison, and metallographic techniques. In addition, to certify the Blank and High Purity (HP) standards, the Glow Discharge Mass Spectrometry (GDMS) technique is used. Generally, values below 0.5 ppm are not certified; these values are indicated by L within the certificate. Uncertified values used for alloy identification are indicated by N within the certificate.

**Accreditation Testing:** The Arvida Research and Development Centre analytical laboratory is accredited to ISO/IEC 17025 by the Standards Council of Canada. The laboratory prides itself in maintaining its high standards in performing the methods of analysis referred to above. The original certification date is August 8<sup>th</sup>, 1989.

**Selection of Materials:** The Arvida Research and Development Centre (ARDC) produce standard samples of aluminum and its alloys. These standards are designed for use with direct reading optical emission spectrometers for spark emission analysis. These materials are produced by a direct chill, continuous cast method. The cast billets measure generally 70 mm in diameter and up to 3 m in length. They are subsequently scalped and sliced, producing about 150 to 300 disks per cast. Each finished disk measures 57 mm in diameter by 38 mm thick.

  
William D. Britt, President & General Manager  
Analytical Reference Materials International Corporation

Certificate No.: 220F-09232011-SUS-F  
Certificate Date: 09/23/2011  
Revision Date/No.: 09/23/2011