

# Certificate of Analysis

## Product Description:

Name:	Aluminum	Source Material:	Aluminum Metal
Part Number:	<b>10001-1</b>	Material Purity:	99.999%
Lot Number:	<b>1012345</b>	Matrix:	2% (v/v) HNO <sub>3</sub>

**Certified Value:** 1000 µg/mL ± 3 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3101a (lot number 060502) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor **k** is about 2.

## Uncertified Values:

**Density:** 1.0142 g/mL @ 20.6°C

## Trace Metal Impurity Scan:

The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag < 0.02	Cu < 0.1	Li < 0.02	Rb < 0.02	Th < 0.02
Al M	Dy < 0.02	Lu < 0.02	Re < 0.02	Ti < 0.02
As < 0.05	Er < 0.02	Mg < 0.5	Rh < 0.02	Tl < 0.02
Au < 0.02	Eu < 0.02	Mn < 0.1	Ru < 0.02	Tm < 0.02
B < 1	Fe 2	Mo < 0.02	Sb < 0.02	U < 0.1
Ba < 0.02	Ga < 0.02	Na < 1	Sc < 0.02	V < 0.05
Be < 0.02	Gd < 0.02	Nb < 0.02	Se < 0.1	W < 0.02
Bi < 0.02	Ge < 0.02	Nd < 0.02	Si < 1	Y < 0.02
Ca < 0.1	Hf < 0.02	Ni < 0.02	Sm < 0.02	Yb < 0.02
Cd < 0.02	Ho < 0.02	Os < 0.02	Sn < 1	Zn < 0.1
Ce < 0.02	In < 0.02	Pb < 0.05	Sr < 0.02	Zr < 0.02
Co < 0.05	Ir < 0.02	Pd < 0.02	Ta < 0.02	
Cr < 0.1	K < 1	Pr < 0.02	Tb < 0.02	(na = not analyzed)
Cs na	La < 0.02	Pt < 0.02	Te < 0.02	

## Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

## Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of aluminum, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

## Traceability Information:

Lot No.: **Error! Reference source not found.**

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The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Standard Weight and Analytical Balance Calibration:**

The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.

The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are calibrated weekly by an in-house method using standard weights.

b. **Volumetric Device Calibration:**

The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer Calibration:**

The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are calibrated against the standard thermometers yearly.

d. **Calibration Standards:**

The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

**Packaging and Storage Conditions:**

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

**Refer to Material Safety Datasheet (MSDS) for hazardous information.**

**Expiration Information:**

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

**Preparation Date: November 19, 2010**

**Shipped Date: December 10, 2010**

**Expiration Date: June 10, 2012**

**Certificate Issue Date: November 30, 2010**

**Quality Information:**

**ISO 17025:2005 Accreditation**



**Accreditation # 49337**

**ISO Guide 34 (RMP) Accreditation**

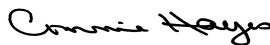


**REFERENCE MATERIAL PRODUCER**

**Certificate Number AR-1436**



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**Connie Hayes,  
Quality Manager**



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