



# Certificate of Analysis

**ULTRAgrade™ Solution**  
**Aluminum ICP Standard**  
**1000 µg/mL**

**Catalog Number:** ICP-013  
**Lot Number:** J00695  
**Job Number:** J00008575  
**Lot Issue Date:** 07/18/2008  
**Expiration Date:** 09/30/2015

**Starting Material:** Aluminum Nitrate Nonahydrate  
**Starting Material Purity:** 99.999%  
**Starting Material Lot No.:** BH00737  
**Matrix:** 2% nitric acid in low TOC water (< 50 ppb)  
**Atomic Weight Al:** 26.98

**Certified Value:** 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

**Classical Wet Assay Method:** Theoretical, based on gravimetric measurements

**Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3101a**

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1 and ISO 9001

## Trace Metallic Impurities in Solution Standard in µg/mL:

|             |           |             |           |   |             |           |             |
|-------------|-----------|-------------|-----------|---|-------------|-----------|-------------|
| <u>s</u> Al |           | <u>*</u> Ga | <0.005    | D | <u>n</u> Nb |           | <u>n</u> S  |
| <u>*</u> Sb | <0.005 ND | <u>n</u> Ge |           |   | <u>n</u> Os |           | <u>n</u> Ta |
| <u>*</u> As | <0.005 ND | <u>n</u> Au |           |   | <u>*</u> Pd | <0.005 ND | <u>n</u> Te |
| <u>*</u> Ba | <0.005 ND | <u>n</u> Hf |           |   | <u>*</u> P  | <0.005 ND | <u>n</u> Tb |
| <u>*</u> Be | <0.005 ND | <u>n</u> Ho |           |   | <u>*</u> Pt | <0.005 ND | <u>n</u> Tl |
| <u>*</u> Bi | <0.005 ND | <u>*</u> In | <0.005 ND |   | <u>*</u> K  | <0.005 ND | <u>n</u> Th |
| <u>*</u> B  | <0.005 ND | <u>n</u> Ir |           |   | <u>n</u> Pr |           | <u>n</u> Tm |
| <u>*</u> Cd | <0.005 ND | <u>*</u> Fe | <0.005 D  |   | <u>n</u> Re |           | <u>*</u> Sn |
| <u>*</u> Ca | <0.005 D  | <u>*</u> La | <0.005 ND |   | <u>n</u> Rh |           | <u>*</u> Ti |
| <u>n</u> Ce |           | <u>*</u> Pb | <0.005 ND |   | <u>n</u> Rb |           | <u>n</u> W  |
| <u>n</u> Cs |           | <u>*</u> Li | <0.005 ND |   | <u>n</u> Ru |           | <u>n</u> U  |
| <u>*</u> Cr | <0.005 D  | <u>n</u> Lu |           |   | <u>n</u> Sm |           | <u>*</u> V  |
| <u>*</u> Co | <0.005 ND | <u>*</u> Mg | <0.005 D  |   | <u>n</u> Sc |           | <u>n</u> Yb |
| <u>*</u> Cu | <0.005 ND | <u>*</u> Mn | <0.005 ND |   | <u>*</u> Se | <0.005 ND | <u>n</u> Y  |
| <u>n</u> Dy |           | <u>*</u> Hg | <0.005 ND |   | <u>*</u> Si | <0.005 ND | <u>*</u> Zn |
| <u>*</u> Er | <0.005 ND | <u>*</u> Mo | <0.005 ND |   | <u>*</u> Ag | <0.005 ND | <u>n</u> Zr |
| <u>*</u> Eu | <0.005 ND | <u>n</u> Nd |           |   | <u>*</u> Na | <0.010 D  |             |
| <u>*</u> Gd | <0.005 ND | <u>*</u> Ni | <0.005 ND |   | <u>*</u> Sr | <0.005 ND |             |

\* - element checked for  
ND - not detected

i - spectral interference  
D - detected

n - not checked for  
s - solution standard element

**Density of Solution** (measured at 22.0°C ± 0.5°C): 1.013 g/mL



ISO 9001 Registered Quality System – TUV USA

  
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