

# Certificate of Analysis

## Aluminum ICP Standard, 1000 ppm Al in 3% HNO<sub>3</sub>

**Lot Number:** 4404F61

**Product Number:** PAL1KN

**Manufacture Date:** APR 05, 2024

**Expiration Date:** SEP 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist. The uncertainty associated with the certified value is ± 0.5% relative, which is the sum of the estimated errors due to the purity of the raw material, the volumetric preparation of the solution, and transpiration of the solution through the container wall.

The final solution concentration is confirmed by AA, ICP, or ICP-MS, and is traceable to NIST Standard Reference Material 3101a. All trace level elements were determined by ICP or ICP-MS.

Name	CAS#	Grade
Water	7732-18-5	
Nitric Acid	7697-37-2	
Aluminum Nitrate Nonahydrate	7784-27-2	

Test	Specification	Result	NIST SRM#
Appearance	Colorless liquid	Passed	
Assay (vs. EDTA/Dithizone)	995-1005 ppm Al	1000 ppm Al	915

### Trace Elements by ICP or ICP - MS

I=Spectral Interference N=Not Tested

All values reported in mg/L (ppm)

Antimony (Sb)	< 0.0001 ppm	Lead (Pb)	< 0.00003 ppm	Strontium (Sr)	< 0.00006 ppm
Arsenic (As)	I	Lithium (Li)	< 0.03 ppm	Sulfur (S)	I
Barium (Ba)	< 0.0001 ppm	Lutetium (Lu)	< 0.0003 ppm	Tantalum (Ta)	0.0594 ppm
Beryllium (Be)	< 0.0001 ppm	Magnesium (Mg)	< 0.0007 ppm	Tellurium (Te)	0.1026 ppm
Bismuth (Bi)	0.0065 ppm	Manganese (Mn)	< 0.00002 ppm	Terbium (Tb)	0.0004 ppm
Boron (B)	< 0.00005 ppm	Mercury (Hg)	< 0.03 ppm	Thallium (Tl)	I
Cadmium (Cd)	< 0.00007 ppm	Molybdenum (Mo)	0.0271 ppm	Thorium (Th)	0.0063 ppm
Calcium (Ca)	I	Neodymium (Nd)	0.0005 ppm	Thulium (Tm)	N
Cerium (Ce)	< 0.00003 ppm	Nickel (Ni)	< 0.0001 ppm	Tin (Sn)	< 0.0002 ppm
Cesium (Cs)	0.0967 ppm	Niobium (Nb)	0.0111 ppm	Titanium (Ti)	I
Chromium (Cr)	I	Osmium (Os)	< 0.003 ppm	Tungsten (W)	I
Cobalt (Co)	< 0.00002 ppm	Palladium (Pd)	0.0042 ppm	Uranium (U)	0.0002 ppm
Copper (Cu)	N	Phosphorus (P)	I	Vanadium (V)	< 0.00004 ppm
Dysprosium (Dy)	0.0001 ppm	Platinum (Pt)	0.0010 ppm	Ytterbium (Yb)	< 0.001 ppm
Erbium (Er)	< 0.00007 ppm	Potassium (K)	< 0.00002 ppm	Yttrium (Y)	0.0007 ppm
Europium (Eu)	< 0.00008 ppm	Praseodymium (Pr)	N	Zinc (Zn)	< 0.0003 ppm
Gadolinium (Gd)	0.0002 ppm	Rhenium (Re)	< 0.00003 ppm	Zirconium (Zr)	< 0.002 ppm
Gallium (Ga)	N	Rhodium (Rh)	< 0.00003 ppm		
Germanium (Ge)	< 0.0003 ppm	Rubidium (Rb)	< 0.00004 ppm		
Gold (Au)	I	Ruthenium (Ru)	0.0003 ppm		
Hafnium (Hf)	0.0108 ppm	Samarium (Sm)	< 0.002 ppm		
Holmium (Ho)	< 0.0001 ppm	Scandium (Sc)	0.0094 ppm		
Indium (In)	< 0.00003 ppm	Selenium (Se)	I		
Iridium (Ir)	< 0.00007 ppm	Silicon (Si)	I		
Iron (Fe)	N	Silver (Ag)	0.0085 ppm		
Lanthanum (La)	N	Sodium (Na)	I		

Specification	Reference
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Aluminum ICP Standard, 1 mL = 1 mg Al (1,000 ppm Al) Al(NO<sub>3</sub>)<sub>3</sub> in 3% HNO<sub>3</sub> EPA (200.7)

This standard is guaranteed to be stable and accurate provided the product is kept tightly capped and stored under normal laboratory conditions. Balances are calibrated using NIST traceable weights whose verification of maintenance and recalibration is documented per in-house Standard Operating Procedures. Class A glassware is also calibrated and routinely rechecked per in-house Standard Operating Procedures. Trace metal analyzed acids and Trace Metals Analyzed Water are used in the manufacture of this product. Triple cleaned containers are used in the manufacture of this product.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
PAL1KN-500	500 mL natural poly	18 months

**Recommended Storage:** 15°C - 30°C (59°F - 86°F)



Paul Brandon (04/05/2024)

Production Manager

This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

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