

# Certificate of Analysis

## Cadmium ICP Standard, 1000 ppm Cd in 3% HNO<sub>3</sub>

**Lot Number:** 4401L66

**Product Number:** PCD1KN

**Manufacture Date:** JAN 16, 2024

**Expiration Date:** JUL 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 3108. All trace level elements were determined by ICP or ICP-MS.

| Name        | CAS#      | Grade |
|-------------|-----------|-------|
| Water       | 7732-18-5 |       |
| Nitric Acid | 7697-37-2 |       |
| Cadmium     | 7440-43-9 |       |

| Test                            | Specification    | Result      | NIST SRM# |
|---------------------------------|------------------|-------------|-----------|
| Appearance                      | Colorless liquid | Passed      |           |
| Assay (vs. EDTA/Xylenol Orange) | 995-1005 ppm Cd  | 1000 ppm Cd | 915       |

### Trace Elements by ICP or ICP - MS

I=Spectral Interference N=Not Tested

All values reported in mg/L (ppm)

|                 |               |                   |               |                |               |
|-----------------|---------------|-------------------|---------------|----------------|---------------|
| Aluminum (Al)   | < 0.0009 ppm  | Lead (Pb)         | 0.7452 ppm    | Strontium (Sr) | 0.0078 ppm    |
| Antimony (Sb)   | 0.2051 ppm    | Lithium (Li)      | 0.0095 ppm    | Sulfur (S)     | I             |
| Arsenic (As)    | 0.0505 ppm    | Lutetium (Lu)     | < 0.0003 ppm  | Tantalum (Ta)  | 0.0197 ppm    |
| Barium (Ba)     | 0.0131 ppm    | Magnesium (Mg)    | < 0.0007 ppm  | Tellurium (Te) | I             |
| Beryllium (Be)  | 0.0589 ppm    | Manganese (Mn)    | 0.0079 ppm    | Terbium (Tb)   | 0.0002 ppm    |
| Bismuth (Bi)    | 0.0245 ppm    | Mercury (Hg)      | < 0.03 ppm    | Thallium (Tl)  | I             |
| Boron (B)       | I             | Molybdenum (Mo)   | 0.0363 ppm    | Thorium (Th)   | 0.0078 ppm    |
| Calcium (Ca)    | N             | Neodymium (Nd)    | 0.0004 ppm    | Thulium (Tm)   | 0.0002 ppm    |
| Cerium (Ce)     | < 0.00003 ppm | Nickel (Ni)       | < 0.0001 ppm  | Tin (Sn)       | 0.0047 ppm    |
| Cesium (Cs)     | 0.0115 ppm    | Niobium (Nb)      | 0.0050 ppm    | Titanium (Ti)  | < 0.001 ppm   |
| Chromium (Cr)   | < 0.00006 ppm | Osmium (Os)       | 0.0023 ppm    | Tungsten (W)   | 0.0847 ppm    |
| Cobalt (Co)     | < 0.00002 ppm | Palladium (Pd)    | < 0.0004 ppm  | Uranium (U)    | 0.0019 ppm    |
| Copper (Cu)     | < 0.00005 ppm | Phosphorus (P)    | I             | Vanadium (V)   | < 0.00004 ppm |
| Dysprosium (Dy) | 0.0002 ppm    | Platinum (Pt)     | 0.0049 ppm    | Ytterbium (Yb) | < 0.001 ppm   |
| Erbium (Er)     | 0.0003 ppm    | Potassium (K)     | I             | Yttrium (Y)    | 0.0035 ppm    |
| Europium (Eu)   | 0.0008 ppm    | Praseodymium (Pr) | 0.0002 ppm    | Zinc (Zn)      | < 0.0003 ppm  |
| Gadolinium (Gd) | 0.0004 ppm    | Rhenium (Re)      | < 0.00003 ppm | Zirconium (Zr) | 0.4703 ppm    |
| Gallium (Ga)    | 0.0042 ppm    | Rhodium (Rh)      | < 0.00003 ppm |                |               |
| Germanium (Ge)  | 0.0118 ppm    | Rubidium (Rb)     | < 0.00004 ppm |                |               |
| Gold (Au)       | I             | Ruthenium (Ru)    | < 0.00007 ppm |                |               |
| Hafnium (Hf)    | 0.0061 ppm    | Samarium (Sm)     | < 0.002 ppm   |                |               |
| Holmium (Ho)    | 0.0002 ppm    | Scandium (Sc)     | 0.0078 ppm    |                |               |
| Indium (In)     | I             | Selenium (Se)     | 0.0709 ppm    |                |               |
| Iridium (Ir)    | 0.0011 ppm    | Silicon (Si)      | I             |                |               |
| Iron (Fe)       | 0.1280 ppm    | Silver (Ag)       | 0.0572 ppm    |                |               |
| Lanthanum (La)  | 0.0017 ppm    | Sodium (Na)       | < 0.02 ppm    |                |               |

| Specification | Reference |
|---------------|-----------|
|---------------|-----------|

Cadmium ICP Standard, 1 mL = 1 mg Cd (1,000 ppm Cd) Cd in 3% HNO<sub>3</sub>      EPA (200.7)

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 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) |
|-------------|---------------------|---------------------------------|
| PCD1KN-100  | 100 mL natural LDPE | 18 months                       |

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



Paul Brandon (01/16/2024)

Production Manager

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

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