

Certificate of Analysis

| Test | Specification | Result |
|------------------------------------|---------------|-------------|
| Appearance | Passes Test | Passes Test |
| Assay (as NH ₃) | 28.0 – 30.0 % | 29.1 % |
| Color (APHA) | ≤ 7 | 5 |
| Insoluble Matter | ≤ 1 ppm | < 1 ppm |
| Residue after Ignition | ≤ 3 ppm | < 3 ppm |
| Carbon Dioxide (CO ₂) | ≤ 10 ppm | < 10 ppm |
| Pyridine | Passes Test | Passes Test |
| Substances Reducing Permanganate | Passes Test | Passes Test |
| Chloride (Cl) | ≤ 0.3 ppm | < 0.2 ppm |
| Phosphate (PO ₄) | ≤ 0.20 ppm | < 0.05 ppm |
| Total Sulfur (as SO ₄) | ≤ 0.8 ppm | < 0.2 ppm |
| Trace Impurities – Aluminum (Al) | ≤ 10.0 ppb | < 5.0 ppb |
| Trace Impurities – Arsenic (As) | ≤ 50.0 ppb | < 2.0 ppb |
| Arsenic and Antimony (as As) | ≤ 30.0 ppb | < 5.0 ppb |
| Trace Impurities – Barium (Ba) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Beryllium (Be) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Bismuth (Bi) | ≤ 20.0 ppb | < 10.0 ppb |
| Trace Impurities – Boron (B) | ≤ 10.0 ppb | < 5.0 ppb |
| Trace Impurities – Cadmium (Cd) | ≤ 5.0 ppb | < 1.0 ppb |
| Trace Impurities – Calcium (Ca) | ≤ 100.0 ppb | 5.0 ppb |
| Trace Impurities – Chromium (Cr) | ≤ 5.0 ppb | < 1.0 ppb |
| Trace Impurities – Cobalt (Co) | ≤ 1.0 ppb | < 1.0 ppb |
| Trace Impurities – Copper (Cu) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Gallium (Ga) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Germanium (Ge) | ≤ 50.0 ppb | < 10.0 ppb |
| Trace Impurities – Gold (Au) | ≤ 10.0 ppb | < 5.0 ppb |
| Heavy Metals (as Pb) | ≤ 200.0 ppb | < 100.0 ppb |
| Trace Impurities – Iron (Fe) | ≤ 10.0 ppb | < 1.0 ppb |

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|-------------------------------------|---------------|------------|
| Trace Impurities – Lead (Pb) | ≤ 10.0 ppb | < 10.0 ppb |
| Trace Impurities – Lithium (Li) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Magnesium (Mg) | ≤ 50.0 ppb | < 1.0 ppb |
| Trace Impurities – Manganese (Mn) | ≤ 5.0 ppb | < 1.0 ppb |
| Trace Impurities – Molybdenum (Mo) | ≤ 10.0 ppb | < 5.0 ppb |
| Trace Impurities – Nickel (Ni) | ≤ 5.0 ppb | < 5.0 ppb |
| Trace Impurities – Niobium (Nb) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Potassium (K) | ≤ 100 ppb | < 10 ppb |
| Trace Impurities – Silicon (Si) | ≤ 150.0 ppb | < 10.0 ppb |
| Trace Impurities – Silver (Ag) | ≤ 5.0 ppb | < 1.0 ppb |
| Trace Impurities – Sodium (Na) | ≤ 100.0 ppb | 41.0 ppb |
| Trace Impurities – Strontium (Sr) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Tantalum (Ta) | ≤ 10.0 ppb | < 5.0 ppb |
| Trace Impurities – Thallium (Tl) | ≤ 20.0 ppb | < 5.0 ppb |
| Trace Impurities – Tin (Sn) | ≤ 20.0 ppb | < 10.0 ppb |
| Trace Impurities – Titanium (Ti) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Vanadium (V) | ≤ 10.0 ppb | < 1.0 ppb |
| Trace Impurities – Zinc (Zn) | ≤ 5.0 ppb | < 1.0 ppb |
| Trace Impurities – Zirconium (Zr) | ≤ 10.0 ppb | < 1.0 ppb |
| Particle Count – 0.5 µm and greater | ≤ 80 par/ml | 28 par/ml |
| Particle Count – 1.0 µm and greater | ≤ 10 par/ml | 8 par/ml |

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Ammonium Hydroxide 29%
CMOS



Material No.: 9731-03
Batch No.: 22H1962011

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|------|---------------|--------|
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC

Jamie Ethier
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700
Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone 610.386.1700