

## Certificate of Analysis

Test	Specification	Result
Appearance	Passes Test	Passes Test
Assay (as NH <sub>3</sub> )	28.0 - 30.0 %	29.5 %
Color (APHA)	<= 7	<5
Insoluble Matter	<= 1 ppm	<1 ppm
Residue after Ignition	<= 3 ppm	<3 ppm
Carbon Dioxide (CO <sub>2</sub> )	<= 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 <sub>4</sub> )	<= 0.20 ppm	<0.05 ppm
Total Sulfur (as SO <sub>4</sub> )	<= 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 & 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	3.0 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	3.0 ppb

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

Test	Specification	Result
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	<5.0 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	10 par/ml
Particle Count – 1.0 µm and greater	<= 10 par/ml	8 par/ml

For Microelectronic Use

Country of Origin: United States  
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak  
Director Quality Operations, Bioscience Production

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