



Material No.: 5367-03 Batch No.: 2211262002 Manufactured Date: 2022-06-28 Retest Date: 2027-06-27 Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (as HCl) (by acid-base titrn)	37.0 - 38.0 %	37.4 %
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 3 ppm	< 1 ppm
Extractable Organic Substances	≤ 3 ppm	< 1 ppm
Bromide (Br)	≤ 0.005 %	< 0.005 %
Free Halogen (as Cl2)	Passes Test	Passes Test
Ammonium (NH4)	≤ 1 ppm	< 1 ppm
Phosphate (PO4)	≤ 0.05 ppm	< 0.03 ppm
Sulfate (SO4)	≤ 0.3 ppm	< 0.3 ppm
Sulfite (SO₃)	≤ 0.8 ppm	0.3 ppm
Trace Impurities - Aluminum (Al)	≤ 100.0 ppb	< 5.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities – Barium (Ba)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	\leq 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 20.0 ppb	1.6 ppb
Trace Impurities - Cadmium (Cd)	≤ 5.0 ppb	< 1.0 ppb
Trace Impurities - Calcium (Ca)	≤ 100.0 ppb	27.4 ppb
Trace Impurities – Chromium (Cr)	≤ 50 ppb	< 1 ppb
Trace Impurities - Cobalt (Co)	≤ 5.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 5.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	\leq 20.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 50.0 ppb	14.5 ppb
Trace Impurities – Lead (Pb)	≤ 25.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 50.0 ppb	< 1.0 ppb

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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





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Test	Specification	Result
Trace Impurities – Magnesium (Mg)	≤ 50.0 ppb	2.9 ppb
Trace Impurities – Manganese (Mn)	\leq 5.0 ppb	< 1.0 ppb
Trace Impurities – Molybdenum (Mo)	\leq 10.0 ppb	< 3.0 ppb
Trace Impurities – Nickel (Ni)	\leq 10.0 ppb	< 5.0 ppb
Trace Impurities – Niobium (Nb)	\leq 10.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	\leq 100 ppb	< 10 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	4.1 ppb
Trace Impurities – Strontium (Sr)	\leq 20.0 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)	\leq 50 ppb	< 10 ppb
Trace Impurities – Titanium (Ti)	\leq 10.0 ppb	< 1.0 ppb
Trace Impurities – Vanadium (V)	\leq 10.0 ppb	< 1.0 ppb
Trace Impurities – Zinc (Zn)	\leq 50 ppb	4 ppb
Trace Impurities – Zirconium (Zr)	\leq 10.0 ppb	< 1.0 ppb
Particle Count - 0.5 µm and greater	\leq 50 par/ml	5 par/ml
Particle Count – 1.0 µm and greater	\leq 10 par/ml	1 par/ml

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specification Result

For Microelectronic Use

Reported value is the average of all samples counted for this lot number, with no individual sample value exceeding the specification. Storage Condition: Store below 25 °C.

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

James Techie

Jamie Ethier Vice President Global Quality

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