

## Certificate of Analysis

Test	Specification	Result
Appearance	Passes Test	Passes Test
Assay (as NH <sub>3</sub> )	28.0 – 30.0 %	28.8 %
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 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	6.0 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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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	21 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	4 par/ml

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Ammonium Hydroxide 29%  
CMOS



Material No.: 9731-03  
Batch No.: 22F2162004

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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  
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