

Ammonium Hydroxide 29%  
CMOS



Material No.: 9731-03  
Batch No.: 0000059223  
Manufactured Date: 2013/08/13  
Retest Date: 2018/08/12


## Certificate of Analysis

Test	Specification	Result
Appearance	Passes Test	PT
Assay (as NH <sub>3</sub> )	28.0 – 30.0 %	29.6
Color (APHA)	<= 7	< 5
Insoluble Matter	<= 1 ppm	< 1
Residue after Ignition	<= 3 ppm	< 3
Carbon Dioxide (CO <sub>2</sub> )	<= 10 ppm	< 10
Pyridine	Passes Test	PT
Substances Reducing Permanganate	Passes Test	PT
Chloride (Cl)	<= 0.3 ppm	< 0.2
Phosphate (PO <sub>4</sub> )	<= 0.2 ppm	< 0.1
Total Sulfur (as SO <sub>4</sub> )	<= 0.8 ppm	< 0.2
Trace Impurities – Aluminum (Al)	<= 10.0 ppb	< 0.2
Trace Impurities – Arsenic (As)	<= 50.0 ppb	< 2.0
Arsenic and Antimony (as As)	<= 30 ppb	< 5
Trace Impurities – Barium (Ba)	<= 10.0 ppb	< 0.2
Trace Impurities – Beryllium (Be)	<= 10.0 ppb	< 0.2
Trace Impurities – Bismuth (Bi)	<= 20.0 ppb	< 1.0
Trace Impurities – Boron (B)	<= 10.0 ppb	< 0.7
Trace Impurities – Cadmium (Cd)	<= 5.0 ppb	< 0.3
Trace Impurities – Calcium (Ca)	<= 100.0 ppb	3.0
Trace Impurities – Chromium (Cr)	<= 5.0 ppb	< 0.4
Trace Impurities – Cobalt (Co)	<= 1.0 ppb	< 0.3
Trace Impurities – Copper (Cu)	<= 10.0 ppb	< 0.1
Trace Impurities – Gallium (Ga)	<= 10.0 ppb	< 0.2

Test	Specification	Result
Trace Impurities – Germanium (Ge)	<= 50.0 ppb	< 2.0
Trace Impurities – Gold (Au)	<= 10.0 ppb	< 0.2
Heavy Metals (as Pb)	<= 200 ppb	< 100
Trace Impurities – Iron (Fe)	<= 10.0 ppb	< 0.4
Trace Impurities – Lead (Pb)	<= 10.0 ppb	< 1.0
Trace Impurities – Lithium (Li)	<= 10.0 ppb	< 0.2
Trace Impurities – Magnesium (Mg)	<= 50.0 ppb	0.3
Trace Impurities – Manganese (Mn)	<= 5.0 ppb	< 0.4
Trace Impurities – Molybdenum (Mo)	<= 10.0 ppb	< 3.0
Trace Impurities – Nickel (Ni)	<= 5.0 ppb	0.3
Trace Impurities – Niobium (Nb)	<= 10.0 ppb	< 0.2
Trace Impurities – Potassium (K)	<= 100.0 ppb	< 2.0
Trace Impurities – Silicon (Si)	<= 150.0 ppb	< 0.4
Trace Impurities – Silver (Ag)	<= 5.0 ppb	< 0.3
Trace Impurities – Sodium (Na)	<= 100.0 ppb	4.0
Trace Impurities – Strontium (Sr)	<= 10.0 ppb	< 0.2
Trace Impurities – Tantalum (Ta)	<= 10.0 ppb	< 0.9
Trace Impurities – Thallium (Tl)	<= 20.0 ppb	< 2.0
Trace Impurities – Tin (Sn)	<= 20.0 ppb	< 0.8
Trace Impurities – Titanium (Ti)	<= 10.0 ppb	< 0.2
Trace Impurities – Vanadium (V)	<= 10.0 ppb	< 0.2
Trace Impurities – Zinc (Zn)	<= 5.0 ppb	< 0.3
Trace Impurities – Zirconium (Zr)	<= 10.0 ppb	< 0.1
Particle Count – 0.5 µm and greater	<= 80 par/ml	72
Particle Count – 1.0 µm and greater	<= 10 par/ml	10

For Microelectronic Use

Country of Origin: US  
 Packaging Site: Paris Mfg Ctr & DC



Phillipsburg, NJ 9001:2008, 14001:2004  
 Paris, KY 9001:2008  
 Mexico City, Mexico 9001:2008  
 Deventer, The Netherlands 9001:2008, 14001:2004, 13485:2003  
 Gliwice, Poland 9001:2008, 17025:2005  
 Selangor, Malaysia 9001:2008  
 Dehradun, India, 9001:2008, 14001:2004, 13485:2003  
 Mumbai, India, 9001:2008, 17025:2005  
 Panoli, India 9001:2008



Richard M Siberski  
 Global Director of Quality Assurance

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.573.2600  
 Avantor™ Performance Materials Inc.  
 3477 Corporate Parkway, Suite #200, Center Valley, PA 18034. U.S.A. Phone: 610.573.2600 . Fax: 610.573.2610