Hydrogen Peroxide, 30% CMOS (Stabilized)





Material No.: 2190-23 Batch No.: 0000058320 Manufactured Date: 2013/09/06 Expiration Date: 2015/03/07

Certificate of Analysis

Test	Specification	Result
Assay (H2O2)	30.0 - 32.0 %	31.6
Color (APHA)	<= 10	5
Free Acid (µeq/g)	<= 0.2	< 0.2
Residue after Evaporation	<= 10 ppm	2
Ammonium (NH4)	<= 3 ppm	< 3
Chloride (Cl)	<= 0.2 ppm	< 0.2
Nitrate (NO3)	<= 2 ppm	< 2
Phosphate (PO4)	<= 1 ppm	1
Sulfate (SO4)	<= 3 ppm	< 3
Trace Impurities – Aluminum (Al)	<= 70.0 ppb	6.8
Arsenic and Antimony (as As)	<= 10 ppb	< 10
Trace Impurities – Barium (Ba)	<= 20.0 ppb	< 1.0
Trace Impurities – Beryllium (Be)	<= 10.0 ppb	< 1.0
Trace Impurities – Bismuth (Bi)	<= 20.0 ppb	< 10.0
Trace Impurities – Boron (B)	<= 10.0 ppb	< 5.0
Trace Impurities – Cadmium (Cd)	<= 10.0 ppb	< 1.0
Trace Impurities – Calcium (Ca)	<= 50.0 ppb	< 1.0
Trace Impurities – Chromium (Cr)	<= 20.0 ppb	2.5
Trace Impurities – Cobalt (Co)	<= 10.0 ppb	< 1.0
Trace Impurities – Copper (Cu)	<= 10.0 ppb	< 1.0
Trace Impurities – Gallium (Ga)	<= 20.0 ppb	< 1.0
Trace Impurities – Germanium (Ge)	<= 10.0 ppb	< 10.0
Trace Impurities – Gold (Au)	<= 10.0 ppb	< 5.0
Heavy Metals (as Pb)	<= 500 ppb	< 250

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

Test	Specification	Result
Frace Impurities – Iron (Fe)	<= 50.0 ppb	1.9
Frace Impurities – Lead (Pb)	<= 10.0 ppb	< 10.0
Frace Impurities – Lithium (Li)	<= 10.0 ppb	< 1.0
Frace Impurities – Magnesium (Mg)	<= 10.0 ppb	< 1.0
Frace Impurities – Manganese (Mn)	<= 10.0 ppb	< 1.0
Frace Impurities – Molybdenum (Mo)	<= 10.0 ppb	< 5.0
Frace Impurities – Nickel (Ni)	<= 10.0 ppb	< 5.0
Frace Impurities – Niobium (Nb)	<= 10.0 ppb	< 1.0
Frace Impurities – Potassium (K)	<= 600.0 ppb	228.4
Frace Impurities – Silicon (Si)	<= 100.0 ppb	< 10.0
Frace Impurities – Silver (Ag)	<= 10.0 ppb	< 1.0
Frace Impurities – Sodium (Na)	<= 100.0 ppb	2.1
Frace Impurities – Strontium (Sr)	<= 10.0 ppb	< 1.0
Frace Impurities – Tantalum (Ta)	<= 10.0 ppb	< 5.0
Frace Impurities – Thallium (Tl)	<= 50.0 ppb	< 5.0
Frace Impurities – Tin (Sn)	190.0 – 500.0 ppb	253.9
Frace Impurities – Titanium (Ti)	<= 10.0 ppb	< 1.0
Frace Impurities – Vanadium (V)	<= 10.0 ppb	< 1.0
Frace Impurities – Zinc (Zn)	<= 50.0 ppb	< 1.0
Frace Impurities – Zirconium (Zr)	<= 10.0 ppb	< 1.0
Particle Count – 0.5 μm and greater	<= 100 par/ml	36
Particle Count – 1.0 μm and greater	<= 10 par/ml	6

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

Nel M Sal

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