



Material No.: 1178-03
Batch No.: 0000183623
Manufactured Date: 2017/09/20
Retest Date: 2022/09/19

Certificate of Analysis

Test	Specification	Result
Ammonium Fluoride (NH ₄ F)(w/w)	33.5 - 35.5 %	35.0
Hydrofluoric Acid (HF)(w/w)	7.0 - 7.3 %	7.2
Residue after Ignition	<= 10 ppm	< 1
Chloride (Cl)	<= 3000 ppb	< 1500
Nitrate (NO ₃)	<= 3000 ppb	< 3000
Phosphate (PO ₄)	<= 700 ppb	< 700
Sulfate (SO ₄)	<= 1500 ppb	< 1000
Trace Impurities - Aluminum (Al)	<= 50.0 ppb	< 2.0
Arsenic and Antimony (as As)	<= 30 ppb	< 30
Trace Impurities - Barium (Ba)	<= 10.0 ppb	< 2.0
Trace Impurities - Beryllium (Be)	<= 10.0 ppb	< 1.0
Trace Impurities - Bismuth (Bi)	<= 20.0 ppb	< 4.0
Trace Impurities - Boron (B)	<= 50.0 ppb	< 7.0
Trace Impurities - Cadmium (Cd)	<= 20.0 ppb	< 3.0
Trace Impurities - Calcium (Ca)	<= 100.0 ppb	2.8
Trace Impurities - Chromium (Cr)	<= 10.0 ppb	< 4.0
Trace Impurities - Cobalt (Co)	<= 10.0 ppb	< 3.0
Trace Impurities - Copper (Cu)	<= 10.0 ppb	< 1.0
Trace Impurities - Gallium (Ga)	<= 10.0 ppb	< 2.0
Trace Impurities - Germanium (Ge)	<= 40.0 ppb	< 25.0
Trace Impurities - Gold (Au)	<= 20.0 ppb	< 2.0
Heavy Metals (as Pb)	<= 1000 ppb	< 500
Trace Impurities - Iron (Fe)	<= 50.0 ppb	< 4.0
Trace Impurities - Lead (Pb)	<= 10.0 ppb	< 6.0

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.573.2600
Avantor Performance Materials, LLC.

3477 Corporate Parkway, Center Valley, PA 18034. U.S.A. Phone: 610.573.2600 . Fax: 610.573.2610

Test	Specification	Result
Trace Impurities – Lithium (Li)	<= 10.0 ppb	< 2.0
Trace Impurities – Magnesium (Mg)	<= 50.0 ppb	3.5
Trace Impurities – Manganese (Mn)	<= 10.0 ppb	< 4.0
Trace Impurities – Molybdenum (Mo)	<= 10.0 ppb	< 2.0
Trace Impurities – Nickel (Ni)	<= 10.0 ppb	< 3.0
Trace Impurities – Potassium (K)	<= 50.0 ppb	< 20.0
Trace Impurities – Silver (Ag)	<= 50.0 ppb	< 3.0
Trace Impurities – Sodium (Na)	<= 100.0 ppb	< 5.0
Trace Impurities – Strontium (Sr)	<= 10.0 ppb	< 2.0
Trace Impurities – Thallium (Tl)	<= 20.0 ppb	< 16.0
Trace Impurities – Tin (Sn)	<= 20.0 ppb	< 8.0
Trace Impurities – Titanium (Ti)	<= 100.0 ppb	< 2.0
Trace Impurities – Zinc (Zn)	<= 100.0 ppb	< 4.0
Particle Count – 0.5 µm and greater	<= 150 par/ml	8
Particle Count – 1.0 µm and greater	<= 8 par/ml	3

For Microelectronic Use

For additional information, go to www.askavantor.com. Search keywords "freezing" and product name.

Storage Conditions: Ship and store material above 60°F (16°C)

Country of Origin: US

Packaging Site: Paris Mfg Ctr & DC



Phillipsburg, NJ 9001:2008, 14001:2004, FSSC 22000
Paris, KY 9001:2008
Mexico City, Mexico 9001:2008
Deventer, The Netherlands 9001:2008, 14001:2004, 13485:2003
Gliwice, Poland 9001:2008, 13485:2012
Selangor, Malaysia 9001:2008
Dehradun, India, 9001:2008, 14001:2004, 13485:2003
Mumbai, India, 9001:2008
Panoli, India 9001:2008


Jamie Ethier
Vice President Global Quality

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