

### Certificate of Analysis

**Product: Isopropyl Alcohol 99%**

**Item Number: IPAS99**

**Grade: Semiconductor**

**Lot Number: 122122**

**Manufacture Date: 12/21/2022**

**Expiration Date: 12/20/2024**

**Country of Origin: United States**

Tested Property	Specification	Analysis
Assay (CH <sub>3</sub> CHOH CH <sub>3</sub> )	99.5% min	99.98
Color (APHA)	10 Max.	5
Acidity	0.2 ueg/g	<0.2 meq/g
Alkalinity	0.1 ueg/g	<0.1 meq/g
Water (H <sub>2</sub> O)	0.05%	<0.02%
Residue after Evaporation	5 ppm	<1 ppm
Solubility in water	To pass test	Pass
Chloride (Cl)	0.2 ppm	<0.1 ppm
Phosphate (PO <sub>4</sub> )	0.5 ppm	<0.1 ppm
Heavy Metals (as Pb)	0.2 ppm	<0.1 ppm
Arsenic & Antimony (as As)	0.01 ppm	<0.001 ppm
Aluminium (Al)	1 ppm	<0.5 ppm
Barium (Ba)	1 ppm	<0.5 ppm
Boron (B)	0.01 ppm	<0.01 ppm
Cadmium (Ca)	1 ppm	<0.5 ppm
Calcium (Ca)	1 ppm	<0.5 ppm
Chromium (Cr)	0.5 ppm	<0.5 ppm
Cobalt (Co)	0.1 ppm	<0.1 ppm
Copper (Cu)	0.1 ppm.	<0.1 ppm
Gallium (Ga)	0.5 ppm	<0.5 ppm

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Germanium (Ge)	1 ppm	<0.5 ppm
Gold (Au)	0.5 ppm	<0.5 ppm
Iron (Fe)	0.1 ppm	<0.1 ppm
Magnesium (Mg)	1 ppm	<0.5 ppm
Manganese (Mn)	1 ppm	<0.5 ppm
Nickel (Ni)	0.1 ppm	<0.1 ppm
Potassium (K)	1 ppm	<0.5 ppm
Silicon (Si)	1 ppm	<0.5 ppm
Silver (Ag)	0.5 ppm	<0.1 ppm
Sodium (Na)	1 ppm	<1 ppm
Strontium (Sr)	1 ppm	<1 ppm
Tin (Sn)	1 ppm	<1 ppm
Zinc (Zn)	1 ppm	<1 ppm

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