PRODUCT SPECIFICATIONS SHEET

Product Name	Isopropyl Alcohol 99% World/GMP, WORLD GRADE ®
Grade	ACS/USP/FCC/EP/BP/JP Grade
Catalog #	231WORLD

TEST	MONO-GRAPH	SPECIFICATION	TYPICAL RESULT	UNITS
Ag (Silver)	USP<232>	Lot Analysis	0.00	ppm
As (Arsenic)	USP<232>	Lot Analysis	0.00	ppm
Au (Gold)	USP<232>	Lot Analysis	0.00	ppm
Ba (Barium)	USP<232>	Lot Analysis	0.00	ppm
Cd (Cadmium)	USP<232>	Lot Analysis	0.00	ppm
Co (Cobalt)	USP<232>	Lot Analysis	0.00	ppm
Cr (Chromium)	USP<232>	Lot Analysis	0.00	ppm
Cu (Copper)	USP<232>	Lot Analysis	0.00	ppm
Hg (Mercury)	USP<232>	Lot Analysis	0.00	ppm
Ir (Iridium)	USP<232>	Lot Analysis	0.00	ppm
Li (Lithium)	USP<232>	Lot Analysis	0.00	ppm
Mo (Molybdenum)	USP<232>	Lot Analysis	0.00	ppm
Ni (Nickel)	USP<232>	Lot Analysis	0.00	ppm
Os (Osmium)	USP<232>	Lot Analysis	0.00	ppm
Pb (Lead)	USP<232>	Lot Analysis	0.00	ppm
Pd (Palladium)	USP<232>	Lot Analysis	0.00	ppm
Pt (Platinum)	USP<232>	Lot Analysis	0.00	ppm
Rh (Rhodium)	USP<232>	Lot Analysis	0.00	ppm
Ru (Ruthenium)	USP<232>	Lot Analysis	0.00	ppm
Sb (Antimony)	USP<232>	Lot Analysis	0.00	ppm

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Se (Selenium)	USP<232>	Lot Analysis	0.00	ppm
Sn (Tin)	USP<232>	Lot Analysis	0.00	ppm
Tl (Thallium)	USP<232>	Lot Analysis	0.00	ppm
V (Vanadium)	USP<232>	Lot Analysis	0.00	ppm
Carbonyl Compounds - Acetone	ACS	0.002% max	0.000	%
Assay (corrected for water)	ACS	99.5% min	99.94	%
Color, APHA	ACS	10 max	1	N/A
Carbonyl Compounds - Propionaldehyde	ACS	0.002% max	LT 0.002%	N/A
Residue after Evaporation	ACS	0.001% max	0.000	%
Solubility in water	ACS	To Pass Test	Pass	N/A
Titrable Acid or Base	ACS	0.0001 meq/g	0.0001	meq/g
Water, wt%	ACS	NMT 0.2%	0.04	%
Absorbance @230nm	EP/BP	0.30 max.	0.09	N/A
Absorbance @250nm	EP/BP	0.10 max.	0.02	N/A
Absorbance @270nm	EP/BP	0.03 max.	0.00	N/A
Absorbance @290nm	EP/BP	0.02 max.	0.00	N/A
Absorbance @310nm	EP/BP	0.01 max.	0.00	N/A
Absorbance	EP/BP	The spectrum shows a steadily descending curve with no observable peaks or shoulders	Pass	N/A
Acidity or Alkalinity	EP/BP	To Pass Test	Pass	N/A
Appearance	EP/BP	The solution is clear and colourless	Pass	N/A
Benzene and related substances - Benzene (by GC)	EP/BP	NMT 2 ppm	0	ppm

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Characters / Solubility	EP/BP	Appearance: clear, colourless liquid. Solubility: miscible with water and with ethanol (96 per cent).	Pass	N/A
Identification A - Relative Density	EP/BP	0.785 - 0.789 g/ml @ 20°C	0.785	N/A
Identification B - Refractive Index @ 20oC	EP/BP	1.376-1.379	1.377	N/A
Identification C - Infrared Absorption	EP/BP	Compares to standard	Pass	N/A
Identification D	EP/BP	The entire sulfuric acid layer turns violet	Pass	N/A
Nonvolatile Substances	EP/BP	NMT 20ppm	0	ppm
Peroxides Test	EP/BP	No color develops	Pass	N/A
Benzene and related substances - Total of Impurities	EP/BP	NMT 0.3%	0.1	%
Water, wt%	EP/BP	NMT 0.5%	0.04	%
Acidity (as Acetic Acid)	FCC	NMT 10 mg/kg	LT 10 mg/kg	N/A
Assay	FCC	NLT 99.5% OF C_3H_8O	99.98	%
Distillation Range	FCC	Within a range of 1°, including 82.3°	Pass	N/A
Identification A - Refractive Index	FCC	1.377 - 1.380 @ 20°	1.377	N/A
Identification B – Infrared Spectroscopy	FCC	The spectrum of the sample exhibits relative maxima at the same wavelengths as those of the reference spectrum	Pass	N/A
Inorganic Impurities - Lead	FCC	NMT 1 mg/kg	LT 1 mg/kg	N/A
Nonvolatile Residue	FCC	NMT 10 mg/kg	0	mg/kg
Specific Gravity	FCC	NMT 0.7840 @ 25°/25°	0.7832	N/A
Solubility in water	FCC	After 1 h, the solution is as clear as an equal volume of water.	Pass	N/A

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TEST	MONO-GRAPH	SPECIFICATION	TYPICAL RESULT	UNITS
Substances Reducing Permanganate	FCC	The pink color is not entirely discharged	Pass	N/A
Volatile Impurities – Methanol	FCC	NMT 200 µL/L	LT 200 µL/L	N/A
Volatile Impurities – Any single specified impurity	FCC	NMT 1000 µL/L	LT 1000 µL/L	N/A
Volatile Impurities – Any other single unspecified impurity	FCC	NMT 1000 µL/L (calculated as ethyl acetate)	LT 1000 µL/L	N/A
Volatile Impurities - Sum of all impurities	FCC	NMT 5000 µL/L	LT 1000 µL/L	N/A
Water	FCC	NMT 0.2%	0.04	%
Appearance	JP	Clear, colorless liquid	Pass	N/A
Distilling Range 81-83oC	JP	More than 94% (vol)	Pass	N/A
Identification Test 1	JP	Light yellow precipitate is formed	Pass	N/A
Identification Test 2	JP	Filter paper turns red-brown color	Pass	N/A
Purity 1- Clarity of Solution	JP	Solution is Clear	Pass	N/A
Purity 2 - Acidity	JP	To pass Test	Pass	N/A
Purity 3 - Residue on Evaporation	JP	NMT 1.0mg/20mL	0.0	mg
Specific Gravity	JP	0.785-0.788 @ 20°C	0.787	N/A
Solubility	JP	Miscible with water, ethanol, methanol, diethyl ether	Pass	N/A
Water, wt/v%	JP	NMT 0.75%	0.04	%
Limit of Volatile Impurities - 2-Butanol	USP	NMT 0.1%	LT 0.1%	N/A
Limit of Volatile Impurities - Acetone	USP	NMT 0.1%	None Detected	N/A
Acidity	USP	NMT 0.70 ml of 0.020N NaOH is required	0.50	ml
Assay	USP	99.0% min	99.94	%

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TEST	MONO-GRAPH	SPECIFICATION	TYPICAL RESULT	UNITS
Limit of Volatile Impurities - Diethyl Ether	USP	NMT 0.1%	LT 0.1%	N/A
Limit of Volatile Impurities - Diisopropyl Ether	USP	NMT 0.1%	LT 0.1%	N/A
Identification B	USP	To Pass Test	Pass	N/A
Identification A - Infrared Spectroscopy	USP	To Pass Test	Pass	N/A
Identification C - Limit of Methanol	USP	NMT 0.02%	Pass	N/A
Limit of Volatile Impurities - Individual unspecified	USP	NMT 0.1%	LT 0.1%	N/A
Limit of Volatile Impurities - Methanol	USP	NMT 0.02%	LT 0.02%	N/A
Limit of Volatile Impurities - n-Propyl Alcohol	USP	NMT 0.1%	LT 0.1%	N/A
Limit of Nonvolatile Residue	USP*	NMT 2.5 mg (0.005%)	0.0	mg
Refractive Index @ 20oC	USP	1.376-1.378	1.377	N/A
Specific Gravity	USP	0.783 - 0.787 @25°C	0.783	N/A
Limit of Volatile Impurities - Total	USP	NMT 1.0%	LT 0.1%	N/A
Water Determination	USP	NMT 0.5%	0.04	%

This product is for further commercial manufacturing, laboratory, or research use, and may be used as an excipient or a process solvent for pharmaceutical purposes. It is not intended for use as an active ingredient in drug manufacturing nor as a medical device or disinfectant. Appropriate/legal use of this product is the responsibility of the user.