PHARMCO
by Greenfield Global

CERTIFICATE OF ANALYSIS

Product Name ETHYL ALCOHOL Absolute, Grain Derived
Grade Meets ACS/USP GRADE Monographs
Catalog # 111000200
Lot # C21B23002
Date of Manufacture: 02/23/21
Recommended Retest Date: Three Years from Date of Manufacture

TEST	MONO GRAPH	SPECIFICATION	RESULT
Assay (by GC, corrected for water)	ACS	NLT 99.5%	99.99%
Assay (by specific gravity@15.56°C)	USP	NLT 99.5%	99.99%
Proof	27CFR 30.23	Lot Analysis	200.0
Identification Test A (Specific Gravity)	USP	It meets the requirements of the test for Specific Gravity	Pass
Specific Gravity	USP	NMT 0.7962 @ 15.56°C	0.7937
Identification Test B (Infrared Spectroscopy)	USP	Conforms to IR Spectra	Pass
Identification Test C (Limit of Methanol)	USP	NMT 200 µL/L (200ppm) of Methanol	Pass
Water (wt%)	ACS	0.2%, max	0.01%
Solubility in Water	ACS+	To Pass Test	Pass
Color of Solution	USP+	The Sample solution has the appearance of water or is not more intensely colored than the standard solution	Pass
Color (APHA)	ACS	10 max	1
Clarity of Solution	USP+	Sample solution A and Sample solution B show the same clarity as that of water, or their opalescence is not more pronounced than that of the Standard suspension A.	Pass
Acidity or Alkalinity	USP+	The solution is pink (30ppm, as acetic acid)	Pass
Titrable Acid	ACS+	0.0005 meq/g max.	0.0002 meq/g
Titrable Base	ACS+	0.0002 meq/g max.	0.0001 meq/g
Acetone/Isopropyl Alcohol	ACS	To Pass Test	Pass
Methanol	ACS	0.1% max	< 0.1%
Substances Darkened by Sulfuric Acid	ACS+	To Pass Test	Pass
Substances Reducing Permanganate	ACS+	To Pass Test	Pass

PHARMCO
by Greenfield Global

TEST	MONO GRAPH	SPECIFICATION	RESULT
Limit of Nonvolatile Residue Residue after Evaporation	USP+ ACS+	NMT 2.5 mg 0.001% , max	0.0 mg 0.000%
UV Absorbance	USP	Examine between 235nm – 340nm 240nm 0.40 max. 250nm-260nm 0.30 max. 270nm-340nm 0.10 max. The spectrum shows a steadily descending curve with no observable peaks or shoulders	 0.22 0.09 0.01 Pass
Organic Impurities	USP	Methanol 200 ppm max. Acetaldehyde and Acetal 10 ppm max. Benzene 2ppm max. Sum of all other impurities 300 ppm max.	1 ppm < 1 ppm None Detected 1 ppm

+This test is performed quarterly

Certification and Compliance Statements

This lot of Anhydrous Ethyl Alcohol complies with all of the current requirements listed in the United States Pharmacopeia, and American Chemical Society monographs
Recommended retest period excludes UV Absorbance for pure Ethyl Alcohol unless packaged in glass or UV protected drums (see shelf life statement)
No chemicals whatsoever are used as solvents at any point in the manufacture, processing or packaging of ethyl alcohol. Only Class 2 and Class 3 residual solvents may appear as impurities / related substances / low level contaminants in Ethanol. Concentration of Class 2 Option 1 and Class 3 residual solvents is below limits in the current USP/NF General Chapter <467>.
This product is not derived, nor does it come in contact with, any materials derived from bovine or other animal sources.
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.

Approved by: T. Boudreau, Quality Control Chemist

Date of Approval: 02/24/21