Designation: ~~E2470 – 09 (Reapproved 2015)$^{\varepsilon 1}$~~ E2470 – 22

Standard Specification for Polyester Grade Ethylene Glycol[1]

This standard is issued under the fixed designation E2470; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

~~ε^1 NOTE—Editorial change was made in Subsection 1.2 in May 2016.~~

1. Scope*

1.1 This specification covers polyester grade ethylene glycol.

1.2 Review the current Safety Data Sheets (SDS) for detailed information concerning toxicity, first aid procedures, handling and safety precautions.

1.3 The following applies to all specified limits in this standard; for purposes of determining conformance with this standard, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E29.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *~~The following safety hazards caveat pertains only to the test methods portion, Section 5, described in this specification:~~This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D482 Test Method for Ash from Petroleum Products

~~D1078~~D850 Test Method for Distillation ~~Range of Volatile Organic Liquids~~of Industrial Aromatic Hydrocarbons and Related Materials

~~D1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)~~

D1722 Test Method for Water Miscibility of Water-Soluble Solvents

D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

D5386 Test Method for Color of Liquids Using Tristimulus Colorimetry

D8005 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)

[1] This specification is under the jurisdiction of ASTM Committee D16 on Aromatic, Industrial, Specialty and Related Chemicals and is the direct responsibility of Subcommittee D16.14 on Alcohols & Glycols.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
~~E202 Test Methods for Analysis of Ethylene Glycols and Propylene Glycols~~
E300 Practice for Sampling Industrial Chemicals
E394 Test Method for Iron in Trace Quantities Using the 1,10-Phenanthroline Method
E1064 Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration
E1615 Test Method for Determination of Trace Quantities of Iron by Visible Spectrophotometry
E2193 Test Method for Ultraviolet Transmittance of Monoethylene Glycol (using Ultraviolet Spectrophotometry)
E2313 Test Method for Aldehydes in Mono-, Di-, and Triethylene Glycol (using Spectrophotometry)
E2409 Test Method for Glycol Impurities in Mono-, Di-, Tri- and Tetraethylene Glycol and in Mono- and Dipropylene Glycol (Gas Chromatographic Method)
E2469 Test Method for Chloride in Mono-, Di- and Tri-ethylene Glycol by Ion Chromatography
E2679 Test Method for Acidity in Mono-, Di-, Tri- and Tetraethylene Glycol by Non-Aqueous Potentiometric Titration
E2680 Test Method for Appearance of Clear, Transparent Liquids (Visual Inspection Procedure)

3. Requirements

3.1 Polyester grade ethylene glycol shall conform to the specification chemical and physical requirements (see Table 1).

TABLE 1 Chemical and Physical Specification Requirements

Specification Requirements	min	max	ASTM Test Method
Glycols	99.9	–	E2409
Ethylene glycol, % mass (m/m)	–	0.05	
Diethylene glycol, % mass (m/m)			
Acidity as Acetic Acid, % mass (m/m)	–	0.002	E2679
Aldehydes as Acetaldehyde, ug/g	–	not reported	E2313
Chloride as Cl, ug/g	–	0.2	E2469
Appearance, Clear & Free from Suspended Matter	pass	–	E2680
~~Chloride as Cl, ug/g~~	~~–~~	~~0.2~~	~~E2469~~
~~Color, platinum cobalt~~	~~–~~	~~5~~	~~D1209~~
Color, platinum cobalt	–	5	D5386, D8005
~~Glycols~~	~~99.9~~	~~–~~	~~E2409~~
~~Ethylene glycol, % mass (m/m)~~	~~–~~	~~0.05~~	
~~Diethylene glycol, % mass (m/m)~~			
Iron, ug/g	–	0.1	E394, E1615
Ultraviolet Transmittance	70	–	E2193
at 220 nm, %T	90	–	
at 250 nm, %T	94	–	
at 275 nm, %T	98	–	
at 350 nm, %T			
Water, % mass (m/m)	–	0.05	E1064
Typical Properties	**min**	**max**	**ASTM Test Method**
Ash, % mass (m/m)	–	0.004	D482
~~Distillation Range~~	~~196~~	~~–~~	~~D1078~~
~~Initial Boiling Point, C~~	~~–~~	~~200~~	
~~Dry Point, C~~			
Distillation Range	196	–	D850
Initial Boiling Point, C	–	200	
Dry Point, C			
Relative Density at 20/20 C or 25/25 C	1.1151 or 1.1129	1.1156 or 1.1134	D4052
Water Miscibility	miscible	–	D1722

4. Sampling

4.1 Sample ethylene glycol in accordance with the appropriate sections of Practice E300 for liquid samples.

~~5. Test Methods~~

~~5.1 Test each composite sample for chemical and physical requirements using the test methods specified in 3.1. Many of these test methods, along with alternative test methods and technologies, can be found in Test Methods E202. In case of a dispute, test methods identified in 3.1 of this specification shall be the preferred test methods.~~