



Standard Test Methods for Analysis of Ethylene Glycols and Propylene Glycols¹

This standard is issued under the fixed designation E 202; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These test methods cover the chemical and physical analysis of the commonly available grades of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, and dipropylene glycol. The key sections appear in the following order:

	Sections
Purity of Reagents	4
Specific Gravity	5-7
Distillation Range	8-10
Acidity	11-13
Water	14-16
Iron	17-25
Color	26-28
Gas Chromatographic Analysis	29-39

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

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 891 Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals²
- D 1078 Test Method for Distillation Range of Volatile Organic Liquids³
- D 1193 Specification for Reagent Water⁴
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)³
- D 1613 Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products³
- E 60 Practice for Photometric and Spectrophotometric

¹ These test methods are under the jurisdiction of ASTM Committee E15 on Industrial and Specialty Chemicals and are the direct responsibility of Subcommittee E15.01 on General Standards.

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² *Annual Book of ASTM Standards*, Vol 15.05.

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ *Annual Book of ASTM Standards*, Vol 11.01.

Methods for Chemical Analysis of Metals⁵

E 180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial Chemicals²

E 200 Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis²

E 203 Test Method for Water Using Karl Fischer Reagent²

E 394 Test Method for Iron in Trace Quantities Using the 1,10-Phenanthroline Method²

E 611 Test Methods for Low Concentrations of Diethylene Glycol in Ethylene Glycol by Gas Chromatography²

3. Significance and Use

3.1 These test methods measure certain chemical and physical properties of ethylene glycols and propylene glycols and may be used to determine compliance with specification in which limits are established for these properties. For those tests that use the procedure of another ASTM test method, that test method should be consulted for additional information on the significance and use of that test.

4. Purity of Reagents

4.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.⁶ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

4.2 Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Specification D 1193, Type II or III.

SPECIFIC GRAVITY

5. Procedure

5.1 Determine the specific gravity of the sample at 20/20°C

⁵ *Annual Book of ASTM Standards*, Vol 03.05.

⁶ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.