



Designation: E 1177 – 03a

Standard Specification for Engine Coolant Grade Ethylene Glycol¹

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1. Scope

1.1 This specification covers both engine coolant grade ethylene glycol and propylene glycol.

1.2 *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.*

1.3 The values stated in SI units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)²

¹ This specification is under the jurisdiction of ASTM Committee D15 on Engine Coolants and is the direct responsibility of Subcommittee D15.07 on Specifications . Current edition approved ~~May~~ Sept. 10, 2003. Published ~~July~~ November 2003. Originally approved in 1987. Last previous edition approved in ~~1998~~ 2003 as E 1177 – ~~98~~03.

- D 3634 Test Method for Trace Chloride Ion in Engine Coolants³
- D 4052 Test Method for Density and Relative Density of Liquids by Digital Density Meter⁴
- D 5827 Test Method for Determination of Chloride in Engine Coolant by Ion Chromatography³
- D 5931 Test Method for Density and Relative Density of Engine Coolant Concentrates and Aqueous Engine Coolants by Digital Density Meter³
- E 202 Test Methods for Analysis of Ethylene Glycols and Propylene Glycols³
- E 300 Practice for Sampling Industrial Chemicals³
- E 394 Test Method for Iron in Trace Quantities Using the 1,10-Phenanthroline Method³

3. Requirements

3.1 Engine coolant grade ethylene glycol or propylene glycol shall conform to the chemical and physical property requirements in Table 1.

TABLE 1 Chemical and Physical Requirements

Requirement	Value for Ethylene Glycol	Value for Propylene Glycol	ASTM Test Method
Ethylene glycol, mass %	94.5 min		E 202
Ethylene glycol, mass %	94.5 min	...	E 202
Diethylene glycol, mass %	5.0 max		E 202
Diethylene glycol, mass %	5.0 max	...	E 202
Propylene glycol, mass %	...	98.5 min	E 202
Dipropylene glycol, mass %	...	1.0 max	E 202
Other glycols, mass %	0.2 max		E 202
Other glycols, mass %	0.2 max	0.2 max	E 202
Total glycols, mass %	99.5 min		E 202
Total glycols, mass %	99.5 min	99.5 min	E 202
Relative density, 20/20°C	1.113 to 1.116		D 4052, D 5931
Relative density, 20/20°C	1.113 to 1.116	1.0375 to 1.0390	D 4052, D 5931
Water, mass %	0.5 max		E 202
Water, mass %	0.5 max	0.5 max	E 202
Acidity as acetic acid, mass %	0.01 max		E 202
Acidity as acetic acid, mass %	0.01 max	0.01 max	E 202
Chloride ion, ppm	5 max		D 3634, D 5827
Chloride ion, ppm	5 max	5 max	D 3634, D 5827
Iron, ppm	4.0 max		E 394
Iron, ppm	1.0 max	1.0 max	E 394
Appearance	Clear, no suspended matter		E 202
Appearance	Clear, no suspended matter	Clear, no suspended matter	E 202
Color, Pt/Co scale		25 max	E 202, D 1209
Color, Pt/Co scale	25 max	25 max	E 202, D 1209

4. Sampling

4.1 Sample ethylene or propylene glycol in accordance with the appropriate sections of Practice E 300 for liquid samples.

5. Packaging, Package Markings, and Transportation

5.1 The packaging, labeling, and transportation of commercial quantities shall conform to applicable federal, state, and local regulations. Conformance is the responsibility of the manufacturer and the shipper.

6. Keywords

6.1 engine coolant; ethylene; glycol; polyester; propylene glycol

² Annual Book of ASTM Standards, Vol 06.03.

³ Annual Book of ASTM Standards, Vol 15.05.

⁴ Annual Book of ASTM Standards, Vol 05.03.

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