Designation: D7388 – 08 (Reapproved 2013)

Standard Specification for Engine Coolant Grade 1,3-Propanediol (PDO)[1]

This standard is issued under the fixed designation D7388; 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.

1. Scope

1.1 This specification covers engine coolant grade 1,3-propanediol (PDO).

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

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:*[2]

D1122 Test Method for Density or Relative Density of Engine Coolant Concentrates and Engine Coolants By The Hydrometer

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

D1287 Test Method for pH of Engine Coolants and Antirusts

D3634 Test Method for Trace Chloride Ion in Engine Coolants

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

D5827 Test Method for Analysis of Engine Coolant for Chloride and Other Anions by Ion Chromatography

D5931 Test Method for Density and Relative Density of Engine Coolant Concentrates and Aqueous Engine Coolants by Digital Density Meter

D6130 Test Method for Determination of Silicon and Other Elements in Engine Coolant by Inductively Coupled Plasma-Atomic Emission Spectroscopy

E202 Test Methods for Analysis of Ethylene Glycols and Propylene Glycols

E300 Practice for Sampling Industrial Chemicals

3. Requirements

3.1 Engine coolant grade 1,3-propanediol shall conform to the chemical and physical property requirements in Table 1.

4. Sampling

4.1 Sample 1,3-propanediol in accordance with the appropriate sections of Practice E300 for liquid samples.

5. Packaging, Package Marking, 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; glycol; 1,3-propanediol; PDO

[1] This specification is under the jurisdiction of ASTM Committee D15 on Engine Coolants and Related Fluids and is the direct responsibility of Subcommittee D15.07 on Specifications.

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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**

TABLE 1 Physical and Chemical Requirements

Requirement	Values for PDO	ASTM Test Method
1,3-Propanediol, mass %	99.0 min	under development
Dipropylene glycol, mass %	0.5 max	E202
Other glycols, mass %	0.2 max	E202
Total glycols, mass %	99.5 min	E202
pH at 50 % in DI water	6.00 – 9.00	D1287
Relative density, 20/20°C	1.0520 – 1.0540	D1122, D4052, D5931
Water, mass %	0.5 max	E202
Acidity as acetic acid, mass %	0.01 max	E202
Glycol esters, mass %	[A]	[A]
Chloride ion, µg/g (ppm)	5 max	D3634, D5827[B]
Sulfate ion, µg/g (ppm)	10 max	D3634
Nitrite, nitrate, phosphate (total, µg/g (ppm))	10 max	D3634
Silicon, µg/g (ppm)	1 mx	D6130
Boron, µg/g (ppm)	10 max	D6130
Aluminum, calcium, copper, iron, magnesium, lead, zinc (total, µg/g (ppm))	5 max	D6130
Appearance	Clear, no suspended matter	E202
Color, Pt/Co scale	25 max	E202, D1209

[A] A titration test method to determine glycol ester content is under development. Specific values will be established once the method has been standardized. However, this is an important property and until such time as specific values are included, a limit for glycol esters should be established by agreement between the supplier and the customer.
[B] In case of dispute, Test Method D3634 shall be the preferred test method.