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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Prediluted Aqueous Propylene Glycol Base Engine Coolant (50 Volume % Minimum) for Automobile and Light-Duty Service¹

This standard is issued under the fixed designation D 6257; 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 the requirements for a prediluted aqueous propylene glycol (50 volume % minimum) base engine coolant for use in automobiles and light-duty vehicles. When used without further dilution, this product functions effectively during both summer and winter in automotive and other light-duty engine cooling systems to provide adequate cooling system performance.

NOTE 1—This specification is based on the knowledge of the performance of engine coolants prepared from new or virgin ingredients. See Appendix X3 for more information.

1.2 The units quoted in this specification are to be regarded as standard. The values given in parentheses are approximate equivalents provided for information purposes only.

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 512 Test Methods for Chloride Ion in Water²
- D 516 Test Method for Sulfate Ion in Water²
- D 1119 Test Method for Ash Content of Engine Coolants and Antirusts³
- D 1120 Test Method for Boiling Point of Engine Coolants³
- D 1121 Test Method for Reserve Alkalinity of Engine Coolants and Antirusts³
- D 1122 Test Method for Density or Relative Density of Engine Coolant Concentrates and Engine Coolants by the Hydrometer³
- D 1126 Test Method for Hardness in Water²
- D 1177 Test Method for Freezing Point of Aqueous Engine Coolants³
- D 1193 Specification for Reagent Water²

D 1287 Test Method for pH of Engine Coolants and Antirusts³

D 1293 Test Methods for pH of Water²

D 1384 Test Method for Corrosion Test for Engine Coolants in Glassware³

D 1881 Test Method for Foaming Tendencies of Engine Coolants in Glassware³

D 1882 Test Method for Effect of Cooling System Chemical Solutions on Organic Finishes for Automotive Vehicles³

D 1888 Test Methods for Particulate and Dissolved Matter in Water⁴

D 2570 Test Method for Simulated Service Corrosion Testing of Engine Coolants³

D 2809 Test Method for Cavitation Erosion-Corrosion Characteristics of Aluminum Pumps with Engine Coolants³

D 3634 Test Method for Trace Chloride Ion in Engine Coolants³

D 4327 Test Method for Anions in Water by Chemically Suppressed Ion Chromatography³

D 4340 Test Method for Corrosion of Cast Aluminum Alloys in Engine Coolants Under Heat-Rejecting Conditions³

D 4725 Terminology for Engine Coolants³

D 5216 Standard Specification for Propylene Glycol Base Engine Coolant for Automobile and Light-Duty Service³

D 5223 Standard Specification for Engine Coolant Grade Propylene Glycol³

D 5827 Standard Test Method for Analysis of Engine Coolant for Chloride and Other Anions by Ion Chromatography³

D 5931 Standard Test Method for Density and Relative Density of Engine Coolant Concentrates and Aqueous Engine Coolants by Digital Density Meter³

3. General Requirements

3.1 Prediluted aqueous propylene glycol base engine coolant shall be formulated with propylene glycol meeting Specification D 5223, water, and shall contain appropriate corrosion inhibitors, dye, and a foam suppressor. Glycols other than propylene glycol may be present but their combined total must

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² Annual Book of ASTM Standards, Vol 11.01.

³ Annual Book of ASTM Standards, Vol 15.05.

⁴ Discontinued 1991 - See 1990 Annual Book of ASTM Standards, Vol. 11.01.

be no greater than 0.5 % by volume. The prediluted coolant shall also conform to the general requirements in Table 1.

3.2 This product shall be prepared using water that meets Type IV reagent water specifications (see Specification D 1193). Use of this water minimizes the formation of hard water scale and avoids the introduction of mineral components, such as chlorides and sulfates, which can increase the corrosion rate of aluminum and iron.

3.3 This product, when installed in accordance with the vehicle manufacturer's recommendations and those on the product label, shall be suitable for use in a properly maintained cooling system (Appendix X2) in normal light duty service for a minimum of one year without adversely affecting fluid flow and heat transfer.

4. Detailed Requirements

4.1 Prediluted aqueous propylene glycol base engine coolant, as packaged, shall conform to the chemical and physical property requirements prescribed in Table 2.

4.2 Report the freezing point of the prediluted aqueous propylene glycol base coolant as packaged. This freezing point shall be -32°C (-26°F) or lower.

TABLE 1 General Requirements

Property	Specified Values	ASTM Test Method
Color	distinctive	...
Effect on non-metals	no adverse effect	...
Foaming		D 1881
Volume mL	150, max	
Break time, s	5, max	

TABLE 2 Chemical and Physical Requirements of the Prediluted Product as Packaged

Property	Specified Values	ASTM Test Method
Relative Density, 15.5/15.5°C (60°F)	1.025 min	D 1122, D 5931
Freezing point, °C (°F)	-32 (-26) max	D 1177
Boiling point, °C (°F)	104 (219) min	D 1120
Effect on automotive finish	no effect	D 1882
Ash content, mass %	2.5 max	D 1119
pH	7.5–11	D 1287
Reserve alkalinity, mL	report ^A	D 1121
Chloride, ppm	25 max	D 3634, D 5827

^AAgreed value between supplier and customer.

4.3 If necessary, adjust the freezing point of the prediluted aqueous coolant to -32°C (-26°F) with deionized water before proceeding with performance testing.

4.4 Prediluted aqueous propylene glycol base engine coolant shall conform to the laboratory test performance requirements prescribed in Table 3, after any needed concentration adjustment.

5. Keywords

5.1 automotive and light-duty service; engine coolant; propylene glycol