



Designation: D8039 – 16 (Reapproved 2023)

# Standard Specification for Heat Transfer Fluids (HTF) for Heating and Air Conditioning (HVAC) Systems<sup>1</sup>

This standard is issued under the fixed designation D8039; 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 ethylene glycol, propylene glycol, 1,3 propanediol as well as glycerin base heat transfer fluids (HTF) used in heating and air conditioning (HVAC) systems. When concentrates are used at up to 65 % concentration by weight in water, or when prediluted heat transfer fluids (30 % by weight minimum) are used without further dilution, they will function effectively to provide protection against freezing, and corrosion.

1.2 The fluids described in this specification are not appropriate for use in systems where internal combustion engines (gasoline, diesel, or CNG/LPG) are used.

1.3 The heat transfer fluids governed by this specification are categorized as follows by the primary base of freeze depressant used:

| Heat Transfer Fluid Type | Description      |
|--------------------------|------------------|
| I                        | Ethylene glycol  |
| II                       | Propylene glycol |
| III                      | 1,3-Propanediol  |
| IV                       | Glycerin         |

1.4 Heat transfer fluids meeting this specification shall be tested and fully comply with requirements listed in **Table 1**.

NOTE 1—This specification is based on the knowledge of the performance of heat transfer fluids prepared from new or virgin ingredients. This specification shall also apply to heat transfer fluids prepared using materials generated from recycled or reprocessed ingredients, provided that these ingredients meet the requirements of Specifications **E1177** and **D7388** for Glycols and Specification **D7640** for Glycerin.

NOTE 2—This specification addresses concentrated inhibited glycols and glycerol that will be mixed with water for use in various climates and prediluted heat transfer fluids (HTF) that are factory-blended with purified water. A table of estimated freeze protection temperatures at appropriate dilutions is provided in **Appendix X1**.

1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee **D15** on Engine Coolants and Related Fluids and is the direct responsibility of Subcommittee **D15.30** on Industrial Heat Transfer Fluids.

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1.6 *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.*

1.7 *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:<sup>2</sup>

- D512** Test Methods for Chloride Ion in Water
- D516** Test Method for Sulfate Ion in Water
- D1121** Test Method for Reserve Alkalinity of Engine Coolants and Antirusts
- D1122** Test Method for Relative Density of Engine Coolant Concentrates and Engine Coolants By The Hydrometer
- D1123** Test Methods for Water in Engine Coolant Concentrate by the Karl Fischer Reagent Method
- D1126** Test Method for Hardness in Water
- D1177** Test Method for Freezing Point of Aqueous Engine Coolants
- D1287** Test Method for pH of Engine Coolants and Antirusts
- D1293** Test Methods for pH of Water
- D1881** Test Method for Foaming Tendencies of Engine Coolants in Glassware
- D4327** Test Method for Anions in Water by Suppressed Ion Chromatography
- D4725** Terminology for Engine Coolants and Related Fluids
- 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

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