



Glycerin-Based Extended Life Automotive Coolant

1 Scope

1.1 Material Description. This standard details the materials and performance requirements of a glycerin based Organic Acid Technology (OAT) extended life engine coolant with a minimum recommended service interval of five (5) years or 150 000 miles when used at recommended concentrations.

1.2 Symbols. Not applicable.

1.3 Applicability. The extended life engine coolant is used to protect automotive engine cooling systems from corrosion, freezing and boiling. The extended life coolant concentrate is intended to be mixed with clean, potable water per the recommended limits specified in ASTM D3306. The extended life coolant Glycerin Base was first approved for the GMSA region using minimum 35 volume percent concentration. The concentrations to be used are specified in the Global Engine Coolant Mixture Best Practice Heating Ventilation and Air Conditioning Powertrain Cooling (HVACPTC-229) unless deviation has been granted by the Global Subsystem Leadership Team (GSSLT).

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D1120	ASTM D1177	ASTM D6660	ASTM E202
ASTM D1122	ASTM D3306	ASTM D7640	

2.2 GM Standards/Specifications.

GMW3059	GMW3420	GMW14270
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2.3 Additional References.

- Global Engine Coolant Mixture Best Practice Heating Ventilation and Air Conditioning Powertrain Cooling (HVACPTC-229). The supplier shall work with the GM responsible to comprehend this requirement.

3 Requirements

All the requirements of the coolant must meet GMW3420 except those described as follows.

3.1 Chemical Requirements. Engine Coolant Glycerin Base shall have a mix composition shown in Table 1. Other Chemical Requirements shall be in accordance to GMW3420.

Table 1: Chemical Performance Properties - Concentrate

Properties	Test Methods	Requirement (Weight %)
A. Ethylene Glycol	ASTM E202	30 minimum
B. Glycerin ^{Note 1}	Appendix A	60 ± 2 maximum

Note 1: Chemical and Physical Requirements of Glycerin must meet and reported as per ASTM D7640. Refer to Appendix A for Determination of Glycerin content.

3.2 Physical Requirements. Engine Coolant furnished to this procedure shall have following Physical Properties changes in comparison to GMW3420. The tests will be done on the coolant concentrate unless otherwise specified. See Table 2.

Table 2: Physical Performance Properties

Properties	Test Methods	Requirement
A. Relative Density (+20 °C/+20 °C)	ASTM D1122	1.183 to 1.213
B. Equilibrium Boiling Point	ASTM D1120	+163 °C minimum
	40% concentrate plus 60% distilled water by volume	+106 °C minimum
	35% concentrate plus 65% distilled water by volume	+104 °C minimum
C. Freezing Point	ASTM D1177 or ASTM D6660: 50% concentrate plus 50% distilled water by volume	-35 °C maximum
	40% concentrate plus 60% distilled water by volume	-24 °C maximum
	35% concentrate plus 65% distilled water by volume	-18 °C maximum

3.3 Others Requirements. All tests required by this specification and by GMW3420 shall be run both at 35% and at 50% concentration, unless otherwise specified.

3.4 Compatibility with other Coolants. The candidate Engine Coolant Glycerin Base shall be tested against Coolants approved under GMW3420, GMW17918, and any other coolant type as selected by the GM. Test procedures and requirements are described at GMW3420.

3.5 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to submit a full material composition disclosure to GM via the International Material Data System (IMDS) or via a completed GMW3059 report form.

4 Manufacturing Process

The extended life coolant concentrate is intended to be mixed with clean, potable water per the recommended limits specified in ASTM D3306. The concentrations to be used are specified the Global Engine Coolant Mixture Best Practice HVACPTC-229 through the freezing point required for each region where the vehicle is sold.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. Samples of components or materials released to a GM material specification shall be tested for conformity with the requirements of this material specification and approved by the responsible Engineering department prior to commencement of delivery of bulk supplies.

A new approval must be received for any changes, e.g., properties, manufacturing process, location of manufacture, etc. If not otherwise agreed, all testing and documentation normally required for initial release must be completed.

It is the responsibility of the supplier to inform the customer in a timely manner, without solicitation, and to include documentation of all modifications of materials and/or processes and to apply for a new release.

5.4 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements.