

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

**COOLANT, LONG LIFE, CONCENTRATE - FOR SYSTEM
CONTAINING CAST AND WROUGHT ALUMINUM**

ESE-M97B44-A

1. SCOPE

The material defined by this specification is an ethylene glycol type corrosion inhibited coolant concentrate composed essentially of monoethylene glycol.

2. APPLICATION

This specification is released for material which, when mixed with water, shall be a satisfactory fluid for automotive engine cooling systems which contain aluminum engine components and aluminum radiators as well as brass and ferrous components. This material is for both initial fill and service use.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 INITIAL QUALIFICATION

The qualification testing will be run in three phases. The requirements of each phase, in order, must be met completely or material testing on subsequent phases will not be performed.

3.2.1 Phase I - Laboratory Material Performance

3.2.1.1 Glassware Corrosion (ASTM D 1384) Weight Loss, max

- . Cast iron, steel, copper, brass 10 mg/coupon
- . Cast aluminum, solder 20 mg/coupon

3.2.1.2 Specific Gravity (ASTM D 1122) 1.11 - 1.14

Date	Action	Revisions
2002 10 11	Revised	Updated and renumbered
1983 05 16	3.1.3.1,3.1.3.2	Revised CEN3-DR891694-E
1981 04 30		Released CTL3-CR 862308-E3

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3.2.1.3	Freezing Point (ASTM D 1177, use 50 parts of concentrate diluted to 100 parts with distilled water)	-37°C or below
3.2.1.4	Effect on Automotive Organic Finishes (ASTM D 1882)	None
3.2.1.5	Foaming Characteristics (ASTM D 1881)	150 mL foam volume, max 5 s break time, max
3.2.1.6	Color	Green (equivalent to 22.5 mg/L Uranine C and 33 mg/L Alizarine Cyanone Green G Extra)
3.2.1.7	Compatibility	Must pass test
	Dilute samples of the candidate coolant and the approved coolant with equal parts of corrosive water (as described in ASTM D 1384). Mix 100 mL of the candidate coolant solution with 100 mL of the approved coolant solution in a 250 mL beaker. Heat the mixture to 90-95 °C. Cover, remove from the heat and let stand 16-24 h at room temperature in the absence of light. There shall be no precipitation or separation into phases. Slight cloudiness or separation that does not completely cover the surface of the liquid shall be acceptable.	
3.2.1.8	Storage Stability	Must pass test
	The coolant shall form no permanent gel when tested by the following method. Place at least 60 mL of coolant concentrate in a bottle and cap it snugly. Put it in a circulating air oven at 65 +/- 2 °C for 14 days. Remove and allow it to cool to room temperature. Examine for gelatinous precipitate.	
3.2.2	Phase II	
3.2.2.1	Aluminum Cylinder Head Heat - Transfer Corrosion Test (FLTM BL 104-01) Weight Loss, max	1.0 mg/cm ² (average of two determinations)
3.2.2.2	Galvanostatic Pitting Test (FLTM BL 105-01)	More positive than -400 mv vs. SCE