



RUGGED™ HD Extended Life EC-1 **Coolant & Antifreeze**

RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze features advanced organic acid technology (OAT) chemistry that is compatible with most common types of heavy-duty and automotive coolants. It contains molybdate and nitrite chemistry to protect against cavitation erosion. It is recommended for heavy-duty applications with no need for additional SCA on initial fill. Chemical levels should be monitored at each service interval. **RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze** is compatible with most Heavy-Duty coolant filters.

RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze is recommended for use in all heavy-duty diesels. It protects all cooling system metals including aluminum from corrosion and rust. **RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze** is blended 50/50 with demineralized water to minimize hard water deposits on heads and blocks. **RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze** phosphate-free, low-silicate technology may extend the life of hoses, gaskets, thermostats and water pumps compared to high silicate and/or soluble oil coolant technologies.

RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze, used as directed, results in an engine coolant that may be used in virtually any engine cooling system. This technology is well proven over decades of use, and is engineered to resemble the extended life coolants used in some heavy-duty vehicle manufacturing plants as factory fill.

RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze meets ASTM D3306, ASTM D6210 and TMC RP-329 (EG). **RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze** if used as directed, will provide satisfactory performance in HD Truck applications including but not limited to the following:

- Caterpillar (EC-1)
- Cummins
- GMC Truck
- GM Dex-Cool
- Mack Trucks
- CNH
- Thermo King
- International
- Volvo
- Freightliner
- Kenworth
- Peterbuilt

RUGGED™ HD Extended-Life EC-1 Coolant & Antifreeze can be used in automotive and light truck applications, however, consult your owner's manual for acceptability while the vehicle is under warranty.

Table of Properties and Typical ASTM Test Results

Test / Property	Method	Result
Color	Visual	Red
Relative Density (Specific Gravity)	ASTM D1122	1.125
Freeze Point @ 50% in water	ASTM D1177	-34 F (-37 C)
Boiling Point (neat)	ASTM D1120	328 F (165 C)
Boiling Point (50% in water)	ASTM D1120	226 F (108 C)
pH 50% in water	ASTM D1287	7.5
Effect on Auto Finish	ASTM D1882	No effect
Chloride	ASTM D3634	5 ppm
Water content	ASTM D1123	50%
Reserve Alkalinity	ASTM D1121	N/A
Foaming Tendencies	ASTM D1881	35 ml / 1.6 sec. Break time
Silicate as Si	ASTM D6130	<1
Nitrite (NO ₂)+ Molybdate (MoO ₄)	ASTM D5827	1560
Phosphate as P	ASTM D6130	<1
Sebacic acid	HPLC	800
Corrosion of heat rejecting aluminum surface	ASTM D4340	-0.06 mg/cm ² /week
Cavitation / Erosion-Corrosion of Aluminum Water Pump	ASTM D2809	8
Corrosion in Glassware	ASTM D1384	Copper 1 mg Solder 0 mg Brass -1 mg Steel -2 mg Cast Iron 1 mg Cast Aluminum 0 mg
Simulated Service	ASTM D2570	Copper-1 mg Solder 1 mg Brass 0 mg Steel 0 mg Cast Iron -2 mg Cast Aluminum 2 mg
Glycol %	ASTM E202	50% min
Military Compatibility		Pass
Military Storage Stability		Pass

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