DELO® ELC ADVANCED ANTIFREEZE/COOLANT

PRODUCT DESCRIPTION

Delo® ELC Advanced Antifreeze/Coolant products have a patented formulation for protection, and compatibility with flux brazing residue present from the manufacturing process of today's aluminum heat exchangers. Delo ELC Advanced products are the next generation, ethylene glycol based NOAT (Nitrited Organic Additive Technology) products to provide excellent extended life coolant system protection in diesel, natural gas and CNG engines for both on- and off-road applications. It is available in Premixed 50/50, 40/60, and 60/40 variants, and as a concentrate.

CUSTOMER BENEFITS

Delo ELC Advanced Antifreeze/Coolant products deliver value through:

- **Excellent Aluminum Protection** — Compatibility with CAB[1] brazed material and fast passivator properties. Effective at protecting aluminum in high temperature applications and eliminating nitrite depletion to provide optimal cooling system performance.
- **Better pH Stability** — Unique inhibitor system neutralizes the drivers of pH shift in coolants.
- **Improved Elastomer Compatibility** — Improved mix of inhibitors package
- **Excellent Hardware Life** — Improved liner pitting performance than previous generation ELC coolants. Delo ELC Advanced shows significant improvement in surpassing the ASTM D 7583 John Deere coolant cavitation test.
- **Managing Costs** — Helps eliminate the cost of using SCAs (supplemental coolant additives), regular testing and the manpower required to perform these tasks, effectively eliminating those costs when compared to conventional or fully formulated coolants.
- **Long Service Life** — Service life of 1,500,000 miles / 2,400,000 km on-road use / 20,000 hours off-highway use, and up to 32,000 hours of stationary engine use when following OEM coolant maintenance recommendations.
- **Optimal Cooling System Operation** — No gel or deposit formation. Silicates and other SCA deposits can reduce heat transfer and increase downtime due to over-heating.
- **Variable Applications** — Recommended for use in on-road, off-road and stationary engine applications that call for an extended life, silicate and phosphate free formulation that contains nitrite and molybdate. Can be used in engines using variable fuel types and variable emission control protocols. Check with your OEM for specific product application requirements.
- **Compatibility** — Compatible with other coolant formulations and supplemental coolant additives. Chevron recommends that this product not be diluted by more than 25% with other coolant formulations. Dilution by more than 25% will reduce extended life performance and other benefits.
- **Environmentally Friendly** — Biodegradable in its unused form. Phosphate, borate, silicate, 2EHA and amine free.
- **Stability** — Storage stable for 8 years in concentrate form.
- **Superb cooling system operation** - The silicate-free formula provides improved heat transfer when compared to traditional stationary gas engine coolants that typically contain silicates. There is even better heat transfer performance when compared to conventional 50/50 stationary gas engine coolants. Lab tests have measured a 7% improvement in thermal conductivity, and with a 40/60 blend, there is a 10% increase in thermal conductivity at operating temperature, leading to fewer high temperature engine-derating events and shutdowns.

1 Controlled Atmosphere Brazing.

Product(s) manufactured in the USA and El Salvador.
Always confirm that the product selected is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.

A **Chevron** company product

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FEATURES

Delo® ELC Advanced contains a special formulation designed to improve compatibility with the industry changes to more CAB brazed aluminum components, more heat exchangers, and higher operating temperatures.

Delo ELC Advanced Antifreeze/Coolant products are heavy duty engine coolants that use an organic corrosion inhibitor technology called carboxylates. Delo ELC Advanced is free of borate, silicate, phosphate, amine and 2EHA. These products contain nitrites and molybdates for additional cylinder liner protection.

Delo ELC Advanced Antifreeze/Coolant products are recommended for use in a wide variety of cooling system applications, including on-road, off-road and stationary engine applications. These products are also recommended in mixed fleet applications where heavy duty and light duty trucks are present. Please check your OEM's coolant recommendations.

Delo ELC Advanced Antifreeze/Coolant products do not require the addition of supplemental coolant additives to obtain their service life of 1,500,000 miles / 2,400,000 km / 20,000 hours, and up to 32,000 hours of stationary engine use when following OEM coolant maintenance recommendations. Routine inspections, coolant top-off and annual laboratory testing are recommended to ensure maximum service life.

Delo ELC Advanced Antifreeze/Coolant products were designed to exceed the CAT EC-1 performance requirements.

APPLICATIONS

Recommended applications for Delo® ELC Advanced Antifreeze/Coolant products:

- Heavy duty engines regardless of fuel type or environmental controls being used where the OEM recommends a silicate free, extended life coolant that contains nitrites[2]
- Mixed fleets where both light duty and heavy duty trucks are present
- Stationary engine applications regardless of fuel type being used
- Marine cooling systems where freeze protection is needed and a nitrite containing coolant is recommended

2 Some OEMs recommend the use of nitrite free coolants. Check with your OEM.

Delo ELC Advanced Antifreeze/Coolants are approved for:

- **Cummins** CES 14439

Delo ELC Advanced Antifreeze/Coolant meets or exceeds the specifications of:

- **ASTM** D6210
- **ASTM** D3306
- **Caterpillar** EC-1
- **Deutz** DQC CB-14
- **TMC** RP 364, 351 (color)
- Phosphate-free requirement of European OEMs
- Silicate-free requirement of Japanese OEMs

Delo ELC Advanced Antifreeze/Coolants are recommended by Chevron for use in (always check OEM recommendations):

- **Ajax** Stationary Natural Gas Engines
- **Caterpillar** Stationary Natural Gas Engines
- **Cooper-Bessemer** Stationary Natural Gas Engines
- **Cummins** applications specifying CES 14603
- **Cummins Westport** ISX 12G and ISL G CNG engines
- **Detroit™** DD15, DD13, Series 60, MBE 4000, MBE 900 Engines
- **Freightliner and Western Star** Truck Diesel Engines
- **GE - Jenbacher** Stationary Natural Gas Engines
- **Hino** Truck Diesel Engines
- **Isuzu** Truck Diesel Engines
- **Kenworth and Peterbilt** Truck Diesel Engines
- **Kobelco** Construction Equipment Diesel Engines
- **Komatsu** Construction Equipment Diesel Engines
- **Mack** MP8, MP7 Engines
- **MTU** 4000 Diesel Engines
- **MWM** Stationary Natural Gas Engines
- **Navistar** CEMS B1 Type 3
- **PACCAR** MX, MX13 Engines
- **Scania and MAN** Truck Diesel Engines
- **Volvo and Mack** Truck Diesel Engines
- **Wärtsilä** Stationary Diesel Engines
- **Waukesha** Stationary Natural Gas Engines
- **White-Superior** Stationary Natural Gas Engines

Always confirm that the product selected is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.

Note: It is recommended that Delo ELC Advanced Antifreeze/Coolant not be diluted with other coolant formulations by more than 25% in order to maintain performance claims.

Delo ELC Advanced Antifreeze/Coolant products are backed by Chevron's Limited Product Warranty. Always check with your original equipment manufacturer to determine the proper fluid for your equipment, its operating conditions, and maintenance practices.

Product Dilution for Boil Over and Freeze Point Protection Recommendations for Delo® ELC Advanced Antifreeze/Coolant - Concentrate

Boiling Protection, °F/°C (using a 15 lb pressure cap) 50% 1:1 (1 part antifreeze/1 part water)	 265/129
Freezing Protection, °F/°C 40% 2:3 (2 parts antifreeze/3 parts water) 50% 1:1 (1 part antifreeze/1 part water) 60% 3:2 (3 parts antifreeze/2 parts water)	 -12/-24 -34/-37 -62/-52

Notes

- Product concentrates should be agitated before use or dilution.
- Delo ELC Advanced Antifreeze/Coolant - Premixed versions should be used as purchased. No dilution is recommended.
- For maximum protection against freezing in extremely cold areas, Delo ELC Advanced Antifreeze/Coolant - Premixed 60/40 can be used, and in areas where less freeze protection is needed, Premixed 40/60 may be used.
- Always dispose of used coolant in accordance with local, state and federal guidelines.

Product Reference

Note: Bitterant is a flavor aversive that may help reduce the accidental ingestion of this product. These products contain bitterant.

Delo ELC Advanced Antifreeze/Coolant - Concentrate
Product Number 227818
SDS Number USA 49252
SDS Number Canada 49254
SDS Number Mexico 49253
SDS Number El Salvador 49256

Delo ELC Advanced Antifreeze/Coolant - Premixed 50/50
Product Number 227819
SDS Number USA 49262
SDS Number Canada 49263
SDS Number Mexico 49264
SDS Number El Salvador 49266

Delo ELC Advanced Antifreeze/Coolant - Premixed 40/60
Product Number 227821
SDS Number USA 66672

Delo ELC Advanced Antifreeze/Coolant - Premixed 60/40
Product Number 227820
SDS Number USA 66675

Typical Test Data

Delo ELC Advanced Antifreeze/Coolant - Concentrate

Appearance	Red
Specific gravity 15/15°C	1.126
Freezing point, °C[a] ASTM D1177	-37
pH[b], ASTM D 1287	8.4
Reserve alkalinity[c], ASTM D1121	3.6
Silicate, %[d]	None

a 50 vol % aqueous solution.
b 1:2 dilution with water.
c As received.
d As anhydrous alkali metasilicate.

Minor variations in product typical test data are to be expected in normal manufacturing.

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Delo ELC Advanced Antifreeze/Coolant ASTM D1384 Glassware Corrosion Test

Delo ELC Advanced Antifreeze/Coolant ASTM D1384 Glassware Corrosion Test		
	ASTM Limit	Weight loss, mg per coupon
Copper	10 max	2
Solder	30 max	2
Brass	10 max	1
Steel	10 max	1
Iron	10 max	0
Aluminum	30 max	6

Delo ELC Advanced Extended Life Prediluted 50/50 Antifreeze/Coolant ASTM D4340 Aluminum Hot Surface Corrosion Test

Delo ELC Advanced Extended Life Prediluted 50/50 Antifreeze/Coolant ASTM D4340 Aluminum Hot Surface Corrosion Test		
	ASTM Limit	Weight loss, mg per coupon
Aluminum	1.0	0.4

Delo ELC Advanced Extended Life Prediluted 50/50 Antifreeze/Coolant ASTM D2570 Simulated Service Corrosion Test

Delo ELC Advanced Extended Life Prediluted 50/50 Antifreeze/Coolant ASTM D2570 Simulated Service Corrosion Test		
	ASTM Limit	Weight loss, mg per coupon[a]
Copper	20 max	8
Solder	60 max	3
Brass	20 max	8
Steel	20 max	0
Iron	20 max	-1
Aluminum	60 max	3

a Negative indicates net gain.

HANDLING PRACTICES

The primary limiting factor in the shelf life of a coolant is silicate instability. Since silicate will eventually polymerize to silicate gel, silicate containing coolants have a shelf life of about 18 months. Delo ELC Advanced Antifreeze/Coolant Concentrate has a shelf life of 8 years, provided the integrity of the container is maintained. Product should be agitated before use.

Always confirm that the product selected is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.