

**Delo®**

DELO™ EXTENDED LIFE COOLANT SYSTEM

Coolant/Antifreeze, Prediluted 50/50, Extender

CUSTOMER BENEFITS

Delo Extended Life Coolant System delivers value through:

- **Improved profitability** - Unsurpassed pitting protection for wet sleeve cylinder liners. Extended drain capability means equipment is in service longer, generating revenue.
 - 300,000 miles on-road use (three years or 6,000 hours off-highway use) on initial fill
 - Additional 300,000 miles on-road use (three years or 6,000 hours off-highway use) by adding Delo Extender
 - Effective, long term corrosion protection for aluminum, brass, cast iron, steel, solder, and copper
 - Improved water pump life due to reduced water pump seal wear resulting from fewer dissolved solids
- **Reduced operating costs**
 - No inhibitor testing is required
 - Effective, long term corrosion protection for aluminum, brass, cast iron, steel, solder, and copper
 - Improved water pump life due to reduced water pump seal wear resulting from fewer dissolved solids
 - Reduced hard water scale
 - Excellent heat transfer
 - Superior protection in high operating temperatures
 - Protects against winter freeze up and minimizes the chance of summer boil over
 - Outstanding hot surface aluminum protection
 - No routine SCA additions required
- **Reduced inventory costs**
 - Compatible with conventional antifreeze. Dilution with conventional antifreeze will reduce extended life benefits. ChevronTexaco recommends that this product not be diluted by more than 10% with conventional coolants
 - No silicate dropout or gel formation during use or storage
 - Also suitable for gasoline powered automotive and industrial engines

FEATURES

Delo Extended Life Coolant System is a heavy-duty engine coolant system which incorporates patented organic corrosion inhibitor technology.

Delo Extended Life Coolant/Antifreeze is a single-phase, ethylene glycol type heavy duty diesel engine coolant based on ChevronTexaco's patented extended life organic corrosion inhibitor system with nitrite added. It is manufactured from ethylene glycol and a highly effective, long-term corrosion inhibitor package. This inhibitor system eliminates the need for silicates, phosphates, borates, nitrates, and amine additives traditionally used for this purpose. It's primary use is for freeze point adjustments. No routine SCA additions are required.

Delo Extended Life Prediluted 50/50 Coolant/Antifreeze is a 50/50 mixture of Delo Extended Life Coolant/Antifreeze with deionized water for freeze protection down to -37°C and boil over protection to 129°C with a 15 lb pressure cap. This product needs no precharging or recharging for 300,000 miles of on-road use (three years or 6,000 hours of off-highway use). After 300,000 miles, simply add Delo Extender, and Delo Extended Life Prediluted 50/50 Coolant/Antifreeze is good for another 300,000 miles of on-road use (three years or 6,000 hours of off-highway use). Delo Extended Life Prediluted 50/50 Coolant/Antifreeze is compatible with other traditional silicate antifreezes, but the extended life benefits will be reduced if mixed.

Delo Extender is the prescribed recharge for Delo Extended Life Prediluted 50/50 Coolant/Antifreeze. It has been specifically formulated to double the life of Delo Extended Life Prediluted 50/50 Coolant/Antifreeze. It should only be added at 300,000 miles of on-road use (three years or 6,000 hours of off-highway use) in heavy duty commercial engines to restore protection against scale buildup, corrosion, cavitation erosion, and pitting of wet sleeve liners. Use of this product at the specified interval is necessary to ensure maximum coolant life of 600,000 miles of on-road use (six years or 12,000 hours of off-highway use). After 600,000 miles of on-road use (six years or 12,000 hours of off-highway use), simply drain your system and fill with a fresh charge of Delo Extended Life Prediluted 50/50 Coolant/Antifreeze.

APPLICATIONS

This is a, nitrate-, borate-, phosphate-, silicate-, and amine-free formulation which uses ChevronTexaco's patented carboxylate technology to provide maximum protection of the six basic metal alloys found in most heat transfer systems. Since the coolant contains no phosphates or silicates, hard water deposits in the cooling system are reduced. Water pump seal wear is reduced as a result of fewer abrasive dissolved solids in Delo Extended Life Coolant System which results in improved water pump seal life.

The patented carboxylate corrosion inhibitors in Delo Extended Life **Prediluted 50/50** Coolant/Antifreeze has been shown to remain above 95% of their original concentration after 300,000 miles of on-road use (three years or 6,000 hours of off-highway use) in heavy-duty diesels without the addition of supplemental coolant additives. After 300,000 miles of on-road use (three years or 6,000 hours of off-highway use), simply add the Delo **Extender**, and Delo Extended Life Prediluted 50/50 Coolant/Antifreeze is good for another 300,000 miles of on-road use (three years or 6,000 hours of off-highway use). This system allows for 600,000 miles of on-road use (six years or 12,000 hours of off-highway use) between coolant changes without worrying about loss of corrosion protection.

Note: These products are not to be used to protect the inside of potable water systems against freezing

Do not add traditional coolants or SCAs to Delo Extended Life Prediluted 50/50 Coolant/Antifreeze, since doing so will reduce the product's extended life benefits.

Delo Extender is not recommended for use with the initial fill of Delo Extended Life Prediluted 50/50 Coolant/Antifreeze.

It is recommended that only Delo Extended Life Prediluted 50/50 Coolant/Antifreeze is used for initial fill and top-offs. Use Delo Extended Life Coolant/Antifreeze, should you need to adjust the freeze point as required by ambient conditions. Concentrate can be added to good quality water to prepare coolant when Prediluted 50/50 is not available or not desired.

It is recommended that coolants be changed at least every six years and disposed of properly.

Delo Extended Life Coolant/ Antifreeze **Pre-mixed 50/50** should be used as manufactured. No further dilution is recommended. For maximum protection against freezing in extremely cold areas, a 60 percent solution can be used. For improved freeze protection to -54°C, adjust Delo Extended Life Prediluted 50/50 Coolant/Antifreeze with Delo Extended Life Coolant/Antifreeze per the fol-

lowing table. Concentrations greater than 67 percent or less than 40 percent are not recommended.

Freeze Point Adjustments as Required by Ambient Conditions	
Total System Capacity, litres	Amount of Concentrate, litres
5	1
10	2
15	3
20	4
25	5
30	6
35	7
40	8
45	9
50	10

Boiling and Freezing Protection for Delo Extended Life Prediluted 50/50 Coolant/Antifreeze	
Boiling Protection, °C(15 lb pressure cap)	129.4°C
Freezing Protection, °C	-37.2°C

Delo Extender has been specially formulated to double the life of Delo Extended Life Prediluted 50/50 Coolant Antifreeze. It should only be added at 300,000 miles of on-road use (three years or 6,000 hours of off-highway use).

Quantity of Delo Extender needed at 300,000 miles of on-road use (3 years or 6000 hours of off-highway use)	
Cooling System Capacity, litres	Delo Extender Quantity, litres
22-30	0.5
30-49	1
49-83	1.5
83-114	2
114-155	3
155-197	4
197-243	5

Delo Extender should only be used with Delo Extended Life Coolants.

Because this product is silicate free, Delo Extended Life **Coolant/Antifreeze** and Delo Extended Life **Prediluted 50/50 Coolant/Antifreeze** can be stored at least 8 years with no problem provided the container integrity is maintained.

Delo Extended Life Coolant System is recommended for all heavy duty and natural gas engines including **Caterpillar, Navistar, Cummins, Detroit Diesel, Mack, MTU**, and other original equipment manufacturers (OEMs).

Delo Extended Life Coolant System is especially recommended for use in the cooling systems of all types of industrial internal combustion engines including systems containing large amounts of aluminum alloys.

Delo Extended Life **Prediluted 50/50 Coolant/Antifreeze** and Delo Extended Life **Coolant/Antifreeze** meet or exceed:

- For automotive service
 - ASTM D 4656 (Prediluted 50/50)
 - ASTM D 3306
- For heavy-duty diesel service:
 - ASTM D 5345 (Prediluted 50/50)
 - ASTM D 4985

Delo Extended Life **Coolant System** meets:

- Phosphate-free requirement of European OEMs
- Silicate-free requirement of Japanese OEMs
- Caterpillar EC-1
- Navistar B1, Type 3

CORROSION PROTECTION

Delo Extended Life Coolant/Antifreeze and Prediluted 50/50 have been tested against all ASTM standards for heavy duty and light duty coolants. In ASTM 1384, Glassware Corrosion test, Delo's inhibitor system rendered weight losses that were only a small fraction of allowed limits for all six metals tested.

Delo Extended Life Coolant/Antifreeze ASTM D 1384 Glassware Corrosion Test		
	ASTM Limit	Weight loss, mg per coupon *
Copper	10 max	2
Solder	30 max	0
Brass	10 max	-1
Steel	10 max	-1
Iron	10 max	-1
Aluminum	30 max	3

* Negative indicates net gain

Traditional coolants containing phosphate and borate exhibit high pH and reserve alkalinity (RA¹) when compared with Delo Extended Life Coolant/Antifreeze. This comparison cannot be used to make conclusions about relative corrosion protection since the definition of RA is based upon the buffering curve of inhibitors that are not present in the coolant. Delo Extended Life Coolant's unique corrosion inhibitor system is designed to protect aluminum and other system metals at lower pH levels than conventional coolants.

A comparison of Delo Extended Life Coolant/Antifreeze with traditional coolants is shown below:

	Delo Extended Life Coolant/Antifreeze	Traditional Coolant/Antifreeze
Typical pH	8.3	10.5
Typical RA (mL)	6.0	12.0

This extended life coolant has low pH and RA relative to traditional coolants. The pH change profile in service is a more important performance measure than the RA level.

Delo Extended Life Coolant/Antifreeze shows a typical pH reduction of less than 1.5 units in 160,000-kilometer fleet tests compared with a pH reduction of up to 3 units for traditional coolants.

1. RA is defined as the amount in milliliters (mL), of 0.1 normal hydrochloric acid required to reduce the pH of 10 ml of antifreeze to 5.5.

The American Society for Testing Materials (ASTM) has eliminated RA Level requirements in both key antifreeze specifications: ASTM D 3306 for automotive and ASTM D 4985 for heavy-duty engines. This action by the ASTM acknowledges that coolants that are not based on phosphate and borate can provide excellent corrosion protection for cooling system metals.

HANDLING PRACTICES

ChevronTexaco recommends flushing your system with clean water if you have been using conventional coolants. If significant deposits are visible, use a commercial cooling system flush designed for your engine, follow the manufacturer's flushing procedure and dispose of properly. Flush with water twice afterwards.

When changing Delo Extended Life Prediluted 50/50 Coolant/Antifreeze after 600,000 miles of on-road use (three years or 12,000 hours of off-highway use), flush with clean water only. Do not use commercial flushes. In the event that a commercial flush is inadvertently used, completely flush the cooling system (twice) with clean water.

The primary limiting factor in the shelf life of a coolant is silicate instability. Since silicate will eventually polymerize to silicate gel, all traditional silicate-based coolants have a shelf life of about 18 months. Delo Extended Life Coolant System is silicate-free and, therefore, can be stored for extended periods (up to 8 years) provided the integrity of the container is maintained.

Always dispose of used coolant in accordance with local, state, provincial, and federal guidelines

TYPICAL TEST DATA

Delo Extended Life Coolant/Antifreeze

<i>CPS Number</i>	227804
<i>MSDS Number</i>	10391
Appearance	Red
Specific gravity 15/15°C	1.130
Freezing point, °C ¹ , ASTM D 1177	-37
pH ² , ASTM D 1287	8.3
Reserve alkalinity ³ , ASTM D 1121	6.0
Silicate, % ⁴	None

Typical test data are average values only. Minor variations which do not affect product performance are to be expected in normal manufacturing.

- ¹ 50 vol % aqueous solution
- ² 1:2 dilution with water
- ³ as received
- ⁴ as anhydrous alkali metasilicate

Delo Extended Life Extender

<i>CPS Number</i>	227018
<i>MSDS Number</i>	10644
Appearance	Red
Specific gravity	1.06
Silicate, %	None

Delo Extended Life Prediluted 50/50 Coolant/Antifreeze

<i>CPS Number</i>	227805
<i>MSDS Number</i>	10400

Typical test data are average values only. Minor variations which do not affect product performance are to be expected in normal manufacturing.