HAVOLINE DEX-COOL® EXTENDED LIFE ANTI-FREEZE/COOLANT

Code 7994 **Havoline Extended Life Anti-Freeze/Coolant DEXCOOL®**
Code 7995 **Havoline Extended Life Prediluted 50/50 Anti-Freeze/Coolant DEX-COOL®**

Havoline Extended Life Anti-Freeze/Coolant* DEX-COOL®** *is a single-phase, ethylene glycol type universal automotive engine coolant based on Texaco's patented extended life carboxylate inhibitor system.* ***Havoline Extended Life Prediluted 50/50 Anti-Freeze/Coolant* DEX-COOL®** *is a 50/50 mixture of* ***Havoline Extended Life Anti-Freeze/Coolant *and deionized water.*

Product Application

Havoline Extended Life Anti-Freeze/Coolant DEX-COOL® is a universal engine coolant which incorporates a patented carboxylate inhibitor technology. This coolant meets both ASTM D 3306 for automotive service and ASTM D 4985 for heavy duty diesel service. It is a nitrite-, nitrate-, phosphate-, silicate-, borate and amine-free formulation which uses Texaco'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 almost eliminated. The low level of abrasive dissolved solids in **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** results in improved water pump seal life.

The life of a coolant in an automobile engine is limited by the corrosion protection ability of the corrosion inhibitors. The main corrosion inhibitors in **Havoline DEX-COOL® Extended Life Anti-Freeze/Coolant** has been shown to remain above 95% of their original concentration after 150,000 miles in automobiles. This allows much longer intervals between coolant changes without worrying about loss of corrosion protection. Used **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** was tested in laboratory controlled corrosion tests for new coolants after it had already been in service for more than 200,000 miles. The used **Havoline Extended Life Anti-Freeze/ Coolant DEX-COOL®** passed the ASTM D 1384 requirements for glassware corrosion with results equivalent to new coolants and also passed the ASTM D 4340 Aluminum Hot Surface Test for new coolant. **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** represents the next generation of universal engine coolants. This coolant is suitable for a five year or 150,000 mile service life in automotive applications.

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

Product Description and Features

Havoline Extended Life Anti-Freeze/Coolant DEX-COOL® is manufactured from ethylene glycol and a highly effective long term corrosion inhibitor package based on carboxylate technology. This inhibitor system eliminates the need for silicates, phosphates, borates, nitrites, nitrates and amine additives traditionally used for this purpose. The replacement of these inhibitors is significant for water pump life because many of these conventional inhibitors have been shown to be abrasive to water pump seals. In comparison field tests with conventional coolants in taxi fleets,

Havoline Extended Life Anti-Freeze/Coolant DEX-COOL® significantly reduced the need to replace water pumps during the 100,000 mile test.

In addition to fleet tests, this product has also been tested by a major manufacturer of water pump seals, and has been found to be more compatible with the seals than any other coolant tested.

Benefits

In service **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** provides:

- Meets GM6277M--General Motor's new Extended Life Coolant specification
- 5 year or 150,000 miles service interval
- Provides effective, long term corrosion protection for aluminum, brass, cast iron, steel, solder and copper
- Protects against winter freeze up and minimizes the chance of summer boil over
- Compatible with water pump seal materials and minimizes the formation of abrasive dissolved solids
- Storage stable for at least eight years
- No silicate dropout or gel formation during use or storage
- 100% biodegradable in its pure unused form
- Excellent heat transfer properties
- Nitrite, borate, phosphate, nitrate, and amine free
- Outstanding hot surface aluminum protection
- Superior protection in high operating temperatures
- Compatible with conventional antifreeze. Dilution with conventional antifreeze will reduce extended life benefits. Texaco recommends that this product not be diluted by more than 10% with conventional coolants.

Product Recommendations and Approvals

Havoline Extended Life Anti-Freeze/Coolant DEX-COOL® is recommended for use in the cooling systems of all types of automotive engines. This product meets ASTM D 3306 for automotive service and ASTM D 4985 for heavy duty diesel service. It meets GM 6277M, Ford WSS-M97B44-D, Volkswagen/Audi G-12, and most other European OEM specifications.
Havoline Extended Life Prediluted 50/50 Anti-Freeze/Coolant DEX-COOL® meets ASTM D 4656 for automotive pre-blend and ASTM D 5345 for heavy duty pre-blend.

Note:

For optimum year round protection against freezing, boiling, and corrosion, a 50 percent **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** solution (1 part AF/1 part water) is recommended. For maximum protection against freezing in extremely cold areas, a 60 percent solution (3 parts AF/2 parts water) can be used. Concentrations greater than 67 percent or less than 40 percent are not recommended.

Product Maintenance

Traditional phosphate and borate containing coolants exhibit high pH and reserve alkalinity (RA) when compared with **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®**. **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** unique corrosion inhibitor system is designed to protect aluminum and other system metals at lower pH levels than conventional coolants. A comparison of **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** versus traditional coolants is shown below.

	Havoline DEX-COOL® Extended Life Anti-Freeze/Coolant	**Traditional AntiFreeze/Coolant**
Typical pH	8.3	10.5
Typical RA (ml)	6.0	12.0

The above comparison should not be used to draw conclusions about the relative corrosion protection of **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** versus conventional coolants. RA (reserved alkalinity) 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. Since RA is based upon the buffering curve of inhibitors which are not present in **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®**, we suggests that it is more important that initial pH not change drastically during service interval versus using RA as a corrosion protection indicator. The American Society for Testing Materials (ASTM) has recently eliminated RA level requirements in both key antifreeze specifications: ASTM D3306 for automotive engines and ASTM D4985 for heavy duty engines. This action by the ASTM acknowledges that coolants which are not based on phosphate and borate can provide excellent corrosion protection for cooling system metals.

Recommended dilution for **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®**

Boiling Protection, °F (C) (15 lb. pressure cap) 50% (1 part AF/1 part water)	265 (129.4)
Freezing Protection, °F (C) 40% (2 parts AF/3 parts water) 50% (1 part AF/1 part water) 60% (3 parts AF/2 parts water)	 -12 (-24.4) -34 (-37.2) -61 (-51.7)

Notes:

- For optimum year round protection against freezing, boiling and corrosion, a 50 percent **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** concentrate solution (1 part AF/1 part water) is recommended. For maximum protection against freezing in extremely cold areas, a 60 percent solution (3 parts AF/2 parts water) can be used. Concentrations greater than 67 percent or less than 40 percent are not recommended.

- **Havoline Extended Life Prediluted 50/50 Anti-Freeze/Coolant DEX-COOL®** should be used as manufactured. No dilution is recommended.

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

- Because this product is silicate free, **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** can be stored at least 8 years with no problem.

Typical Characteristics

Havoline Extended Life Anti-Freeze/ Coolant	**Typical**
Code No.	**7994**
Appearance	Orange
Specific gravity 60/60 °F	1.130
Freezing point, °F (ASTM D 1177) 50 vol. % q.s. aqueous solution	 -34
pH (ASTM D 1287), 1:2 dilution with water	8.3
Reserve Alkalinity(ASTM D 1121), as received 10 ml sample	6.0
Silicate, % (as Anhydrous Alkali Metasilicate)	None

ASTM D 1384 Glassware Corrosion Test

Weight loss in milligrams per coupon, negative indicates net gain

	Copper	Solder	Brass	Steel	Iron	Aluminum
Havoline Extended Life Anti-Freeze/ Coolant	2	-2	2	-1	-3	4
ASTM Limits (Max.)	10	30	10	10	10	30

Handling Practices

The primary limiting factor in the shelf life of a coolant is silicate instability. Since silicate will eventually polymerize to silicate gel, all traditional coolants have a shelf life of about 18 months. **Havoline Extended Life Anti-Freeze/Coolant DEX-COOL®** is silicate-free and, therefore, can be stored for at least 8 years without a problem provided the integrity of the container is maintained.

For information on the safe handling and use of these products, refer to their Material Safety Data Sheets. For more information and availability, **1+800-782-7852**.