

# Penray's Fill-For-Life ESI Coolant Program

Category: Coolants  
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## Introduction:

Many customers have expressed a desire for information and recommendations regarding the use of Pencool® Need-Release® coolant filters in a Fill-For-Life program.

## Penray's Recommendation:

Using and maintaining a properly formulated coolant is one of the most important aspects of engine maintenance. The intent of this bulletin is to provide the information required to help diesel engine operators avoid cooling system problems. Coolant used must meet the following basic requirements:

- Provide an adequate heat transfer medium.
- Protect against cavitation damage.
- Provide a corrosion-resistant environment.
- Prevent formation of scale and deposits.

To achieve these requirements, coolants must be of good quality. Demineralized or deionized water mixed with fully formulated antifreeze is the best choice. Pencool 3000 may be used to provide corrosion protection in water-only coolant.

## Appropriate Fill-For-Life Coolants can now be classified into two (2) general groups:

1. Preferred: Fully formulated, phosphate-free extended service interval (ESI) coolants.
2. Accepted: In warm climates, plain water that meets the quality requirements published by ASTM, inhibited with 5% Pencool 3000.

Fully-Formulated Antifreeze is Preferred : Antifreeze is used to provide freeze protection for the coolant. It contains chemicals that provide protection against corrosion. Use antifreeze or coolant that meets ASTM D-6210 or D-6211 "Type A" phosphate-free requirements. The maintenance procedures described below for "antifreeze" or "coolant" apply equally to PG and EG.

Coolant recycled by reverse osmosis or ion exchange, properly re-inhibited to meet RP-329 or 330 requirements has been demonstrated to provide service equivalent to virgin antifreeze. Recycled antifreeze or coolants of these types are preferred. Other recycled coolants, especially coolants recycled through filtration processes, are not acceptable. Redistilled coolants vary in quality and must be qualified on a case-by-case basis.

For best overall performance, use a coolant consisting of 33% to 60% fully formulated antifreeze. Fully formulated antifreeze should be used without the addition of any additional coolant additive. If a pre-diluted fully formulated coolant is purchased, simply fill the clean cooling system. Always verify that the freeze point and nitrite concentrations are correct with a Penray test strip, to insure engine protection. Many antiquated antifreeze formulations available in the market may not contain all the required additives. Penray recommends against using these types of antifreezes.

Supplemental Coolant Additive (SCA) for Fully-Formulated Coolant: Fully formulated coolants do not require, and should not receive, an initial charge of SCA. Plain water systems do need to be treated. The proper dosage for plain water coolant is 5.0 percent by volume. Check the nitrite concentration at regular intervals (3 months, 20,000 miles or 300 hours, whichever comes first) with a Penray test strip. Additional SCA must be added to the coolant if it becomes diluted, as indicated by a nitrite concentration less than or equal to 1,200 PPM. If the nitrite concentration is greater than 1,200 PPM, and the system is equipped with a Penray Need-Release filter, do not add additional Pencool SCA.

SCAs replenish protection for the cooling system components. The coolant must be maintained with the proper concentration of SCA. Penray Need-Release automatically provides extended protection. The proper use of Need-Release will:

- Provide pH control.
- Restore Inhibitor levels to prevent corrosion.
- Prevent the formation of mineral deposits.
- Prevent cavitation of cylinder liners.

**Coolant Test Procedures:** Nitrite concentration is an indication of the inhibitor concentration. Use Penray test strips. The coolant must be tested for nitrite levels at intervals of 3 months, 20,000 miles or 300 hours. Nitrite concentration must be at least 1,200 ppm.

**Test Kit Procedures:** Use a Penray Coolant Two-Way Heavy Duty Test Strip to measure nitrite and glycol concentrations. Cavitation/corrosion protection is indicated on the strip by the level of nitrite concentration. Freeze/boil-over protection is determined by glycol concentration.

Use the test strips as follows:

1. For best results, test while the coolant is between 50° - 140°F (10.0° - 60°C). Dip the strip into the coolant for one second. Remove and shake to eliminate excess fluid. Immediately compare end pad (% Glycol) to the color chart.
2. Sixty seconds (one minute) after dipping compare the nitrite pad.

A laboratory analysis program is available through authorized Penray dealers under part number PTK 103. To verify long term coolant acceptability, submit a sample for coolant analysis every five (5) years, 600,000 miles, or 10,000 operating hours, whichever comes first.

## Summary of Coolant Recommendations

1. Always maintain the engine coolant to meet engine manufacturer's specifications.
2. Only use water that meets the ASTM water quality recommendation.
3. For topping-up and initial-fill use 30% to 60% fully formulated antifreeze, and water that meets ASTM water quality standards.
4. If you are using Need-Release, test the nitrite concentration with a Penray Test Strip. Add Pencool only if the nitrite concentration is below 1200 ppm.
5. Do not use automotive coolants.