Using Penray Test Strips to Maintain Mixed Coolant Technologies

Category: Coolants
Bulletin No. 99.019
Date: 03/01/99

PENRAY®

Introduction:

Many customers have expressed a desire for a simple and easy method to test heavy-duty coolants to insure proper freeze and inhibitor protection. Most coolants prove to be a mixture of competing technologies that are marketed across the country. The method used to test these coolants ought to be simple and reliable to use, and it must be inexpensive.

Background:

Several field coolant tests have been in use for years. These include the use of refractometers to measure freeze point or glycol concentration, titration kits to measure various inhibitor concentrations, and electronic meters to measure pH and conductivity. These tools are accurate and precise, but their expense and complexity of use sometimes results in inconsistent or abandoned testing practices in the real world. Recent breakthrough technology has provided a very attractive and reliable alternative for testing heavy-duty coolant.

Facts:

The new generation test strips (Penray TS-100, for example) are proven accurate. They differ from the instrument and titration test methods in that they are less precise. Test strips are a valuable screening tool to flag serious variations from normal and desirable coolant properties. They indicate when a need exists to perform more extensive testing or to adjust the coolant chemistry.

Penray's Recommendation:

Use Penray Two-Way Heavy Duty Test Strips (TS-100 or TS-102) to evaluate nitrite containing coolants including products from Caterpillar®, FleetCharge®, FleetGuard®, Detroit Diesel®, John Deere®, Quaker State®, AES, Toxguard, etc.

Maintaining The System:

Penray recommends a conservative approach to the maintenance of systems containing mixtures of coolants and/or SCAs. While the best way to test the coolant is to send a sample to a qualified coolant laboratory for analysis and recommendation, such a service is not always available or practical. As a quick and easy alternative, Penray recommends that the user evaluate the nitrite concentration and freeze point using a Penray Two-Way Heavy Duty Test Strips. Nitrite concentration and freeze point should be maintained within the engine manufacturer's specification; typically 1,200-6,000 ppm nitrite and 50% glycol is widely considered normal. Penray recommends that the molybdate concentration be ignored when evaluating mixed coolants, as low molybdate concentrations, when using a 3-way test strip, will mislead the user into thinking that the inhibitor concentration is too low, when, in fact, it is not. Therefore the use of 3-way test strips is not recommended.

Directions For Using Two-Way Test Strips:

1. Remove a fresh test strip from the bottle
2. Re-close bottle
3. Dip the strip in coolant sample for 1 second
4. Read the glycol concentration immediately against the green color chart
5. After about 60 seconds, read the nitrite concentration by comparing to the pink color chart

Notes:

Results are not reliable if:

- More than 75 seconds have passed since dipping the strip
- The strips have expired (see date code)
- The coolant sample is pure antifreeze (with no water in it)

Strips have been exposed to the atmosphere more than an hour (cap left off)