

WHY AUTOMOTIVE ANTIFREEZE IS THE WRONG CHOICE FOR INDUSTRIAL ENGINE COOLING SYSTEMS

AMBITROL* coolants are industrially inhibited glycol based heat transfer fluids, designed specifically for heavy industrial engines. This means that, unlike typical automobile antifreeze formulations, no silicates are used in their formulation. Although silicates are necessary to protect the aluminum in automobile engines, they cause a wide variety of problems in industrial engines.

Reduced Heat Transfer Efficiency

Silicates are added to auto antifreeze to protect metal surfaces of aluminum engine components by coating the surfaces. Components of large industrial engines are not made of aluminum and do not require this protective coating. Unfortunately, if auto antifreeze is used in an industrial engine, the silicates will coat all metal surfaces in the cooling system, including the heat exchanger surfaces. Such a coating will typically reduce the heat transfer efficiency of the system by approximately 10%. In addition, the coating will increase in thickness each time the system is drained and the antifreeze replaced.

Premature Pump Seal Failure

While silicates form this coating, a significant amount of silicate material continues to flow through the heat transfer system. Silicates are somewhat abrasive and can lead to premature pump seal failure. This failure is estimated to occur in an average of 2000 hours (based on centrifugal pumps data by Gorman-Rupp Industries).

Gelling of Coolant

If automotive antifreeze is run at glycol concentrations greater than 50%, at silicate inhibitor levels above 200 ppm, and/or at temperatures greater than 160°F, it is possible for silicates to form high molecular weight cross-linked polymers in heat transfer systems. This can cause the fluid to become gelatinous, sometimes thickened to a point at which the heat transfer fluid is no longer pumpable.

Frequent Drain and Refill Required

Most automobile antifreeze formulations are not readily analyzed and re-inhibited. Therefore after the typically recommended two- to three-year lifetime for these products, the system must be drained and refilled with a fresh charge of antifreeze.

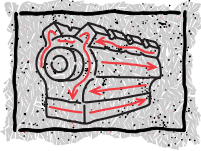
The long-term costs associated with frequent draining and refilling more than outweigh the initial costs for industrially inhibited glycol fluids from The Dow Chemical Company.

AMBITROL INDUSTRIALLY INHIBITED COOLANTS — Choosing Between EG and PG Coolants

The glycols present in AMBITROL coolants have many similar properties, but differ in heat transfer efficiency and toxicity. AMBITROL CN fluids, based on ethylene glycol (EG), are the more efficient heat transfer fluids. AMBITROL NTC fluids, based on propylene glycol (PG), are low in acute oral toxicity, which makes them more suitable for applications where accidental ingestion of the fluid is possible.

The improved efficiency of AMBITROL CN coolants is due mainly to the lower viscosity of these fluids. The remaining properties of the fluids—thermal conductivity, density, heat capacity, and freezing points—are all very similar. By utilizing the “Engineering and Operating Guide” for AMBITROL inhibited glycol based coolants, you can calculate the effect that switching from one glycol product to another has on your system's efficiency.

*Trademark of The Dow Chemical Company



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For More Information...

Tel: 1-800-447-4369

Fax: 517-832-1465

Web site: www.ambitrol.com

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