NORKOOL®

INDUSTRIAL PRODUCTS

TECHNICAL BULLETIN

NORKOOL® Industrial Coolants versus Automotive Antifreeze

NORKOOL® Industrial Coolants are superior to automotive antifreeze for use in industrial cooling systems where an ethylene glycol-based fluid is required. NORKOOL Coolants are specially formulated for heavy-duty operation and provide extensive corrosion protection and excellent heat transfer characteristics in cooling systems for many years. The corrosion inhibition system contained in Union Carbide's NORKOOL Coolants makes it a more stable, longer-lived fluid than automotive antifreeze.

The use of automotive antifreeze in an industrial system can cause extensive damage to the cooling system. Automotive antifreeze contains a corrosion inhibitor system that is best suited for today's car cooling system, with its large amount of aluminum components and its intermittent system operation. The silicate and silicone inhibitors in antifreeze provide corrosion protection by coating the aluminum surfaces to protect when the system is not operating (>50% of the time). This coating, while protecting against corrosion, reduces the capacity of the metal to transfer heat and to cool the engine. In an industrial system which operates continuously, and which contains little to no aluminum, the silicate and silicone inhibitor system merely serves to reduce heat transfer and cooling capacity and is not beneficial in protecting against corrosion of the non-aluminum surfaces.

In addition to reducing the heat transfer and cooling capacity of the system, automotive antifreeze poses a more long-term, but more detrimental, threat to the system. The long-term solubility and compatibility of the silicate and silicone inhibitor system with the ethylene glycol is poor. Over time, the silicates will react with the glycol to form a gel-like film. This gel further reduces heat transfer by coating cold surfaces, restricting flow in the system, and may plug piping completely, potentially causing catastrophic failure. When phosphates or water hardness ions are present in the system with the silicate inhibitor, a gritty sand may form along with the gel. As these gritty particles circulate with the coolant, they are very abrasive and may erode and corrode the metal walls of the system. Additionally, as a result of this abrasiveness, pump seal failure is more likely.

In order to maintain fluid stability and prevent silicate gel formation, automotive antifreeze must be replaced frequently: in heavy duty applications, annual replacement is required. This results in added costs due to downtime, and system cleaning, as well as the expense of the new antifreeze. In systems where a heavy silicate film exists, chemical cleaning will not dissolve this material; mechanical cleaning will be required. These high system maintenance costs contrast those of NORKOOL Industrial Coolants.

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NORKOOL® Coolants do not require frequent replacement, and thus the overall economics significantly favor NORKOOL.

NORKOOL Coolant's corrosion inhibitors provide a system which protects against the breakdown of the inhibitors or the glycol. NORKOOL Coolant has a high reserve alkalinity to neutralize any corrosive acids and to maintain the fluid's stability. With proper fluid maintenance, as outlined in our state-of-the-art sample analysis program, NORKOOL Coolants protect industrial cooling systems for many years. Therefore, to insure the longest life of your cooling system at the lowest overall cost, NORKOOL Coolants belong in your industrial cooling system.

Product Safety

When considering the use of any Union Carbide products in a particular application, you should review our latest Material Safety Data Sheets and ensure that the use you intend can be accomplished safely. For Material Safety Data Sheets and other product safety information, contact the Union Carbide Sales Office nearest you. Before handling any other products mentioned in the text, you should obtain available product safety information and take necessary steps to ensure safety of use.

No chemical should be used as or in a food, drug, medical device, or cosmetic, or in a product or process in which it may contact a food, drug, medical device, or cosmetic until the user has determined the suitability and legality of the use. Since government regulations and use conditions are subject to change, it is the user's responsibility to determine that this information is appropriate and suitable under current, applicable laws and regulations

Union Carbide requests that the customer read, understand, and comply with the information contained in this publication and the current Material Safety Data Sheet(s). The customer should furnish the information in this publication to its employees, contractors, and customers, or any other users of the product(s), and request that they do the same.

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