

# 10 Glycol Tips for Water Chiller Operators

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The use of an industrial inhibited glycol and water mixture is recommended in most water chiller systems. Ethylene and Propylene glycol are the two standard types of inhibited glycols commonly used.

The primary job of glycol is to prevent freezing of the process fluid and ensure consistent flow at the operating temperature. Inhibited glycol also help prevent scale formation and corrosion while protecting metals such as brass, copper, steel, cast iron and aluminum. Water systems treated with inhibited glycol will also be protected from algae and bacteria that can grow and degrade the fluid system performance.

**This brief provides ten essential tips for glycol users in water chilling operations.**

## 1. Don't Mix Glycols

Do NOT mix different types or brand names of glycol. Mixing glycols can cause corrosion inhibitors to precipitate out of the solution, resulting in gel formation that can clog filters and restrict flow. If switching glycol types or brands, the system must be thoroughly flushed and cleaned before refilling.

*\*Contact the DTS Parts Department for Flush and Fill Instructions.*

## 2. Don't Use Automotive Grade Anti-Freeze

Automotive anti-freeze is not suitable for industrial chiller applications. These products are not designed for industrial applications and may cause problems with heat transfer or fluid flow. Many automotive glycols contain silicate-based inhibitors that can coat heat exchangers, attack pump seals, or form a flow restricting gel.

## 3. Check Local Environmental Regulations

Always verify state and local environmental codes and regulations when selecting a process fluid. Some regions restrict or prohibit the use and disposal of certain glycols or additives, particularly ethylene glycol.

## 4. Ethylene Glycol for Most Standard Industrial Applications

Ethylene glycol is the most common heat-transfer fluid for general industrial use where low toxicity is not a requirement. It offers excellent heat transfer performance and is typically more cost-effective for high-volume industrial users.

However, ethylene glycol has moderately acute oral toxicity and must never be used in systems where the fluid could come in contact with potable water, food, beverage products, or food-processing environments.

## 5. Propylene Glycol for User-Contact Applications

Propylene glycol provides similar freeze protection and corrosion/algae prevention levels as ethylene glycol but with a lower level of toxicity. It is generally safer to handle, easier to dispose of, and commonly used in applications where personnel may come into frequent contact with the fluid.

For food plants or facilities where contamination is a concern, a food-grade propylene glycol must be used. Food-grade propylene glycol contains a specialized corrosion inhibitor package rated for incidental food contact, whereas standard propylene glycol inhibitors are not food-safe.

## 6. Understanding the Differences Between Ethylene and Propylene Glycol

At very low temperatures, propylene glycol becomes more viscous than ethylene glycol, which can slightly reduce heat transfer efficiency. Some chillers are specifically designed to compensate for this viscosity change, allowing either glycol type to be used.

Ethylene glycol is often selected due to its lower initial cost, but propylene glycol is frequently preferred due to less stringent SDS handling requirements and improved safety for maintenance personnel. Dimplex Thermal Solutions generally recommends propylene glycol for these reasons.

## 7. Use Distilled or Reverse-Osmosis Water

Water quality is just as important as glycol selection. Dimplex Thermal Solutions recommends the use of distilled or reverse-osmosis (RO) water when mixing glycol. These water sources reduce mineral content that can lead to scaling, corrosion, and increased maintenance. Water should come from a good quality, filtered source meeting the requirements of the process machine manufacturer.

## 8. Beware of Deionized and City Water & Maintain Fluid Cleanliness

Deionized (DI) water may be used for initial system fill, but unless the chiller is specifically designed for continuous DI operation, the water will aggressively attack certain metals once it begins absorbing ions. Always confirm compatibility with the chiller manufacturer before using DI water.

City or well water is also NOT recommended due to dissolved minerals, chlorine, and other additives that can shorten component life.

Maintaining clean fluid and proper glycol concentration will extend system life and reduce downtime. If the chiller was not supplied with a factory-installed fluid filter, installing a filtration system is strongly recommended to remove debris and contaminants.

## 9. Freeze Protection vs. Burst Protection

It is critical to understand the difference between freeze protection temperature and burst protection temperature.

- Freeze protection temperature is the point where ice crystals begin to form, creating a slush or “snow cone” consistency.
- Burst protection temperature is the temperature at which the fluid freezes solid and can rupture piping.

For example, a 30% glycol solution may begin to form slush at -15°F, but it will not freeze solid or burst piping until temperatures drop to approximately -20°F or lower. While the pump may not be able to circulate slushy fluid, the piping is still protected from mechanical failure.

## 10. Maintain a Minimum Glycol Concentration of 30%

Glycol concentrations should never be less than 30%. Concentrations below this level – especially with propylene glycol – can act as a food source for biological growth.

For example, a system operating with 10% propylene glycol is very likely to develop fungal or bacterial mats inside the tank and piping, creating a difficult and costly cleanup. Glycol concentrations between 30% and 50% create an environment where most microorganisms cannot survive and provide adequate corrosion inhibition.

### Typical Water/Glycol Mixtures

Application	Glycol %	Water %	Freeze Point
Indoor Chiller and Process	30	70	5° F / -15° C
Outdoor Chiller/Low Temperature	50	50	-35° F / -37° C

*\*Figures based on the performance of K-Kool-E brand ethylene glycol.*

For more information or to order glycol please contact our **Parts Department:**

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