

# Adding Antifreeze to Your Central Boiler Furnace System

If you are thinking about adding antifreeze to your Central Boiler furnace system, it is important to review the following information (which is also located in the owner's manual and/or the installation guide).

## Antifreeze

Most outdoor furnaces are installed without antifreeze when an existing heating system is in place and there is no anticipation of leaving the outdoor furnace unattended for extended periods of time (10 days or more). If the building being heated has an alternate heat source, system water may be kept from freezing by running the circulating pump(s) and drawing heat from the existing furnace or boiler in the home or building.

To prevent freezing if the outdoor furnace is not fired for extended time periods or if lengthy power outages are anticipated during cold weather, a nontoxic propylene glycol boiler-type may be used in the system. Some types of antifreeze that contain various inhibitors have been known to create problems like coagulation and jelling. To prevent potential problems, **do not use propylene glycol that is premixed with inhibitors**. Central Boiler 1650XL Inhibitor Plus (p/n 1650) is compatible with (raw) propylene glycol. It is important to use 1650XL Inhibitor Plus with straight propylene glycol for corrosion protection. If adding antifreeze to the system, it is imperative that the entire system contain **at least 30% antifreeze concentration mixed with softened, reverse osmosis or deionized water** to prevent bacterial growth and minimize minerals in the system. Bacterial growth is likely to occur with low antifreeze concentrations and can cause corrosion in the furnace water jacket and/or clogging of heat exchangers. To confirm the antifreeze solution is adequate and to kill bacteria, immediately heat the system up to 185° F, allow the pumps to circulate for at least 24 hours and then obtain a sample of the system water. Using an antifreeze tester, the solution must be protected to 10°F (-12°C) or below.

**NOTE: If using antifreeze, test the pH and nitrite levels once each month. Be sure to adhere to all warnings and precautions on the antifreeze label. Do not use automotive or RV types of antifreeze. If using antifreeze, use Test Kit (p/n 597) when testing the treated water in the outdoor furnace (see Water Quality and Maintenance in your Owner's Manual).**

It is also important to use the recommended amount of MolyBoost in Central Boiler's Titanium Series furnaces.

## Things to Know When Purchasing Antifreeze for Use in an Outdoor Furnace

**Concentration** - When purchasing uninhibited (raw) propylene glycol antifreeze, be sure the label identifies the percentage of product, as some are pre-diluted. Propylene glycol is sold in 100% concentration or in premixed diluted (30%-50%) concentrations. A testing tool should be used to test the antifreeze at the time of purchase. System concentration should not vary significantly from test to test.

**Freeze Protection Level** - The label should also identify the quantity required for the level of freeze protection needed. The glycol mixture concentration must be determined to adequately protect at the minimum temperature that the system is expected to be subjected to. Avoid using overly concentrated solutions, which adds unnecessary expense and can reduce heat transfer efficiency.

Volume	Freeze Point
50%	-29°F / -34°C
45%	-18°F / -28°C
40%	-8°F / -22°C
35%	2°F / -17°C
30%	10°F / -12°C



## Other Important Information

Propylene glycol possesses many characteristics that make it ideal for use in heat transfer systems where protection from freezing is required. Desirable properties include high boiling points, low freezing points, and stability over a wide range of temperatures, and high specific heats and thermal conductivities. Although propylene glycol is generally recognized as safe (GRAS) by the FDA, it is not intended for human consumption.

The concentration of antifreeze in the system should not be less than 30% or more than 50%. A low concentration can result in microbiological contamination causing the water to turn green and results in very low pH levels that can cause excessive, rapid corrosion.

While high quality glycol solutions may last many years, improper maintenance or biological contamination will significantly shorten fluid life.

If water or antifreeze is added to the system always immediately heat the entire system to 185° F to prevent biological contamination that might occur from adding water.

## Why You Should Not Use Automotive Antifreeze or Inhibited Propylene Glycol Products in Your Central Boiler Furnace

- Toxicity: it is sometimes difficult to get MSDS sheets with a complete list of chemical contents for automotive antifreeze or inhibited glycol. Some consist of some Methanol and Ethylene, both highly toxic chemicals. Many of these other antifreeze products, like Cryo-Tek™, contain phosphates and/or silicates to provide the corrosion protection. While this may offer some protection against corrosion, these inhibitors also have been the cause of plugged heat exchangers and other problems especially when there are water-to-water or water-to-air transfer exchangers with large differential temperatures in the heat exchangers.

- With inhibitors other than Central Boiler products the ability to test the inhibitor level often is not possible. Some of the manufacturers of the inhibited antifreeze or other corrosion inhibitors suggest that testing the pH of the solution indicates the level of corrosion protection. That is not an accurate method of monitoring the corrosion protection level. With Central Boiler's 1650XL Inhibitor Plus, p/n 1650, used along with raw (non-inhibited) propylene glycol, the nitrite level can be accurately measured to allow proper maintenance of inhibitor protection.
- pH maintenance is also very important. 1650XL Inhibitor Plus is buffered to prevent excessively high pH from occurring even if more inhibitor is added to the system than is needed. Other products may contain chemicals to increase the pH levels without buffers to prevent excessive pH.

## Why Using Central Boiler Products is Important

Central Boiler's MolyBoost, p/n 1670, and Sludge Conditioner, p/n 1660, can be used with 1650XL Inhibitor Plus, p/n 1650, and will still allow for accurate testing of the inhibitor protection level. These products have been formulated to prevent corrosion in all Central Boiler furnaces, including the Titanium Series, to provide protection for system pumps, brass and copper fittings and allow for accurate testing of the protection level. It is very important to understand these products can all be used together but the 1650XL Inhibitor Plus is required to provide the correct nitrite level. **Failure to use 1650XL Inhibitor Plus will void the corrosion warranty coverage.** The MolyBoost and Sludge Condition cannot adequately provide corrosion protection without the proper nitrite level being maintained.

## Where to Find Propylene Glycol

If you have any questions, or for help finding propylene glycol, contact your dealer.

