



## Protecting Small Hydronic Systems in the Winter

In the fall and winter, we get many questions about protecting small residential heating systems. They seem to cluster around two topics:

- Adding antifreeze to provide corrosion and freeze protection
- Laying up the system before an extended winter vacation

### Antifreeze

People ask if automotive antifreeze can be used in their heating system to provide protection against freezing and minimize corrosion in the piping system. It seems to make sense, because that's what these products do in an automobile engine. But the answer here is pretty clear: don't put them in a hydronic system. Those products are designed to protect an engine cooling system, so they have additives that are not necessarily friendly to hydronic pumps and seals. Along with freeze protection, you would get a load of problems.

If you must use antifreeze, make sure it's designed for hydronic systems, that it has the proper concentration of inhibitors, and that it's well mixed before you put it in the system. That brings up another issue. Small systems are filled with water through a pressure-reducing valve from the city water supply. City water pressure usually is high enough to fill the system and establish a little extra pressure at the top to prevent boiling and allow venting. To fill a small system with antifreeze solution, you would need a mixing tank and pump, but people don't have access to that equipment. It might be a great idea to add antifreeze to a larger hydronic system, because coils can freeze if they are exposed to cold ventilating air. But in a large building with a large system, there are maintenance people and equipment to do it right.

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Most small systems don't need antifreeze and additives for corrosion protection, anyway. Unlike a larger system, for which renovations, system changes, and maintenance actions are probable, a small system rarely, if ever, is opened up and drained. A system that is tight - as it should be - does not require any significant amount of make-up water. That means the oxygen in the system is rapidly "locked up" in forming metallic oxides, and the system as a whole becomes very non-aggressive. In short, corrosion stops. We routinely see small systems that have been in operation for decades with very little corrosion, simply because there's little loss of water. So there is no need to add new water, with its load of dissolved oxygen.

### Vacation

As cold weather approaches, a lot of people pack up and leave for warmer places, which brings up the other issue: What should we do with the heating system before leaving? Draining the heating system means exposing it to oxygen and renewing the corrosion process. Unless the system is completely dry, you can expect pockets of rusty water to work on the piping the whole time you're gone. Refilling the system with fresh, oxygenated water when you return just starts the process all over again. If you drain the heating system, you also have to worry about everything that could be damaged by low temperatures during the absence.

Given those drawbacks, most people simply set the thermostat down a bit and let the system maintain a high enough temperature to avoid damage. There are a few things you should double check:

- Inspect the burner system to ensure safe, efficient operation while you're gone.
- Make sure the system has an adequate fuel source.
- Make sure the boiler relief valve is not clogged or plugged and that it is positioned to discharge toward a floor drain.
- Look at the system pressure gauge to see whether the compression tank is maintaining the system pressure within an acceptable range as the system temperature swings from minimum to maximum. Undersized tanks, waterlogged tanks, or those with broken diaphragms can cause the pressure to rise too high, causing the relief valve to discharge.
- Think about adding low-water fuel cut-off protection to your boiler system. This will shut down the burner in the event of a serious loss of water.
- Shut the valve between the city water supply and the pressure-reducing valve to minimize water damage in case the system does start to leak.
- Lubricate the pump, if necessary.

If you have any hydronic system questions, contact your local Bell & Gossett Representative. They have solutions to all of your hydronic system problems.

**For more helpful information, visit our website at [www.bellgossett.com](http://www.bellgossett.com).**