HSC Hartford Steam
Building Comfort You Can Rely On

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in the Loop

The No-Glycol Alternative: Laying up chilled-water coils for less

If you already have an easy, cost-effective method of laying up your building's chilled-water coils, then you're one of the lucky ones. But if you're like the majority of building managers and engineers, you're probably still looking for a better way to get your coils ready for winter – and this article may hold the answer you're looking for.

Without proper layup, coils can freeze and become so damaged they must be replaced. Plus, frozen coils eventually thaw, which can cause significant flooding. So winterizing coils is a must; doing nothing isn't an option.

As shared with us by Dominick Tuzzo of Nalco Co., various methods of freeze protection have been employed over the years:

- Using a glycol solution to lower a coil's freeze or bursting point (the most prevalent, but not the most chilled-water 'friendly', method).
- Blowing out the coil with compressed air.
- Installing coils that incorporate freeze plugs within the coil design.
- Winterizing recirculation pumps to keep chilled water circulating throughout the coil during winter.

Tuzzo warns that while glycol winterization appears to be the quick and easy solution, it has numerous drawbacks: Once the glycol is introduced, the coil may not be easily converted back to chilled water. Connecticut weather during the shoulder seasons may swing wildly from day to night: The temperature may drop to less than 32 degrees F during the night, thereby requiring freeze protection, but rise to more than 55 degrees F the next day, requiring reactivation of chilled water through the coil.

Ethylene glycol is toxic and may not be released down customer drains. Substitution of propylene glycol may not provide the required burst protection, as a higher percentage of propylene glycol is required to achieve the same level of freeze protection as ethylene glycol.

Glycol has a different specific gravity and a different heat transfer coefficient than chilled water. The use of glycol may create a coating on the waterside surfaces of the coils, which will lower their heat transfer efficiency unless completely removed prior to reintroducing chilled water.

Glycol can contaminate our system's chilled water, decreasing water quality and increasing everyone's costs.

Glycol winterization is both costly and labor-intensive. There is no economic payback associated with glycol winterization. There are, however, savings to be exploited by moving away from glycol.

It is expensive to purchase AND dispose of glycol, and both costs continue to rise.

But for Hartford Steam's district cooling customers, the most serious side effect of all is how glycol can contaminate our system's chilled water, decreasing water quality and increasing everyone's costs.

Glycol contamination occurs when customers do not completely remove all trace amounts of glycol from their coiling coils before reintroducing chilled water. The glycol breaks down into acid byproducts that become nutrients for bacteria. The system then becomes fouled and corrosive, even in the presence of the best corrosion inhibitors. Customers throughout the system are then faced with fouling Y-strainers, discolored chilled water, increased corrosion problems, reduced heat transfer efficiencies and/or a host of other issues related to glycol contamination.

As a result, an ounce of prevention is worth a pound of cure: Try to avoid glycol coil winterization.

Glycol causes chilled-water system fouling and that means Hartford Steam Co. has to check system bacteria counts daily, regularly adjusting the amount of chemicals added – all of which increase chilled-water costs.

Although abandoning glycol may seem daunting, there is a proven approach that not only eliminates glycol use, but also saves you money in the process.

Dubbed "The LaRocca Solution" after its creator Dave LaRocca, the procedure is relatively simple: Air is blown continuously through the coils to ensure they become completely dry and remain so. Instead of using a separate blower or air compressor to blow out the water, the supply fan itself is used. On most medium- and high-pressure HVAC systems, the static pressure produced by the supply fan is sufficient to overcome the internal resistance of the coil tubes. You just need to configure the chilled-water piping in a manner that permits the coils to be drained by gravity and then purged by the discharge of the fan. The fan does all the work.

LaRocca, who is now the Yale School of Medicine's associate director of leased properties, Facilities Operations Center, first wrote up this method in the December 1997 issue of *Heating/Piping/Air Conditioning* magazine. "We were using glycol in the mid-1990s," he said. "But I knew we needed to find an alternate coil layup solution. Glycol was just too much of a problem and too expensive. One day I was looking at the supply fan and realized that four inches of static pressure blowing through eight inches of chilled-water main would produce

quite a volume of air, forcing the chilled water out of the pipe. We made some retrofits to our system, put the theory into practice and it worked. We've been using it ever since."

LaRocca claims this winterizing method has saved both time and money. There is no need to buy glycol, and no need to dispose of it. Plus, labor costs are significantly reduced since there is no handling, measuring or mixing. The seemingly endless hours of pumping to evenly mix the glycol and water are eliminated, plus workers' compensation costs are reduced. And then there is the added benefit of being able to place cooling coils quickly back into service.

In 1997 LaRocca estimated it cost $155,000 (~$208,000 in 2008) to modify a building system with 56 large air-handling units (more than 10 gal) and 41 small AHUs, with a resulting annual savings of about $33,000 (~$45,200 in 2008). He figures the savings would be even greater today since glycol purchase and disposal costs have risen dramatically since then. "Whatever the number," he said, "the conversion has paid for itself many times over."

If you would like to learn more about "The LaRocca Solution," go to Hartford Steam's Web site at www.hartfordsteam.com/resources.htm and read the special feature – LaRocca's 1997 article that details the process. Or call Jeff Lindberg at (860) 548-7348 to find out more.

There IS an alternative to using glycol to lay up your coils for winter. We encourage you to seriously consider using the proven LaRocca Solution. It could be the ticket to keeping your chilled-water costs down and system water quality at its finest.

A Rising Star at City Steam Brewery

Beer may be the feature attraction at City Steam Brewery, but a new star is definitely on the rise – freshly baked baguettes. Several months ago Brewmaster Ron Page decided to turn his artisan bread-baking hobby into a signature offering at the brewery – and the result has been nothing but phenomenal.

Desiree Meyer is head baker, teaming her skill with Ron Page's experience to produce the delicious baguettes at the City Steam Brewery.

"We started out baking a couple hundred baguettes per month, and we're already up to more than 6,000 per month, including rolls, torpedoes and baguettes," says Page. "We're baking all of the bread served in the restaurant, but it's hard to keep up with the demand. Ultimately, though, we'd like to open it up and sell a limited number – hot from the oven - to the general public."

Page notes that when you think about it, many of the ingredients for beer and bread are the same, so it's really a perfect pairing. He's convinced that the malted barley used in his baguettes are what make them extra special, as not many bakeries have regular access to the types of ingredients he has on hand for making his famous brews.

Congratulations, Ron and the City Steam Brewery, on your new rising star. Hartford Steam is pleased to continue providing steam for your brewing process and keep your patrons comfortable while they're enjoying the fruits of your labor.

Making a Statement With Years of Service

Tony Dudus is Hartford Steam Co.'s accountant II.

It's been more than a decade, but to Tony Dudus, it seems like just yesterday he began work at Hartford Steam Co. and first learned about the company's district heating and cooling systems.

Since joining the company in 1997, Tony has learned much about the technology as well as the business. Previously with Aetna Insurance, he now serves as accountant II. He's in charge of processing financial statements and working closely with Diane Wojcik and Jeff Lindberg on customer billings. He also handles cash management.

"The people here are great," says Tony. "Whether I'm doing work for Hartford Steam Co. or one of the other divisions, I find my work enjoyable. I like the challenge of making it all tie out and determining final earnings figures."

Tony is originally from the area and now lives in South Glastonbury. He spends much of his free time serving as chauffeur and watching his three daughters practice and play traveling soccer. He also enjoys golf and saltwater fishing, where he feels catching striped bass is his calling.

Thanks, Tony, for your years of service to our company and our customers!

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