Green Buildings

BY PAUL APPLER

Sealants play HVAC/R maintenance role

Refrigerants escaping into the atmosphere from leaking heating, ventilating, air-conditioning and refrigeration (HVAC/R) equipment are major contributors to global warming. And it's mind boggling how many pieces of HVAC/R equipment there are in commercial buildings.

Most people relate to rooftop air-conditioning equipment, but there could be dozens and maybe hundreds of pieces of equipment in a building that range from walk-in cooler, refrigerators, ice makers, chillers, food-service equipment, etc. Unfortunately, all of this equipment has the potential to leak refrigerants one day.

Fixing or replacing a suddenly leaking $30,000 rooftop HVAC/R unit on a retail store, hospital, office facility or some other commercial building can shock even the most bountiful maintenance budget of a facility. A facility manager also that knows the options on failing equipment can not only save his/her building money, but most likely save the environment of leaking refrigerants and therefore run a greener facility.

Most HVAC/R units eventually leak due to basic wear and tear from continual vibrations and many times from galvanic corrosion. It will most likely happen after 10 or 15 years, but it could also happen after just a few years. Then comes the decision a facility manager must make with the service contractor (repair, component replacement or total unit replacement). On a $30,000 rooftop unit: a repair might range from $300 to $1,000; a component replacement, such as a coil might cost $750 to $2,000; and a total unit replacement would be $30,000, not to mention added labour and installation costs.

There's a fourth option that might be one of the largest secrets in maintenance today—HVAC/R system sealants that stop leaks and prevent future leaks from occurring for several years.

It's recommended that a service technician should try to repair a refrigerant leak conventionally—finding the lead and brazing it. Unfortunately, not all leaks can be found or are accessible to fix even if they're detected. That's when sealants should be considered.

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Service contractors sophisticated enough to work on commercial HVAC/R equipment probably have heard of the industry's relatively new high-tech sealants, but not all use them. The reasons vary, but continually putting in refrigerant into a leaky system, even though they know it will leak out over the course of the next six to 12 months and their services will be needed again, shouldn't be an option.

This unlawful method is called, "topping off" a leaking system. It's not only detrimental to the environment, but contractors and their unknowing commercial building clients can receive hefty fines from the Environmental Protection Agency (EPA) if discovered.

HVAC/R sealants have only appeared on the market since around the turn of the century, but they're one reason why fewer refrigerants are being accidentally released into the environment. Sealants are a blend of organisilanes that react to moisture. When injected into an HVAC/R system, they move freely through the system with the refrigerant.

In a leaking system, the refrigerant and sealant leak out of an exit hole. The sealant reacts to moisture in the atmosphere and crystallizes around the hole, forms a bond and prevents any more leaking. This is very similar to the human body and how blood clots to stop the bleeding of a wound.

An extra advantage is the preventive maintenance aspect. The residual sealant remains in the system and immediately stops future leaks as they occur. The facility manager nor the contractor will really know how many times other leaks occurred and were stopped.

Bonded leaks can endure up to five to 10 years, thus giving a new lease on life to an aging system. Delaying a $30,000 rooftop equipment replacement by 10 years can be a boon for any facility's maintenance budget.

That's the economic angle. The environmental angle means fewer refrigerants are leaked into the atmosphere. Additionally, an HVAC/R system runs more efficiently under a full refrigerant charge. As a result, it uses less energy.

One of the first uses of sealants helped prevent a Ford plant in Windsor, ON, from shutting its engine production back in 2001. Maintenance engineers had the choice of replacing a leaking chiller component vital to the production process, which could have taken up to a week of idle time, or sealing the system. They sealed the system in just a few hours with two $60 cans of sealant and the chiller is still running flawlessly today and hasn't leaked since.

Sealants can help maintainers reduce costs and stop refrigerants from entering the atmosphere via leaking HVAC/R equipment.

So, what does a facility manager do when suggesting a sealant to a reluctant contractor that either isn't familiar with the technique or insists it doesn't work? The answer is to call any local HVAC/R distributor that carries sealants and ask for a recommended contractor. **PEM**

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