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SNOWMELT systems

Getting rid of the white stuff
is a big job. Catch our drift?

By Allison Deerr



32,000 lineal feet of 3/4-inch RadiantPEX (e PEX b) tubing from Watts Radiant was installed at the new JB Hunt HQ facility in Lowell, AR. Watts Radiant photo by Dan Frisch.

ant snowmelt system is to remove just enough cold from the mass to melt snow and ice.

“Building owners and facility managers are well aware of the importance of proper snow removal, from conforming to the Americans with Disabilities Act for safe and easy access, to providing protection from slip and fall injuries,” said Jeff Wiedemann, product manager of controls for Uponor.

“For commercial applications, especially those deemed critical areas — hospital and senior housing entry areas, helicopter pads, delivery and handicap access ramps — snow-melting performs a valuable, perhaps life-saving function,” said Rich McNally, Eastern region sales manager, Watts Water Technologies.

Conventional snow-removal methods — plowing, shoveling, salting, sanding — can impose a great financial burden year after year, not just for the labor and materials, but also the wear and tear on the surfaces in and around the structure, Wiedemann said. “Traditional snow-removal methods can even be an environmental hindrance if using special chemicals that are either tracked into the building by guests or absorbed into the ground during the spring thaw.”

Frequently, a key obstacle to winning the interest of building owners is the upfront cost for snow melt system installation, McNally said. “Well, it’s not inexpensive, but there are benefits that balance out the equation. These include convenience, environmental enhancements — no salts, cinder and chemical deicers — and the greatly reduced labor and hardware costs needed to do the job. Ice-melt chemicals can kill nearby plants, increase building cleanup as they’re tracked inside and, over time, degrade concrete and asphalt.”

One of the key obstacles to choosing hydronics is neutralized if a facility has waste heat that can be exchanged, McNally explained. “If excess heat is available, or if all that’s needed is an additional geothermal or water-sourced heat pump during the design phase, an upgrade may be feasible. And, given today’s litigious society, the cost of the system is more than returned with one avoided lawsuit. Some insurers recognize the value of these systems, rewarding building owners with reduced insurance rates.”

Cost-effective

Snowmelts themselves are not that expensive to operate since they’re activated only occasionally, McNally said. “The biggest cost incurred with a snowmelt system is the up-front cost. Glycol antifreeze is required for all systems because system fluid is either dormant or could go dormant for a period of time. Relatively large pumps may be required to move slushy water-glycol mixture on initial system start-up. Larger heat sources are required to deliver the 100-300 Btu/hour/square foot. Supply and return piping is required to get the energy from the boiler to the manifolds for the tubing buried in the slab.”



Action, Inc. installers secure 3/4-inch PEX to reinforcement wire. Watts Radiant photo by Dan Frisch.

The cheapest system to operate is an on-off snowmelt, he asserted. “Idled systems, because they operate any time the temperature is below 38 degrees Fahrenheit, cost more to operate. These systems typically consume up to 100 Btu per hour per square foot whenever they are idling and up to 300 Btu per hour per square foot during full operation. Hospitals may have waste heat from steam or condensate that may be readily available, greatly reducing or eliminating energy needs.”

Snowmelt systems are installed in sidewalks, driveways, stairs, roadways, ramps, bridges, access ramps, parking garage ramps, parking spaces for the handicap, airport runways, hospital ambulance zones and helipads, carwashes and loading docks.

With space becoming more and more precious, many hospitals are forced to install rooftop helipads, which can become extremely dangerous when coated with ice and snow.

There’s nothing like waking up to a fresh dusting of snow — on top of the six feet of powdery white stuff Mother Nature dropped on the area last week. In parts of the West where snow fall in autumn, winter and spring is a given, removing those drifts from specific spots becomes a matter of safety, convenience and economics.

Hydronic radiant snowmelt systems are gaining ground on traditional snow-removal methods. As the experts explain it, snowmelt isn’t radiant heating. Radiant snowmelt is not shedding warmth to a space. The job of the radi-

SNOW MELT



Most of the snowmelt loops were about 400 feet long; here the PEX is secured to re-wire. Watts Radiant photo by Dan Frisch.

Snowmelt systems keep them free of the dangers to the helicopter pilots and others.

Instead of melting an entire large area, like an airport runway or expansive parking lots, smaller “hot pads” are equipped with melt systems where snow can be deposited. This technique is often used for airport runways and large parking lots. It’s not uncommon to have a hot pad of perhaps 30 feet by 30 feet with snow piled four- to six feet high.

How they’re configured

Uponor designs snow melt systems using a reverse-return loop pattern, Wiedemann said. “Regardless of the shape or size of the snow melting area, using this method will always ensure uniform heating across the surface, effectively removing all the snow buildup over time. Tubing spacing, or distance between the piping, can also affect the performance of the system. This spacing will depend on several factors: (1) the criti-

cal nature of the area; (2) how cold the geographic area gets; (3) wind speed; and (4) snow fall rate.”

The snow melt system installer must consider a number of options including installation method, tubing type and heat source. There are several different methods for installing the PEX tubing, including tie-downs to wire mesh or rebar, or stapling to rigid foam. The heat source for snow-melting systems can vary from traditional modulating-condensing (commonly called “mod-con”) boilers, to solar, geothermal and even waste heat.

When it comes to controls, choices include automatic, semi-automatic and manual, Wiedemann said. An automatic system uses a sensor placed in the ground to detect when snowfall begins. The sensor sends a signal to the heat source to activate the warm liquid flow through the radiant tubing. A semi-automatic control requires a manual intervention to start the system,

but also includes a timer that will operate for a preset amount of time and then shut the system off when it times out. A manual control is simply that; the system turns on and off with the flip of a switch.

“Another option for controlling a snow-melt surface is to idle the system at a preset temperature (typically between 22 and 28 F) to ensure it can ramp up quickly in the event of snowfall. This option is often useful in critical areas that must remain snow- and ice-free, such as walkways or entryways to buildings to keep them safe. The idle option can be used with either automatic or semi-automatic controls,” Wiedemann said.

With hydronic snow-melting, the method of snow and ice removal employs tubing buried outside in a mass to gently melt-off winter precipitation to keep pathways, driveways, and other areas dry and clear, McNally said. Typical snowmelts employ tubing buried in a concrete slab. The most popular tubing used is either syn-

thetic material or cross-linked polyethylene “Both types of tubing have a long history of performance and longevity in high temperature applications.”

Tubing comes in a variety of sizes; typically 5/8- to 3/4-inch inside diameter will be seen in a snowmelt system. The tubing ties into the supply and return piping via twin distribution manifolds. The layout is usually easiest if these manifold pairs are located together next to the zone, or area to be snow melted. Manifolds can be located away from the zone, but then more tubing will be required to get to and from the manifold pair. Tubing lengths vary according to manifold placement, McNally explained.

“Tubing is spaced six- to 12 inches on center and circulates water that’s been heated to 110 to 140 F. Tube spacing is varied according to the degree of snow melting required. More snowfall that needs to be melted at a faster rate will require closer spacing of tubes. More material over the top of the tubing increases resistance to heat transfer requiring a higher supply water temperature.”

“Hydronic snowmelt systems are often found where existing hydronic systems are already at work, such as with radiantly-heated spaces, or where pool heaters are already in use — becoming an opportunity for dual-purpose use of existing heating equipment,” McNally added. A heat exchanger can be added to decouple the interior heating system and system fluids from the anti-freeze-protected fluids used for snow melting.

“The link to existing systems changes entirely when larger snowmelt systems are planned. When large parking areas or loading dock spaces are to be snow melted, the need for Btus — and often for equipment fully dedicated to the task — mean that system designers typically separate heating systems used for interior and exterior spaces.”

So, let it snow. Wherever the white stuff piles up, there’s a hydronic radiant snowmelt solution. **RJ**

Allison Deerr, a longtime RJ contributor, is based in Anaheim.



Action, Inc. installers secure 3/4-inch PEX to reinforcement wire. Watts Radiant photo by Dan Frisch.

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