



thinking outside the box for radiant heating

Warm floors and full-home heating systems are not the only radiant-heating business opportunities available in this economy, as long as HVAC techs think outside the box.

BY KOLYN MARSHALL

When most people think of radiant heat, they think of warm bathroom and kitchen floors or full-home heating systems. While this is an accurate image, there is a bigger, broader picture that should be considered. The introduction of new technology and tools is not always a door-opener for new business. It sometimes requires thinking outside the box to find the path to new opportunity. One of the easiest ways to start is with what is already known about radiant heat.

From many perspectives, radiant-heat systems are no different than traditional forced-air HVAC systems or, for that matter, even a refrigeration system—each is a means of conveying heat energy either toward or away from a destination.



⤴ Techs tie down EPDM radiant-heat tubing in the area where auto mechanics work at the Volkswagen dealership in York, PA.

In today's energy-conscious environment, when every Btu is being scrutinized, the key is to design a system that is simple, energy-efficient and reliable. This is where contractors and technicians need to start thinking outside the box.

Running hot and cold

Most grocery-store coolers and freezers are designed for a single task: to remove heat from a case or enclosure so that food is kept cold or frozen. This is generally done via a compressor that extracts heat from the cooler and evacuates it out of the building. Think of adding a radiant-heat system to the equation—rather than vent that extracted heat, reclaim it.

Adding a refrigerant-to-water heat exchanger and a radiant system, a smart system designer could divert that vented heat, and put that otherwise wasted energy to work—to melt snow from a portico, loading dock or sidewalk area, or even to supplement the heating of an interior space. Heat reclamation is one innovative way to integrate radiant heat into a system, but there are more.

Waste-oil boilers are an energy-efficient, green alternative to traditional boilers and a perfect match for a hydronic radiant application. One example where this has been used is at the wildly innovative York, PA-based Volkswagen dealership. The system installed took the term “fahrvergnügen” (or driving with zeal) to a whole new level when designers incorporated radiant heat into the dealerships' 24-bay service area.

“Of course, it's in the winter that we see the greatest transformation,” says Chris Bernlohr, General Manager of York Volkswagen. “Customers are quickly aware of the comfort they have in a facility with whole walls of glass—just the opposite of what you'd expect.”

A.D. Supplies, located in Willow Grove, PA, was the supply and installation firm—specializing in waste-oil-fired heating systems—that handled the installation.

“The York VW facility was one of several new VW marketplace dealerships [where] we’ve [installed] waste-oil systems,” says Jeff Dale, President of A.D. Supplies. According to Bill Shapcott, Dale’s partner in the business, the firm specializes in fleet garage, truck and auto-dealer facility installations within a four-state region.

York VW managers took several additional steps on their own to reap the “heat-for-free” rewards concept. Waste-oil boilers were coupled with 30,000 lineal ft of Watts Radiant’s Onix EPDM tubing to provide heat in the service area where mechanics are greeted by a heated concrete floor on subzero days. The fuel being burned to heat this floor is a random mix of used motor oils, crank-case oil, transmission oil and hydraulic fluid that would otherwise require proper disposal, which costs the company money.

Why shovel when snow melts?

In addition to interior comfort and energy efficiency, radiant heat can enhance daily life in other ways as well. Snow-melt technology, for example, is essentially radiant heat applied to outdoor surfaces. There are few differences between the two heating techniques, and both can be used to heat low- or high-mass concrete surfaces to melt ice and snow, keeping surfaces safe and clear of icy accumulations. These systems work especially well to preserve concrete surfaces stamped with a pattern.

Exterior applications range from traditional driveway and sidewalk snow-melting to more elaborate uses for hospital helicopter-landing pads; senior-housing entry areas; zoo pens for large animals, including winterized water features; higher-temp airport “hot spots” where large volumes of snow can be rapidly melted; and commercial loading ramps.

Mammoth Mountain ski resort, located in Mammoth Lakes, CA, took snow-melting to a whole new level when they began expanding their ski lodge and outdoor amenities. Consider these conditions:

- Average of 32 ft of snowfall each year;
- A typical winter storm can dump up to 3 ft of snow at one time;
- Elevation at base camp is 7,953 ft above sea level;
- Outside temperatures drop as low as -20°F;
- Lift stations average 50,000 rides per hour; and
- The entire resort covers 3,500 acres and 3,100 vertical ft.

“We see snow melt as a valuable investment,” says Tom Hodges, Director of Development Management and



⚡ An average of 32 ft of snowfall/year, an elevation of 7,593 ft above sea level, and outside temperatures that can drop to -20°F were some of the considerations required for the Mammoth Mountain ski resort snow-melt installation.

Governmental Relations for Mammoth Mountain. “There are many advantages for us to use this technology.”

Public safety is a primary consideration with so many skiers attracted to the resort. Snow melt assures fewer slips and falls, and it also keeps the lifts accessible and open for the thousands of rides per hour all the lift stations provide.

Uncommon luxury

Snow melting is not the only exterior application where radiant heat can be used. Managers at the WS Hotel in San Diego, CA, utilize this technology to offer patrons a rather uncommon luxury.

As part of an exclusive outdoor attraction, the hotel incorporated EPDM radiant heat into a rooftop sand bed that surrounds a fire pit. EPDM tubing was placed under stone patios, the sand beds and perimeter concrete seating. Patrons can sit comfortably outside, with toes dug deeply into warm sand, even when outside temperatures drop during fall and winter.

Similar technology was applied on a larger scale several years ago at the home of the NFL’s New England Patriots, Gillette Stadium in Foxborough, MA. Thirty miles of RadiantPEX tubing was placed about 6 in. below the surface of the natural turf to keep the grass healthy and the playing field green all year long.

Even managers of the Cloverleaf Kennel Club dog-racing track in Loveland, CO, invested in an extensive radiant-heat retrofit of their track a few years ago. It was important to control the dirt track’s moisture level, and in an effort to extend the racing season, prevent the track from freezing. The radiant-warming system helped to optimize the running surface, which improved running times—for a greyhound with a top running speed of 45 mph, twice the speed of the fastest human runner, this was important. The system has worked well since its installation and, if this is any indication of customer satisfaction, tails are routinely wagging.

» To reduce system installation time at Rehabitat, Dave Yates, President of F.W. Behler Inc., installed a pre-manufactured "HydroControl" panel.



Dogs, birds and kangaroos

Animals also are happier in Pennsylvania, where Dave Yates, President of F.W. Behler Inc. in York, PA, helped a volunteer task force of eager helpers install radiant heat at the nearby Rehabitat Animal Shelter, a facility for birds of prey, canines and macro-pods.

On his first visit to the jobsite, Yates was introduced to Owen, the larger of several kangaroos. "I could've sworn the animal was sizing me up, ready to belt me if the planned installation of radiant heat didn't measure up to his expectation."

Wendy Looker, who manages Rehabitat, explained that, though their budget was tight, the many animals there would benefit from the comfort of radiant heat.

The system they settled on for the new 1,800-sq-ft building would be divided into three distinct areas: office/dogs; raptors; and macro-pods. To reduce installation time, Yates installed a pre-manufactured "HydroControl" injection panel. Prior to the mechanical tie-ins, and with direction from Yates, the volunteer crew installed thousands of feet of synthetic-rubber EPDM radiant tubing, which was tied to reinforcement wire pre-concrete overpour.

During the first winter with radiant comfort, the macro-pods were warm, and the raptors and canine critters were comfortably cuddling up to the heated concrete slab, resting and healing remarkably well. Radiant heat was just what the doctor ordered. Owen and Yates have been good friends ever since.

Improving and saving lives

Radiant heat can improve the health and happiness of the human species as well. When Dee Hein built a cancer-recovery center and yoga center studio on Orcas Island, 20 miles

off the coast of northwest Washington, she installed radiant heat to provide uncompromised comfort for recovering patients.

"Radiant heat is ideally suited to yoga. People have commented about how cozy they feel in our new studio," said Dee. "It's especially important for yoga to be practiced in a comfortable setting. With a warm floor, it's pure magic."

Radiant heat not only can help people heal, but help save lives as well. J.B. Hunt, one of the largest trucking companies in North America, takes transportation seriously. Their reputation for safety and efficiency played into a decision they made to install an extensive snow-melt system for their new headquarters building in Lowell, AR.

The 22,000-sq-ft snow-melt system has been hard at work for the trucking firm for the past two winters, easily dealing with rigors of Midwestern ice and snow. In a sad irony, founder Johnnie Bryant Hunt slipped on ice at a nearby restaurant in December 2006. He died in the hospital five days later.

It was the firm's corporate vision that prompted the extensive snow- and ice-free zone outside their new headquarters—a new, five-story office addition that effectively doubled the size of their office space. Today, the large circular driveway, sidewalks and entryway are easy to navigate throughout the winter.

The largest part of the snow-melt system lies under a bed of asphalt. Just below it, 32,000 lineal ft of 3/4-in Radiant-PEX tubing carries a heated, 50/50 glycol solution to and from a large plate-to-plate heat exchanger. The 11-zone hydronic system has a liquid volume of almost 1,000 gal and requires 175 gpm to accomplish the mission of melting snow and ice before it has time to accumulate. Installing the system required the work of a team from Fort Smith, AK-based

Action Inc., the mechanical contracting firm that installed the system.

"We used...three-quarter inch Epex-B, laid under a 10-in. layer of chat," said Ron Wright, Vice President of the firm. Once the [tubing] was laid and the chat filled over the top, a four-in. layer of asphalt was added. The system was designed as a reverse-return system with one large circulation pump.

The heart of the hydronic system is a large, skid-mounted HydroControl package that was built specially for this job by Watts Radiant. The 4,200-lb system includes a bank of circulators, pipes and valves, and the bypass loop protects the boiler from the inrush of cold water at startup. Essentially, all of the system's hydronic functions are here, or interact with the unit.

"The HydroControl skid saved Action Mechanical a lot of piping strategy and field time," said Cary Pestel, President of Boone and Boone Sales Company Inc., a manufacturer's rep firm based in Tulsa, OK. "Wright told me that had they built the control unit themselves, they [would] have put hundreds more man hours into the job."

All of these applications represent just a small facet of what radiant heat can do. The technology is incredibly efficient and inherently flexible in its application. Couple those characteristics with a mechanical solution that can tap waste heat or reclaimed energy, and the possibilities are limitless. That is thinking outside the box. ☞

[Editor's Note: Marshall will be offering a detailed presentation on unique applications and installations for radiant-heat technology during the 73rd RSES Annual Conference and HVACR Technology Expo, which takes place Nov. 9–13, 2010, in Tucson, AZ. For more information on this and other accredited educational sessions, visit www.rses.org/conference.aspx.]

A 15-year veteran of the radiant-heat industry, Kolyn Marshall brings both design and field experience to his position as Marketing and Product Manager at Watts Radiant. For more information, e-mail marshakl@watts.com or visit www.wattsradiant.com.

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