

Radiant Heat

Efficient and Now Easier, Radiant Heat is Rising!

Several ideas that originated in Europe have crossed to the U.S. Here, microbreweries, coffeehouses and rock climbing have all caught on. Such is also the case with something a little less recreational: radiant heating.

Maybe you won't find a residence with radiant heating in every neighborhood, as you do at Starbucks, but there's no doubt its popularity is growing. Paul Izenstark, director of technical services at Warmboard Inc., comments that the demand for radiant floor heating has increased an average of about 25 percent a year nationwide in the past 10 years.

What accounts for this performance? In a word, comfort, which Steve Bench of Heatizon Systems describes as "almost the unique selling proposition of this industry."

Radiant floor heating can be either hydronic or electric. Hydronic is more commonly used in new construction for whole-house heating; electric in remodeling for smaller spaces such



COURTESY WARMBOARD INC.

Warmboard radiant heating—installed at the same time as subflooring—combines high-strength tongue-and-groove plywood and APA-rated subfloor paneling with a low mass, high-performance radiant heat floor panel.

between the wires, the applicator can cover anywhere from 60 square feet to 74 square feet. Warmup also offers a dual-wire mat, which Mangino says contractors seem to prefer. One reason for that may be the company's safety-net guarantee: If a contractor accidentally cuts a wire, he can return the old product for a free replacement.

A radiant panel will heat all objects that are in its direct line of sight—including people. Whether electric or hydronic, a radiant system is designed to match the heat loss of the human body. The surface temperature of a heated floor usually is lower than our body temperature, yet feels comfortable.

Radiant heat moves in any direction, giving up its warmth when it comes into contact with a cooler surface. The larger the surface, the lower the temperature required, according to the Radiant Panel Association.

Warmboard offers what Izenstark says is a

IN ADDITION TO COMFORT, RADIANT PANELS OFFER CONSUMERS ANYWHERE FROM 10 PERCENT TO 30 PERCENT ENERGY SAVINGS. A THERMOSTAT IN EVERY ROOM IS A BIG ADVANTAGE, ACCORDING TO THE RADIANT PANEL ASSOCIATION, BECAUSE CONSUMERS CAN KEEP ROOMS NOT IN USE COOLER THAN THE REST OF THE HOUSE.

as bathrooms. A survey conducted by the Radiant Panel Association, which represents manufacturers, distributors, dealers and installers of radiant panel heating, put the number of 3,000-square-foot (the average-size project) hydronic installations in 2005 at 150,000 to 160,000, representing \$2 billion in revenue for the industry. While cautioning that it is difficult to estimate how many installations the 6.2 million square feet of electric radiant sold represents, the association made "a rough guess" of 31,000, or more than \$90 million in industry revenue.

Sharon Mangino, general manager of Warmup Inc., says electric installs more easily. "Our product is very easy," she says. "It was designed for the do-it-yourself market originally."

Warmup has a kit that contains everything needed for installation, including reels of wire, a thermostat, a primer to add tackiness to the floor and tape. By changing the spacing

unique, two-in-one product: a structural subfloor and a radiant panel that offers the lowest water temperatures in the industry.

"The lower the water temperature pumping through your floors, the more efficient the system is," Izenstark says. "A lower water temperature also makes it easier to interface with alternative energies like solar or ground-source heat pumps. Some contractors are after methods that offer the lowest water temperatures to heat the home because efficiency is a hot word right now, and it's going to be for the rest of our lives." In addition to comfort, radiant panels offer consumers anywhere from 10 percent to 30 percent energy savings. A thermostat in every room is a big advantage, according to the Radiant Panel Association, because consumers can keep rooms not in use cooler than the rest of the house.

Installation costs for the hydronic systems vary. Izenstark estimates the professionally



COURTESY ELECTRO PLASTICS INC.

STEP Warmfloor's mat is being installed in this home to create a self-regulating radiant heat system that acts as an efficient on/off sensor.

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installed cost for a heating system for an entire home at \$10 to \$15 a foot. That's materials and labor. For a 3,000-square-foot home, that could run from \$30,000 on the low end to \$45,000 on the high end. Labor probably accounts for half the cost, Izenstark says. If a new boiler is required, that adds to the tab. Viega North America suggests that a heating professional determine whether an existing boiler can support the new radiant system.

A product from Electro Plastics Inc. called STEP Warmfloor offers an alternative to hydronic and electric panels. STEP Warmfloor is a 3/64-inch-thick mat that transfers heat through semiconductive plastics. Wires are used, but only to bring in the low voltage required to power the system.

Monica Irgens, president of Electro Plastics, says STEP Warmfloor is self-regulating: As the material gets warmer, it generates less heat.

"The whole material is a sensor," she says. "It's much more efficient than an on/off system." It also reacts more quickly to differences in temperature, she says. In tests conducted by the company, it calculated that STEP Warmfloor was 39 percent more efficient than heating with forced air.

Forced air remains the dominant player when it comes to heating. Just 4 percent of all heating is radiant. But therein lies an opportunity for builders, says Larry Drake, executive director of the Radiant Panel Association.

"This is a way for builders to set themselves apart," Drake says. "Customers are asking for it. It's value added."

Related Advertisers: Step Warmfloor, p. 83; Warmboard Radiant Subfloor, p. 81 & 95; Warmup Inc., p. 83; Zurn Pex Plumbing and Radiant Heating Systems, p. 83.

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RADIANT HEATING COMPARISON CHART

COMPANY	PRODUCTS/FEATURES	OTHER COMMENTS
Danfoss Group Global 905-676-6000 danfoss.com	Hydronic floor heating system units are preassembled with manifolds for domestic cold/hot water and for regulation of the system; electric floor heating systems feature a heating cable mat that can be applied directly to the surface of any flooring and is installed within the thickness of the tile adhesives	New product series Convec Comfort Panels combine an efficient heating and cooling system with simple design that can become an integral part of any building without disturbing the aesthetic appearance of the individual rooms
Electro Plastics Inc. 877-783-7832 warmfloor.com	STEP Warmfloor, an energy-efficient, patented electroplastics element that differs from hydronic (water tubing) and cable systems; low-voltage (24V AC or DC) self-regulating system	Easy to install, maintenance free, compatible with any floor covering. Mat is only 3/64" thick. Can be used as primary heat source or installed in areas where extra heat is desired
Heatizon Systems 888-239-1232 heatizon.com	Low-voltage electric radiant space & floor heating systems	Tuff Cable and Z Mesh heating elements have a 25-year limited warranty
Radiantec Co. 800-451-7593 radiantec.com	Hydronic floor heating systems. Closed system, for space heating, uses boiler or hot-water heater to heat hot water. Indirect system uses high-efficiency hot-water heater for both space heating and domestic hot-water needs while keeping the two systems separate. Open direct system uses high-efficiency hot-water heater to provide hot water for space heating & domestic hot water within a single system	Radiantec guarantees its products from age-related breakdown for 30 years
Vanguard Piping Systems Inc. 800-775-5039 vanguardpipe.com	Hydronic radiant heating featuring Vanguard's Vanex PEX (cross-linked polyethylene) tubing for the in-floor heat exchanger; available in 3/4" & 1" sizes	Vanex PEX tubing is manufactured, sampled, tested, marked and third-party-listed in accordance with ASTM standards F876 and F877
Viega 800-370-3122 climatepanel.com	ProRadiant hydronic radiant systems, including Viega Climate Panel System for installation over wood sub-floors, existing concrete slabs or in walls; Viega Concrete System for garages, basements, pool surrounds or anywhere a new slab will be poured; Viega Thin-Slab System for tile & stone flooring	Viega's Climate Trak plates fit under the floor between joists to grip Viega Pextron tubing, which can be quickly snapped into place. Sections are 8 feet long for faster installation & may be shortened to fit joist space.
Warmboard Inc. 831-685-9276 warmboard.com	Radiant subfloor heating that combines high-strength tongue-and-groove plywood structural APA-rated subfloor panel with low-mass high-performance radiant heat floor panel. Radiant panel & structural subfloor are installed at the same time.	The conductive surface of Warmboard is 24-gauge aluminum, which enables Warmboard to use lower water temperatures. Most Warmboard systems operate with water between 90 & 110 degrees.
Warmly Yours.com Inc. 800-875-5285 warmlyyours.com	TempZone, electric floor heating under tile and stone; Environ II, electric floor warming under carpet and laminate applications	TempZone floor heating systems are 15-watt-per-square-foot systems that raise floor & room temperatures to the desired setting more rapidly; when partnered with SmartStat programmable thermostat they use no more electricity than comparable 12-watt-per-square-foot systems.
Warmup Inc. 888-927-6333 warmup.com	Undertile electric floor heating systems. Thin-as-a-nickel heating element; flexible design makes it easy to work around existing fixtures or cramped floor layouts	Systems feature transferable 30-year warranty
Zurn Plumbing Products 903-886-2580 zurn.com	Zurn PEX radiant hydronic heating system; Simply Heat electric floor warming system	Simply Heat comfort costs about 1 cent per square foot per day when mats are installed with the specially designed Simply Heat thermostat

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