



RADIANT HEATING SYSTEMS
RESIDENCE

CASE STUDY



Clean Heat and Comfortable Warmth Make Breathing Easier

As they designed and built their dream home, Del and Sandi Goetze of Lakeville, Minn., knew they would install an Uponor radiant floor heating system.

They had experienced the unique comfort of radiant heat in the basement levels of two previous homes. But, most importantly, they have a young son with severe allergies, and the comfort and cleanliness of radiant heat compelled them to use the system in every level of their new home.

"Forced-air heating systems churn air, spewing dirt, dust and pollen throughout the interior spaces," says Del Goetze. "Building a new home was my opportunity to create the best possible environment for our son. The radiant floor heating system has improved our son's health, and my wife and I breathe easier, too."

Using radiant floor heat offered additional benefits for the Goetze family. Their two-story, 5,900-square-foot home features high, vaulted ceilings, huge windows and a walkout basement.

They choose flooring materials like carpet, hardwood, ceramic tile and concrete aggregate for the living,



Uponor radiant heating provides comfort under any floor covering — wood, tile or carpet.

dining, solarium, spa, kitchen and bath areas. And throughout the home, all the floors are comfortably warm and dry.

"We would have been crazy to use a forced-air heating system with all that wood and tile," says Del Goetze. "Our floors would have been frigid."

And the Goetze family is also pleased with the efficiency of the system.

"Our monthly natural gas bill averages only \$113," says Del Goetze. "That's extremely low for a house of this size in a region known for its long, cold winters."



Radiant heating was perfect for the Goetze home which had high, vaulted ceilings and large windows throughout.

Mechanical System Information

The basement walkout level is slab-on-grade concrete construction. A vapor barrier, foam insulation and wire mesh were installed, and Wirsbo hePEX™ plus tubing was laid and then covered with concrete. On the first and second stories, tubing was laid on suspended wood floors and covered with 1½ inches of poured underlayment. A 160,000 BTU/h gas boiler with an 80-gallon storage tank provides heated water for the tubing network. Twelve separate heating zones offer flexible and efficient warmth for this large home.



Uponor's Wirsbo hePEX™ plus tubing was installed over suspended wood floors and covered with a poured underlayment on the first and second stories of the home.



The design information in this case study is provided for illustrative purposes only. The actual requirements of similar projects will depend on regional climatic conditions, project-specific heat loss, owner expectations, applicable building codes, etc. Please contact your Uponor representative for assistance in designing your specific projects.

Summary of Benefits

Clean and Consistent

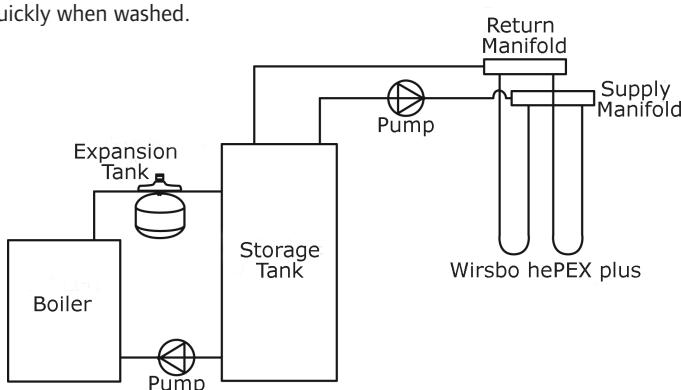
Hydronic radiant floor heating provides clean, consistent warmth. It's like a giant radiator underneath the floor, conducting warmth to the body and radiating heat to the objects in the room. There are no fans or blowers to spread dust or allergens, and there is no furnace noise.

Functional

Because the floors are warm, every level of the Goetze residence is comfortable. Also, the options for flooring materials were multiplied. Tile, wood and concrete, known for their durability, became practical choices for areas used by stocking and bare feet. The floors also dry quickly when washed.

Energy Efficient

The Goetzes' average monthly cost for natural gas is only \$113 — about half the cost to heat a comparable home in Minnesota with a forced-air system. The Goetze bill includes energy used to heat the house, dry the clothes and run the water and pool heaters that serve the kitchen, bath and spa areas. Heat stays low, where the family is, not concentrated at the ceiling levels, and the system is zoned for room-by-room temperature control.



Project Data

Type of Structure:	Two-story residence with a walkout basement
Total Heated Square Footage:	5,900 square feet
Amount and Type of Tubing:	5,840 feet of ¾" Wirsbo hePEX plus tubing
Number of Loops, Average Length:	21 loops, 278 feet
Number of Manifolds:	5
Number of Zones:	12
Boiler Size:	One 160,000 BTU/h gas boiler with an 80-gallon storage tank
Type of Circulators:	Two single-speed, ½-horsepower, cast-iron pumps
Basement/Walkout-level Construction:	Slab-on-grade concrete
First- and Second-floor Construction:	1½" poured underlayment over suspended wood floor
Floor Coverings:	Carpet, hardwood, ceramic tile and concrete aggregate (around spa area)