



# Uponor

RADIANT HEATING SYSTEMS  
COMMERCIAL

CASE STUDY

## Contractor Installs Radiant Heating in His Own Facility

Pat's Heating & Air Conditioning, Inc. in Oconomowoc, Wis., has been in business since 1989, and owner Pat McNamee understands very well the importance of providing customer satisfaction — his business is built on it.

By 1996, McNamee's business had outgrown its warehouse. The company needed more space and a location closer to the major highway.

In planning the design for his new warehouse, McNamee wanted comfort for his employees and efficiency for his bottom line. He also wanted to create a hands-on setting where customers could come in to see the equipment and experience a pleasant environment.

He decided to go with radiant floor heating when he recalled touring the Uponor factory while there for training.

"I remember noticing all the warehouse truck doors were open in the middle of winter, but the space inside still felt comfortable," he says. "It was obvious the radiant floor heating system in this warehouse had a quick recovery time, even with the doors opening and closing all day."

After experiencing the comfort and efficiency of the Uponor system first hand, McNamee was



Pat McNamee's own employees installed the Uponor radiant floor heating system in the offices and warehouse of the new facility.

convinced it was the ideal system for his own warehouse. He installed the system in June 1997 and decided to perform a test to see if radiant heating really was more efficient than forced-air heat.

During the month of January 1998, McNamee heated the new warehouse with forced-air unit heaters, and the gas heating bill was \$903.10. On Feb. 1, the building was converted to the Uponor radiant floor heating system and the gas bill dropped to \$406.50. The February bill not only included heating the space comfortably but also the energy required to bring the cold slab up to temperature. The gas bill for March was \$400.

Wisconsin Electric and Natural Gas confirmed the degree days for January and February were

comparable, creating a perfect test situation for a forced-air system versus a radiant floor heating system.

McNamee's new warehouse installation provided a unique opportunity to compare the efficiency of a radiant floor heating system to a forced-air heating system using the same location, similar traffic patterns and comparable degree-day temperatures.

"Since we've moved into our new facility, our employees say they can't believe how comfortable they feel," he says. "There are no more cold feet or drafts in the offices. Plus, we notice we're a lot more comfortable at a lower temperature with the radiant floor heating than we were at a higher thermostat setting with forced air."



## Summary of Benefits

### Comfort

McNamee's employees start the day loading trucks in a warm, comfortable environment. Even with the five overhead doors open, the space remains comfortable, and temperature returns to setpoint within minutes after the doors close. Office workers enjoy comfort and warmth everywhere because the heat is evenly distributed.

### Energy Efficiency

Spaces with a large cubic volume, such as warehouses, realize tremendous savings because they can take advantage of the concrete floor's thermal mass. Unlike forced-air systems, radiant floor heating does not heat the air which escapes every time large warehouse doors open and close. Instead, concrete floors absorb, store and re-radiate heat evenly and efficiently, allowing quick heat recovery. When the doors do close, the heat is right where you need it, not lost to the great outdoors.

### Customer Friendly

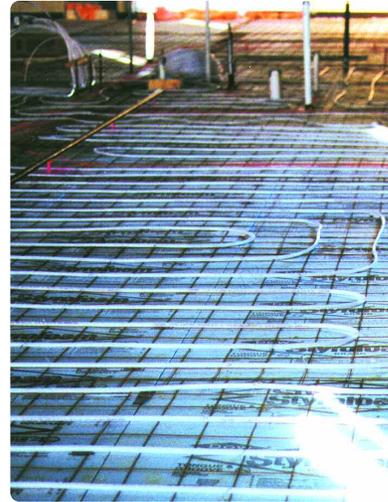
Customers enjoy the comfort they feel in Pat's Heating & Air Conditioning, Inc. showroom. The mechanical room and manifolds are also available to view so visitors can understand how the system works.

### Floor Coverings

The facility has tile and carpet in the office and concrete in the warehouse area. This flooring variety highlights the benefits of radiant floor heating which works under many types of floor coverings.

## Mechanical System Information

The 8,000-square-foot, block-and-steel commercial building has slab-on-grade concrete with 27 loops of 250 to 300 feet of Wirsbo AQUAPEX® tubing tied to rebar over 1-inch insulation. Four manifold locations, with 5 to 10 loops per manifold, supply warm water to six zones. A 160,000 BTU/h tank heater heats the water, and bronze pumps, a brass air eliminator and a cupronickel (75% copper, 25% nickel) heat exchanger complete the non-ferrous system so oxygen diffusion is not a concern.



Over 7,000 feet of Wirsbo AQUAPEX tubing covers the facility floor.

## Temperature Information

Average temperature from Dec. 11, 1997 to Jan. 15, 1998: **27°F**

Average temperature from Jan. 15, 1998 to Feb. 13, 1998: **28°F**

Average temperature from Feb. 13, 1998 to March 17, 1998: **33°F**

## Heating Costs Comparison Table

Heating Method	January	February	Cost Difference
Forced-air	\$903.10	–	
Radiant	–	\$406.50	\$496.60

## Project Data

**Size of Structure:** 8,000 square feet

**Type of Construction:** Block-and-steel commercial building

**Floor Construction:** Slab-on-grade concrete

**Outside Design Temperature:** -10°F

**Room Setpoint Temperature:** 60°F in warehouse; 70°F in offices

**Heat Plant Size:** 160,000 BTU/h tank heater

**System Supply Water Temperature:** 113°F

**Tubing Type:** Wirsbo AQUAPEX®

**Number of Loops, Average Length:** 27 loops, 250 to 300 feet

**Installation Date:** June 1997

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.

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