



Uponor

RADIANT HEATING SYSTEMS GREENHOUSE

CASE STUDY

Protecting Plants with Better Climate Control

Business is blossoming at Lowe's Greenhouse. Owner Jeff Griff has taken the necessary steps to assure that his vast assortment of flowers and plants will flourish in the cold winter months in Chagrin Falls, Ohio by installing Uponor radiant floor heating.

Lowe's Greenhouse specializes in growing and selling unusual annuals and perennials. With over 3,000 different varieties of plants, flowers and herbs to care for and maintain, Griff knew he needed to find a better way to heat the plants. Before installing radiant floor heating, he used heated benches to keep his plants warm.

Underneath each bench, a steel hot water pipe would radiate heat to the plants to keep them warm. Over time, this system became difficult to maintain and started to leak. Tired of his old system and wanting a new look for the greenhouse, Griff started plans to renovate. Early in the renovation process, he decided to install radiant floor heating.

"Remodeling the greenhouse was a huge project, but I knew from the beginning that I wanted to install radiant floor heating," says Griff. "Everyone in the industry knows radiant floor heating is the most efficient way to heat a greenhouse."

Griff created a smoother, freer-flowing design for the greenhouse by converting the existing five greenhouses into three, creating the appearance of one continuous room.

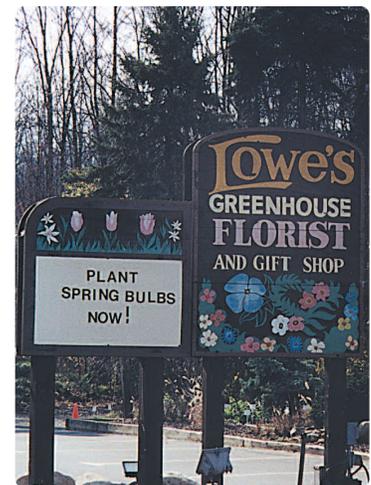
"The use of radiant floor heating was essential to the new design of the greenhouse because it eliminated the use of space heaters, so now we have more open space," says Griff.

Heating the 7,560-square-foot glass and aluminum greenhouse could have been a nightmare with a traditional heating system. High ceiling and numerous windows make it easy for heat to escape. This is not the case with radiant floor heating because heat stays near the floor where it is needed the most.

"Maintaining the perfect climate is essential to my business," he says. "Plants thrive in a warm environment. With radiant floor heating there are no cold drafts or damp floors to worry about, so the temperature in the greenhouse stays consistent and comfortable all the time."

He adds that one of the best features of the Uponor radiant floor heating system is the freedom he has with his displays. "It's really nice to place the plants on the floor and

see them root. One of the secrets to growing healthy plants is keeping the soil warm. By placing the plants on the floor, they are sitting right on the source of the radiant heat, so they root quicker."



Business is blossoming at Lowe's Greenhouse, even during the cold winter months, thanks to Uponor radiant floor heating.



Summary of Benefits

Improved Working Conditions

Labor load is reduced because plants and flowers don't need to be carted around from bench to bench to keep them warm. The old heating system was hard to maintain and leaked. Uponor radiant floor heating requires little maintenance and does not leak, so Griff can spend more time with his customers.

Flexibility

Warm floors allow more freedom with displays, and plants root quicker when they are placed at the source of the radiant heat. Additionally, Griff was able to create a more open feeling in the greenhouse because there are fewer obstacles to get in the way such as space heaters or wall radiators.

Climate Control

High ceilings and numerous windows make it easy for heat to escape, but with radiant floor heating, heat stays concentrated near the floor where it is needed most. Also, there are no cold drafts or damp floors, so the temperature stays consistent and comfortable all the time.

Mechanical System Information

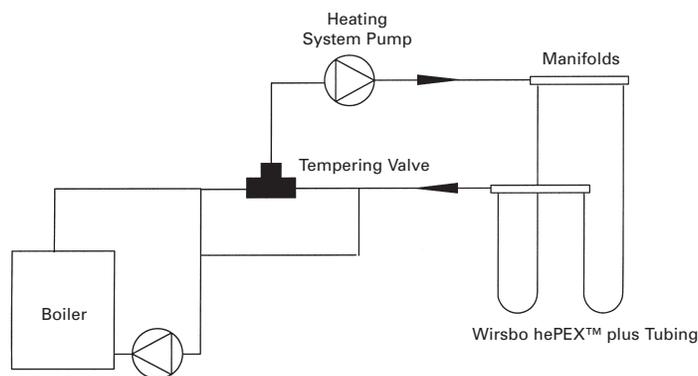
Uponor radiant floor heating was installed in the main showroom. First, 2-inch foam insulation and wire mesh were installed using slab-on-grade construction. Then Wirsbo hePEX™ plus tubing was laid 12 inches on center, and concrete was poured. A cast-iron boiler provided heated water for the tubing network. The boiler is connected to Uponor's system through a series of manifolds.



Uponor radiant floor heating was essential to the new design of the greenhouse because it eliminated the use of space heaters and allowed for more open space.

Project Data

Size of Structure:	7,560 square feet
Type of Construction:	Glass and aluminum greenhouse
Floor Construction:	Slab on grade
Outside Design Temperature:	0°F
Room Setpoint Temperature:	65°F
Heat Plant Size:	Cast-iron boiler
Energy Source:	Natural gas
System Supply Water Temperature:	109°F
Tubing Type:	¾" Wirsbo hePEX plus
Number of Loops, Average Length:	30 loops, 200 feet
Number of Manifolds:	3
Tubing Spacing:	12" on center
Pump and Pump Size:	75 gallons per minute (gpm) at 20 ft./hd.



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