



Uponor

RADIANT HEATING SYSTEMS
SHELL AERO CENTRE

CASE STUDY

Flying High with Radiant Heat

With the unpredictability of Rocky Mountain weather, Bill Roberts of Calgary's Petrin Mechanical faced quite a challenge when seeking an energy-efficient system that would provide warmth in a unique setting — the Shell Aero Centre's airport hangars.

When the hangar's onramp doors would open for planes to enter and leave, winter cold and winds would quickly chill the entire area. Roberts required a system that would not only take into account the massive heat loss of the grand structure, but would also provide rapid heat recovery from the opening and closing of the hangar doors. Additionally, Roberts needed to keep labour costs and component sizing reasonable.

Original specifications called for large infrared heaters in the hangars, but concerns of heat loss and heat recovery time eliminated them as an option. When Uponor representatives proposed radiant floor heating, Roberts admits he was initially skeptical. But he states Uponor's quick response and their technical expertise sold him on the system.

Uponor's radiant floor heating system provided several advantages the large infrared heaters could not. First, it reduced the time for warming the planes and gave the workers a clean, comfortable and dry working space — providing them a

healthier environment and increasing productivity. Second, the system distributed offered evenly distributed heat. Third, the system provided a quiet work environment with no noisy fans blowing air, dust and allergens around. Most important, though, was radiant floor heating provided the rapid heat recovery and energy savings Roberts required. Once he learned of Uponor's 25-year limited warranty, Roberts was convinced radiant floor heating would meet all his needs.

Designing a system for the hangars, which included two 20,000-square-foot buildings and one 18,000-square-foot building, was rather uncomplicated. The system included four boilers to heat the water for the complex. Two boilers, with capacities of three million BTUs each, were used to heat the main resources hangar and the office. The other two boilers, with capacities of 1.5 million BTUs each, were used to heat the other two hangars and 30,000 square feet of additional office space.

It took four installers eight hours to install 40,000 feet of tubing, which complimented the simple design of the system. Large-diameter tubing allowed the loops to be spaced further apart, and because the loops were all the same length, the system was self-balancing.

Using Uponor PEX tubing in the hangars allowed for the delivery of the required BTUs economically and efficiently. The tubing was buried five inches deep in concrete slab to create a massive thermal heat sink. This is deeper than the tubing would usually be placed, but satisfied the need for rapid heat recovery.

The system used reset controls to sense the outdoor air temperatures to control incoming water temperatures. This would allow the system to adjust to sudden changes in outdoor temperatures, like with a Chinook wind.

And the Uponor system has been quite a success for the Shell Aero Centre. In fact, 14 years after the installation of the radiant floor heating system, Uponor did a follow up to see how the system was performing.

Don Henderson, a representative of the Shell Aero Centre, noted the decision to go with Uponor radiant floor heating was great based on its excellent rapid heat recovery in response to the demanding environment. He says it's also economical to operate, and it's clean and quiet.

Using Uponor radiant floor heating provided both the planes and the workers with a clean, comfortable and dry environment all at a reasonable cost.

Summary of Benefits

Comfort

The clean and quiet operation of Uponor radiant floor heating provides an enhanced work environment which promotes worker productivity. It also offers dry floors, elimination of noise and draft from overhead unit heaters and supplies comfortable, even heat.

Energy Efficiency

The system is unique in its ability to perform rapid heat recovery which produces significant energy savings.

Ease of Installation

The flexibility of Uponor PEX tubing requires fewer connections than rigid heating systems — saving time and money and reducing the risk of leaks.

Security

Choosing Uponor radiant floor heating was a trouble-free, low-maintenance solution that exceeded all of Shell Aero Centre's expectations. Supported by Uponor's 25-year limited warranty, Petrin Mechanical is confident that the Uponor radiant floor heating system will provide warmth and efficiency for the life of the building.



The design information in this case study is provided for illustrative purposes only. The actual requirements of similar projects are dependent 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.

Project Data

	Hangars	Offices
Square Footage:	58,000 square feet	40,250 square feet
Heat Source:	2-3 million BTU boilers	2-1.5 million BTU boilers
Type of Construction:	Pre-engineered steel structure	Pre-engineered steel structure
Floor Construction:	9" of concrete, tubing in 5" depth	4" of concrete, tubing in 2" depth
Outside Design Temp:	-29°C	-29°C
Room Setpoint Temp:	20°C	23°C
Heat Plant Size:	6 MBTU/h	3 MBTU/h
Tubing Type:	1" Wirsbo PEX	¾" Wirsbo hePEX™
Average Loop Length:	512'	170-440'
Number of Manifolds:	3 manifolds, 24 loops each	17 manifolds, 8 loops each
Tube Spacing:	18" on centre	12" on centre
System Flow:	652 U.S. gallons per minute	326 U.S. gallons per minute



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eight hours to install
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