Plastics Pipe Institute
BUILDING & CONSTRUCTION

Case Study – Project in Action

"SOCIETY ORLANDO" HIGH-RISE COMPLEX HVAC AND PLUMBING SYSTEMS WIN PROJECT OF THE YEAR

Use of PEX and PP-RCT Pipes
Keys to Success
for Community Living Development

The Building & Construction Division of the Plastics Pipe Institute, Inc. (PPI) honored the Society Orlando complex with the Project of Year Award due to its use of plastic piping materials in both the hybrid air-and-water HVAC cooling and its domestic water supply systems. The award was presented to PPI-member company Uponor (Apple Valley, MN).

The Society Orlando is a two-tower, 1.5-million-square-foot, mixed-use, high-rise project in the downtown Orlando, Florida Central Business District. By combining Uponor PP-RCT and PEX pipes, the installation cost was cut by 70 percent while providing piping systems that will not corrode or tuberculate and are designed to last the life of the structure.

Each year, the PPI membership reviews and votes on Project of the Year and a Member of the Year for each of the five PPI divisions. The awards were presented during the group's annual membership meeting held May 9 - 12, 2023.

The HVAC mechanicals for the project include a hybrid air-and-water system involving condenser-chilled water from a rooftop cooling tower pumped through 800 feet of large-diameter Uponor PP-RCT pipe from three to 10-inch diameter. The cooling water runs through 12,600 feet of Uponor Wirsbo hePEX™ PEX-a tubing in diameters from ¾ to 3 inches installed as 958 pre-fabricated vertical risers, with runs branching off to fan coil units inside the apartments. A second return line of the same materials follows a similar route in reverse, carrying warmed water from the apartments back to the cooling tower to be chilled again. For the domestic water system, the project used 138,000 feet of Uponor AquaPEX® PEX tubing and ProPEX® fittings, including multiport tees in diameters from ½ to 1 inch.

One tower is a 330-foot, 26-story building with 462 units, while the other is a 16-story building with 245 units. In addition to the combined total of 707 rental apartments, the finished structure will have 36,000 square feet of office and retail space.

"The scale of this project is nothing short of amazing," stated Lance MacNevin, P. Eng., director of engineering for PPI's Building & Construction Division. "The use of both PEX and PP-RCT piping systems made it possible to keep the costs very realistic and still provide reliable systems for moving the water for the HVAC systems and to deliver potable water to each apartment and business. Plastic piping materials are the most sustainable choices for this type of project and allowed the contractors to meet demanding construction schedules while improving worker safety."

PP-RCT pipe is made from random copolymer polypropylene (PP) with modified crystallinity and temperature resistance which means it can provide

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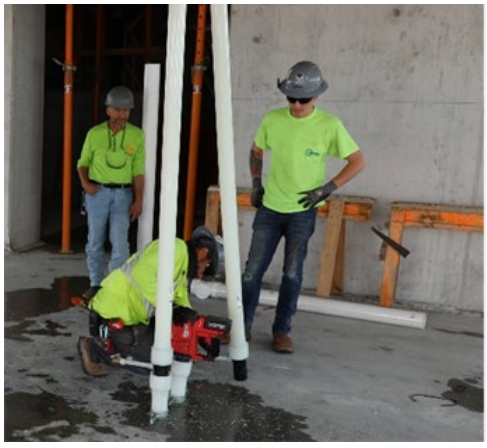
greater pressure capabilities at higher temperatures than conventional polypropylene. According to PPI, PP-RCT piping products are rated for continuous operation of 100 psi at 180ºF (690 kPa at 82ºC) temperature when SDR 9 (or thicker) wall type is selected.

"PEX was first produced in 1972," explained MacNevin, "and is making greater inroads in commercial work partially because it is flexible, so it is efficient to install around obstacles and when changing direction. It also resists corrosion and scaling. The PEX system on this project uses cold-expansion fittings produced according to ASTM F1960, eliminating the need for soldering and the flames and chemicals associated with "sweating" joints. A PEX plumbing system is also cost-effective because it is less labor intensive and can optimize system performance. The 3,000 individual pipe connections were made with Uponor ProPEX fittings, which added to the speed of the installation."



"Conservatively, we had a 40 percent reduction in actual field labor, easily," stated Jerry Rollen, director business development Colwill Engineering (Apopka, FL). "We've basically installed that entire piping project with a four-man crew. Uponor's PEX product lends itself to where you can literally put four risers on your shoulder and carry them down a flight of stairs and it's one guy doing it. It's not very labor-intensive. That's two dozen risers by two guys in one day. That would take 10 guys a week with a traditional piping system."

The Colwill crew's productivity was enhanced by the more than 200 hours of offsite prefabrication at the Uponor North America Lakeville Distribution Center. Each of the 26 floors in the larger Society Orlando tower had 24 risers with 44 connections, totaling 27,456 connections.

"When those risers came in," Rollen explained, "prefabricated with the valves on them, we would measure the height, set the first height, and then we go to the next floor. It's literally two joints for a pair of risers per floor. Because of the pre-fabrication by Uponor, we could do an entire floor with the smaller diameter, up to probably about an inch and a half, in a day with two guys."

Prefabrication of the polymer piping system also helped reduce job-site waste. Working with the precut lengths, Colwill installers needed to trim only six to eight inches of the pipe to connect the riser from one floor to the next.

The flexibility of PEX tubing also proved beneficial for the project. For example, in a high-rise structure, holes for the risers needed to be cut into the concrete pad. This can be challenging to vertically align all those holes, one floor after another, and to create a perfectly straight pipe run. If rigid metal pipe was used, installers would have needed to add more connections to overcome the problem of drift. According to Rollen, the flexibility of PEX allowed the crew to have a minor drift from one floor to the next. "The risers in the tower worked great," he continued, "and it came off without any hitch."

While Rollen has been a strong proponent of PEX tubing in his commercial projects for more than a decade due to its durability, flexibility, and cost-effectiveness, this was his first use of PP-RCT.

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The 800 feet of PP-RCT pipe supplies and returns water to the rooftop cooling tower. Joining sections and fabricating the various angles was done by heat fusing the sections together. This eliminated open-flame welding required for carbon steel and iron pipe, plus increased safety and sped-up the work, especially in tight spaces.

According to Rollen, with many highly skilled field installers retiring and not as many newcomers entering the profession, it's beneficial to have piping products that are efficient, repeatable, dependable, and easier to install.

Rollen confirmed that he plans on using PEX and PP-RCT everywhere he can going forward. "We're living that glory right now," he said about the successful installation of the systems. "So, we're feeling pretty elated because it's the right thing for the owner and for those who will live and work at Society Orlando."

More information can be found at https://plasticpipe.org/building-construction/index.html

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Plastics Pipe Institute
The Voice of an Industry.

About PPI:
The Plastics Pipe Institute, Inc. (PPI) is the major North American trade association representing the plastic pipe industry and is dedicated to promoting plastic as the materials of choice for pipe and conduit applications. PPI is the premier technical, engineering and industry knowledge resource publishing data for use in the development and design of plastic pipe and conduit systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods.

A Pipe Performance Report from the Field