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Provide lasting pipe performance

LOCHINVAR SELECTS PP-R PIPE FOR ITS NEW TESTING LOOP

PROJECT INFORMATION

PROJECT	PRODUCTS USED	LOCATION / DATE
Lochinvar® Corporation Manufacturing Facility, Boiler Testing	Aquatherm Climatherm®	Lebanon, TN Winter 2011

AQUATHERM ADVANTAGES

- Climatherm did not require insulation like black pipe would have thanks to its natural R-value
- The thermal expansion resistance — up to 75% compared to plastic piping in operating temperatures up to 200°F was essential to the job
- The lighter weight of PP-R compared to steel provided solid labor savings



THE CHALLENGE

Lochinvar engineers sought a solution that would satisfy the requirements for testing water heaters, boilers, and pool heaters while being corrosion proof

THE SOLUTION

Aquatherm was installed to avoid long-term corrosion or degradation issues

Corrosion-proof pipe and its extensive warranty helped convince cutting-edge manufacturer to try heat-fused Aquatherm.

Featuring a corporate history dating to the early 20th century and cutting-edge technology such as the Crest® Condensing Boiler, Lochinvar® Corporation is a leading manufacturer of high-efficiency water heaters, boilers, pool heaters and storage tanks.

The company's headquarters in Lebanon, TN, sits on 125 acres featuring administrative offices; an engineering technology center with an engineering R&D testing lab; a state-of-the-art, 100-seat amphitheater-style training facility; plus eight manufacturing lines and distribution.

EXACTING REQUIREMENTS

Lochinvar performs a 100% functional test on every water heater and boiler produced in their Lebanon facility, requiring a specific amount of water flow during these tests. The company's life cycle testing and product development



These butt-fused lines serve the boiler testing system. Since PP-R is corrosion proof, plant officials don't have to worry about long-term deterioration of the pipe and problems they'd previously experienced (below).

department has experienced a continual increase in demand for gallons per minute (GPM) in its Hydronic Testing Loop.

A new system was deemed necessary in the winter of 2011



and sized to support current and future system demands. The new test loop would serve the manufacturing facility.

According to Jim Durbin, Plant Engineer, the new system was designed to satisfy the requirements for testing water heaters, boilers, and pool heaters being manufactured. It rejects heat from eight test stations within the manufacturing plant and delivers up to 1,250 GPM of 95°F heat rejection water ($\pm 2^\circ$) to each of the eight test areas. The system will also cool the 120° heat rejection water to 95° for re-use.

Lochinvar prides itself on a product engineering concept that encourages a close working relationship with consulting engineers, architects, and project designers in the interest of developing water heating or hydronic systems perfectly suited to specific project requirements. So when the company's facilities group was in the process of designing the new testing facility, an innovative pressure pipe system was met with curiosity and a bit of skepticism.

AN INTRIGUING ALTERNATIVE

Lee Company, a leading provider of HVAC, plumbing and electrical solutions with headquarters in Franklin, TN, has worked with Lochinvar for roughly 15 years. Lee Company sales engineer, Kenny England, explained that due to the potential of long term degradation of steel piping at the facility, Aquatherm's polypropylene-random (PP-R) pipe seemed like a good alternative for the new loop.

Also vouching for the efficacy of the PP-R pipe was the Nashville office of Ferguson Enterprises, Inc. (a Lochinvar distributor). Ferguson salesman Rick Hollis explained that while new to North America, Aquatherm has been used around the world for almost four decades. "Aquatherm had so many benefits for this application that it was very easy to spell them out," Hollis said.

Aquatherm's Climatherm® is specifically designed for chilled water, condensing water, radiant heating, and industrial applications. With the company's fiber composite layer (a fiberglass layer impregnated inside the pipe), it provides exceptional strength and resistance to thermal expansion — by up to 75% compared to plastic piping in operating temperatures up to 200°F.

The corrosion-resistance and a natural R-value of 1 are combined with the pipe's heat fusion welding method,

which bonds both sides of a joint into a single, homogenous material, without the use of flames, chemicals, or mechanical connections. Once fused, pipes and fittings have the same physical properties, thus eliminating systematic weaknesses that can be caused by introducing different materials into the joint in other types of piping systems.

"Along the way we decided that Climatherm® piping would be a better long-term product, as there are no long-term corrosion or degradation issues," Jim Durbin said. "Also, Climatherm did not require insulating the piping like we would have had to with black pipe."

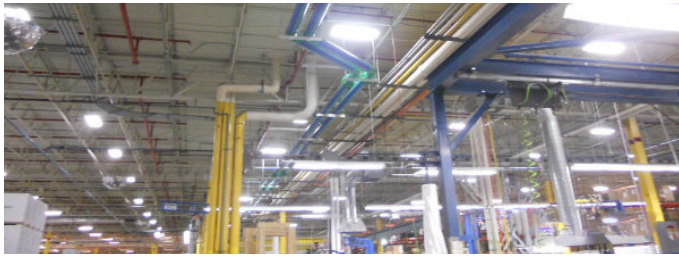
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-JIM DURBIN, PLANT ENGINEER

England added that Aquatherm's extensive warranty also helped convince Lochinvar to try the PP-R pipe. When installed by Aquatherm-trained and certified technicians, the pipe and fittings carry a 10-year, multi-million-dollar warranty covering product liability, personal injury, and property damage.

A STEP – BUT WORTHWHILE – LEARNING CURVE

Ferguson and Aquatherm conducted a fusion welding training session at Lee Company's shop for several installers who would be working both on-site and in the company's pre-fabrication shop. Lee Company then rented the necessary fusion welding tools from Ferguson and began the installation of about 1,300 linear feet of 8-inch Climatherm and 200-300 feet each of 3- and 4-inch Climatherm for the branches.



The installation began in February 2011 and took roughly a month and a half. While the Lee Company installers experienced a learning curve, they began achieving some efficiencies as they became comfortable with the fusion tools and the PP-R.

The main and branch lines basically run from cooling tower to the test area, where each water heater, boiler or pool heater is filled with water and tested simulating a real world installation before it is shipped to their customers. The water is heated and flushed out, and the water is re-used.


A majority of the work was done at the pre-fab shop, as 40-foot sections of the 8-inch pipe received flanges and were hauled to the jobsite. While the material for the Aquatherm pipe was slightly more expensive than the Schedule 40 steel, the ability to install in 40-foot sections instead of 20-foot sections, and use only three men to hang the pipe was huge,

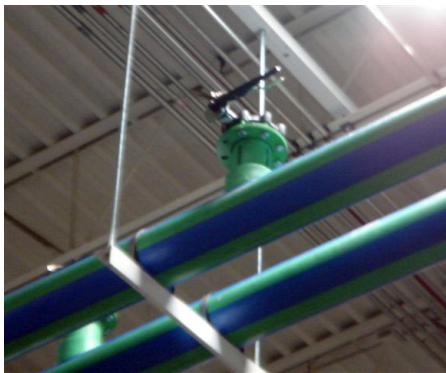
England said. "We were installing this pipe 20 feet in the air and the lighter weight of the Aquatherm was a big labor savings," he added.

Part of the learning curve on the job was that England initially designed the system with fewer pipe braces than were needed, so some more support needed to be added. Also while the job was sold based on using couplings, England said they decided to use flanges, which did provide some labor savings, but cost more.

MORE FUSION IN THE WORKS

Lee Company is using Aquatherm on a high profile hotel in the area, and England reported that the installation is going considerably smoother since the crew is more familiar with heat fusion. "I think we will use it again and as you become more familiar with it, your labor profits will rise," he added.

"When you get familiar with Aquatherm you can pick up a lot of labor savings, but the learning curve did cost me some of that profit on this job. Money wise Aquatherm cost me a bit more, but the customer is really happy with it, and at end of day that's what's important. Plus, their flow rate to their test area is a lot better than it was with the steel pipe," England concluded. 



The German-manufactured pipe has been one of the world's most durable and greenest piping systems for nearly four decades and proven successful in 70-plus countries. Aquatherm piping systems offer many performance and environmental benefits, such as:

- Eliminating toxic materials, glues and resins, and open flames from the piping installation equation
- An R-value of 1 or greater depending on pipe size and SDR
- The fusion welding process, which creates seamless connections that last a lifetime without leaking or failing
- An optional faser-composite layer in the pipe reduces linear expansion of the pipe by up to 75% compared to plastic piping

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