



AQUATHERM PROVES BEST CHOICE FOR INJECTION-MOLD PROCESS COOLING

PROJECT:

Berry Global Injection-Molding Facility
Process Cooling

PRODUCTS:

aquatherm blue pipe®

LOCATION/DATE:

Lawrence, KS
Spring 2017

AQUATHERM ADVANTAGES:

- Unlike the existing carbon-steel piping, Aquatherm PP-R piping systems won't corrode, rust, or scale, eliminating future downtime caused by pipe corrosion
- Because Aquatherm PP-R is so lightweight, the piping systems are easy to fabricate in advance and lift and heat-fuse onsite, even the project's 16-in.-dia. pipe
- An inherent low thermal conductivity makes insulating Aquatherm unnecessary in some indoor applications, saving on installation costs and creating a cleaner, more uniform installation

AQUATHERM PP-R PIPING ELIMINATES FUTURE DOWNTIME CAUSED BY CORRODED PIPE

A mere half-second loss in production time can cost an injection-molding facility tens of thousands of dollars.

Jacob Francis knows the stakes are high. As facility maintenance supervisor at Berry Global in Lawrence, KS, he plays that game every day. So, it was a nail-biting proposition when, faced with the need to replace a large portion of pipe used to transport cooling water to more than 20 injection-mold and thermoforming machines, he opted to transition the plant from carbon-steel pipe to Aquatherm polypropylene-random (PP-R) Blue Pipe® in Spring 2017.

The existing carbon-steel piping, along with an undersized chilled-water storage tank, had to be replaced because of excessive corrosion. Cooling the molds is a critical, time-sensitive part of the injection-molding process; the plant already had begun to incur losses because rust and pipe scale was interfering with the cool-water flushing of the molds.

"Our [cooling] cycle time on some of the equipment had increased due to hot cores. This resulted in significant losses in production," Francis said.

Increasing production demands on an undersized storage tank and piping system exacerbated the complex problem.

The system itself is simple. Chilled water



leaves the chiller at 55°F and flows directly to the injection-molding equipment. Water exits through orifices in the aluminum or steel molding equipment and circulates to what was originally a 4,000-gal holding tank before circulating back through the chiller. However, according to Francis, at the required 3,800 gpm, the water never had an opportunity to "settle," causing air to be absorbed within the system. The completely aerated system not only was rusting badly, but the excessive air also prevented water-treatment chemicals from adhering to and protecting the carbon-steel pipe effectively. Corrosion already had eaten two holes in the chilled-water tank.

The situation would only get worse until the piping was replaced, but that created an even greater challenge: How do you replace 300 ft of 10- and 16-in. welded steel pipe for a manufacturing process that virtually never stops?

The plant in Lawrence, one of Berry Global's



130 facilities around the world, produces food-grade plastic cups and containers for various restaurants and food and beverage industries. The plant operates 24/7 every single day of the year, save a day or two at Thanksgiving and Christmas. Shutting down operations for just one hour comes at a high price to large injection-molding manufacturers like Berry, a price they most certainly would have to pay several times over if the piping was replaced with field-welded carbon steel, which can take a long time to install.

“At first, we were going to have three days for the actual installation, but that got whittled down to just 24 hours ... The timeframe was really challenging, but Aquatherm made things a lot easier.”

—Todd Mihalchik, Industrial Mechanical Estimator and Project Manager, P1 Group, Lawrence, KS

Todd Mihalchik, industrial mechanical estimator and project manager for P1 Group in Lawrence, KS – MCAA member and the mechanical contractor selected for the piping renovation – had another thought: Aquatherm PP-R piping systems.

Even though no one from P1 Group previously had installed Aquatherm pipe in such large diameters, Mihalchik’s conversations with local representatives from the Lawrence branch of Ferguson Enterprises, a wholesale distributor of plumbing and mechanical supplies with 1,400 locations serving customers throughout the



U.S., Puerto Rico, the Caribbean, and Mexico, convinced him that the piping might be the answer for his longtime client, Berry Global.

Wedged between a costly shutdown and a rapidly deteriorating system, Francis agreed to listen to presentations from Aquatherm, during which he learned why Aquatherm is the ideal choice for critical process applications like his.

ADVANCED FABRICATION SIMPLIFIES INSTALLATION

Aquatherm PP-R piping systems have all of the characteristics you could want for a mission-

critical application, from a flameless fusion pipe-joining process to long-lasting, reliable service. Unlike metal pipe, which must be welded into place at the jobsite, Aquatherm pipe components are joined using a safe and simple heat-fusion process to create virtually leak-proof connections in minutes. Because the product is so lightweight, large sections can be fabricated in a contractor’s shop – or in Lindon, UT, at Aquatherm’s North America headquarters in the state-of-the-art Design & Fabrication Services department – then easily transported to the jobsite. Because Aquatherm PP-R is completely non-corroding, it will not break down, weaken, or scale like metal piping systems and does not require chemical treatment.

Francis gave P1 Group the green light to install Aquatherm Blue Pipe to replace the chilled-water piping serving two-thirds of the plant’s injection-molding processes.

At a training session held just prior to the Berry project, installation specialists Aquatherm Regional Sales Manager Mike Engle and Ferguson Enterprises’ Nathan Geyer taught P1 Group technicians the appropriate heat-fusion procedures.

“About five or six of our installers attended the five-hour course taught by Aquatherm where they learned all the different heat-fusion welding techniques,” Mihalchik said.

The installation included the construction of a new 10,400-gal outdoor chilled-water tank, 16-in. supply and return piping to and from



the tank, and assorted lengths of 12- and 10-in. piping connecting a 16-in. Aquatherm header to the various injection-mold presses. Nearly all of the piping sections were fabricated in advance at P1 Group's fabrication shop, then installed using rented Widos butt-welding equipment as well as a McElroy Spider™ and McElroy handheld socket-fusion equipment. The only exception was the 16-in. header, which Aquatherm's Design & Fabrication Services team fabricated because P1 Group did not have ready access to the welding equipment needed for the large-diameter pipe.

“The fact that we didn't have to insulate the pipe is another huge benefit. None of the indoor pipe had to have any insulation, even though we are carrying 55°F water in an 80°F ambient space.”

—Jacob Francis, Facility Maintenance Supervisor, Berry Global, Lawrence, KS

The fabricated piping sections, some of which were 15 ft or longer, were lightweight enough for just two men to carry into the installation space and hoist into place. This was a huge advantage for P1 Group, given the project's ever-shrinking installation window.

“At first, we were going to have three days for the actual installation, but that got whittled down to just 24 hours on Good Friday before Easter. The timeframe was really challenging, but Aquatherm made things a lot easier.”

A 'FORTUNATE MISTAKE'

The only glitch, which occurred during the all-night installation, turned into a blessing for Mihalchik and his crew. At one point, the installers discovered that two of the 10-in. lines off the 16-in. header had been cut too short. It might have been a panic-inducing discovery if not for Engle, Geyer, and Ferguson Enterprises' Kent Cramer who were at the jobsite during the installation and able to oversee some impromptu pipe fusion to adjust the length of the 10-in. pipe.

“They showed us how easy a fix it really was. In a way, it was a fortunate mistake because now we know we can work through it easily on our own. I'm a 100-percent believer in Aquatherm now for sure,” Mihalchik said.

Francis is equally convinced he made the right decision choosing Aquatherm. In fact, he had another 700 ft of Aquatherm Blue Pipe installed for domestic water service to Berry's nearby warehouse, and he looks forward to identifying even more opportunities to use Aquatherm piping.

NO INSULATION REQUIRED

“The fact that we didn't have to insulate the pipe is another huge benefit. None of the indoor pipe had to have any insulation, even though we are carrying 55°F water in an 80°F ambient space,” Francis said.

Francis added that despite some extremely warm, humid days since the pipe was installed, he has yet to see a drop of condensation on the Aquatherm pipe.

“I have one flange where carbon-steel pipe meets



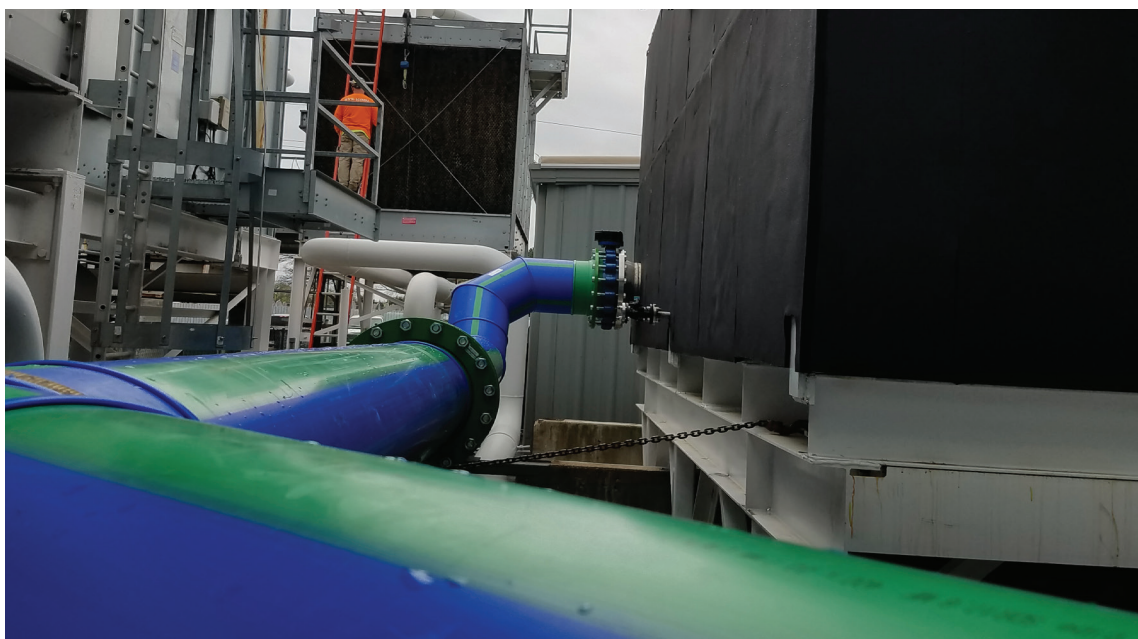
the Aquatherm. I can put a hand on each and feel that the Aquatherm is barely below room temperature while the carbon-steel pipe is really cold.”

An inherent low thermal conductivity (R-value of 1 or more depending on the pipe size and standard dimension ratio) makes insulating Aquatherm unnecessary in certain indoor applications. Not only does this save installation costs, it creates a cleaner, more uniform installation in which the pipe is exposed for easy inspection.

“It really looks sharp,” said Francis, who also credits P1 Group for a very professional-looking installation.

The plant already has seen improvements in system performance, both in terms of chiller usage and pump efficiency. Perhaps even more important, the Berry plant has eliminated future downtime caused by pipe corrosion – at least where Aquatherm is installed. Furthermore, the company has all but eliminated the need for chemical treatment in its piping system.

“For a process project like this, Aquatherm was a no-brainer choice,” Francis said. 🌱



The German-manufactured pipe has been one of the world's most durable and greenest piping systems for 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 more per inch 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 fiber-composite layer in the pipe reduces linear expansion of the pipe by up to 75% compared to plastic piping



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