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Provide lasting pipe performance

PP-R PIPE SYSTEM ENDURES “CRAZY DRUMMER” AND CAUSTIC CHEMICALS AT TANK FARM

PROJECT INFORMATION

PROJECT	PRODUCTS USED	LOCATION / DATE
Webb Chemical Service Corporation, Chemical Transport & Compressed Air	aquatherm green pipe® aquatherm blue pipe®	Muskegon, MI, Summer & Fall 2012

AQUATHERM ADVANTAGES

- Chemically inert, Aquatherm was approved to transport chemicals such as ethylene glycol, propylene glycol, caustic potash, caustic soda, sodium bisulfate, and phosphoric acid
- Aquatherm's heat-fusion technique allowed for a 50% faster installation than welded stainless steel, leading to its use on a second project
- Along with leak-free connections, the 10-year, multi-million dollar warranty provided Webb Chemical with peace of mind



Situated in Muskegon, MI on about 20 acres dissected by active rail lines, Webb Chemical Service Corporation is a full-service chemical repackaging and distribution facility. The 50-year-old business provides commodity chemicals to a huge variety of industries including industrial, pharmaceutical, household, agricultural, aerospace, and many others throughout the U.S.

Webb Chemical grew from its commitment to quality and the environment, so when the company's design staff was formulating plans for a facility expansion, finding a pipe system that mimicked those attributes was important.

IT STARTED WITH A MAGAZINE ARTICLE

Brett Lascko, owner of Lascko Services (Muskegon, MI), had spotted an article about Aquatherm polypropylene-random (PP-R) pipe in a plumbing trade magazine and was interested in learning more. So, a couple months later when Columbia Pipe & Supply Co. account manager Peter Holt presented the PP-R pipe system to him, he was “all ears.” Holt, who's based in Grand Rapids, explained the ins and outs of the PP-R system, how the pipe has been used around the world for 40 years, and is relatively new to North America. He also related that the pipe is made from a chemically inert material and demonstrated its remarkably reliable connection method: heat fusion.

THE CHALLENGE

Webb Chemical was looking for alternatives to traditional piping systems and, if possible, labor and material savings while maintaining safety and quality

THE SOLUTION

The plant manager realized Aquatherm would be an affordable, quality piping product that, if installed properly, would safely transport the chemicals without leaks



Lascko wanted to integrate PP-R into his 14-year-old company's repertoire, but needed the right project. In late summer 2012, when he was trying to prevent some potential pipe corrosion and leakage issues for a long-time customer, Webb Chemical, “it all clicked in my head,” he said.



Webb was building a new 6,000-sq-ft tank farm (a facility for repackaging and storing chemicals) that would house eighteen 8,700-gal tanks as the delivery system for the packaging center in the adjacent building. The tanks are filled, via a valve system, with chemicals that arrive via train or tanker trucks and then used to distribute chemicals into smaller shipping containers. The original bid for the pipe system feeding these massive cross-linked polyethylene (XLPE) tanks, supplied by Snyder Industries, Inc., included multiple material types, such as stainless steel Teflon-lined pipe, CPVC, PVC, and fiberglass.

However, Webb Chemical plant manager Kolin Convertini explained that he and his staff were extremely open to alternative pipe systems. "We were looking for alternatives to hard rigid piping, and a cost/benefit ratio between labor and material."



As Holt had explained to Lascko, the chemically inert nature of PP-R makes it an ideal material for carrying just about any type of liquid that would be used at the facility, and Aquatherm's heat-fusion technique also eliminates systematic weaknesses and leak paths in the pipe system. The heat-fused joints maintain the same properties as the pipe itself, so physical stresses will not compromise their integrity. Additionally, Aquatherm's fiber-composite layer reduces thermal expansion by up to 75% compared to other plastics, and withstands constant temperatures up to 180° at 100 psi.

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- KOLIN CONVERTINI, PLANT MANAGER,
WEBB CHEMICAL, MUSKEGON, MI

"THE PERFECT STORM"

The actual behavior of any piping system when exposed to a specific chemical is extremely dependent on the exposure conditions (temperature, pressure, flow, duration, etc.), the stresses on the piping material, and system (mechanical, thermal, cyclic, etc.), and the ancillary materials in the system (O-rings, seals, gaskets, metal components, etc.). Thus, Aquatherm evaluates each installation for chemical applications on a case-by-case basis and approved usage of the pipe system.

Regarding the use of Aquatherm on the Webb project, Lascko explained, "It was like the perfect storm. I got the list of chemicals that would need to be carried in the pipe and got it to Aquatherm and they told us we could use it on 12 of the 18 tanks. I think we had an answer within 24 hours."

In addition to the hearty nature of the system, officials at Webb chemical also welcomed the peace of mind that comes with a comprehensive 10-year multimillion dollar warranty. "It's a beneficial thing when a company puts their name on their product and issues a letter testifying that we can use this product for our application, plus the warranty is one of the things that sets your mind at ease," explained Convertini.

Obviously, with multiple chemicals such as ethylene glycol, propylene glycol, caustic potash (45%), caustic soda (50%), sodium bisulfate, and phosphoric acid (75%), the first priority at the facility is safety. "We need to keep everything where it needs to be. What Aquatherm sold me on was the strength of the pipe, the compatibility of the pipe and how it's going to perform," Convertini said.

"Because of the joining system we're not going to have leaks at the joints. With the types of pumps that we have, we do have some vibratory issues and we have to maintain and constantly check and make sure fittings are tight and gaskets are in good form and don't slip, slide, or pinch."

Lascko and his team of nearly a dozen installers took the half-day Aquatherm factory certified training course from Columbia Pipe and began the process of preparing for the installation. The contractor bought a McElroy Spider™ 125 socket fusion welding tool that connects 1-4-in. pipe and fittings specifically for this project.

In October 2012 Lascko employees then began installing Aquatherm Green Pipe® and Aquatherm Blue Pipe® in diameters including ½-in., 2-in., and 3-in. to connect the tanks and supply valves located outside the facility where tankers connect. The ½ in. pipe was used for drain lines. In total on the first job, Lascko installed approximately:

- 3,000 feet of 2-in. Faser-composite Green Pipe SDR 7.4 and Blue Pipe SDR 11
- 700 feet of 3-in. Faser-composite Blue Pipe SDR 11
- 700 feet of ¾-in. Faser-composite Blue Pipe SDR 7.4
- 338 feet of ½-in. Faser-composite Green Pipe SDR 7.4
- 338 feet of 1-in. Faser-composite Green Pipe SDR 7.4
- 169 feet of 1 ½-in. Faser-composite Blue Pipe SDR 11



Lascko said that once his installers "got going, they really got moving with it...We got increasingly more comfortable and the fusions became more and more perfect as we went along."

ABOUT THAT "CRAZY DRUMMER..."

The "drumming" process, which occurs when the air diaphragm pumps mete out the chemical and put it into drums or intermediate bulk containers of different sizes, ranging from 5-350 gal, is stressful on the pipe system due to a large amount of vibration. The polypropylene pipe, along with the Graco Pumps and automated ABZ butterfly valves used on the systems are subjected to some heavy stress, so more supports were required on the installation than normal.

Aquatherm Green Pipe was used in 3-in. and ¾-in. diameters for the facility's 125 psi compressed air lines, which are used to supply the pumps. While the lines would have typically been piped using black steel, Lascko explained that there "were fewer leaks with the pulses and surges with Aquatherm, and no seepage that would have occurred with the black steel."


Convertini added: "Quality was definitely one of our concerns. There were issues with other types of pipe, even with the compressed air." Lascko also explained that expansion and contraction of the pipe was an issue. "It's relatively stable for a plastic. Another benefit Aquatherm offered was how tough it is versus PVC. The impact resistance Aquatherm offered was helpful," he explained.

20-50% SAVINGS

Lascko recalled that the product made sense for the application from the beginning. Since his company was an early adopter of PEX pipe, the jump was not a big one. However, when the end result was a 50% labor savings compared to welded stainless steel, it definitely caught his attention. "We did some studies and we think [installing Aquatherm] is very similar to gluing PVC time-wise, but once you get past the learning curve it is about a 20-30% savings over threaded pipe."

One thing that did add a bit to the material cost of the job was the cost of polypropylene valves, particularly the 3- and 4-in. valves. "They can be pretty expensive, but the benefit to the owner is that he is getting a more structurally sound and more watertight system, and the joints are better. If it's a valve intensive job the cost starts to climb, but we did discover that two flanges and a butterfly valve is a good option there too," Lascko added.

Once the initial Aquatherm installation was complete, the Webb staff – some of whom were trained on Aquatherm so they can do some of their own maintenance and expansion – decided to install the product on another job. When a new compressed air system was installed, Lascko ran several hundred feet of ¾-in. and 3-in Aquatherm Green Pipe to the new compressor.

The initial Aquatherm installation has been operational for over a year and Convertini reported that it has performed as advertised, promised, and warrantied. "I'm trying to find other areas to use the Aquatherm in and looking for different applications." 



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
- 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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