

"Brutal" sulfuric acid environment?

Here are two important new tools for your maintenance arsenal

Contractor experience and innovation paid big dividends for a sulfuric acid regenerator when two challenging problems arose during an installation project at one of the company's plants.

Eco Services in The Woodlands, Texas, is one of the country's largest providers of sulfuric acid regeneration services and of merchant virgin sulfuric acid. Sulfuric acid is a key catalyst for oil refiners in the production of alkylate, a critical high-value gasoline blending component. Once utilized in the alkylation process, sulfuric acid becomes spent and must be regenerated back into a high-strength sulfuric acid for reuse by refiners.

Eco Services contracted with Select Plant Services in Pearland, Texas, to manage a project at their Martinez, Calif., regeneration plant. The project included the installation of an asphaltic lining in the quench system (or scrubber). The quench system receives combustion products from spent sulfuric acid that has been thermally decomposed in a furnace. Gaseous sulfur dioxide, water, and carbon dioxide are the result of this process, which are then cooled in a waste heat boiler. The quench system circulates dilute sulfuric acid, scrubs the majority of the carbon and ash generated in the furnace, and cools the gas by water vaporization.



Quench system at Eco Services' regeneration plant in Martinez, Calif.

The quench system is subject to hot gas and weak acid. Ronald Eickelman of Select Plant Services describes the environment as "brutal." As such, the materials with which the quench system is constructed must be selected carefully, and the use of acid-resistant brick and protective membranes is typical.

The Eco Services system in Martinez is constructed of a carbon steel shell lined with acid resistant brick. A 3/8-inch-thick asphaltic liner was to be installed to form an impervious, flexible, chemical resistant membrane between the steel shell and the brick with a thin sheet of Teflon™ helping to form an additional protective barrier.

A common problem gets an innovative solution

Eickelman and his crew weren't confident that a large solid gasket would provide effective sealing on a 16-ft. diameter body flange in the steel shell of the new quench tower. In fact, according to George Wang, a former Senior Process Technologist for Eco Services and now a sulfuric industry consultant, "Ensuring a proper seal in this flange application is one of the biggest challenges for the sulfuric acid industry—other industries, too. If the flange has any imperfections—is aged, corroded, or over-torqued during installation—you can't achieve a perfect seal. This is especially true when you have a flange as large as 16 ft. in diameter."

Fortunately, Eickelman had years of experience using Pelseal® Viton™ liquid fluoroelastomer products to solve a range of acid-related maintenance problems. His crew applied a Pelseal 2690 caulk using a standard caulking gun to create a dependable seal on the 16-ft. diameter flange. The caulk is one part black sealant, whose high viscosity enables its use in horizontal and vertical applications.

"We encountered our second

problem after installing the asphaltic liner. We spark tested the liner the next morning after installation and discovered cracks throughout the liner," Eickelman said. "So, we removed the lining and tried relining the quench system a second time. We spark tested the lining that evening, and it passed. But overnight the liner was affected by the cooler nighttime temperatures, and in the morning we noticed additional cracks in the liner. I'd never seen this happen with an asphaltic liner before. Clearly, we needed a Plan B."

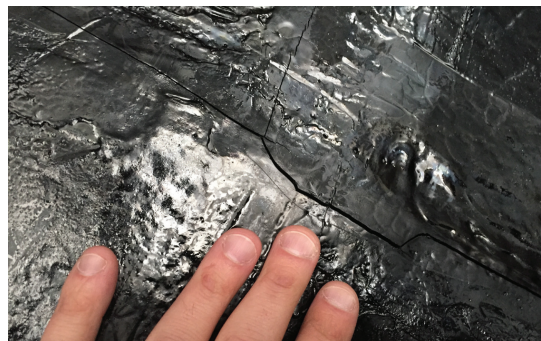
Innovation and experience prevent a serious setback

"Had the problem not been caught, the weak sulfuric acid would have migrated through the brick and corroded the carbon steel shell in weeks," said Gavin Floyd, Engineering Manager of Eco Services Inc. "That would have required expensive maintenance and would have significantly reduced the life of the equipment. Working under cost and installation schedule constraints, we didn't feel that trying to reinstall the liner was the best way to go. Ron and I believed we had an innovative solution that would enable us to reduce downtime."

"It's in situations like this that you depend upon your experience with all the solutions at your disposal," said Eickelman. "Gavin and I have a lot of confidence in Pelseal from 10 plus years of past experience. It has been an important tool in our arsenal."

Eickelman applied Pelseal's PLV6032 fluoroelastomer over the liner to seal it. PLV6032 is a two-part coating used in a variety of extreme, corrosive environments.

"Based on our experience with Pelseal, we were sure the system we installed would hold up against one of the worst environments an acid plant has to offer," Eickelman said. "And the system has worked just as intended

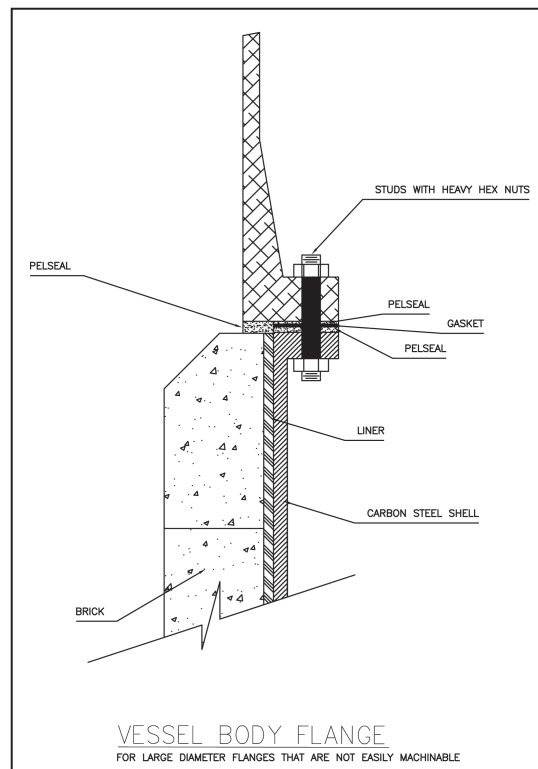


Cracks appeared in the asphaltic liner after its installation.

since installation, saving us from having to perform expensive, premature maintenance."

"We were pleased to find new solutions for some of our most common maintenance problems. These materials are easy to use, and their acid resistance makes them ideal for maintaining equipment in our industry," Floyd concluded.

Headquartered in The Woodlands, Texas, Eco Services is one of the country's largest providers of sulfuric acid regeneration services and merchant virgin sulfuric acid. For more information, please visit www.pelseal.com, email sales@pelseal.com, or call 215-245-0581. □



Cross section of large vessel body flange using Pelseal® to fill gaps caused by imperfect mating surfaces.