

The Corrosion Chronicle



FRP: The enlightened choice for bleach storage

The global market for sodium hypochlorite is nearly two billion metric tons (4.4 trillion lbs) on a 100 percent chlorine basis, growing at about two percent annually. North America alone consumes more than 15 trillion pounds (6.8 million metric tons) of sodium hypochlorite (bleach) on a 10 percent chlorine basis. About two thirds of that sum is used in the form of laundry detergent. The remainder goes into disinfectant applications – most notably water and wastewater treatment. Bleach is a rapidly growing alternative to chlorine in water treatment and has increasingly become an essential component in large-scale wastewater treatment and drinking water purification the world over.

Chlorine and bleach have long competed in water purification, paper bleaching and other applications. Legislation for the safe handling of

chlorine is strongly influencing users to make the switch to sodium hypochlorite. In the U.S., the practice of shipping chlorine by rail has now come under serious scrutiny by the Department of Homeland Security. Bleach, in contrast, is a common liquid that poses considerably less concern. In fact, the Clorox Company announced recently that it would stop making bleach from shipped chlorine. Instead the company will purchase high-strength bleach (15 percent) and dilute it down to household strength (six percent). Similarly, responding to public concern over the shipping of chlorine, Olin Corporation has now developed a fleet of 300 rail cars specifically designed to carry concentrated bleach as a less hazardous alternative.

continued on page 2

Fall 2010

In this issue

- ATEA builds scrubber for pharmaceutical company
- Corrosion barrier composition
- Outotec chooses LEPSA and Derakane for sulfuric acid facility

HETRON™

DERAKANE™
EPOXY VINYL ESTER

ASHLAND

ATEA Environmental builds scrubber for pharmaceutical technology company

One of the world's leading producers of pharmaceutical products recently invested \$175 million to build a new plant in Changshu, China, for the production of intermediates for Active Pharmaceutical Ingredients (APIs). The plant was put in operation in 2009.

The production of API's often leads to hazardous waste gas, which must to be treated in waste gas treatment units. Organic waste gas is typically combusted at high temperatures. The resulting flue gas at 300 degrees C, containing HCl, Cl₂ and CO₂, is then cooled in a quench tower and ultimately treated in a counter-current scrubber before discharge to the atmosphere.

A TEA Environmental Ltd., along with its subsidiary ATEA Composite Co., Ltd (Shanghai), specializes in the design, consultancy and construction of composite equipment and composite piping for use in a variety of industries. The team is comprised of highly knowledgeable engineers and technicians, most of whom have extensive experience in industrial applications. ATEA Environmental Ltd. (Shanghai) secured the flue gas treatment unit for this project and started the engineering in 2008.

The challenge of this project was the high temperature flue gas leaving the heat recovery unit after the combustion process. Industrial quench towers and scrubbers require careful material selection and design consideration due to a combination of high heat and corrosive chemical attack. Heat resistant materials such as steel alloys are often not suitable for these chemical environments whereas FRP materials have superior resistance against chemical attacks but relatively weak mechanical properties under thermal exposure.

A TEA decided to build the quench tower and scrubber in FRP. In order to protect the equipment against elevated temperatures, a water film was applied onto the inner quench-wall surface, acting as a heat barrier. ATEA selected Derakane 470-300 epoxy vinyl ester resin, a heat resistant Novolac*-based resin from Ashland, to maximize resistance of the quench tower and scrubber to the hot flue gases inherent in this process. They also increased the thickness of the corrosion barrier to further protect the FRP structure against corrosive chemical attack.



ATEA Scrubber made with Derakane 470- epoxy vinyl ester resin



*Quench Tower
Diameter: 1,200mm
Height: 11,300mm*



*Scrubber
Diameter: 2,000mm
Height: 11,700mm*