

WATERBORNE ACRYLIC RESINS FOR PROTECTIVE COATINGS

## CASE HISTORY: Calcium Hydroxide Slurry Tanks



Tanks prior to painting in 1986.

Starting in 1984, a number of structures were painted at the Rohm and Haas chemical plant located in Philadelphia, PA. The plant is bounded on two sides by waterways, and would be considered a normal industrial environment. Among the structures painted were several tanks used at the water treatment

facility for storage of acid and base slurry. At the height of its use, the water treatment station recycled 3 million gallons of process water by addition of acid and calcium hydroxide

The calcium hydroxide slurry tanks are located on the opposite side of the water treatment building from the acid tank. The tanks were installed in 1977, precoated with a shop primer, and painted with several two-component systems including a commercially available polyester-urethane, an acrylic-urethane and several epoxy-polyamide systems, both solventborne and waterborne. Within 18 months, all the coating systems, with the exception of a narrow band of acrylic latex coating, showed signs of cracking.

### DETAILS OF PROJECT

#### SURFACE PREPARATION:

Sandblasting down to original shop primer.

#### TOPCOAT:

2 coats of semi-gloss WB acrylic topcoat based on waterborne acrylic resin.

#### DFT:

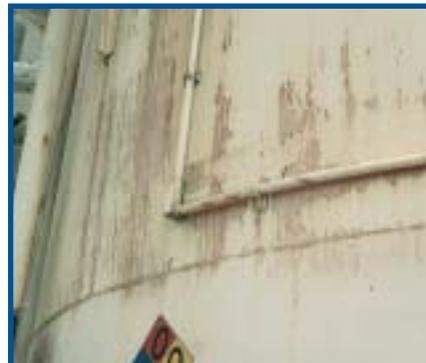
2 – 3 mils per coat,  
total DFT = 4 – 6 mils.

*Project completed in the spring of 1986.*

## SURFACE PREPARATION & COATING APPLICATION

These tanks needed repainting in 1986, because at that point the old thermoset paint system was flaking off. In addition to the normal weather patterns, the lime storage tanks are also subjected to a 200°F exotherm several times a week when dry lime is slaked into the tank mixture, a condition which would be expected to stress any paint system. Often because of viscosity restraints, solventborne coatings start out at relatively low

molecular weight and rely on crosslinking reactions after application to develop film toughness. However, these crosslinking reactions can often lead to a brittle film, which most likely led to the poor exterior performance of the original coating on these tanks. Waterborne acrylic latex paints have inherent toughness and excellent weathering properties due to the initially high molecular weight of the resins.



Close-up of tank showing flaking of the original thermoset coating.

## PROJECT ASSESSMENT:

In 1986, the tanks were sandblasted back to the original primer, and two coats of a waterborne acrylic latex paint replaced the original thermoset systems. On a recent inspection after 15 years of service, the tanks were still in excellent condition. The topcoat has chalked, but no significant signs of corrosion were found.



Tanks after painting in 1986.



One of the tanks after 15 years - August 2001.