

STONHARD *Solutions*

Polymer flooring restores 40,000 sq. ft. surface at chlor-alkali plant

Problem

Occidental Chemical Corporation's plant at Delaware City, DE, is a major producer of chlorine, liquid caustic soda and caustic potash. In operation since 1965, it has been expanded to a present capacity of 380 tons per day.

The plant's electrolytic conversion of brine requires 40,000 sq. ft. of process area on each of two levels. The upper level contains the electrolytic cells and related systems. The lower operating floor level is partly occupied by sodium and potassium amalgam decomposers. It also serves as the principal access-way for piping and electrical systems.

After 21 years of service, the concrete floor of the lower operating level was severely eroded. Standards for cleanliness and safety required restoration of the floor. The concrete surface could not be restored with coatings, concrete patches failed to maintain bonds, and re-placement of the bulk concrete was deemed impractical. A new floor over the concrete was considered the best option.

Stringent requirements were specified for both the installation and performance of any new flooring system. Resurfacing such a large area with the plant in operation would require special attention to safety. The large area would need to be divided into smaller parcels. Also, the floor material and the application method had to accommodate irregular surfaces and different thicknesses. It had to bond to concrete and permit pitching for a good drainage system. The finished floor also had to support equipment loading and provide adequate traction for walking, without affecting cleanability.

Solution

A high performance, ambient cure, polymer floor system was selected, with installation by the vendor's own installer. The job was done in two 20,000 sq. ft. stages. Each was further divided into 16,400 sq. ft. of a general service polymer floor and 3,600 sq. ft. of a more temperature resistant and dimensionally stable one. The latter was used in a 12 ft. wide lane at the outer perimeter of the cell house, where high ambient temperatures were a concern.

The old floor surface was first scarified, thoroughly cleaned of all loose concrete and dried. A special fast setting epoxy-based grout was applied to repair deep holes and erosion, and to set contours and pitch for drainage. Next, a two-component, penetrating, moisture-tolerant epoxy based priming system was applied over the grout

to enhance bonding and to reduce absorption of liquids from the next layer.

The polymer floor layer, a three-component troweled mortar consisting of epoxy resin, curing agent and selected, graded aggregates blended with inorganic pigments was then applied. Resin was pre-packaged and pre-measured at the vendor's plant under stringent quality controlled conditions, assuring delivery of correctly proportioned and consistent mixes. A "mix" covered 16-17 sq. ft. at a nominal 1/4" thickness. A "screed" applicator was used to apply an initial layer which could then be compacted and smoothed with steel trowels. This provided great flexibility for adjusting to different elevations around equipment and building parts, while maintaining a full 1/4" of polymer flooring material.

Finally, the polymer floor was sealed with a 100% solids, two-component, ambient-cure, epoxy resin coating. Expansion joints were filled with a two-component polysulfide sealant formulated for horizontal joints in flooring exposed to pedestrian and limited vehicular traffic.

Results

The most important result to Occidental was the placement of a functional floor without having to replace the bulk concrete.

The polymer floor was completed without interruption and without interruption of plant operations on schedule. It is also maintaining a safe surface for walking without the use of anti-slip additives which would limit cleanability. It has withstood forklift trucks and a handling tractor which imposes high unit loadings.

The Stonhard Difference

Stonhard is the unprecedented world leader in manufacturing and installing high performance polymer floor, wall and lining systems. Stonhard's seamless, long-wearing and easy to clean floor systems are engineered to perform in both industrial and commercial environments without sacrificing design and innovative vision. You'll experience unparalleled products, easy maintenance, progressive and customized designs and Stonhard's single source warranty covering both installation and products. Stonhard maintains 300 project engineers and 175 installation teams worldwide who will work with you on design specifications, project management, final walk through and service after the sale.



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