

Corrosion Engineering Product Performance Profile:

Boehringer Ingelheim Corp., Petersburg, VA

Operation: cGMP-validated Active
Pharmaceutical Ingredient (API) and
Intermediates Manufacturing

Problem: Need attractive, chemical-
resistant, durable, conductive process
flooring for solvent processing area.

Solution: TUFCEM® Tiling Systems



Installer trowels on Thinset® Adhesive adjacent to bonded, pre-spaced tiles.

Conductive tile flooring exceeds API manufacturer's expectations for safety, reliability and aesthetics in new cGMP-validated facility

The flagship manufacturing facility of Boehringer Ingelheim Corporation (BI) in Ingelheim, Germany, sets the standard by which its other plants are measured. So as the Petersburg, Virginia, Chemicals plant made plans to expand its Active Pharmaceutical Ingredient (API) manufacturing capacity, it looked to the Ingelheim Werks for design cues that would help it meet its safety and reliability goals and ensure compliance with current Good Manufacturing Practices (cGMP).

Preferring the aesthetic appeal of tile flooring that had been used at Ingelheim, BI gave Petersburg the green light to scrap the epoxy monolithic floor finishes originally planned and to specify similar tile flooring for these new process areas. "We're a pharmaceutical company," Barry Reid, BI Project Manager explained, "so there was a lot of emphasis put on the floor's appearance." Petersburg selected attractive fully vitrified TUFCEM® Tile furnished by Henkel Technologies.

Pre-lugged tiles produce consistently spaced 2mm wide joints, giving TUFCEM Fully-Vitrified Tiling Systems an advantage over other tile systems. The narrow grout joints minimize the grout's chemical exposure, contributing to the floor's longevity.

Hexagonal tiles were selected to ensure the finish conformed to the variable-slope floor. To provide a safe, non-skid walking surface, the architect-engineer also chose a durable, integrally-formed, textured tile

surface—an option also inherent to the design of dust-pressed TUFCEM Fully-Vitrified Tiles.

Though aesthetic considerations drove the decision to use tile flooring in lieu of an epoxy surfacer, reliability was also a major concern. The flooring system had to hold up in a tough environment.

"This floor sees a very wide variety of solvents, acids, and bases," said Reid, "Chemical incompatibility has caused maintenance problems with epoxies here in the past. We needed a floor that would be compatible with our current mix of chemistries as well as those we might use in the future."

Reid further explained, "Epoxy floors don't hold up very well to impact. Dropping a wrench, for example, could cause chipping. Even if the tile did chip, you'd still have over a half-inch of protection." Of the performance benefits of tile, Reid said, "TUFCEM Tile has eliminated these problems. After two years [of performance history with TUFCEM Tiling Systems] in Bay 34, we haven't had to make any repairs, and it still looks good."

With heavy solvent usage anticipated in the new process areas, the facility's design also had to include engineering controls for fire risk management. To control electrostatic discharges (ESD), which could ignite fugitive solvents, BI called for conductive flooring to ground personnel wearing conductive footwear and ankle straps.

Henkel Technologies recommended carbon-filled, novolac epoxy-based versions of PENNTROWEL® Water Cleanable Grout and THINSET® Adhesive to provide the required combination of chemical resistance and conductivity. A conductive tape grid was embedded in the adhesive and linked to several grounding points.

According to Reid, the manufacturing operations in Bay 34 have already been cGMP-validated, and he expects Bay 33 to be validated upon completion of construction. "Our decision to use TUFCEM Tiling Systems was highly influenced by cGMP design principles," which recommend the use of flooring that is smooth and cleanable. Reid said that he "had every confidence TUFCEM Tiling Systems would meet cGMP requirements; it was a non-issue."



Hexagonal, Carolina Clay, fully-vitrified TUFCEM® Tiles used at BI Chemicals



Technologies

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