

# Conductive Tile Flooring Exceeds API Manufacturer's Expectation for Safety Reliability and Aesthetics in New cGMP-Validated Facility



## LOCATION

Petersburg,  
Virginia



## OPERATION

Pharmaceutical manufacturing



## PRODUCTS

TUFCHEM™ Tiling Systems  
Fully Vitrified Tile  
THINSET™ Adhesive  
PENNTROWEL™ Water Cleanable Grout

**Challenge:** Need for an attractive, chemical-resistant, durable, conductive process flooring for solvent-processing area that complies with cGMP standards

**Solution:** TUFCHEM Tiling Systems fully vitrified hexagonal tile with THINSET Adhesive as a bedding compound and PENNTROWEL Water Cleanable Grout for side joints

The flagship manufacturing facility of Boehringer Ingelheim Corporation (BI) in Ingelheim, Germany, sets the standard by which its other plants are measured. So as BI's 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," the BI Project Manager explained, "so there was a lot of emphasis put on the floor's appearance." Petersburg selected ErgonArmor's TUFCHEM Tiling Systems' attractive fully vitrified TUFCHEM Tile.

Pre-lugged tiles produce consistently spaced 2mm wide joints, giving TUFCHEM 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 TUFCHEM 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 the project manager, "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."

The project manager 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, he said, "TUFCHEM Tile has eliminated these problems. After two years of performance history with TUFCHEM Tiling Systems] in Bay 34, we haven't had to make any repairs, and it still looks good."



1. TUFCHEM Tiling Systems tile flooring is perfect for heavy traffic areas like the material transportation corridor.

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.

ErgonArmor 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."



2. Hexagonal, Carolina Clay, fully-vitrified TUFCEM tiles used at BI Chemicals