

STONHARD *Solutions*

NASA Conquers Yet Another Frontier – Their Floors

In October 1958, the National Aeronautics and Space Administration (NASA) was created in the United States. Over the next twenty years, more than 1,600 space-craft were launched and twelve men walked on the moon.

With this success comes a reputation for universally high standards. So, when more than 60,000 square feet of eight month old vinyl tile began disbonding at Cape Canaveral's Kennedy Space Center, a better flooring solution became high priority.

The Space Station Processing Facility (SSPF) is where NASA stages and loads shuttle payloads, including International Space Station Alpha flight hardware and the shuttle/Mir docking module. This three story, 457,000 square foot building includes 63,000 square feet of space shuttle element processing areas, airlock, operational control rooms, labs, logistical areas and office space for more than 1,000 NASA employees.

The processing and airlock areas were designed to support non-hazardous space station and shuttle payloads in Class 100,000 clean room areas. These areas are routinely exposed to harsh physical abuse from air pallets and chemical attack from Hypergol, a corrosive, highly flammable rocket fuel. In addition, sensitive electronic components are handled here which must be protected from ESD damage.

Originally, these critical areas were overlaid with a well known conductive vinyl tile. This tile



A space station laboratory at NASA's Kennedy Space Center in Cape Canaveral, Florida.

was installed in May of 1994. However, only eight months after the initial installation, the tile began to delaminate.

This floor weakness was further compounded by the presence of the air pallets used to move equipment and materials throughout the facility. The force created by these air pallets caused the tile seams to fail and blew the tiles off the floor.

This floor failure exposed the concrete substrate to the corrosive Hypergol fuel. Additionally, the area was now susceptible to ESD events which could damage electronics and endanger personnel.

NASA's management moved quickly to solve their flooring issues. The flooring system had to be strong and seamless to combat the aggressive abuse from air pallets and their heavy loads, non-sparking to prevent the

Hypergol from igniting, conductive to prevent ESD damage to sensitive electronic equipment and, finally, able to meet the standards of a clean manufacturing process.

Stonhard's Stonlux ATK fit this tall bill. This conductive, seamless epoxy flooring system was installed at Kennedy Space Center by one of Stonhard's own specially trained crews.

Before installation could begin, however, the crew had to remove what remained of the vinyl tile and overlay the substrate with Stonfil OP2, a polymer modified, cementitious, osmotic pressure resistant grout. This grout was applied to eliminate problems associated with osmotic pressure from the negative side of the floor slab.

Finally, the Stonlux system was installed. First, a series of two separate primers was applied to

the substrate to provide exceptional adhesion between the concrete and the Stonlux ATK flooring system. Grounding plates were then set into the second layer of conductive primer (AT Primer) to provide a controlled ground point.

Once the AT Primer was tack-free, the Stonlux ATK was applied with a V-notched rake in open areas and a V-notched hand trowel in more confined or detailed areas. The notch allows the self-leveling Stonlux ATK material to flow through to the necessary thickness. A spike roller was then used to release entrapped air and enhance the flow and leveling characteristics of the material. This spike rolling step enhances the appearance of the fully cured floor.

The final step in the installation was the testing of the cured system. Since past flooring attempts had failed, NASA engineers developed a stringent testing procedure to evaluate the finished floor.

The procedure involved numerous tests of the flooring materials during the installation process, as well as evaluation of the finished floor's properties, including: electrical resistance, resistance to sparking, adhesion, thickness and hardness. Each of these tests was performed using the approved ASTM standards and other tests developed by accredited sanctioning bodies. The testing phase of the project was performed by representatives of NASA and an outside materials analysis laboratory over a four week period.

Stonhard's Stonlux ATK conductive flooring system passed every test with flying colors. The material was found to be completely spark-proof and safe for explosives applications. The electrical resistance of the floor

was not only within standard, but also displayed a consistency that had not been achieved with the tile. This consistency, coupled with the floor's exceptionally low body voltage generation values provided a Class 0 sensitivity safe environment.

Now, as NASA's facilities expand to support the existing US/Russian manned space station Mir, as well as exciting new programs for long-term manned space travel, Stonhard surfaces continue to expand in the facilities as well.

And we're happy to report, "Houston, we have no problems!"

The Stonhard Difference

Stonhard is a world-leading manufacturer and installer of high-performance polymer floor and lining systems designed for tough commercial and industrial environments requiring protection against corrosion, impact, abrasion and continuous daily wear. We deliver long-lasting, high-performance systems for tough environments. We offer customized solutions to satisfy the most demanding design specifications and work with you directly from start to finish. You are protected with a single source warranty on both product and workmanship. Known around the world for excellence, the Stonhard name means quality products and unmatched service.

*The products used on this project include:
Stonlux ATK
Stonfil OP2*

STONHARD
single
source

- FORMULATING
- ENGINEERING
- SALES + SERVICE
- INSTALLATION
- PROJECT MANAGEMENT

For more information on Stonhard's high-performance polymer floor, wall and lining systems, visit us at www.stonhard.com or call toll free at 800/257-7953.