

STONHARD Solutions

ESD Flooring: The Underlying Factor

If you want your facilities to be free of ESD, it's best to start from the ground up.

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In the spring of 1989, planning began for a new state-of-the-art electronics facility in San Jose, CA. In December 1990, phase one of Pyramid Technology's mini-computer facility was completed. At this facility, Unix based mini-computers and assembled from subassemblies, and custom configurations are generated for specific applications.

Every aspect of the new facility was scrutinized, from design to material selection. When it came down to the floors, more than simple color selection remained. Specifically, the flooring's electrical functionality needed to be addressed.

Beyond Workstations

Engineering determined that the problem of controlling static electricity on personnel and equipment could not be limited to the workstation areas. A broader approach needed to be taken to control charge throughout the entire facility. The approach would need to attack static electricity at its main source – the floor. This was felt to be the only way ESD could be controlled throughout the facility.

The facility encompasses several manufacturing areas, from assembly to burn-in testing. Because of the broad range of requirements and the varying amounts of physical stress placed on the floor surface, an epoxy overlayment was chosen.



Part Two: A second primer layer follows the first to provide conductivity and an additional seal.

Approaches Considered

For static dissipative floors, three basic approaches were considered; waxes, vinyls, and epoxies. Waxes did not offer permanent static protection and the proposed maintenance program presented additional expense. The vinyl systems did not have the durability needed for Pyramid's environment.

Although vinyls and waxes definitely have their applications, a light manufacturing area where wheeled loads are present, is not one of them.

An epoxy overlayment was selected over an epoxy coating for reasons of longevity. Over periods of years in a manufacturing environment, wear patterns in coatings may expose the subfloor, which could lead to costly repairs and patches throughout the floor.

This made the overlayment option more attractive and justified the additional expenditure. A light Silver Gray color was selected to

provide maximum light reflectivity and a pleasant, bright working environment. No special maintenance requirements were necessary and the floor system retains a gloss level without the need for polishes or waxes.

The floor's electrical resistance was set for a range of 10^6 to 10^8 ohms to optimize dissipation of static charge without sacrificing the safety of workers.

Installation

The floor was installed by the manufacturer's (Stonhard, Maple Shade, NJ) installation team. On-site engineers supervised the installation, performed electrical tests and prepared a report detailing the floor's resistance in all areas.

The substrate below the flooring system was prepared mechanically by a shot blast machine. This preparation removed all laitance from the concrete and left a clean, sound surface. An epoxy primer

was then applied to seal the concrete and penetrate the substrate for a strong bond.

A second primer was applied to further seal the surface and provide a conducting base. Once the primer became tack-free, the 1/8" epoxy overlayment was applied using a notched trowel or rake followed by a spike roller. Spike rolling releases air and compresses the fine aggregate, leaving a liquid-rich surface.

After spike rolling, grounding contacts were inserted in the epoxy to permanently cure in the flooring system. One such terminal was installed for every 1,000 sq. ft.

Pyramid Technologies found the flooring system to be almost 100% effective in controlling electrostatic discharge in the facility, when combined with ESD footwear having a resistance of a megaohm or less. In addition, the floor is easy to clean, durable and its color enhanced the aesthetics of the facility.

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.

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