

Durability in Resinous Flooring Systems

Durability in flooring relates to the lasting functional and physical aspects of a flooring system. The floor you purchase today should withstand the abuse it was intended to withstand without appreciable changes in appearance or physical properties. In most cases systems can be designed to meet these expectations. Mechanical abuse, chemical attack, thermal movement, moisture vapor and substrate preparation are among the primary factors affecting durability. It is important to make your expectations and requirements known to the flooring contractor or design professional before flooring systems are specified.

The question "What do you want from a new floor system?" does not always get the same response. Many end users expect a new flooring system to solve all their existing problems, what ever they are. Some expect the floor to "look good" and others are less impressed by aesthetics than by function. Most of the responses are industry specific and experience dependent.

Durability of flooring is affected topically by traffic patterns, the type of traffic such as metal or rubber wheels or foot, chemical abuse and UV exposure to name a few. Generally, resinous materials that are harder and which exhibit tighter molecular cross-linking perform best against mechanical and chemical abuse. Chemical resistance and staining are addressed in an accompanying section titled "Chemical Resistance". Likewise, thermal effects are discussed in an accompanying section titled "Thermal Movement".

Mechanical abuse becomes a contest between the hardness of one surface against another. Steel-wheeled traffic will abrade any resinous material and eventually wear into the system. In the case of abrasion, the functional performance of flooring systems can be enhanced by the addition of aggregates that are harder than steel, however aesthetics will suffer. Caster and wheel selection are important aspects when considering long-term wear of your flooring system.

Even though resinous flooring systems are "hard" surfaces, they too have their limitations. Compressive strengths of epoxy flooring are generally in the 8,000 to 12,000 psi range. Although these are large numbers, consider the effect a small lady in spiked heels can have on a hard wood floor. Point loading, indentation of static loads as well as loads exerted from rolling casters of your equipment can be a critical consideration for floor performance.

UV rays are absorbed into the flooring system and their energy causes molecular deterioration. Epoxy and latex materials will degrade faster than aliphatic urethane. To date we have found aliphatic urethane to give the best long-term performance to wear as well as chemical and UV resistance.

Physical factors of construction also affect the overall longevity of the flooring system. If the substrate is affected by movement or cracking, the flooring will be effected. Expansion joints are designed to allow for movement in the concrete either from expansion and contraction or from deflection. Since resinous floors are rigid, any movement from below will translate through the floor and become visible. Aggressive movement will crack through the flooring and expose the substrate to the operating environment. This exposure will allow chemicals and topical water to enter into the void and migrate below the flooring system. Conditions such as this begin the deterioration of the system from below.

It is impossible to predict how much a crack will move. Once a facility is occupied and final internal climatic conditions are established there should be minimal movement in the concrete slab caused by temperature. Still some does occur. Known cracks and control or pour joints should be addressed with the intent to deflect the energy associated with movement and reduce the subsequent telescoping effects on the flooring. True expansion joints should be referenced through the flooring system as the floor is installed when ever possible. The referenced joint can be filled with a caulk material to allow for traffic movement across the joint and compensate for load transfer at the joint edge. Damage from vertical movement or deflection can only be prevented using referenced joints.

Moisture problems will shorten the useful life of flooring systems. This is discussed in an accompanying section titled "Moisture".

Durability implies attributes associated with long lasting and resistant properties. Many factors effect the overall performance of a floor system that we casually refer to as durability. Durability, as a component of the flooring system, is designed, not assumed. It does not come in a can but rather through an analytical process that leads to a better understanding of the expectations of the project.

For recommendations on a specific project complete our Project Evaluation Form or simply call our sales and technical personnel for assistance.