

Prevent Failure of Your Food Plant Floor: Important Tips & Considerations for a Reliable Floor

With so many options available on the market, selecting the ideal floor to withstand the rigors of your day-to-day operation while also fitting within your budget can be a daunting task.

The simple reality: floor failure is detrimental to your plant's productivity. Therefore, understanding potential floor failure triggers up front can enable you to prepare for and select the most reliable surface to meet the unique needs of your production facility.

FAILURE TRIGGER #1 Poor resistance to thermal shock

In food processing plants, daily maintenance includes washing floors with very hot water or steam to remove blood, grease and chemical contaminants from the floor surface. Because many plants operate at cool ambient temperatures, the floor is subjected to thermal shock as the cool floor is suddenly exposed to temperatures at or above 180°F.

In a rigid floor composed of conventional epoxy, vinyl ester or polyester type materials, these drastic temperature changes can cause cracks or delamination from the concrete substrate. Fortunately, thermal shock resistant flooring surfaces, such as *polyurethane concrete* and *flexibilized high temperature epoxies*, withstand extreme temperature fluctuations.

FAILURE TRIGGER #2 Inadequate surface preparation

No matter how adequate the floor material is, if the concrete surface is not properly prepared, a failure is likely to occur. This type of failure is usually catastrophic: the affected area must be removed and replaced.

The best preparation is to mechanically abrade the floor with steel shot; this is vacuumed up along with the cement dust and can be recycled for further use. This method not only removes the weak alkaline laitance but also provides a consistent profile for application of the coating. Water blasting can also be used if shot blasting is prohibited. A chemical degreaser is required if oils or fats have penetrated the concrete surface. Avoid acid etching.

FAILURE TRIGGER #3 Excessive moisture transmission in slab

A leading cause of floor failures is excessive moisture vapor transmission through the concrete slab. It can lead to floor blistering, disbonding and degradation. All concrete has some degree of moisture; the key is to understand the acceptable level of moisture vapor transmission and how to determine the amount in your floor.

Two industry-accepted quantitative tests exist. The calcium chloride method utilizes a test kit that is placed in random locations on the floor to measure the amount of vapor transmission during a 24-hour period. Generally speaking, an acceptable level is three pounds or less of moisture vapor transmitted over a 1,000 square foot area during a 24 hour period.

Another test method measures relative humidity (RH) in the slab using a probe; RH levels should not exceed 80%. There are several ways to treat the concrete prior to coating if moisture levels are high.



FAILURE TRIGGER #4
Insufficient chemical resistance

Make sure the product selected has supporting data for resistance to the chemicals and foodstuffs to which it will be exposed. This includes the temperature of the material and the degree of exposure (immersion, intermittent splash and spillage or infrequent contact). Some materials such as grease may be fairly inert at normal temperatures but very corrosive when heated.

FAILURE TRIGGER #5
Product is not environmentally friendly

The use of the proper flooring material should not require the removal or covering of exposed meats and other prepared products. Floor products used in the food processing industry should be free of solvents, reactive styrene monomer and other toxic chemicals. With their high volatile organic compound (VOC) content, polyester and vinyl esters generally are not recommended for applications in food areas due to potential tainting of food products. Methyl methacrylates (MMA) exhibit a strong odor that may prevent installation when workers are present. The floor manufacturer should certify its products to meet USDA requirements.

FAILURE TRIGGER #6
Product does not inhibit bacteria growth

Floor seams, grout lines and cracks in concrete are a breeding ground for bacteria, fungi, molds and mildew. Seamless flooring minimizes these traps, providing a monolithic, hygienic surface that is free of crevices where dirt and bacteria can dwell. The addition of a built in anti-microbial inhibits bacterial and fungi growth between cleaning cycles.

FAILURE TRIGGER #7
Poor slip resistance

Over time, many floors begin to wear and become a slipping hazard in wet areas. This can result in

injuries to workers and higher insurance premiums. The surface texture of any floor used in a wet area should be skid resistant and not subject to removal of the texture when exposed to normal wear and tear conditions.

Conversely, a very rough texture is difficult to clean and may harbor bacteria.

Always request a sample of the product to be used and compare this to the finished texture of the floor. Also, avoid conditions such as pallet scraping, which can cause excessive surface wear.

FAILURE TRIGGER #8
Inattention to joints and termination details

The weakest links in a typical floor are the expansion and control joints and termination points around drains and in doorways. These construction details should be identified prior to construction to prevent undercutting, cracking and disbonding. Expansion joints are best installed after the floor surface is in place. Control joints can be saw cut after floor placement then filled with a polysulfide or epoxy joint sealant. Termination points should be keyed to prevent lifting and undercutting.

FAILURE TRIGGER #9
Inexperienced applicator

An experienced applicator is a virtual necessity on any floor installation. Not only will the applicator know how to install the specific products, but they will also know what to do when challenges are encountered on the job. They should exhibit experience, integrity and financial stability. The applicator should have at least five years of experience in installing similar products, have plenty of job references, install the systems as demonstrated, and have a consistent track record of standing behind their warranty.

If an applicator has underbid the job, pay special attention to proper material application thicknesses, use of the products specified, and short-cutting on the surface preparation.



FAILURE TRIGGER #10
Choosing the low cost solution

Oftentimes, the low cost solution is the one that turns out to be the most expensive. Always check the expected service life of the product prior to choosing a floor system. This will enable you to amortize the cost over the life of the floor to compute the real cost. Also, be wary of warranties that are nothing more than empty sales gimmicks. The best assurance to getting a good job is to use a supplier and applicator that have done similar jobs with verifiable performance histories. Avoid companies that offer a limited number of flooring options.

FAILURE TRIGGER #11
Unrealistic expectations

Most polymeric floor systems for food plants are functional rather than architectural in nature. The floor that looks the best may not be the best long term performer. Ask the applicator or manufacturer to see other jobs in similar plants. This will enable everyone to “be on the same page” when it comes to the job expectations.

The manufacturer and applicator should be prepared to provide the following important items:

- *Normal service life of the floor*
- *Conditions under which the floor can and will perform*
- *What constitutes normal wear and tear*
- *Product limitations, precautions*
- *Proper maintenance steps required to keep the floor in good working order*