Planning for a Large Flooring Project

Design Considerations

Flooring for Food & Beverage Manufacturing Facilities

A GUIDE

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Introduction

Flooring is one of the most abused surfaces in the food manufacturing facility. From large machinery rolling over it, to extreme temperature variances experienced within minutes, the floor must take it and not crack or damage.

For a project to be successful, flooring must be designed specifically with the individual room requirements in mind. But most of all, it needs to be hygienic, functional, tough, and safe to walk on. That's because failures, even seemingly insignificant ones, can cause expensive downtime, production losses, product contamination and, in the worst case, accidents.

The Requirements

Standard 3.2.3: Food Premises & Equipment; Flooring Requirements

10 (2) Subject to subclause (3), floors must:
(a) be able to be effectively cleaned;
Floors must be capable of being effectively cleaned to remove accumulations of food waste, dirt, grease or other visible matter. Such accumulations provide food for pests, enable microbial growth and could directly contaminate food. The food waste, dirt, grease or other visible matter on the floor may be from a variety of sources including food spills, food handlers' shoes and food packaging brought into the premises.

Generally, to be effectively cleaned, floors in kitchens and other areas where food is prepared or cooked should be smooth (within occupational health and safety guidelines), free from cracks and crevices, and resistant to hot water, steam and/or chemicals. It is also important in permanent premises that the floor is durable otherwise the business will be faced with replacement costs and associated disruption. Examples of floors that meet the criteria include glazed tiles with flush epoxy grouting, sheet vinyl and epoxy resin.
The same criteria would apply to floors in wash up areas.

The type of floors that are suitable for staff amenity areas, including wash rooms, will depend on the extent to which food residues are carried into these areas and the method of cleaning necessary to keep the floors clean. Glazed tiles, sheet vinyl and epoxy resin would be suitable, as would flooring for storage areas.

There is no requirement that the floor be capable of being sanitised, that is, withstanding chemical sanitisers or the high temperatures of hot water or steam sanitising. Such a requirement is not considered necessary because food should not be in direct contact with the floor and walking on the floor negates the sanitiser's effect. Cleaning methods should be adequate to remove soil as well as reduce micro-organisms to a safe level. However, if a business sanitises floors, the floor must be able to withstand the effects of sanitising to be appropriate under subclause (1).

If an enforcement agency considers that the type of food operation necessitates that the floor must be capable of being sanitised to ensure very low levels of contaminants (for example, very low levels of listeria) in the environment, this could be required under clause 3 General requirements. Clause (3)(c) of this standard states that the design and construction of food premises must permit the premises to be effectively cleaned and, if necessary, sanitised.

Defining a Food-Safe Floor

The term food-safe flooring is not defined in the Food Safe Standards, nor is there any certificate that can be obtained for it. It is a phrase used by companies that offer flooring solutions to the food and beverage manufacturing industry.

A food-safe floor is one that is sealed, prevents bacteria growth, is easily cleaned and can stand up to external stresses, such as heavy foot and forklift traffic, thermal shock, chemicals and acids.

As outlined in the Standards above, floors do not need to be sanitised, as food is not being prepared on that surface. However it is very important they are effectively cleaned. Some methods of cleaning involve high pressure hosing, which can bring any bacteria growing on the floor to being airborne, a threat to food and machinery around.

Important Design Factors

FOOD SAFETY & HYGIENE

Food safety and hygiene have become visible on the radar screens of consumers, industry, regulators and other stakeholders like never before. However, innovations in food manufacturing technology have significantly increased over the past decade. With consumers demanding more nutritious and better tasting food, the industry has responded with a number of new processes and methods for manufacturing.

As food manufacturing facilities offer the perfect conditions for bacteria to grow, It is extremely important that companies do what they can to ensure hygiene standards are being upheld. Flooring must be designed so that it’s easy to clean, and it actively fights against bacteria growth for the lifetime of the floor.

PERSONAL SAFETY

With 86% of total workplace injuries occurring due to slips and falls, with 90% of these happening when the floor is wet, employee safety is one of the most important requirements for any workplace. Slips, trips and falls tend to occur most frequently in areas where meat, fruit, vegetable, fat and other residues are present.

While implementing methods to prevent these residues from falling on the floor in the first place, companies can also select flooring solutions that provide the optimum level of grip, without compromising on cleanability. Obviously, it is important that the correct hygienic shoes and boots are worn, and observing careful working habits.

Important Design Factors

RESISTANCE APPLICABLE FOR INTENDED USE

There is no one flooring solution that is ideal for every area in every sector of the food manufacturing industry. For each particular area in your facility, ensure that the resistance is applicable for the intended use. For example, if you are designing a slaughter floor, you would need to cater for large equipment being used, as well as heavy hooks accidentally falling on the floor from time to time.

Further detail on this topic can be found in our whitepaper: A Solution for Every Room in the Food Production Facility.

MAINTENANCE

Cleaning and sanitation of floors remains one of the most important tasks in the maintenance schedule. The heavier the slip resistance, the more frequent and vigorous the cleaning will need to be. Additionally, oily floors, for example in a commercial bakery, will require detergent solutions to be applied, agitated and left on the floor for a specific length of time prior to being rinsed and removed, which in turn increases downtime.

High temperature and/or high pressure hose cleaning is another popular method, but not all floor finishes are able to tolerate extreme temperatures or pressure. If aggressive cleaning agents are used instead, they may cause damage to the floor, depending what type it is.

Antimicrobial Flooring

By nature, typical polyurethane cement or epoxy floors are passively antimicrobial. In other words, they don’t encourage bacteria growth. But they do nothing to stop bacteria from growing on the floor.
One of the major dangers of bacteria growing on the floor, is the risk of the bacteria becoming airborne when high pressure hosing is carried out, spreading the bacteria onto other critical surfaces.

So we decided to change what we offered. With over 50 years of history in paint chemistry, we decided it was time to develop our own suite of solutions, specifically designed for the food and beverage manufacturing industry.

Each of our SteriFloor solutions have unique antimicrobial technology, incorporated into every layer to maximise the antimicrobial activity. This technology has been designed to stand up against typical acids and chemicals found in food manufacturing facilities.

Key Design Considerations

JOINTS

Joints are required in floor surfaces to compensate for the movement of the concrete slab below. There are two critical times to consider where joints are needed. First, when the design is for a new build facility or extension. Second, when an area is being repurposed.

If you’re working on the design for a new facility, it is important to ensure joints should be placed away from areas that are subject to high traffic but close to areas where there are high temperature variances (to allow for resultant floor movement), and close to high elevation points to avoid moisture.

For areas that are being repurposed, it is important to take a look at the existing joints and ensure they are doing their job in eliminating cracks. If a freezer, blast freezer or coolroom is being installed, it is critical to install a joint at the door entry, to allow for concrete and floor movement due to expansion and contraction.

Key Design Considerations

FALLS, DRAINAGE & JUNCTIONS

Drains should be placed close to, but never under, manufacturing machines. This will ensure they are positioned well to still do their job and yet remain accessible for cleaning and maintenance. Falls in the floor ensure the liquid moves to the drains efficiently. There are no set gradient standards for falls in food plants, but they generally range between 1:100 and 1:80. Often abattoirs/meat processing facilities will specify a steeper slope to move liquids to drains faster.

Falls and drains will affect the number of joints and how they're positioned. A junction to a circular gulley, for instance, does not need a joint. However if an area is exposed to high traffic, hot liquids and movement, and has a junction between a long, wide channel and the floor, it will require a joint.

Sustainability

As the Earth's resources are dwindling, it is critical that we do what we can to use our planet's resources responsibly and preserve what we can to offset our carbon footprint for the oncoming generations. The development of our SteriFloor suite not only allows us to provide a sterile, food-safe floor, but also one that preserves other surfaces for many years, reducing unnecessary waste. On top of this, our solutions have been designed to lower carbon emissions, remove VOC emissions, and other discharges typically found in flooring and throughout the installation.

One of the critical aspects to developing our SteriFloor solutions was to provide a suite that was solvent-free, and to significantly reduce the emissions of any harmful volatile organic compounds (VOCs) to the atmosphere during installation. In addition to this, we have advanced our flooring preparation methods, to eliminate the use of acid etching to prime the floor, which most flooring solution providers use, releasing damaging emissions into the air. As well as changing this preparation method, we make sure to only use electric grinders, ruling out the use of gas or petrol grinders on every project.

For more information regarding flooring sustainability, please read our article on it here: alliedfinishes.com/general/sustainability-in-flooring/

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