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Meeting Food Industry Regulations through Floor Specification

The rules that food and beverage producers have to comply with are becoming ever more complex and codified as the combination of national, regional and international regulations increases.

In large part this is because the hazards inherent in food production have multiplied because of growing populations requiring more intensive production processes on a larger scale. To reduce the risks from contaminated foodstuffs, producers need to ensure that as their production facilities expand they still safeguard the hygienic integrity of their products.

Governing Regulations across Asia

The food and beverage industry within Asia in particular is facing increasing calls to comply with the latest regulations from governments, international health authorities and end users who want to minimise health concerns and secure food supply chains.

Whilst many nations in Asia have precisely set out guidelines and laws, others do not – however high hygiene standards based on benchmarks from international bodies such as the Food and Agriculture Organisation (FAO), International Food Safety Authority Network (INFOSAN) or the World Health Organisation (WHO), must still be maintained to avoid disease outbreaks and to guarantee the trust of international buyers.

Alongside national laws and international organisations, governments across Asia may also use the rules laid out in best practise guidelines such as the Hazard Analysis of Critical Control Points (HACCP), or the Good Manufacturing Practise (GMP) to define the standards that food producers must adhere to.

Commentators on the global food industry have noted that access to the food export market will increasingly depend on the capacity of producers to meet regulatory requirements, with the most lucrative markets typically also having the most sophisticated and demanding regulations. To improve market access and maintain a competitive edge, exporters must be willing to meet these regulations.

Ensuring a sanitary environment is a crucial aspect of many nations' food safety litigation. For example Malaysia's Food Hygiene Regulations (2009) state that "food premises must be maintained at all times in a good, clean and tidy condition" whilst Singapore's Sale of Food Act forbids selling food that has been manufactured, prepared, preserved, packaged or stored under "insanitary conditions" that might contaminate food or render it unfit for consumption.

The regulations covering food production will typically include rules on the design, maintenance and management of any facility involved with the production, processing and storage of food or beverages, giving the operators of these facilities a lot of benchmarks to hit. The FAO's General Principles of Food Hygiene for example

states that the facility's design should minimise contamination and that surfaces are "durable and easy to maintain and clean".

Hygienic and Food Safety Considerations

There are a number of steps that building operators can take to sufficiently prevent the growth and propagation of pathogenic microorganisms in a building so as to comply with stringent hygiene regulations – and ensuring a clean floor is one of the principle factors to achieving this.

It is often the floor that becomes the most contaminated area of a production site for a number of reasons. Dirt can enter the building beneath feet, bacteria can fall on the floor and get trapped within cracks and gravity will cause most of the contaminants on walls or stationary objects to end up on the floor.

The FAO recommends that the floor is "smooth finished and without cracks" as seams, joints, grout lines and gaps can become ideal breeding sites for contaminants such as bacteria, fungi, mould and mildew. All of these could spoil consumable goods on the premises and potentially lead to fatal foodborne illnesses that could irreversibly damage a brand's reputation and ability to function.

Having a seamless floor finish is vital to ensuring an effective cleaning regime able to remove contaminants. Resin flooring solutions can ensure a smooth, monolithic and crack free surface that will not only dramatically improve hygiene, but also protect the building's concrete substrate and provide a level, reliable platform for the day-to-day operation of the facility.

However the floor must also be robust enough to withstand the rigours of a production environment, which could include impacts from heavy traffic, equipment and dropped tools, thermal shock, wear from frequent cleaning and exposure to chemical abuse from sanitizers, acids, lubricants and the foodstuffs themselves. If a floor cracks or splits then it no longer assists with removing

pathogens, and instead becomes the perfect site for contaminants to thrive.

To avoid this resin flooring solutions have hard wearing properties that allow them to reliably withstand most industrial settings. This includes being highly chemical resistant and able to cope with sustained physical abuse for long periods of time. These properties, and the protection against harmful microorganisms that they provide, have made resin floors a popular choice within the global food and beverage industry.

Antimicrobial additives that actively inhibit the growth of bacteria on the floor's surface can also be included into the polyurethane mixture of a resin floor, further adding to the hygienic credentials of a site. This can be of particular benefit in nations such as Thailand, where the Ministry of Public Health has implemented a surveillance and monitoring programme on food, focusing specifically on contamination from microorganisms.



TIP:

Flowfresh systems are seamless, durable and contain an antimicrobial additive, Polygiene®, to prevent bacteria build-up.

Specialist Details

Alongside the choice of material there are certain points on a floor that must be carefully considered, as they are more likely to gather dirt and bacteria than others. The main sites that this applies to are expansion and control joints, termination joints around drains, doorways, hot stoves and equipment.

These construction details should be identified prior to the floor's installation to prevent undercutting, cracking and debonding of the surface from the substrate. With a resin solution, expansion and control joints can be saw cut after the floor surface is in place, whilst termination points can be keyed to prevent lifting and undercutting.

The corners where the floor meets the wall is another area of potential bacterial growth. To make it easier to clean this area the FAO's guide to establishing production facilities states that "during construction of the floor, it should therefore be curved up to meet the wall". Resin coving can be applied to this area to create a seamless surface that flows from the floor to the wall without gaps.



TIP:

Using coving eliminates cracks between the wall and the floor, boosting hygiene properties.

Floor Cleaning Requirements

Intensive cleaning routines are essential to complying with hygiene regulations. In Indonesia's regulations it is the "efforts" to prevent "the growth and propagation of purifying and pathogenic microorganisms" that are a key factor in the definition of food sanitation.

However the hot water used to remove unwanted chemicals and production by-products from the building could in fact adversely affect the building's hygiene levels. This is because the thermal shock from the water could crack, delaminate or erode the surface, making it easier for pathogens to accumulate in gaps in the floor.

This failure occurs when the flooring material expands and contracts with the temperature changes at a rate significantly different to the concrete substrate underneath. Thermal shock resistant flooring and coatings that move with the concrete slab below will not deteriorate in the same way and will maintain the seamless and smooth finish required for a thorough cleaning routine.

Moisture Vapour Transmission

Another vital consideration when installing a floor in a food plant is to protect against excessive moisture vapour rising from the concrete substrate that could blister or debond the top coating and make a previously compliant facility fail to meet hygiene standards. There are several options available to protect against this happening, the most common of which is installing a damp proof membrane above the concrete slab.

Having an impervious, non-porous floor is an important aspect mentioned in many food safety laws around the world. Producers intending to export to Europe should note that the European regulations recognise that this is an important factor as these laws insist on sites having easy to clean and regularly disinfected floors, which necessitates an impervious surface.

Slip Resistance Considerations

Because of water from wash downs, liquid from spillages and oils from products, food and beverage facilities are often wet and slippery environments. The Handbook of Hygiene Control in the Food Industry advises that resin floors are ideal for solving this problem, as they can have anti-slip aggregates added into the mixture, which provides grip underfoot for the safety of employees alongside a seamless finish to easily clean away the spillages before they become a hygiene risk.



TIP:
Textured aggregates add grip, minimising slip risks whilst maintaining the benefits of a seamless finish.

Installation Considerations

Before installing a resin floor make sure that the type, depth and installation method is the optimum choice for the specific environment it is going into, as these can be tailored to different circumstances to ensure the facility stays within the demands of the law. In particular specifiers need to complete a risk audit to check that the finished floor will be able to resist the level of chemical abuse and heavy impacts that it will be subjected to within the workplace.

A resin finish must also be installed by trained applicators, as the complexity of the systems means that it is practically impossible to achieve the high-quality finish needed for an ultra-hygienic floor without the proper knowledge and training.

Summary

The design of a production facility's floor can be seen as both a potential danger and a potential opportunity. It is dangerous to have an inadequate

floor that is porous, cracked and difficult to clean because it can very quickly become the site of unhygienic contamination build up, which is illegal under the regulations for food producers.

However if the right floor is chosen for the environment then it can provide a wealth of benefits, as it will allow for easier cleaning that effectively removes contaminants and satisfies the demands of regulatory authorities whilst simultaneously providing a reliable platform for efficient operational activities.

This guide has been produced to give an overview of the regulations governing the food & beverage industry in Asia, which manufacturers and processors must comply with.

Detailed recommendations and advice are available from our network of regional technical and sales representatives.

For more information on Flowcrete's specialist flooring solutions, get in touch with the team today...

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