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What is a HACCP Food Safety Management System and How Does it Relate to Flooring?



The Hazard Analysis and Critical Control Point (HACCP) food safety management system is a preventive risk assessment tool operated by the food industry to ensure that all food safety hazards are assessed and that appropriate controls are put in place to eliminate or reduce contamination of food from those hazards. It is a regulatory requirement in many parts of the world and is a demand placed upon the whole food chain as a means of demonstrating due diligence.

It provides the means to reduce process hazards arising from issues such as poor temperature control, foreign body hazards from machinery or contamination from food handlers. But it also requires that food safety hazards from layout and facility are controlled and this includes the specification of materials and equipment such as flooring.

The HACCP principles are designed to protect food safety and thus the consumer across the entire food manufacturing process, from harvesting to consumption. The cost of failing to protect against contamination is high, as it can lead to financial and reputational damage to the producer as well as outbreaks of foodborne illness and in the worst-case scenario public fatalities.

The Development of HACCP

HACCP was first devised in the 1960s by a project team made up of experts from NASA, the US Army and the Pillsbury Food Group, who had been tasked with designing a risk-assessed based protocol for identifying and managing food safety hazards to prevent food poisoning resulting from rations taken aboard spacecraft.

The hazard analysis aspect of the system makes for an exhaustive list of all the possible factors within a food plant that could pose a risk, such as contamination through poorly cleaned or designed equipment, taints through unsuitable chemical usage, physical risks resulting from broken plastic or metals found in the factory and dirt from raw ingredients to name just a few.

The success of NASA's project led to the HACCP protocol being incorporated into Codex Alimentarius - a joint World Health Organisation / Food and Agriculture Organisation publication which sets out the rules for operating a HACCP based food safety management system for the global food industry to follow.

Today, the majority of sectors within the food industry have recognised that being HACCP compliant not only means that their facilities will meet the demands of regulatory authorities, but also that it will provide reassurance to the end-user that the products they are purchasing have been safely procured, produced and processed.

**TIP:**

Improve hygiene by allocating specific process zones, defined by different coloured floors.

Regulatory Importance

National and European food and beverage legislation stresses the importance of implementing due diligence procedures, many of which rely on HACCP's advisory framework for facility design and construction.

The Food Safety & Hygiene (England) Regulations 2013 reiterates Article 5 (1) of Regulation 852/2004 of the European Parliament, which states that "food business operators put in place, implement and maintain a permanent procedure or procedures based on the HACCP principles". Parallel legislation is also in force in Scotland, Wales and Northern Ireland.

Within the UK, a number of Food Standards Agency (FSA) recognised guides have been developed in association with various organisations to advise food business operators on how to comply with the EU and national regulations on food hygiene.

The FSA is acutely aware of the importance of minimising contamination risks and the danger posed by foodborne illnesses was highlighted in its Annual Report of Incidents 2015. In this report, 1,645 contamination incidents were investigated and microbiological contamination was at the root of nearly a quarter of them.

The costs of these incidents are significant! Not only could a foodborne illness outbreak lead to

serious financial and reputational damage for the producer, but every year the FSA estimates that nearly a million people in the UK are affected, which has a net cost to the country of £1.5 billion.

This has led to the FSA's Foodborne Disease Strategy, a compliance and enforcement plan that aims to secure major improvements in public protection and health through an overall better and more efficient risk-based regulatory system.

Central to this strategy is the development of a programme that covers themes such as how risk is assessed and profiled, the monitoring of risk, incentivising complaint behaviour and tackling non compliance. One of these activities is the dissemination of practical advice to assist food businesses to comply with HACCP requirements enshrined in food hygiene legislation. FSA enforcement officers will also check during routine inspections that a business has an appropriate HACCP-based food safety management system in place.

Other key bodies and regulations to be aware of that cover food hygiene and HACCP compliance include the Global Food Safety Initiative (GFSI), the British Retail Consortium (BRC), Food Safety System Certification 22000 (FSSC22000), the International Featured Standard for Food (IFS), the European Union's Regulation 1169/2011 and the European Food Safety Authority (EFSA).

As a globally accepted benchmark of food safety, HACCP is also important for businesses eager to gain access to export markets. Many nations will require food to have been produced according to a HACCP standard, for example produce sold into the United States needs to comply with the Food Safety Modernization Act. Proving that a business can meet the necessary level of due diligence is essential for clients abroad to know that the food in question has been manufactured to a hygiene standard that they recognise.

TIP:

Daily wash downs are made more effective by integrated drainage and slip resistance.



HACCP Compliance and Third Party Certification

HACCP International operates a globally recognised product certification scheme that evaluates materials, equipment and services used within the food industry. Certification follows the assessment of objective evidence to prove that a manufacturer has identified potential food safety hazards arising from the materials or equipment and has implemented appropriate controls.

HACCP International evaluate a product using a risk assessment based protocol in support of a Standard called "Food Safe Products for Use in the Food Industry", which is closely aligned to the methodology used by the food industry when adhering to Codex Alimentarius.

The Standard outlines nine key product assessment criteria. Each criterion examines potential food safety hazards and how the manufacturer of the equipment or material has controlled these potential hazards so that they do not adversely affect the HACCP based food safety management system operated by the food business.

The HACCP International technical team and product assessors are all degree qualified within a scientific or food technology discipline and all have extensive operational backgrounds and experience from within the food industry.

Having this certification confirms a product's suitability for use within food processing, production and packaging facilities that operate to the world's highest standards.

HACCP's Flooring Guidelines

Getting the floor area right is a critical part of implementing an effective HACCP food safety management plan, as otherwise this part of the facility can present a variety of challenging health and safety concerns - especially for large-scale industrial facilities where slip risks, contamination threats and potentially dangerous working practices all need to be carefully accounted for.

The floor is a particular concern, as gravity will cause the majority of contaminants to end up on it and unwanted substances can easily be walked in from elsewhere. Therefore, if the floor is difficult to clean and starts to harbour dangerous pathogens then the site could be putting its workers and clients at risk.

As such the material chosen to provide a protective floor coating plays a much larger role in food safety than one might originally suspect and should be taken seriously at the design stage.



TIP:

Durable flooring will withstand heavy plant machinery, minimising bacteria harbouring cracks.

The HACCP International certification program highlights the importance of seamless and impervious flooring, as seams, joints, grout lines and gaps can become breeding sites for bacteria, fungi, mould and mildew. Making sure that the floor provides a seamless surface will help the cleaning regime quickly wash any unwanted substances out of the area.

It is important to ensure that the floor is able to maintain these properties for an extended period of time, as otherwise its seamlessness or imperviousness could be compromised and degraded by the site's workload.

Should an inadequate floor be installed and it becomes cracked and porous then it will become a prime environment for microbes, dust and mould to thrive – turning the finish into an unsightly, unsanitary and unsafe surface

General conditions within the food and beverage industry can easily affect an insufficiently robust finish. The floor could be subjected to impact, thermal shock, point loading, heavy foot traffic and exposure to corrosive by-products such as fats, hot oils, blood, sugar solutions and natural food acids. Additionally, these substances can infiltrate the concrete material resulting in microbial growth and the spread of bacteria, which will in turn degrade not only the production environment but may contaminate the products themselves.



TIP:

Integrated coving reduces the build-up of bacteria that can contaminate food products.

Effective Cleaning to Meet the Demands of HACCP Based Food Safety Programs

The HACCP International standard requires floors to allow for adequate drainage and cleaning in order to facilitate the fast and effective removal of excess liquid and slippery contaminants from the area.

To meet this benchmark, easily cleanable stainless steel drainage should be incorporated into the floor plan and the floor needs to be sloped to the drains to avoid water pooling and to ensure that waste liquid flows in the right direction.

A rigorous cleaning process is essential to ensuring that contaminants are quickly and effectively removed – however the cleaning regime itself could pose a hazard unless the floor is durable enough to deal with it. Steam cleaning, pressure washing, hot water wash downs and the use of aggressive cleaning agents can all place a significant amount of stress on the floor, eating away at the surface, exposing the concrete's weaknesses and leading to bacterial penetration as it becomes more and more porous.

Certain practical considerations need to be accounted for in order to retain a suitably hygienic finish. For example a joint installed on either side of a drainage channel will counteract the fact that the stainless steel drain will have a different coefficient of movement to the surrounding flooring system. Without this joint, the two materials will struggle to expand and contract next to each other when faced with temperature fluctuations. A crack here could lead to many problems from contamination build-up to water ingress.

HACCP International Compliant Flooring Materials

The HACCP International Food Zone Classification System breaks down a food handling facility into four physical areas and/or applications for which an item may be suitable. Flooring comes under the SSZ (Splash or Spill Zone) classification, which as a rule covers items that are suitable for use in food handling areas such as kitchens, production areas and processing areas but that are not meant to come into direct contact with the food or with items that will touch the food.

TIP:

Apply a wall sealer to extend hygiene across any food or beverage processing facility.



TIP:

A textured floor system that will protect against slips allows for a regular cleaning regime.



An exposed concrete slab needs to be covered with a high performance flooring system in areas where consumable food and beverage products are being produced, processed, packaged or stored.

Traditional food and beverage flooring materials such as thermoplastic coverings, terrazzo, epoxy resins and polyurethane screeds all meet general hygiene criteria thanks to the seamless, non-absorbent and easy-to-clean finish that they create (however this does not mean that all of such materials are automatically HACCP International certified).

Seamless resin-based surfaces are increasingly being specified in large-scale food and beverage environments on account of the material's hygienic profile and hardwearing performance characteristics. Robust polyurethane systems are especially applicable, as they can withstand conditions such as heavy impact, corrosive substances, foot traffic and thermal shock for an extended period of time. The seamless nature of polyurethane flooring provides a cleanability advantage, as the unwanted water, liquids, oils and greases won't be impeded from moving towards the drainage channel.

As a general rule, the thicker the system the longer its service life and the better able it will be to withstand damage. It is important to have a detailed knowledge of the site's operational activity to avoid specifying a thin finish that will crack when faced with the reality of the building's daily use.

HACCP and the Future of Manufacturing

The fact that many other industries, such as the pharmaceuticals, cosmetics, aviation, chemical and car sectors are waking up to the advantages of operating quality and safety systems which compare in many ways to a HACCP based system is testament to the direct correlation that it has on quality and high standards. This is in large part because, while originally intended

to reduce the amount of foodborne illnesses, constructing a large-scale industrial complex according to these principles is a good indication that the facility will be able to remain a highly sanitary working space despite the inherent challenges of such locations.

The above advantage of materials meeting the needs of business operating a HACCP food safety management system is likely to become increasingly critical, as industrial facilities become ever larger, complex and productive to meet the booming demand for consumer products. As production speeds increase so too does the risk of contaminants creeping into the process – making due diligence and a careful analysis of preventive measures all the more important.

Incorporating HACCP principles into the design, construction and maintenance of a facility is therefore critical to conforming with the latest thinking on hygiene and safety within contamination sensitive environments.

Going forward, food and beverage businesses need to keep a close eye on how the HACCP guidelines and protocols may apply to them as, chances are, that they are going to become (or indeed already are) essential to meeting the standard required to trade domestically and abroad.

This guide has been produced to provide an overview of HACCP and its relation to food & beverage manufacturing environments.

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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