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WHAT IS A HACCP FOOD SAFETY MANAGEMENT SYSTEM AND HOW DOES IT RELATE TO FLOORING?

An overview of HACCP food safety management systems and how they apply to flooring in food & beverage environments.

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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.

By providing an advisory framework for each aspect of the design and construction of a food and beverage plant, HACCP reduces process hazards arising from issues such as poor temperature control, foreign body hazards from machinery or contamination from food handlers. HACCP also requires that food safety hazards from layout and facility are controlled and this includes the specification of materials and equipment such as flooring materials.

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 effectiveness of the HACCP approach for the Australian food and beverage industry is highlighted in the Food Standards Australia New Zealand - Risk Analysis in Food Regulation handbook, which states that it "has been instrumental in identifying unsafe practices and reducing reliance on end-product testing for chemical or microbiological hazards before sale".

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 Organization / Food and Agriculture Organization 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 produce has been safely procured, produced and processed.

Regulatory Importance

The bodies that set the standard for food industry facilities use a variety of management strategies and place responsibility for compliance on the food industry.

The Food Standards Australia New Zealand - Risk Analysis in Food Regulation handbook emphasises the need for Australia's food industry to embrace HACCP, as is states that it "identifies and addresses chemical, microbiological and physical hazards in a preventative manner, leading to the development of food safety plans for manufacturing industries and food businesses in general".

HACCP's guidelines have become largely ubiquitous in the food and beverage industry. Food Standards Australia New Zealand, the bi-national Government agency in charge of setting safety benchmarks, has stated in the Australia New Zealand Food Standards Code that certain businesses are required to develop and implement food safety programs based on a systematic identification and control of hazards as identified in the HACCP system.

One such stipulation under the Codes section is for the production of ready-to-eat meat, which states that a producer must "identify all food safety hazards and controls through the use of a HACCP plan".

Alongside national legislation, food facilities also need to adhere to state government and industry authorities, which may have additional requirements in addition to the Food Standards. This is exemplified by Dairy Food Safe Victoria (DFSV), which specifically requires that before a dairy manufacturer can apply for a license they must develop a "written food safety program" that has been based on "Codex HACCP principles as outlined in Codex Alimentarius, Basic Texts on Food Hygiene, Annex Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application". The dairy manufacturer's program must "outline the control measures and procedures" required to "reduce or eliminate food safety hazards associated with milk and dairy products".

The Australian food and beverage processing community is therefore taking HACCP very seriously, as it emerges as an industry-wide concept to prove that a business has been duly diligent and taken the necessary preventative steps to safeguard the sanitary integrity of its produce and minimise the chance of a foodborne illness outbreak among consumers.

It's important to bear in mind that the standards for measuring risks associated with microbiological and chemical hazards in food differ between Australia and New Zealand. New Zealand's food safety program is set by the Ministry for Primary Industries (MPI). The MPI emphasises that HACCP applications are relevant to all food sectors and provides specific material for sectors including: dairy; food service; honey & bee products; food & beverage manufacturers; meat, ostrich, emu and game; plant products; poultry & eggs; seafood; cold & dry stores; and wine.

As a globally accepted benchmark of food safety, HACCP is also important for businesses eager to gain access to lucrative export markets. Many other nations will require food to have been produced according to a HACCP standard and proving that a business can meet this level of due diligence means that clients abroad can rest assured that the food has been manufactured to a hygiene standard that they recognise.

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 in a scientific or food technology discipline and have extensive backgrounds and experience 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. The material chosen to provide a protective floor coating therefore plays a much larger role in food safety than one might originally suspect and should be taken seriously at design stage.

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.

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.

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.

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 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.

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 cementitious urethane 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. Hard wearing cementitious urethane 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 cementitious urethane flooring provides a cleanability advantage, as 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

Australia has one of the safest food supplies in the world due to effective working partnerships between food manufacturers, food handlers, retailers and government regulators who set a high bar for production standards based on management strategies such as HACCP.

The advantage of materials that meet the HACCP standard 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 preventative measures all the more important.

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

The fact that many other industries, such as the pharmaceuticals, cosmetics, aviation, chemical and car sectors are also waking up to the advantages of operating quality and safety systems based on HACCP is testament to the direct correlation that this system 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 challenges of intense operational activity.

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 both domestically and abroad.

This guide has been produced to provide an overview of HACCP food safety management systems and how they apply to flooring in food & beverage 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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