Flowcrete
for the world at your feet

WHY DO I NEED A PROTECTIVE RESIN FLOORING SYSTEM?

WHAT RESIN FLOORING OPTIONS ARE AVAILABLE?

THE IMPORTANCE OF RESIN FLOORING WITHIN THE SAFE DESIGN OF A FOOD PROCESSING FACILITY

WHAT FACTORS SHOULD I CONSIDER WHEN SELECTING A RESIN FLOORING SYSTEM?

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Food safety is vital for consumer confidence and the hygienic design of food processing facilities is central to the production of safe food and beverage products.

The sensitive nature of food processing environments and the risk of contamination demands that food safety be factored into the design and construction of a food or beverage facility at planning stage.

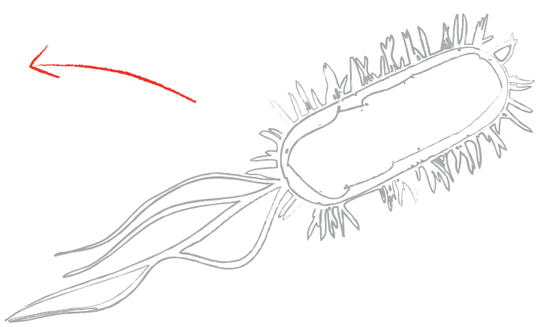
WHY DO I NEED A PROTECTIVE RESIN FLOORING SYSTEM?

1. CORROSIVE INGREDIENTS
2. CONCRETE DEGRADATION
3. CLEANING PROCESSES AND PRODUCTS

For all of these reasons it is non-negotiable that an exposed concrete slab is covered with a high-performance flooring system where consumable food and beverage products are produced, processed, packaged or stored.

DID YOU KNOW?

Bacteria multiply by splitting into halves every twenty minutes, meaning that in just three hours one bacterium will become about 1020!



SO, WHAT RESIN FLOORING OPTIONS ARE AVAILABLE?

This is a big question asked by industrial facilities managers and plant operators working within the food and beverage industry.

Resin flooring systems are available in a wide range of shapes and sizes and have been designed to best meet the different working areas within a food or beverage plant - all of which will be subject to different operating conditions.

DURABLE, HARD WEARING CEMENT BASED SYSTEM

1 CEMENTITIOUS POLYURETHANE

Cementitious polyurethane systems are a popular choice for clients working in the food industry.

A typical polyurethane material used in this application comes in mortar form combining cement and water-based technologies that:

- exhibit a high cross-linked density, making them ideal for abusive environments subject to prolonged chemical attack,
- deliver a thermal co-efficient of expansion, which is similar to that of concrete,
- have a non-porous finish, preventing bacteria and mould spores from surviving in joints or cracks,
- are also low odour as well as non-toxic and non-hazardous.

FAST CURE ACRYLIC WITH MMA ADDITIVE

2 METHYL METHACRYLATE (MMA)

MMA resin can fully cure in just one to two hours, minimising downtime.

Although MMAs have a unique odour, the odour is harmless and can be minimised during installation with proper ventilation.

MEDIUM DUTY FINISHES FOR LIGHT-USE AREAS

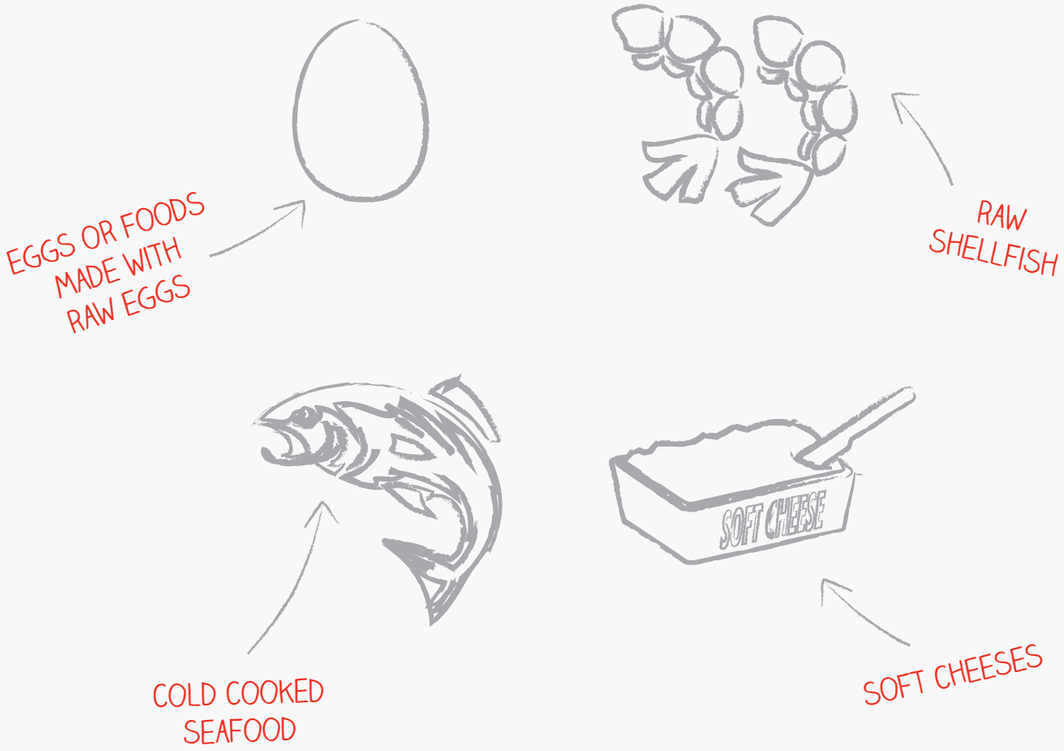
3 EPOXY

Epoxies offer limited resistance to organic acids, which are found in a large quantity of natural foodstuffs. However, epoxies offer no resistance to thermal shock making them more susceptible to cracking and de-bonding in more rigorous food and beverage environments.

Epoxy resin surfaces are a good choice for non-processing zones of food manufacturing facilities that are not subject to the same high protection demands.

DID YOU KNOW?

FOODS MOST PRONE TO BACTERIAL CONTAMINATION ARE:



WHAT FACTORS SHOULD I CONSIDER WHEN SELECTING A RESIN FLOORING SYSTEM?

Understanding the most important operational criteria and service requirements of the facility or area in question is central to specifying a resin flooring system that will best meet your needs.

HYGIENE

Resin flooring systems offer clients an enhanced hygiene performance resulting from a seamless finish.

In an exclusive partnership with Flowcrete, Polygiene® can be incorporated within the resin matrix of a polyurethane system in order to offer complete surface protection against harmful bacteria, mould and yeasts.

Unlike many antimicrobial alternatives, this protection remains active for the lifetime of the floor, even if worn or damaged, offering clients' a long-term hygiene performance.

ANTIMICROBIAL ACTIVITY AFTER 60 WASH CYCLES

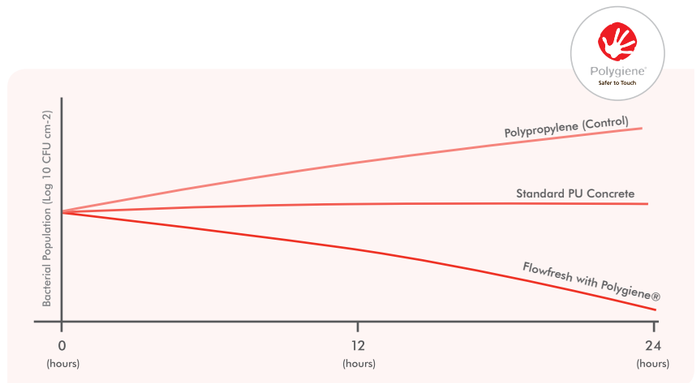


FIGURE 1: Japanese Industrial Standard JIS Z 280: 2000 measures the survival of bacterial cells on cementitious polyurethane with Polygiene® and compares this to polyurethane concrete containing no antimicrobial additive and an untreated polypropylene control.

SLIP RESISTANCE REQUIREMENTS

It is imperative that all floors in food manufacturing and preparation zones, as well as staff breakout areas and amenities, have a non-slip surface, so as to prevent slips and trips.

Resin flooring is available in a range of textures and can be graded with broadcast aggregates in order to increase the anti-slip profile of the product.

It is important to note that coarsely textured surfaces, such as positively graded resin systems, are more difficult to keep clean, therefore a compromise may need to be made where heavy slip resistance and ease of cleaning are both of critical importance.

DID YOU KNOW?

Slips and trips account for an average of 20% of reported injuries.

NATURE OF CHEMICAL CONTACT

Chemical attack is typically described as the breaking down of the floor's polymer structure such that it is no longer able to fulfil its function.

Failure to anticipate the nature or degree of chemical attack may result in erosion of the surface.

By far and away the most effective method of protection against chemical attack is a polyurethane system. The material offers a significantly enhanced resistance to corrosive substances, solvents and foodstuff by-products, particularly organic acids, when compared to epoxy or MMA systems.

CHEMICAL RESISTANCE OF RESIN FLOORING

Chemical Substance	Cementitious Polyurethane	Epoxy	MMA
Hydrochloric Acid	●	○	●
Sulphuric Acid	●	○	●
Citric Acid	●	●	○
Oleic Acid	●	-	-
Acetic Acid	●	-	●
Lactic Acid	●	○	●
Ethanol	●	●	-
Methanol	●	-	-

Chemical Substance	Cementitious Polyurethane	Epoxy	MMA
Sugar Syrups	●	●	-
Caustic Soda	●	●	●
Blood	●	●	●
Oil Ingredients	●	●	●
Detergents	●	●	●
Beer	●	●	●
Wine	●	○	○
Whiskey	●	○	○

● High Resistance ○ Limited Resistance - No Resistance

FIGURE 2: *Chemical Resistance of Resin Flooring Comparison Chart*: Flowcrete Group Ltd, 2013.

THERMAL SHOCK & CYCLING

Most often, thermal shock happens when facilities that usually remain at room temperature are cleaned using very hot water or steam to remove stubborn blood, grease and other chemical contaminants.

This immediate change will cause the floor finish to expand or contract at a different rate to the substrate, leading to cracks, bubbling, peeling or delamination.

Cementitious polyurethane systems are much better equipped to deal with thermal shock than epoxies or MMAs, having a coefficient of thermal shock that is similar to that of concrete.

In cold stores and blast freezers, or alternatively in areas with furnaces or underneath hot ovens, thick cementitious polyurethane systems are recommended.

CLEANING & MAINTENANCE

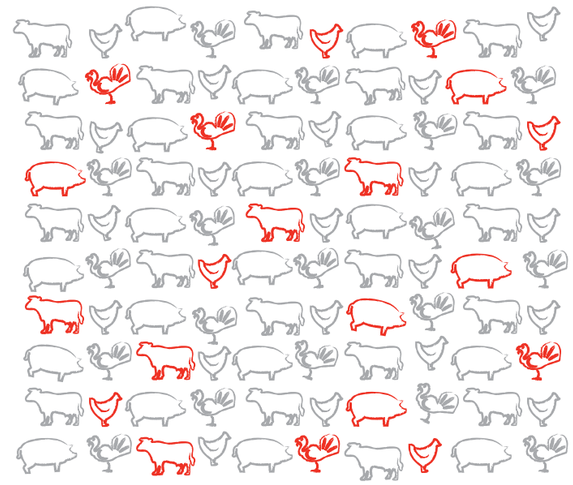
An effective cleaning and maintenance routine should be in place to preserve the aesthetic and performance of the resin finish.

Resin flooring will not be affected by most special purpose cleaning materials. A small spot test in an inconspicuous area is a worthwhile precaution before applying any new cleaning product.

It is important to note that cementitious polyurethane systems are compatible with steam cleaning and hot water washdown cleaning methods, whereas this is not recommended for epoxy or MMA systems.

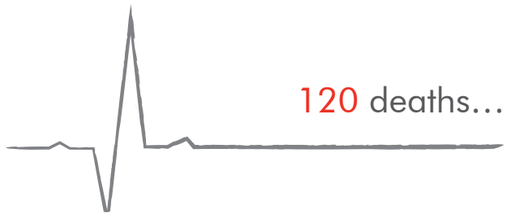
DID YOU KNOW?

A study in The New England Journal of Medicine found that 20% of samples of ground chicken, beef, turkey, and pork contained Salmonella.



DID YOU KNOW?

EACH YEAR, ACCORDING TO THE DATA IN AUSTRALIA, FOOD POISONING RESULTS IN, ON AVERAGE...



120 deaths...

days of lost work...

1.2 million visits to doctors...

300,000

prescriptions for antibiotics...

THE ESTIMATED ANNUAL COST OF FOOD POISONING IN AUSTRALIA IS A$1.25 BILLION.

LOOKING FOR PERFORMANCE FLOORING FOR YOUR FOOD & BEVERAGE PRODUCTION FACILITY?

Flowcrete's range of cementitious polyurethane - Flowfresh - is not only durable as well as thermal shock, chemical and slip resistant, it also contains Polygiene®; an antimicrobial additive that kills bacteria on contact.

DID YOU FIND THIS E-BOOK USEFUL? GET MORE FROM FLOWCRETE...

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