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Advantages of Cementitious Polyurethane Over Epoxy In Brewery Production Areas

First and foremost, the production area of any brewery must provide an effective, hygienic and fully optimised beer-producing environment.

All brewing and kegging rooms require a floor that can provide substantial protection against the challenging on-site conditions faced on a daily basis and that also comply with the sanitation mandates and surface characteristics of the FDA and USDA.

Synonymous with the craft beer industry is the patience, planning and effort that goes into making the optimal brew and as such it is therefore pivotal to the success of a brewery that it ensures everything is in place to facilitate excellence on a consistent basis.

As new craft breweries open and existing businesses expand, it is vital that the flooring material in the integral production area is of the highest possible standard. Which then begs the question of which type of flooring is most suitable for the brewing environment?

Two of the most common are cementitious urethane and epoxy resin, both of which have various pros and cons and as such a strong case can be made for both types of flooring system in a brewhouse production area.

Chemical Resistance

Cementitious urethane boasts unrivalled resistance to corrosion, inorganic alkalis, organic alkalis and solvents. In contrast, epoxy resins offer limited resistance to the organic acids that are found in a large quantity of beers.

Should corrosive substances find their way onto the floor, such as the incredibly important sugar solution used in the brewing process, then this can cause a problem. If the finish is not sufficiently chemically resistant then such a substance could erode the floor, thus leading to an unsanitary surface. To avoid this occurrence, a system must be able to withstand long-term exposure to such chemicals.

Hygienic Properties

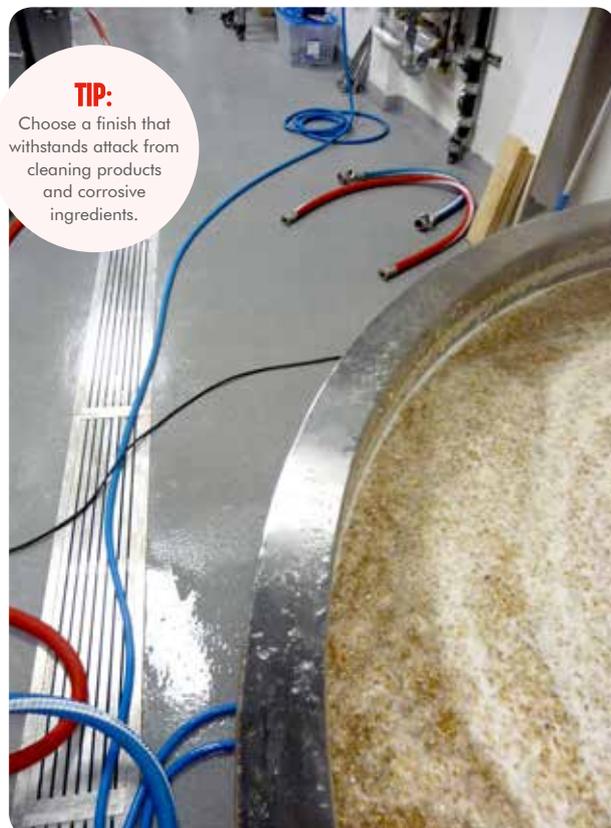
Another all important theme within breweries is ensuring that, in spite of the heavy workloads and adverse conditions often encountered, the floors are able to maintain a clean space that avoids unwanted bacteria ruining the beer. It is often the floor that becomes the most contaminated area of a production site for various 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. Floors and drains in brewery production plants consistently generate a high percentage of positive test results for bacteria and can lead to cross-contamination throughout the facility.

Cementitious urethanes can contain a powerful silver ion-based antimicrobial additive within the floor finish to inhibit the spread of bacteria and other harmful pathogens between wash cycles. Phthalate free cementitious urethane formulations are also available, removing any harmful plasticisers from the mix.

Temperature Resistance

The hot temperatures required to create craft beer and the steam cleaning carried out to remove stubborn contaminants can also present a challenge to the brewery's floor. That said, cementitious urethane is resistant to boiling water and production by-products up to 120°C.

The robust build up of cementitious urethane avoids floor failures from extreme temperatures and as its thermal coefficient of expansion is similar to that of concrete it will move with the underlying substrate during thermal cycling conditions, avoiding cracks and gaps appearing in the floor's surface.



Epoxies offer less resistance to thermal shock, making them more susceptible to cracking and de-bonding in rigorous brewery environments.

Epoxy resin cannot handle live steam and temperatures above 77°C meaning that it is a more suitable choice for non-processing zones of brewery facilities that are not subject to the same high protection demands.

Slip Resistance

In the vast majority of breweries, an anti-slip flooring system, that will remain slip resistant under high foot and rubber wheeled traffic conditions for the long-term, is required.

Employees and visitors to the site can bring in remnants of bad weather underfoot or the area in need of surfacing may be subject to wet service conditions, cleaning processes or spillages – all of which can result in the floor becoming slippery, increasing the risk of slips and trips and as such any liability to the brewery owner.

Cementitious urethane systems are available at varying levels of slip resistance with matte, textured surfaces, meaning that breweries can tailor their flooring to the specific needs of certain areas of the plant.

Abrasion Resistance

Abrasions caused by hoses, kegs, and pallets are likely to inflict physical harm to the floor. Alongside these factors a brewhouse facility's interior will also contain exceptionally heavy machinery, while forklift trucks will need to drive around the site and the staff may be carrying (and potentially dropping) tools, mechanical parts and a number of other items.

All of these factors could eat into the floor finish. If the floor coating is too thin then this initial impact could expose the substrate, becoming an area where oils, water, chemicals, food by-products and greases can access the substrate

and undermine the coating. In general, the thicker the system the longer its service life and the better it will withstand potential damage.

Epoxy is often described as the tried and true of resinous flooring systems, with solutions available in thin film applications of 20 mils thickness for light duty applications all the way up to thick overlays of 9.5 mm or more.

A 6–9.5 mm thick cementitious urethane floor finish is a more common sight in breweries, as not only will it have a better chance of dissipating impacts, but should a chip occur then it is less likely to progress down to the substrate.

Anticipated traffic loadings need to be particularly accounted for, as just a hand pallet truck when fully loaded could weigh in excess of 1 ton, putting a lot of pressure through the wheels and into the floor. The compressive strength of the floor system can be used to determine the suitability of the floor to the task at hand.

Moisture Vapour Transmission

Moisture vapour can be a serious concern for any brewery and the substrate needs to be carefully analysed to ascertain what measures need to be taken to avoid blistering in the floor finish.

Epoxy systems will bond well to concrete. However, they are a vapour barrier and as such moisture may build up beneath the floor and over time lead to failure. Cementitious urethanes are able to breath ensuring vapour does not create pressure beneath the coating.

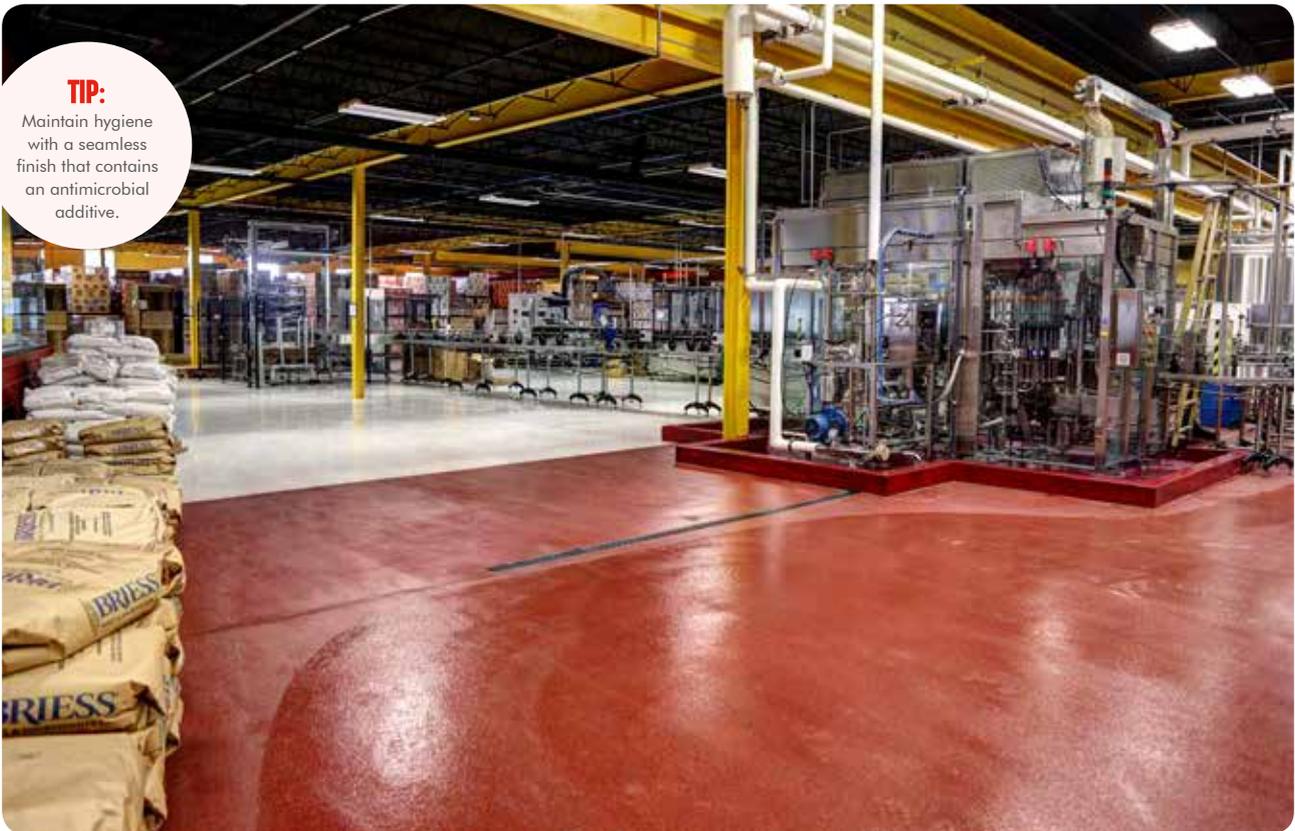
Installation & Maintenance

Cementitious urethane systems are ideal for projects with short installation and cure windows because they require only a limited amount of downtime before the floor can be in use whereas epoxy resin systems require a minimum of 48 hours cure time in production facilities and a total of seven days before all of the full benefits can be utilised.



TIP:

Maintain hygiene with a seamless finish that contains an antimicrobial additive.



Significant lifecycle cost savings over a 10 year period are standard fare with cementitious urethane but should any flooring problems occur throughout the lifetime of the system, dilapidation work can be completed within a twenty-four hour window at a fraction of the cost of epoxy resin systems, and they can be installed over the top of an existing floor finish if needs be.

Regulations

The USDA & FDA recommend that brewhouse production flooring is smoothly finished and without cracks as seams, joints, grout lines and gaps can become ideal breeding sites for contaminants such as bacteria, fungi, mold and mildew. All of these could spoil the beer and potentially lead to fatal illnesses that could irreversibly damage a brand's reputation and ability to function.

Cementitious urethane systems are USDA/FDA compliant and CFIA approved, meaning that they are more than fit for purpose in a brewery

environment and bypasses the industry's red tape. Epoxy floors also meet the regulation requirements to be seamless and impervious, however because they are more likely to fail when subjected to a brewery's operational activity, it could mean that a once compliant brewery falls below the required standard over time.

Having a seamless floor finish is vital to ensuring an effective cleaning program, allowing for the easy removal of 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.

Aesthetics

Chances are the next time you visit your local brewhouse, you'll encounter specialist polymer flooring systems throughout the facility rather than the typical tile or ceramic finishes traditionally found in these environments.

You'll find these systems not only behind the scenes where the beer is brewed, but also in the tasting rooms where it's being consumed. Polymer flooring systems are being used more often in these environments owing to a combination of excellent performance attributes and design versatility.

Aesthetic appeal is something that cementitious urethane systems offer in abundance, with an array of vibrant colours and eye-catching finishes available. Site visitors, customers and even company employees should all leave with an excellent impression of a brewery in order to maintain a quality brand image.

Epoxy systems are also available in a number of different colours and patterns, making them an equally stylish choice in the first instance but when wear and tear is taken into account, the more resilient nature of urethane means that it maintains its visual appeal for far longer.

Overall, a cementitious urethane system provides a stronger, more robust, reliable and aesthetically pleasing option for production areas with its reduced maintenance needs yielding long term cost savings. There is definitely a place for the more lightweight epoxy resin systems within tasting lounges of brewery facilities but in terms of production areas, cementitious urethane has all the right ingredients to brew up a winning formula.

This guide has been produced to provide an overview of cementitious urethane compared with epoxy flooring solutions in brewery environments.

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