



Preventing Tile Assembly Failures in Commercial Kitchens

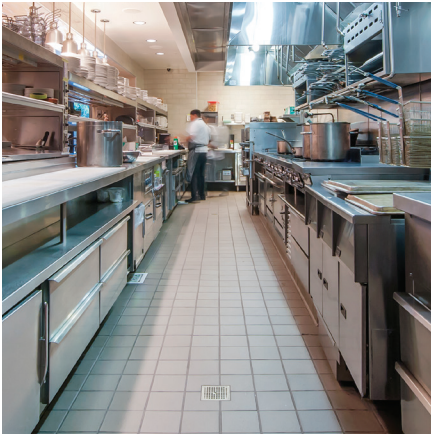
High heat. Harsh cleaners. Heavy impacts. Commercial kitchens present one of the most hostile environments for tile in any building application today. The temperatures and chemicals, along with grease exposure and the need to avoid downtime, create a serious challenge for anyone responsible for installing or maintaining these spaces. Premature tile failures can disrupt operations, create safety issues or worse – present a potential health code violation. Understanding how to specify, build and maintain the correct flooring assembly will save headaches down the road.

Because of its durability, tile is most frequently selected for these environments. However, not all tile, setting materials and cleaners are made for food preparation spaces. Specific subfloor preparation steps must also be considered. By understanding the particular complexities of these installations, construction professionals can help ensure greater performance and value over a longer period of time.

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CUSTOM[®]
TILE INSTALLATION SYSTEMS



Protect against slips and falls with tile that has a DCOF greater than 0.42.



Ceramic tile offers a beautiful and durable finish for dining areas as well as kitchens.

Choosing the Right Tile

Floor covering options for commercial kitchens are limited. Most will not hold up to grease, other organic contaminants and strong antimicrobial cleaners. The acids in food and grease are so aggressive that they can even break down concrete. Ceramic tile, on the other hand, is known for durability and resistance to most substances. The first step to success is selecting the right ceramic tile as defined by the American National Standards Institute (ANSI). Any tile selected for a commercial kitchen must meet the requirements of ANSI A137.1 for heavy duty use.

It is also critical that the surface of the tile is not too slippery when it gets wet. The Tile Council of North America (TCNA) recommends that tile have a Dynamic Coefficient of Friction (DCOF) greater than 0.42 for wet tile surfaces. Using tile with a DCOF greater than 0.42 will help reduce the risk of slip and fall accidents. Abrasive or treaded tiles should be considered.

It is equally important that the tile is rated for high traffic areas, impact strength and resistance to chemicals typically found in the commercial kitchen. Thick quarry tile is commonly selected for these areas and is typically available in a few different color options.

Choosing the Right Tile Installation System

To remain durable, ceramic tile must be installed with appropriate setting materials and methods. The grout and mortar can deteriorate and the tiles will break or come loose eventually if the wrong products are used for installation.

Preparation

To achieve a strong tile installation, the right foundation is required. All surfaces must be properly prepared to receive tile. Both ANSI and TCNA define a proper surface for the installation of ceramic tile in the following way. The floor should be flat, with no more than 1/4" deviation in 10 feet, or 1/8" if the tiles are longer than 15" on any side. All tiled floors should be sloped to drains to help evacuate water. Application of a self-leveling underlayment will help floors meet the stringent flatness requirements that help protect tile from breakage.

A waterproofing membrane under the tile is recommended, especially if the commercial kitchen is above ground over an occupied space. Use a fast-drying, liquid waterproofing, elastomeric membrane that meets the requirements of ANSI A118.10. Liquid-applied membranes are easy to install and provide continuous coverage to completely waterproof the substrate. RedGuard® Waterproofing and Crack Prevention Membrane is a liquid that also helps to isolate cracks and protect the tile from minor subfloor movement.

After substrate preparation is completed to meet industry requirements, the site is ready for tile installation. The surface should be free of all contaminants that may inhibit the bond of the mortar. If the tile installation does not take place right away, it is important that all the work that went into preparing the surface is protected from traffic and damage.

Technical White Paper

COMMERCIAL KITCHENS



Epoxy mortars are more chemical and impact resistant in busy restaurants.

Epoxy grouts resist stains and protect the mortar.



Mortar

The next step is determining the proper installation materials. Common cement mortars meeting the requirements of ANSI A118.4 may not be the best choice. In most cases, the tile and grout in an assembly protect the mortar from being exposed and contaminated with aggressive chemicals. However, in commercial kitchens, even the best tile setting job does not always keep material from seeping through to the mortar below. If the mortar is cement-based, it will dissolve upon contact with acidic materials.

Under these conditions, installing the tile with a chemical resistant 100% solids epoxy mortar is usually recommended. Situations where the tiled surface is exposed to higher levels of acidic contaminants will benefit the most. Mortars like EBM-Lite™ Premium Epoxy Bonding Mortar meet the ANSI A118.3 requirements for a chemical resistant epoxy mortar. An epoxy mortar can also offer exceptional high strength to protect tile from impact damage, a universal risk in kitchens.

With restaurant renovations, it is common to fast-track tiling so the kitchen can reopen for business quickly. The projects are often tiled overnight for a return to service the next day. When the job must be completed in hours, choose a fast-setting, improved modified mortar that meets ANSI A118.15 requirements. These mortars are designed for demanding conditions, cure quickly and are ready for traffic in just a few hours. Ultimately, the site analysis, mortar choice and tile setting should be made by a tile industry professional familiar with the needs of commercial kitchens.

Grout

All tile in commercial kitchens must be set with grout joints between the tiles. ANSI recommends that ceramic tiles are spaced with a minimum 1/16" gap between them. Traditionally, these joints are filled with cement-based grout. Unfortunately, basic cementitious grouts deteriorate in the presence of acidic materials, such as foodstuffs, so cement-based grout is not recommended for use in commercial kitchens.

In these harsh environmental conditions, it is best to use a chemical resistant, 100% solids epoxy grout to fill the space between the tiles. While epoxies hold up much better when continuously exposed to acids, they still deteriorate over time. Manufacturers have responded by developing even more chemical resistant epoxy grouts that meet the demanding requirement of ANSI A118.5 for furan grout. CEG-IG™ Industrial Grade Epoxy Grout is an example of a grout that holds up well at the most challenging commercial and industrial sites, including areas that are exposed to fatty acids and are routinely cleaned with no-rinse enzymatic cleaners or are subject to intense cleaning with hot water or pressure washing.

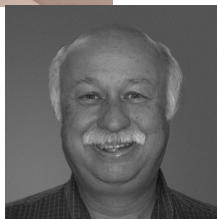
Maintenance

Finally, to ensure a long-lasting, trouble-free tiled surface, it is important to use the right cleaning products. Kitchen surfaces are constantly coated with grease and other foodstuffs, so they are often treated with strong, antimicrobial cleansers. These typically harsh cleaning cycles are carried out on a daily basis in food preparation areas.



Build up of grease and fatty acids will disintegrate grout.

Remove grease with neutral cleaners that will not damage tile and grout.



The no-rinse cleansers often used in kitchens leave a residue that continually breaks down the fats and proteins into fatty acids. These acids will begin dissolving the grout, and continual use of the cleaner will eventually damage the tile installation. It is best to use neutral cleaners that are designed to safely and effectively clean ceramic tile. These cleaners will not dull the surface of the ceramic tile or harm the grout. Using cleaners designed by the installation product manufacturer assures that the products are appropriate for use with ceramic tile and will not damage the assembly, which can result in costly repairs.

Inspect tiled restaurant floors routinely. If a broken tile is discovered at any time, it should be replaced immediately to contain further damage to the tile assembly from water or other contaminants getting under the tile.

Summary

For a commercial kitchen tile assembly that will last for years, be sure to install the right tile with the right products and follow all product manufacturer's directions. It is important that the installer is experienced with the challenges of ceramic tile in commercial kitchens.

An extended warranty for the entire tile installation can be obtained by using a complete system of products from a single manufacturer. For instance, CUSTOM offers up to a 10-year warranty that includes the replacement of tile, installation products and the cost of labor in the event of a failure.

Using installation and cleaning products that are designed to stand up to the rigors of a commercial kitchen will ensure a durable, appealing surface for years to come.

About the Author

Steve Taylor is Director of Architecture and Technical Marketing for Custom Building Products and has more than 30 years of experience developing products for the construction industry.

Steve is a member of the Tile Council of North America (TCNA) and Materials & Methods Standards Association (MMSA). In these roles, he helps to determine proper tile installation methods and standards. This includes simplifying the tile installation process to save tile professionals time and money.