

# INSTALLATION CHALLENGES AND SOLUTIONS: COMMERCIAL KITCHEN FLOORS

---

**Note:** The recommendations within this document are common industry standards and Custom Building Products' requirements. Additional limitations or specific recommendations may be listed within the Technical Data Sheets of products used in an installation assembly. When those instructions conflict with this document, the most stringent requirements and limitations shall apply.\*

All finishes in a commercial kitchen experience severe conditions from exposure to high heat, water, food residue, heavy loading, traffic and cleaning products but none more than the kitchen floor. So much so that some major restaurant franchises have projected major repairs or complete flooring replacement costs within a five to ten-year period depending on the type of finishes installed. While quarry and porcelain tile assemblies are the most long-lasting finishes, there are important method and product choices that can help ensure success. Please consider some of the installation challenges and solutions below.

## **Installation Challenges**

Finished flooring in a commercial kitchen environment is specified based on these primary considerations – aesthetics, safety and durability. Regarding safety concerns, slip and fall events can cause serious injuries along with expensive medical costs and therefore tile and other finishes must provide a higher measure of slip resistance. The ceramic tile industry recommends the wet dynamic coefficient of friction (DCOF rating) for level wet indoor areas of a minimum of 0.42 using the ANSI A326.3: Dynamic Coefficient of Friction (DCOF) test method. Pitched floor areas may require a different rating. To achieve higher friction, tiles are manufactured with a textured finish or with abrasive silicon carbide embedded in the surface. But, as surfaces are less smooth, they are more prone to trap residues and require more extensive maintenance to preserve the level of cleanliness required where food is prepared. This situation creates the largest challenge to a commercial kitchen floor. Food residues and oils contain natural acids that can have a long-term damaging effect on floor finishes, grouts and adhesive mortars. To remove these residues, chemicals in cleaning products and methods of cleaning can do additional damage either by the type or concentration of the chemicals. For example, the use of no-rinse enzymatic cleaners may be effective in breaking down residues and oils, but the no-rinse method leaves acids on the surface that can degrade epoxy grouts. Grout manufacturers have formulated specialized epoxy grouts to address these and other cleaning solutions.



**CUSTOM**

INSTALLATION CHALLENGES and SOLUTIONS

Technical Services 800-282-8786  
[custombuildingproducts.com](http://custombuildingproducts.com)

Quarry tile has been the most durable choice of tile for commercial kitchens and with good reason. They perform well in wet and high heat conditions. They are usually in 6" x 6" (15cm x 15cm) formats which are easier to install on a pitched floor. They also manage heavy point loading when installed correctly with a proper installation system. High-use kitchens require appropriate, high performance chemical-resistant materials to complement quarry and porcelain tile. The assembly component most affected by the service conditions discussed above is grout. The grout will be subjected to all that the tile is, but due to the concavity of the joint, food residues, oils, contaminated water and unrinsed detergents may have extended contact with the grout surface. The worst case area is typically around drains near dishwashers and where rubber mats trap water and residues.



Another challenge in high-use kitchens is the potential damage to the tiles from impact or when new equipment is installed. All too often, due to scheduling, damaged tile repairs are only performed after they become problematic where multiple tiles or large areas of grout require replacement. In these conditions, contaminated water attacks cement-based adhesives, mortar beds and concrete. Damage spreads rapidly to adjoining areas due to the wet floor environment. Unfortunately, due to a lack of storage space, replacement tiles are usually stored not on-site and when discontinued, unsightly repairs are made as shown.

### Addressing Challenges - Specification

For demanding applications like a commercial kitchen floor, the assembly must be specified without a "weak link". The major factors to consider start at the substrate. The flatter the floor with proper pitches to drains, the less damage will occur from contaminated water and cleaning solution residues in prolonged contact with the tile and grout. Tiles without lippage are also less likely to chip from traffic. For flattening substrates, the use of flowable hydraulic cement underlayment (self-leveling underlayment) is the best option to produce a smooth surface in a thin application. To create a pitched substrate over concrete, the use of an ANSI A108 mortar bed is the most effective method. Always consider - will the floor require pitches to drains or will a flat floor be adequate when relying on maintenance to move water to gutter drains?

To protect cement-based substrates, the best method is to specify a liquid-applied membrane meeting ANSI A118.10 and A118.12. These membranes are thin and manage extra heavy loading while at the same time are elastomeric, expanding when subjected to thermal shock and heat. They connect directly into drains with no seams in the floor or at coves to create a monolithic barrier. Some membranes have moisture mitigation properties that assist with blocking moisture vapor emissions (MVE). Note that epoxy grout applications require very low MVE rates.

All building materials expand and contract, especially when subjected to dramatic ambient and surface temperature changes, therefore joints in the existing slab should be honored. Using the tile's coefficient of linear thermal expansion rate, movement joint widths and frequencies can be plotted to accommodate thermal growth and thermal shock. *Refer to the current Tile Council of North America's Handbook Section- Movement Joints for guidelines and formula calculations.* Applications that experience high temperatures may require joints placed in frequencies at a minimum of 8'-12' (2.4m – 3.65m). Joint widths are based on using Class 25 ASTM C920 sealants which elongate or compress at a +/- 25% rate while requiring a minimum hardness. **Important Note: Inadequate movement joint treatment is the number one cause of failure in tile applications.**

Choosing the adhesive for the kitchen or "back of house" floor versus the dining area in a restaurant is the next important factor to consider. While epoxy grout has extremely low water absorption rates, it does not form a waterproof layer to block water from reaching the underside of a tile. Over time, contaminated water can damage cement-based adhesive mortars and affect bonding. The best option is to use a chemical resistant epoxy adhesive. It provides the longest lasting bond with the best performance. Based on the dining area usage, a cement-based mortar should be acceptable with ANSI A118.15 mortars as the best option. With either adhesive type used in the kitchen area, mortar



**CUSTOM**

INSTALLATION CHALLENGES and SOLUTIONS

Technical Services 800-282-8786  
custombuildingproducts.com

coverage should be specified at  $\geq 95\%$  as the floor will be subjected to water and be classified as a wet area. To achieve proper coverage, the industry's accepted troweling technique is well described in the National Tile Contractors Association's video [Trowel & Error](#). (Also available in [Spanish](#) and [Russian](#)).

As previously noted, ANSI A118.3 epoxy grouts have different levels of performance. Typically referred to as "industrial grade," higher performing grout has much greater resistance to food residues, heat and cleaning chemicals such as enzymatic solutions. They often cure faster, which is an added benefit to the construction schedule. To help prevent last-minute issues with grout residues from installation, consider sealing tiles or specify pre-sealed tiles.

To improve the ease of maintenance, consider sealers that penetrate the surface of quarry tiles, reducing water absorption and traffic staining. There are sealers that accomplish this without changing the appearance of the tile. Always use cleaning products types recommended by the grout manufacturer so they will be effective in cleaning without creating long-term damage.

Specify retainage of at least 3% attic stock of floor tiles and sufficient base tiles in the event of damage or equipment replacement to be stored on-site or in a convenient storage location.

Due to the complexities of commercial kitchen applications, involve your installation material representatives early in the project with specification review, product selection and warranty provision discussions, mockup evaluations and at the project startup.

For best results on your project, specify the use of a qualified installation company as described below.

A. Installer Qualifications:

- 1) Company specializing in performing the work of this section with minimum five years documented experience.
- 3) Installer shall be a five-star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
- 4) Installer's on-site supervisor shall hold the International Masonry Institute's Foreman Certification.
- 5) Installer shall employ Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.
- 6) Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of **[mud floors] [mud walls] [membranes] [shower receptors] [gauged porcelain tile/gauged porcelain tile panels and slabs] [and] [large format tile]**.

**Product Selection\***

CUSTOM® products have been successfully used in specifications for millions of tiles and have lasted for decades. Please consider these options for your project:

**Moisture Mitigation**

[TechMVCTM Moisture Vapor and Alkalinity Barrier](#) (No limit MVER)

[RedGard® Waterproofing and Crack Prevention Membrane](#) (Limited to 12lbs MVER)

**Flowable Hydraulic Cement Underlayment /Self-leveling Underlayment with Primers**

[TechPrime™ A Acrylic Primer](#)

[TechLevel™ 150 Self-Leveling Underlayment](#)

[TechLevel™ XP-1 Self-Leveling Underlayment](#)

**Crack Isolation and/or Waterproofing**

[RedGard® Waterproofing and Crack Prevention Membrane](#) (Primary membrane over concrete/occupied space)



**CUSTOM®**

**INSTALLATION CHALLENGES and SOLUTIONS**

Technical Services 800-282-8786  
[custombuildingproducts.com](http://custombuildingproducts.com)

### **Adhesive Mortars**

[EBMLite™ Epoxy Bonding Mortar](#)

[MegaLite® Crack Prevention Mortar](#) (650-725psi bond strength)

[ProLite® Tile & Stone Mortar](#) (400-500psi bond strength)

- Both mortars available in rapid-setting versions

### **Grout**

[CEG-IG 100% Solids Industrial Grade Epoxy Grout](#)

[CEG-Lite™ 100% Solids Commercial Epoxy Grout](#)

[Prism® Ultimate Performance® Grout](#)

### **Sealant**

[CUSTOM® Commercial 100% Silicone Sealant](#)

### **Sealers**

[Aqua Mix® Sealer's Choice® Gold – Rapid Cure Formula](#)

[Aqua Mix® Penetrating Sealer](#)

[Aqua Mix® Grout Release](#)

### **Cleaners**

[Aqua Mix® Heavy Duty Tile & Grout Cleaner](#)

[Aqua Mix® Concentrated Stone & Tile Cleaner](#)

CUSTOM® Limited Installation System Warranties are available for assemblies using these products covering labor and material replacement.

**Note:** Project conditions will vary and may affect product recommendations. Consult individual product Technical Data Sheets for specific recommendations and limitations regarding project conditions. Assembly mockups can determine suitability for these conditions on specific projects. For project specification review, onsite technical assistance, product, specification & warranty details contact CUSTOM architectural services or technical support at (800) 282-8786 [Custom Building Products - Contact us](#)

The information in this bulletin is presented in good faith, but no warranty, expressed or implied, is given nor is freedom from any patent in as much as any assistance furnished by CUSTOM with reference to the safe use and disposal of its products provided without charge. Custom Building Products assumes no obligation or liability therefore, except to the extent that any such assistance.

ICS003 N1/22



**CUSTOM**®

INSTALLATION CHALLENGES and SOLUTIONS

Technical Services 800-282-8786  
[custombuildingproducts.com](http://custombuildingproducts.com)