

Tile & Stone Installation Systems

Grouting commercial kitchens

Epoxy grouts are ideal for commercial kitchens and industrial facilities that have special maintenance considerations and need superior resistance to various chemicals. However, not all epoxy grouts are created equal. The demands that epoxy grout floors experience differ substantially as well. Those familiar with commercial kitchens recognize that they can be a harsh environment. Their floors commonly endure improper maintenance methods, heavy carts, a lot of water, frequent cleaning, oils and disinfecting chemicals. One example is oleic acid, manufactured from animal- and plant-based (vegetable) fats and oils, that can damage even epoxy grouts because it becomes concentrated when no-rinse cleaning practices are used.

A mystery of grout deterioration

When the tile industry first recognized issues with significant grout joint deterioration back in the 1990s, many manufacturers of epoxy grouting materials were somewhat puzzled as to the potential causes. It was not until there was industry discussion that a common denominator was discovered. It was suspected that the recently developed kitchen floor cleaners like no-rinse cleaning agents may have been strong enough to chemically degrade the epoxy grouts on the market at that time. Another theory was that maintenance personnel might not be properly following the products' dilution instructions.

Testing was conducted by several manufacturers in an attempt to determine the root cause of the grout deterioration. Cured samples of their grouts were placed in solutions of no-rinse cleaning agents at various dilutions. However, after months of exposure, no discernable degradation of the grout samples could be observed. Grout continued to deteriorate in commercial and industrial food-preparation areas, whether the grout was epoxy (ANSI A118.3), furan (ANSI A118.5) or cement-based (ANSI A118.6 and ANSI A118.7). Typically, the first signs of grout deterioration did not occur until after a few months of use. But the grout damage would quickly progress to complete deterioration in kitchen areas subjected to no-rinse applications, eventually leading to full grout failure.

A new theory emerged that a combination of factors might be causing the degradation. MAPEI introduced test results to the industry that indicated cooking oil combined with dwell time and no-rinse enzyme cleaners resulted in rapid deterioration of epoxy grout. That discovery led to further research into what might actually be happening with those commercial kitchen installations. The normal concentration of oleic acid in various cooking oils varies from 0.5% up to 2%, which is not strong enough to significantly deteriorate grout joints, even after long periods of time. When animal- and plant-based oils/fats are

combined with no-rinse cleaning practices and exposed to the grouts, the oleic acid concentration can jump as high as 30%. It should be noted that cottonseed oil, peanut oil and hydrogenated oils (such as margarine) show even higher concentrations of oleic acid. When such solutions are left to dwell on the surface of grout joints, significant deterioration occurs rapidly.

Independent testing indicates that epoxy grouts from all manufacturers are negatively impacted by exposure to these high concentrations of oleic acid. This exposure causes significant damage that continues at an increasing rate as the deterioration progresses. Naturally, the most severe degradation usually occurs where high concentrations of animal- and plant-based fats and oils are present, and where no-rinse cleaning practices are employed. Heat from ovens and fryers accelerate the degradation. Areas that are not in the vicinity of ovens and deep fryers may show no grout degradation, even when the same no-rinse cleaning practices are used.

For sanitary reasons, the tile in a commercial kitchen needs to be grouted. While in recent years most grout joints have become narrow, grout joints of quarry tile in commercial kitchens commonly feature a minimum width of 1/4" (6 mm). Considering how commercial kitchens are subject to hot water and pressure-cleaning, harsh cleaners, disinfecting chemicals, fatty acids and no-rinse cleaners, the best choice for grout is a high-performance, 100%-solids, industrial-grade epoxy grout meeting or exceeding ANSI A118.3 requirements. MAPEI's *Kerapoxy*[®] *IEG CQ* is an industrial-grade, water-cleanable, 100%-solids epoxy grout with high chemical and stain resistance. It is ideal for the demands on a commercial kitchen, with such additional features as being stain-resistant, nonshrinking, non-sag, fast-curing and efflorescence-free.

Strategies for grout protection

There are a number of strategies regarding product selection and maintenance for reducing the potential for deteriorated grout.

Product selection

When selecting a grout, consider the amount of chemical and physical abuse expected for the installation. Many ANSI A118.3 epoxy grouts are not able to withstand the rigors of a floor exposed to fats and oils and maintained with no-rinse cleaning practices. Selecting an epoxy grout that can better withstand these rigors is a best practice.

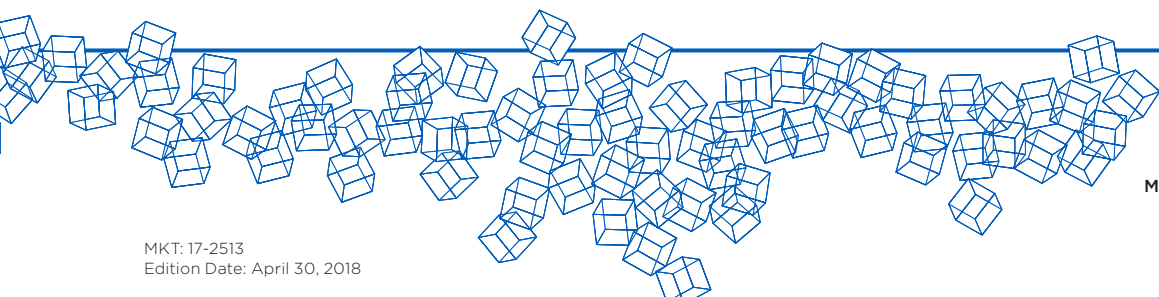
Kerapoxy IEG CQ industrial epoxy grout with colored quartz represents the best grouting option for commercial and industrial food-preparation areas, due to its

high-performance characteristics as a reaction resin grout. *Kerapoxy IEG CQ* has been benchmarked against other epoxy grouts and shows the best resistance to this type of chemical attack as a result of no-rinse cleaning practices. *Kerapoxy IEG CQ* exceeds the requirements of ANSI A118.3, carries the ISO 13007 RG classification and meets some of the ANSI A118.5 furan grout specifications.

Maintenance

When properly installed and maintained, tile and grout can last the life cycle of the installation. If no-rinse cleaning methods are used, even industrial-grade epoxy grouts can eventually be affected and undergo deterioration caused by strong oleic acid concentrations in commercial kitchens and industrial food-preparation areas. Deterioration typically requires three factors: oleic acid, no-rinse cleaners and dwell time. Removing any one of those three components will help reduce the likelihood of degradation issues considerably. Either remove or rinse away the fatty acid, or change to a neutral cleaner that is known to effectively clean quarry tile. Neutral cleaners like *UltraCare™ Concentrated Tile & Grout Cleaner* are highly concentrated and formulated for continuous use. When used regularly according to the directions on the packaging, this biodegradable, neutral cleaner from MAPEI helps to maintain the ceramic tile as well as grout without causing damage.

If the user plans to utilize a no-rinse cleaning regimen, MAPEI recommends testing to determine the suitability of the specific product for the installation (due to the variety of no-rinse cleaners and methods on the market). Consult MAPEI's Technical Services Department for assistance in evaluating or performing the necessary testing of proposed cleaners or methods.



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