

An 'Expanded' Look into Large Format Tile

by Bill Griese

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This article, the first of a two-part series pertaining to large format tile, will provide the background behind large format tile, and discuss the science behind the “trendy” and increasingly popular use of such products. In part two, we will discuss installation and the extra precautions that consumers should consider when dealing with large format tile.

The use of large format tile can contribute to a minimalistic “monolithic envelope” look that is gaining popularity.

How large is large?

Currently, a specific definition for “large format tile” does not exist. In the tile industry, the term “large format” has evolved over the last several decades. There was a time when 4”x4” tiles were considered large. Soon thereafter, 8”x8” tiles were considered large. In fact, the current 2008 TCA Handbook for Ceramic Tile Installation includes the statement, “Large tiles are generally considered to be 8”x8” and greater.” While this is valid from an installation perspective, with the regularity that 12x12’s are used today, most would not consider 8”x8” to be very “large.” Tiles as large as 24”x48” are becoming common. Some manufacturers are even producing tiles measuring up to 1x3 meters! But generally, most would consider large format tiles to be 18”x18” and larger.



How are manufacturers able to produce such large tiles?

Large format tiles can open up small residential spaces, such as this condominium kitchen, making them seem larger.

Today, manufacturers possess a wealth of technological advances that allow for ceramic tiles to be produced larger and larger.

Beginning with raw materials, improvements in organic binders and advances in spray drying technology resulted in sturdier green body (unfired) tiles with more evenly distributed densities.

Pressing technology also improved. As tiles get larger, presses must get stronger to achieve the die pressures necessary for producing large format tile. Some manufacturers have presses with capacities as high as 7,000 tons. Advancements in large format isostatic dies also aided pressing technology.

Large format tiles provide a larger design “canvas,” and the opportunity for glaze patterns and designs to be big, detailed, and continuous. Designs of high resolution can be transferred onto larger surfaces and fired to achieve commercial-grade durability. With the use of automated and highly precise equipment, uniform temperatures throughout very large kilns can be achieved to aid in firing accuracy and shrinkage management.

Finally, tile rectification assists in the dimensional accuracy of large format tiles. By mechanically finishing all four sides, manufacturers can produce very large tiles within tight targets for facial



dimensions. This eliminates the need for multiple calibers.

In addition to traditional tile forming processes, some manufacturers are incorporating innovative practices that allow for tile sizes to increase facially, but decrease in thickness. In some cases, these very large but thin tiles are reinforced with fiberglass mesh backings to maintain high breaking strengths.

Why are large format tiles so popular these days?

With the increasing amount of manufacturers able to produce large format tiles, there is an expanding market. According to a 2007 survey of manufacturers producing 18”x18” and larger tiles, such tiles made up approximately one-third of their sales. According to a survey of distributors that same year, sales of tiles 18”x18” and larger were 35- to 40-percent of their business and trending upwards. Without a doubt, large format tiles are in style, and continue to increase in popularity. But why? There are a multitude of reasons.

For one, the use of large format tiles results in less grout overall. Having less grout generally appears “neater,” and can make cleaning -up and maintenance easier. Furthermore, with rectified large format tiles, where the edges are only slightly beveled or not beveled at all, the use of such tiles creates the perception of a narrower joint, less grout, and a generally “flusher” look. However, as we will discuss in the second article, this look can only be achieved if the appropriate installation practices are followed. If these practices are ignored, the installation of non-beveled edge large format tile, especially with a narrow joint, can be highly problematic.

Designers often enjoy using large format tiles in situations where the same type of tile on the floor is used to cover surrounding walls and/or ceilings. This “European” minimalist style, sometimes referred to as a “monolithic envelope,” is becoming increasingly popular.

The use of large format tiles can also make average-sized rooms appear larger and bring proportionality to large commercial spaces.

For exterior applications, large format tiles are becoming more popular for use on building façades. When used in conjunction with cladding systems, exterior tile façades create an air pocket that evacuates warm air in the summer, and keeps insulation dry in the winter. This effective thermal barrier is an energy efficient exterior option, though its use is not widespread in the U.S. But regardless of whether or not large format tiles are used on building exteriors in this way, more and more architects and designers are considering large format tiles an attractive exterior option.

What should customers expect with large format tile Installations?

In many cases, large format tiles are inappropriately specified as if they were natural stone. Customers need to know that tile and stone each has unique advantages and drawbacks, and each requires different installation practices. In the next series, we will discuss the steps that should be taken when installing large format tile.

This is the second article of a two-part series pertaining to large format tile. In the December 2008 article, we provided a brief background of large format tile, and discussed its increasing popularity. In this article, we will discuss the extra precautions that should be taken when considering and installing large format tile.

What extra precautions are required when installing large format ceramic tile?

A successful large format tile project requires appropriate substrate preparation and correct mortar selection, and there are some special considerations that should be given if a narrow grout joint is desired.

Substrate Preparation

Poor mortar coverage can result in unsupported hollow spots that make tile susceptible to cracking from concentrated weight. Photo courtesy Ceramic Tile and Stone Consultants.

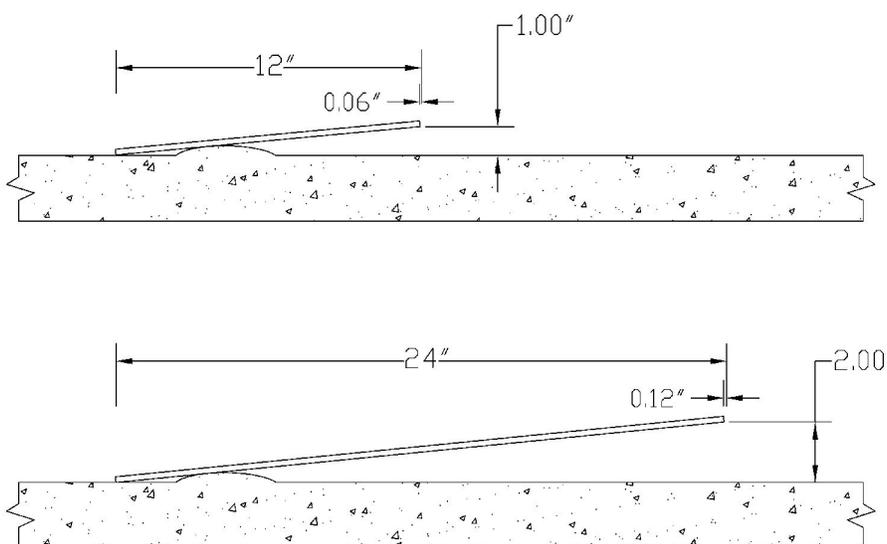


Perhaps the most critical component to consider when installing large format tile is the substrate. It is important to make sure that the substrate is sufficiently flat. The TCA Handbook calls for 1/4" maximum deviation from planarity every 10 feet, 1/16" deviation in every foot, and 1/32" deviation between adjoining edges (sheets of plywood, masonry block, etc.). However, one should consider even stricter tolerances when working with large format tile for a number of reasons.

With larger tiles, the effects of an uneven substrate on the installation are magnified, making it harder to avoid lippage or misalignment. Smaller tiles can better accommodate variation in the subfloor. With larger pieces, layouts contain fewer tiles, and therefore fewer opportunities to make gradual adjustments when compensating for the effects of an uneven substrate.

Uneven substrates can also lead to failures. In low points, mortar coverage may be poor. This can result in hollow spots that are not supported by mortar, making the tile susceptible to adhesion failures or cracking from concentrated weight.

If the substrate is not sufficiently flat, doubling the tile size can result in lippage that is twice as severe, and the tile can fall two times shorter of its projected horizontal layout.



It is critical that customers be aware of the extra time and money required to flatten substrates for any tile installation, but especially with large format tile. When dealing with an uneven floor, an installer can grind down high spots, fill in low spots, or utilize a combination of both to achieve the necessary degree of flatness. Self-leveling underlaments (SLU's) are also a convenient option to consider.

Mortar Selection

Mortar selection is a critical component in achieving a successful large format tile installation. A thick-set mortar bed, common in a natural stone installation, can be used when installing large format tile. More commonly, a medium-bed (thin-set) method with a large notch trowel of 1/2-inch or greater is used.

These mortars are formulated with coarser aggregate to provide anti-slump characteristics that resist larger, heavier tile sinking in the mortar. Some medium bed thin-set mortars also utilize innovative technology, such as hollow ceramic micro-spheres, to improve trowelability while maintaining anti-slump properties.

With flat floors, a full contact mortar can also be considered. These innovative mortars change viscosity as the tile is moved back and forth allowing full contact to be made between the tile and the floor.

Narrow Grout Joints and Tile Selection

A narrow grout joint is generally considered to be less than one-eighth of an inch. For all tile installations, and especially ones with large format tile, extra precautions should be taken if a narrow grout joint is desired. A successful narrow grout joint installation with large format tile is achievable as long as a few necessary steps are taken.

Widening the grout joint does not eliminate lippage, but can make it much less apparent. Photo courtesy Ceramic Tile and Stone Consultants.



First, one should consider the use of rectified tile. Narrow grout joints allow very little opportunity to make layout adjustments when compensating for any dimensional variation in the tile. Rectified tile has less dimensional variation, because the edges are ground to achieve more precise facial dimensions than traditional calibrated tile has. This is clearly shown in the 2008 ANSI accredited standard A137.1, American National Standard Specifications for Ceramic Tile, which lists the dimensional requirements for rectified tile, calibrated tile, and natural tile (tile that has not passed through a sorting/calibrating machine).

When considering narrow grout joints, it should be noted that section 4.3.8 of the ANSI accredited standard A108.02 states that “the actual grout joint size shall be at least 3 times the actual variation of facial dimensions of the tile supplied.” This does not permit the use of narrow grout joints with tiles exhibiting much variation in their sizing.

Prior to the passage of the 2008 ANSI accredited A137.1 standard for ceramic tile, there was no standard sizing requirement for rectified tile, and even today the international standard for tile (ISO 13006) does not have such a requirement. Unfortunately, some large format tiles on the market promoted as “rectified” do not meet the A137.1 standard, and are only as dimensionally precise as calibrated tile.

Inherent tile warpage must also be considered when considering narrow grout joints. Though such warpage is usually slight, lippage can result when the low spot in one tile is next to the high spot in another. This becomes more noticeable as grout joints become smaller or where wall wash lighting is used.

There are some designs that should simply be avoided if narrow grout joints are desired with large format tile. Examples include running bond, brick, and pinwheel patterns, or wherever the center of one tile is near the end of another. When opting for these patterns with large format tile, it is important to consider a wider grout joint to reduce noticeable lippage.

In summary, the successful installation of large format tile requires more precautions than necessary with smaller tile. Proper steps should be taken with substrate preparation, setting procedures, and materials selection. One must also give special consideration to the grout joint size and layout; when narrow grout joints are desired, pay additional attention to selecting tile both flat and consistent in its sizing.

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