



Installing Large Format Tiles

*2' x 4' Installed Porcelain Tile
Brocade Communications Systems, Inc.,
San Jose, CA*

Architects, designers and owners appreciate the clean, monolithic look of large format tile on their building projects. Today, their options for large tiles include extremely large tiles – panels that can measure 4' wide by 10' long. These panels are produced with a unique processing line and require special care and methods in their installation.

Large format tiles, traditionally pressed porcelain tiles that can come in excess of 4 square feet, are becoming common for wall and floor installations. The Tile Council of North America (TCNA) defines a large format tile as any ceramic or natural stone tile with one edge greater than 15", and the TCNA Handbook offers specific recommendations for their installation. Custom Building Products offers medium bed mortars and thin-set mortars with medium bed features for the installation of large ceramic and natural stone tile. Understanding the trends and latest developments from tile manufacturers, CUSTOM® formulated a specialized line of mortars for these specific installations.

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CUSTOM®

When setting large format tile, consider substrate preparation to ensure flatness.

Perhaps the most important thing to consider when setting large format tile is that substrate flatness is paramount to the success of the installation. The American National Standards Institute (ANSI) specification for the installation of ceramic tile sets forth a maximum allowable flatness tolerance for ceramic tile with one edge greater than 15". The standard recommends that the substrate have no more than a 1/8" variance in 10', with no more than 1/16" variation in 24".

The preparation of a substrate is important in any installation, but with large format tile, a flat surface is crucial. The depressions found in all concrete slabs or wood sub-floors are a landscape of mountains and valleys when setting large format tiles. A substrate that exceeds the ANSI standards must be corrected with an appropriate patching or self-leveling underlayment, such as CUSTOM's Levellite®, or must be ground to the correct tolerance. A flat substrate ensures a fast, high-quality installation. Please note that floor deflection is also an important consideration. Check your floor span and tile weight to local building codes.

Control joints must also be incorporated into these large expanses of ceramic and natural stone tile. Expansion joints should not be covered, but should be continued through to the finished surface. Cracked or suspended substrates should be covered with an appropriate crack isolation membrane, such as CUSTOM's CrackBuster Pro®.

TCNA, with the support of the tile installers, has developed specific recommendations for the installation of large format ceramic and natural stone tile:

- Medium bed mortars should be used to install tiles with one edge greater than 15" where the final embedded thickness of the mortar will exceed 3/16".
- Crack isolation or uncoupling membranes, such as CUSTOM's SpiderWeb® II, can improve the performance of the tile installation in above-ground installations.
- The actual grout joint width shall be three times the variation in the facial dimension of the tile and never less than 1/16".
- Running bond patterns will have a maximum offset of 33% for tiles with one edge greater than 18".

It is advisable to review the current TCNA guidelines in the handbook before beginning an installation project involving large format tile. The guidelines are updated regularly as new tiles and methods are introduced.

As we noted, it is recommended to use a medium bed mortar when installing large format tile to compensate for irregularities in the tile and substrate. Common thin-set mortars shrink as they cure. This displacement of water causes the mortar to retract and pull the tile as it hardens. When this occurs with a thick layer of a common thin-set mortar, it can leave an uneven surface from tile to tile known as "lippage," or even crack the tile.

Mortars with medium bed features are formulated to control the amount of shrinking that occurs during the curing process, which allows the tiles to stay level with each other. Custom Building Products has developed a line of thin-set mortars with medium bed capabilities that are easy to spread, offer non-slump/non-slip support and are available in rapid-setting formulations. Whereas standard mortars are capable of a setting bed 3/32" to 3/16" thick, a thin-set mortar with medium bed features can span from 3/32" up to 3/4" thickness after beat-in, providing maximum support and coverage.

Porcelain and natural stone tile manufacturers recommend the use of a polymer-modified mortar for the installation of tile to concrete, plywood and synthetic membrane surfaces. TCNA recommends the use of mortars meeting ANSI A118.4, A118.15 and A118.11 standards for these installations. The latest developments by Custom Building Products in mortar technology utilize specialized, spray-dried polymers in their polymer-modified medium bed mortars. These mortars require only the addition of water at the job site. Many large format tiles have a reinforcing resin-fiberglass backing that requires an epoxy bonding mortar. Custom Building Products has developed a 100% epoxy medium bed mortar with the same handling and non-sag characteristics as its cement-based counterparts.

CUSTOM offers a complete line of mortars that can be used to meet the needs of the large format tile in every situation:

MegaLite® Crack Prevention Mortar is ideal when maximum bond strength and flexibility is required. Its lightweight formula makes for easy handling and will support large tiles in vertical installations. It bonds to many difficult surfaces and dense





2' x 2' Installed Travertine
Private Residence,
Laguna Beach, CA

One of the most significant advancements for large format tile and stone is the development of thin-set mortars with medium bed capabilities.

porcelain and stone tile. MegaLite exceeds the requirements of ANSI A118.4, A118.15 and A118.11. MegaLite can be used for both thin-set and medium bed installation up to 3/4" thick. MegaLite contains a post consumer recycled lightweight aggregate, meets the requirements of ANSI A138.1 and contributes towards LEED certification.

ProLite® Large Format Tile & Stone Mortar offers high flexibility and bond strength in a lightweight formula with superior handling characteristics for a wide variety of floor and wall tile installations. Excellent for setting large format tile or stone, ProLite will not sag or slip on walls and offers non-slump performance for floor installations. ProLite exceeds the requirements of ANSI A118.4, A118.15 and A118.11. ProLite is suited for thin-set or medium bed application up to 3/4" thick. Formulated with CustomLite® Technology, ProLite is 40% lighter than traditional mortars, and a 30 lb. bag covers the same area as a 50 lb. bag of traditional mortar. As part of CUSTOM's Emerald System™, ProLite is formulated with recycled material, meeting the requirements of ANSI A138.1 and contributing towards LEED® certification.

ProLite® Rapid Setting Large Format Tile & Stone Mortar offers the same high performance and flexibility as the standard ProLite Mortar in a rapid-setting formula to meet the rigors of setting large format tile and stone for fast track commercial or residential installations. ProLite Rapid Setting mortar exceeds the requirements of ANSI A118.4, A118.15 and A118.11. Suitable for thin-set or medium bed application up to 3/4" thick after beat-in, it has sufficient working time to allow for tile adjustments. However, it sets quickly, allowing the grouting process to begin in under three hours, and can handle light traffic in four hours. ProLite Rapid Setting Mortar contains a one-part formula with no need for a separate liquid additive to improve bond strength, flexibility or performance. It maintains excellent open time and adjustability for non-slump performance in floor installations. Formulated with CustomLite Technology, ProLite Rapid Setting Mortar is 40% lighter than traditional mortars, providing excellent handling characteristics. A 30 lb. bag covers the same area as a 50 lb. bag of traditional mortar. As part of CUSTOM's Emerald System, ProLite Rapid Setting Mortar is formulated with recycled material, meeting the requirements of ANSI A138.1 and contributing towards LEED certification.

Complete Contact-LFT Rapid Setting Large Format Tile & Stone Mortar is a new, premium mortar that offers full mortar transfer to the back of large format tile with minimal effort. It eliminates the need for back-buttering or extensive beating-in techniques, saving time and labor for most installations. It is more fluid than traditional thin-set mortars, yet holds its ridges and supports deeper notch trowel sizes for large format tiles. Formulated with Controlled Cure Technology™, it cures rapidly and develops high early strength for quicker installations. Grouting can occur in as little as three hours, allowing the surface to open for heavy commercial traffic 24 hours after grouting. Complete Contact-LFT RS Rapid Setting Mortar exceeds the requirements of ANSI A118.4, A118.15 and A118.11 without any additives.

Marble, Granite and Travertine Premium Medium Bed Mortar was developed to maximize the bond to natural stone tile. It is also an excellent mortar for the installation of large porcelain tile. It can be used to install large tiles that require a setting bed up to 3/4" thick. Marble, Granite and Travertine Premium Medium Bed mortar meets the requirements of ANSI A118.4 and A118.11. It is an excellent choice for installation of large ceramic and natural stone tile in both interior and exterior applications. The use of Marble, Granite and Travertine Premium Medium Bed Mortar will contribute towards LEED certification.

Large Format Tile-LFT Fortified Medium Bed Mortar is a new, non-slip, non-sag and non-slump polymer-modified medium bed mortar specifically designed for large format tile and stone for interior and exterior floor, wall and countertop installations. CUSTOM Large Format Tile Mortar has excellent handling features and exceeds the requirements of ANSI A118.4 and A118.11.

Many large format tiles, particularly very thin (3 mm) porcelain and stone tile, have a resin/fiberglass reinforcement coating on the back. This reinforcement coating can be difficult to bond to with a cement mortar, and in most cases, requires an epoxy-based bonding mortar.

EBM-Lite™ Epoxy Bonding Mortar is 100% solids epoxy bonding mortar that exceeds ANSI A118.3 standards and can be used as a thin-set or medium bed mortar for installing large format tiles. EBM-Lite's unique and technologically advanced formulation provides non-sag and non-slip features that allow the mortar to hold trowel ridges and



3' x 3' Installed Porcelain Tile
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tile in place. Its non-s slump capabilities help support large format tile in floor installations. Formulated with CustomLite Technology, it is 30% lighter than other epoxy mortars. This technology provides both the handling characteristics of a cement-based mortar and the superior performance of an epoxy. As part of CUSTOM's Emerald System, EBM-Lite Epoxy Bonding Mortar is formulated with recycled material, meeting the requirements of ANSI A138.1 and contributing towards LEED certification.

With large format tile, it can be challenging to obtain full mortar transfer from the substrate to the back of the tile without leaving voids. Using the correct notched trowel provides a proper setting bed and reduces the amount of time spent pulling and resetting tile due to a lack of coverage. To increase mortar coverage required for large format tiles, Custom Building Products has developed the new **SuperiorBilt® LFT Trowel**, which is available in three notch sizes. The use of the SuperiorBilt LFT Trowel with the appropriate medium-bed mortar will help to ensure that the tiles meet a coverage rate of 95% or better. Unlike ordinary notch trowels, CUSTOM's patented notch pattern provides more contact with less pressure. The patterns give a more predictable flow of mortar, reducing the size and amount of air pockets under the tile. With the introduction of thin (3-5.5 mm thick) porcelain tiles, 100% coverage is mandatory, especially at the corners and edges to ensure proper support of the tile. Installers should carefully remove an occasional tile to check coverage rates during the installation process. Back buttering large tile or stone may be an option to consider if proper coverage is not reached.

Installing large format tile greatly reduces the number of grout joints, as well as the amount of grout used for the installation. Typically a 10,000 square foot installation of 12" floor tile required 36 bags of traditional cement-based grout. When large format 36" tiles are installed, this need for grout is reduced to 10 bags for the same area. Since less grout is used, this is an opportunity to use a premium grout that offers uniform color and stain resistance for the same job cost.

Custom Building Products' **Fusion Pro® Single Component Grout™** fits the need for a premium grout. Fusion Pro is ready to use and makes installation easy. It meets the performance requirements of ANSI A118.3, shows uniform color throughout the installation, and resists staining by most common staining agents. The use of Fusion Pro eliminates the need to return to the job site and seal the grout days later; stain protection is achieved as soon as the grout is installed. The installation of large format tile has also changed the way that tile is grouted. Rather than spreading the grout over the entire face of the tile, the installer will often only apply grout to the joints. If this method is used, care must be observed to avoid "picture framing" the tile, where small amounts of grout will penetrate into porous tile or slightly change the hue of other tiles a few inches around the perimeter of the tile. The best way to avoid this is to pre-seal the entire tile with a pre-sealer like Aqua Mix® Grout Release.

Large format tile provides a low-maintenance, long-lasting, sustainable finish that architects, designers and owners are asking for today. The use of products formulated to work together during tile installation will assure the longevity of the installation. Custom Building Products' surface prep materials, mortars and grouts have been formulated to work together, and CUSTOM backs the installation with an extended system warranty when a full system of installation products are used. CUSTOM's line of large format tile mortars enhances an extensive list of ceramic tile installation products and meets the needs of any situation, assuring the customer of a beautiful-looking tile installation 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.

