



Installing Gauged Porcelain Tiles/Panels TDS 170

Large, gauged porcelain tile/panel products range in thickness from $\sim 1/8''$ (3.5 mm) to $5/16''$ (8 mm) and some may be manufactured with a resin or mesh backing. Undoubtedly, the resin or mesh backing provides stability to the reduced porcelain tile/panel. Many of the manufacturers of these gauged porcelain products are suggesting that their products can be used for interior vertical applications and limited interior floor and exterior wall applications. Consult with the porcelain tile/panel manufacturer for their recommendation on which specific gauged tile/panel type and thickness is suitable for a specific application. Note that not all thicknesses in a manufacturer's product range are suitable for all applications. Exterior applications and demanding floor applications may require the use of a specific manufacturer's porcelain tile/panel (type and thickness) that has been rated for the application and area of use.

LATICRETE International, Inc., the world leader in ceramic tile and stone installation systems, has had a long and successful history of installing thin, ceramic tile/panel dating back to the early 1970's. Based on our successful track record, the following installation systems can be specified for today's innovative, gauged porcelain tile/panel installation challenges. Special installation techniques are required for successfully installing these gauged porcelain units. For example, using a glass installer's "vacuum suction cups" and / or "installation frames" can facilitate easier handling and placing of the tile/panel and reduce the chance of cracking them during handling and installation. Consult the gauged porcelain tile/panel manufacturer before selection and installation to determine the porcelain's suitability for the intended area of use and the specified project. It is highly recommended that the manufacturer of the gauged porcelain tile/panel provide information regarding the tile/panel's suitability and acceptability for the intended use and for the service rating of the tile/panel.

LATICRETE International, Inc. strongly recommends the use of installers who have demonstrated their commitment to their craft and taken the time to stay current with the latest materials and methods. Requiring references and a portfolio along with a bid or estimate is a good way to ensure the installer has successfully completed work of similar size, scope, and complexity. In addition, interior installations should be done in accordance with ANSI A108.19 – American National Standard Specifications for Gauged Porcelain Tile and Gauged Porcelain Tile Panels/Slabs.

SUBSTRATE PREPARATION:

The main challenge for installers is to make sure that the substrate is extremely flat, so as to achieve the required coverage. Floor installations of gauged porcelain tile/panel are recommended over cured bonded or unbonded mortar beds (must conform to ANSI A108.1B requirements) and interior concrete floor slabs (and approved existing interior ceramic tile over concrete) that meet the maximum allowable deflection standard of $L/360$ under total anticipated load. Concrete substrates should be cured in accordance with the gauged porcelain tile/panel manufacturer's written installation instructions. Installations over wood-framed floor constructs, gauged porcelain tile/panels can be direct bonded in interior floor installations to mortar beds or the following backing board and panel types: cementitious backer unit (ANSI A118.9 or ASTM C1325), fiber-cement backer board (ASTM C1288 or ISO 8336 Category C), coated glass mat water-resistant gypsum backer board (ASTM C1178), fiber-reinforced water resistant gypsum backer board (ASTM C1278). Floor substrates for the installation of gauged porcelain tile/panel must be prepared to a Floor Flatness (F_F) of 50. The floor flatness (F_F) requirements should be determined just prior to the installation of the gauged porcelain tile/panels. If the slab does not meet the floor flatness requirements then appropriate surface preparation should be conducted. Maximum variation in the substrate is not to exceed $1/8''$ in $10'$ (3mm in 3m) from the required plane, and no more than $1/16''$ in $24''$ (1.6mm in 60cm) when measured from high points. Please refer to LATICRETE TDS 233 "Floor Flatness (F_F) and Floor Levelness (F_L)" for more information. Typical interior wall substrates are concrete, concrete block and cement backer board. Typically, the following LATICRETE® Polymer Fortified Mortars and NXT™ or DRYTEK® LEVELEX™ Self-Leveling Underlayments can be used to properly prepare a substrate:

- 3701 Fortified Mortar
- NXT Level Plus
- NXT Level
- DRYTEK LEVELEX
- DRYTEK LEVELEX Plus
- DRYTEK LEVELEX DL

- DRYTEK LEVELEX FR

INTERIOR - walls and limited floor applications based on the porcelain tile manufacturer's recommendations:

Gauged porcelain tile/panel manufacturer's installation information and product testing that has been received / conducted to date reveals that the following LATICRETE / LATAPOXY products can be used for interior applications:

- 254 Platinum
- 254R Platinum Rapid (for smaller module tile that can be installed with a shorter open time)
- 257 TITANIUM™
- 4-XLT
- TRI-LITE™
- LATAPOXY® 300 Adhesive

EXTERIOR FACADES (based on gauged porcelain tile/panel manufacturer's recommendations):

In some cases, requests have been made to use gauged porcelain tile/panel on exterior applications. Please note that for exterior veneer installations, the thickness of the gauged porcelain tile/panel can be a concern. The 2015 International Building Code (IBC) - Chapter 14 – Exterior Walls - requires that “adhered veneer finish types” (which include ceramic and porcelain tiles) be a minimum of ¼” (6mm) thick for use as exterior cladding. In addition, facial size dimensions can also be a factor. For porcelain tile, the 2015 IBC [Section 1405.10.2] requires that exterior adhered porcelain tile be a maximum of 24” (610mm) in any face dimension nor more than 3 square feet (0.28m²) in total face area and shall not weigh more than 9 lbs. per s.f. (44.2 kg/m²).

Therefore, the project Architect or Engineer will have to gain code approval for the use of a gauged porcelain tile/panel finish material for use in these applications. The following LATICRETE® products can be used for these applications upon code approval:

- 254 Platinum
- 257 TITANIUM

In addition, exterior façade installations should be waterproofed to help prevent the infiltration of water into the structure and to protect building elements from corrosion. HYDRO BAN® or 9235 Waterproofing Membrane are ideal waterproofing membranes for exterior façade installations and are 100% compatible with LATICRETE adhesives and mortars used for these installations. Weather protection during the installation and cure period are vital to the performance of the exterior veneer. Please refer to TDS 110 “Protecting Exterior Installations of Tile, Stone and Adhered Veneers” for more information.

For full installation instructions for exterior gauged porcelain tile/panel applications, please see LATICRETE Master Specification “Gauged Porcelain Tiles”.

NOTES:

Obtaining suitable mortar coverage between the porcelain unit and the substrate is absolutely essential to the long term performance of the porcelain tile, especially at corners and edges. For interior installations, there should not be any voids larger than 2 In² and a coverage minimum of 85% per square feet is required. See ANSI A108.19 Section 15 for further information about required mortar coverages. Some gauged porcelain tile manufacturers require a flat troweled skim coat on the back of the tile in lieu of a notched trowel coat. Using the appropriate specialty notched trowel (e.g. [European Tile Masters Euro Notch Trowel](#) or [Raimondi Flow Ridge Slant Notch Trowel](#)), typically 3/8” (9mm) deep, along with proper troweling techniques and back-buttering will make achieving complete coverage easier. To help ensure maximum coverage to both the substrate and to the back of the porcelain tile, mix the adhesive to a slightly wetter consistency (e.g. 254 Platinum mixed with up to 6 qts. (5.6 L) of water) than as a typical thin bed mortar (mortar ridges must still hold their shape).

Key mortar into the substrate and gauged porcelain tile/panel. Apply notched coats of the thin-set mortar to BOTH the back of the gauged porcelain tile/panel and the substrate. Typically, the trowel ridges are applied in straight lines, on both the back of the gauged porcelain tile and on the substrate, and should be parallel to each other and perpendicular to the long edge of the tile when placed (unless otherwise directed by porcelain tile/panel manufacturer). Do not allow the mortar to dry or skin over during the installation process. Care must also be taken when removing a gauged porcelain tile/panel (if possible) to inspect the thin set mortar coverage during the installation process and while the mortar is still wet to avoid damaging the gauged porcelain tile/panels during this process. The use of hand held “vibrating” pads can assist in properly bedding the

tile/panels and achieving maximum adhesive mortar coverage. Follow the gauged porcelain tile/panel manufacturer's installation instructions concerning proper embedding/beat in/vibrating of their tiles, including possibly walking on freshly installed tile for horizontal applications.

Allow a minimum of 72 hours for cure time at 70°F (21°C) prior to grouting and exposing floor installations of gauged porcelain tile/panel to light foot traffic only. Regardless of whether rapid or normal setting thin set / medium bed mortars are used, LATICRETE typically requires that floors need to be protected from heavy traffic, lifts, etc.... for at least 7 days at 70°F. Full cure typically occurs in 28 days at 70°F. However, cooler temperatures (and other climatic conditions) and the size of the porcelain tile/panel can impact the cure rates. In addition, anytime heavy lifts or other equipment is exposed to the floor, protection of the tile/panel should be put into place (typically 3/4" thick plywood / OSB). See the Tile Council of North America's (TCNA) statement of protection on this matter in the current TCNA Handbook for Ceramic, Glass and Stone Installations. It is important to note that the above cure rates are typical, but can be affected by many variables. Consult with the gauged porcelain tile/panel manufacturer for their suggestions on cure rates, time to traffic and protection of newly installed projects.

Using mechanical edge-leveling systems for floor applications (e.g. [Tuscan Leveling System](#), MLT Systems, etc...) can help reduce lippage and achieve complete coverage beneath the porcelain tile/panels; especially at the edges and corners.

Bonding issues of the resin or mesh backing to the gauged porcelain tile/panels (or any tile or stone) is outside of the control of LATICRETE and is an issue of which the tile/panel manufacturer is responsible.

GROUTING:

Since the gauged porcelain tile/panels are thinner than typical tile/panel, extra attention must be given to "clean out" any adhesive mortar left in the joints during the installation in order to facilitate grouting, and the acceptance of enough grout within the grout joint. In most cases, half the depth of the grout joint should be available to receive the grout. For 1/8" (3mm) thick porcelain tile/panel that would be only 1/16" (1.5mm). This may not be enough to allow the grout to remain in place. Therefore, the entire depth of the tile/panel should be free of adhesive in the joints to receive the grout.

Interior Applications:

- SPECTRALOCK® PRO Premium Grout* (provides best performance for commercial applications)
- SPECTRALOCK PRO Grout (provides best performance for commercial applications)
- PERMACOLOR® Select†
- PERMACOLOR Grout
- PERMACOLOR Select NS

Exterior Applications:

- PERMACOLOR® Select
- PERMACOLOR Grout
- PERMACOLOR Select NS

MOVEMENT JOINTS:

Joints scheduled to act as movement joints should also be cleaned out of all adhesive mortar and grout in order to receive bond breaker tape and the suitable sealant so as to allow the movement joint to function correctly. Use LATASIL™ to treat the movement joints. Follow standard industry guidelines for movement joints in accord with Tile Council of North America movement joint details and information EJ-171.

For more information on the nuances of installing large format tiles and stones, see LATICRETE TDS 193 "Installation of Large Format Tile & Stone".

* United States Patent No.: 6,881,768 (and Other Patents) † United States Invention Patent: 6,784,229 B2 (and Other Patents)

Technical Data Sheets are subject to change without notice. For latest revision, check our website at www.laticrete.com
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