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Construction Solutions

# Installing Large Porcelain Tiles and Panels (Floors)

TDS-1170F

Large porcelain tile and panel products range in thickness from ~3.5 mm to 12 mm and some may be manufactured with a resin or mesh backing. Undoubtedly, the resin or mesh backing provides stability to the reduced thickness porcelain tile and panel. Many of the manufacturers of these large porcelain products are suggesting that their products are limited interior floor applications. Consult with the porcelain tile and panel manufacturer for their recommendation on which specific large tile or 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 or panel (type and thickness) that has been rated for the application and area of use. Consult the large porcelain tile and 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 large porcelain tile and panel provide information regarding the tile's or panel's suitability and acceptability for the intended use and for the service rating of the tile or panel.

LATICRETE the world leader in ceramic tile and stone installation systems, has had a long and successful history of installing thin, ceramic tile and 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, large porcelain tile and panel installation challenges. Special installation techniques are required for successfully installing these large 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 or panel and reduce the chance of cracking them during handling and installation.

LATICRETE 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 quote or estimate is a good way to ensure the installer has successfully completed work of similar size, scope, and complexity. In addition, installations should be done in accordance with LATICRETE specifications and technical data, manufacturers guidelines, good trade practice and AS 3958.

**Floor Tile Limitation:** Large porcelain tiles and large porcelain tile panels and slabs shall not be used in floor applications subject to equipment or rolling loads with steel wheels. Consult the tile manufacturer for installation recommendations for applications where hard rubber wheel rolling loads are anticipated.

## **SUBSTRATE PREPARATION:**

The main challenge for installers is to make sure that the substrate is extremely flat and in the required plane, to achieve the required coverage. Floor installations of large porcelain tiles and panels are recommended over cured bonded or unbonded mortar beds (must conform to AS 3958 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 large porcelain tile and panel manufacturer's written installation instructions.

Installations over wood-framed floor constructs (interior only), large porcelain tile and panels can be direct bonded in interior floor installations to mortar beds or cementitious backing boards or compressed cement boards. Wood framed floor systems over which large porcelain tiles or large porcelain panels and slabs will be installed shall be in conformance with Australian Standards, including meeting a maximum allowable deflection standard of  $(L/720)$ .

Floor substrates for the installation of large porcelain tile and panel must be prepared to a Floor Flatness (FF) of 50. The floor flatness (FF) requirements should be determined just prior to the installation of the large porcelain tile and 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 3mm in 3m from the required plane, and no more than 1.5mm in 600mm when measured from high points. Please refer to TDS 1233 "Floor Flatness (FF) and Floor Levelness (FL)" for more information. Typically, the following LATICRETE Polymer Fortified Mortar and LATICRETE LEVEL Self-Leveling Underlayment can be used to properly prepare a substrate:

- 3701 Fortified Mortar Bed
- 3701 Mortar Admix with 226 Thick Bed Mortar
- LATICRETE® LEVEL over LATICRETE PRIMER
- LATICRETE SUPERCAP® SC-500 over LATICRETE PRIMER

### **INTERIOR - floor applications based on the porcelain tile manufacturer's recommendations:**

Large porcelain tile and 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 Adhesive
- 257 TITANIUM™ Adhesive
- LATAPOXY 300 Adhesive

For full installation instructions for interior floor large porcelain tile and panel applications, Please contact LATICRETE. Refer to AS 3958 for General Requirements for Installation.

### **NOTES:**

Obtaining suitable adhesive thickness and coverage between the porcelain unit and the substrate is absolutely essential to the long term performance of the large porcelain tile and panel, especially at corners and edges. For interior installations, there should not be any voids larger than 12.9cm<sup>2</sup> and a coverage minimum of 85% per 929cm<sup>2</sup> is required. See AS 3958 for further information on adhesive thickness and coverage. Some large porcelain tile or panel 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 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 large porcelain tile or panel, mix the adhesive to a slightly wetter consistency (e.g. 257 TITANIUM™ mixed with up to 5.2L of water) than as a typical thin bed adhesive (adhesive ridges must still hold their shape).

Key adhesive into the substrate and large porcelain tile or panel. Apply notched coats of the thin-set adhesive to BOTH the back of the large porcelain tile or panel and the substrate. Typically, the trowel ridges are applied in straight lines, on both the back of the large 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 large porcelain tile or panel manufacturer). Do not allow the adhesive to dry or skin over during the installation process. Care must also be taken when removing a large porcelain tile or panel (if possible) to inspect the thin set adhesive coverage during the installation process and while the adhesive is still wet to avoid damaging the large porcelain tile or panels during this process. The use of hand held "vibrating" pads can assist in properly bedding the large tile or panels and achieving maximum adhesive coverage. Follow the large porcelain tile and panel manufacturer's installation instructions concerning proper embedding/beat in/vibrating of their tiles or panels, including possibly walking on freshly installed tile or panel for horizontal applications

Allow a minimum of 72 hours for cure time at 21°C prior to grouting and exposing floor installations of large porcelain tile or panel to light foot traffic only. Regardless of whether rapid or normal setting thin set or medium bed adhesives are used, LATICRETE typically requires that floors need to be protected from heavy traffic, lifts, etc.... for at least 7 days at 21°C. Full cure typically occurs in 28 days at 21°C. However, cooler temperatures (and other climatic conditions) and the size of the porcelain tile or panel can impact the cure rates. In addition, anytime heavy lifts or other equipment is exposed to the floor, protection of the tile or panel should be put into place (typically 19 mm thick plywood / OSB). See the AS 3958 statement about protecting installations. It is important to note that the above cure rates are typical but can be affected by many variables. Consult with the large porcelain tile or panel manufacturer for their suggestions on cure rates, time to traffic and protection of newly installed projects.

Using lippage control devices (e.g. Ramondi Leveling System, MLT Systems, etc. . .) can help reduce lippage and achieve complete coverage beneath the porcelain tile and panels; especially at the edges and corners.

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

### **GROUTING:**

Since some of the large porcelain tile and panels are thinner than typical tile or panel, extra attention must be given to "clean out" any adhesive 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 3mm thick porcelain tile and panel that would be only 1.5mm. This may not be enough to allow the grout to remain in place. Therefore, the entire depth of the thin large tile or 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)
- PERMACOLOR® Select†
- PERMACOLOR Grout
- PERMACOLOR NS

### ***Exterior Applications:***

- PERMACOLOR Select
- PERMACOLOR Grout
- PERMACOLOR NS

### **MOVEMENT JOINTS:**

Joints scheduled to act as movement joints should also be cleaned out of all adhesive, grout and other contaminants 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 AS 3958 movement joint details and information.

For more information on the nuances of installing large format tiles and stones, contact LATICRETE.

\* United States Patent No.: 6,881,768 (and Other Patents)

† United States Invention Patent: 6,784,229 B2 (and Other Patents)

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