

Thin-Body Porcelain Tile

Reference Guide for Interior and
Exterior Walls, Ceilings and Soffits
— 3 to 6 mm in Tile Thickness



REFERENCE GUIDE RGT0113

DEFINING THIN-BODY PORCELAIN TILE

Thin-body porcelain tile is a lightweight product that is produced using less materials and less energy. This combination makes it a perfect choice for many “sustainable” installation projects specifying interior walls, floors and facades.

Typically, a “thin-body porcelain tile” has a thickness range of 3 to 6 mm, and a “standard-body porcelain tile” is > 7 mm thick.

Installation of thin-body porcelain tile is different from standard-body porcelain tile, requiring special installation techniques to prevent breakage during and after installation. In addition to the reduced tile thickness, many of these thin tiles are produced in large-format sizes ranging from 50 x 50 cm to 100 x 300 cm, which may require special equipment when placing the tile and making adjustments. The manufacturer of the “thin-body porcelain tile” should be consulted before selection and installation to determine the tile’s suitability for the specified project.

VERTICAL GUIDE OVERVIEW

This guide covers the installation of thin-body porcelain tile (3 to 6 mm in thickness) for interior wall and ceiling and exterior facade and soffit applications. For the purpose of this guide for both interior and exterior walls, soffits and ceilings, the following steps are recommended:

1. Proper surface preparation
2. Proper material selection
3. Proper trowel selection
4. Use of a mechanical edge-leveling system
5. Vibration of tile into mortar bond coat (tile 3 to 3.5 mm [3 to 3,5 mm] in thickness)



Example of a thin-body, 3.5-mm (3,5-mm) porcelain tile with fiber-reinforcing mesh

Note 1: Refer to the most current “American National Standard Specifications for Ceramic Tile” (ANSI A137.1) for defining various types, sizes, physical properties, and grading procedures for porcelain tile.



Example of a thin-body, 5-mm porcelain tile

- Section 1405.10.2 –“Exterior adhered masonry veneers – porcelain tile. Adhered units shall not exceed 5/8 inch (15.8 mm) thickness and a maximum of 24 inches (610 mm) in any face dimension nor more than 3 square feet (0.28 m²) in total face area and shall not weigh more than 9 pounds psf (0.43 kN/m²). Porcelain tile shall be adhered to an approved backing system.”

3. Refer to the most current installation methods of the Tile Council of North America (TCNA) or the Terrazzo Tile & Marble Association of Canada (TTMAC) for interior and exterior walls and ceilings.

Note 3: The manufacturer of the thin-body porcelain tile should be consulted before tile selection and installation to determine the tile’s suitability in accordance with all federal, state and local municipal codes for wall and ceiling applications.

Note 2:

1. Building Officials and Code Administrators International, Inc. (BOCA) addresses the size and weight of tile units on exterior facades in the U.S. BOCA-1996 edition:
 - Section 1405.6.2 – “Height of adhered veneer – exterior adhered veneer shall not be attached to wood frame construction at points more than 30 feet (9144 mm) in height above the non-combustible foundation. Height increases are permitted where an engineering analysis is provided.”
 - Section 1405.6.3 – “Sizing of adhered veneer units shall not exceed 36 inches (914 mm) in the greatest dimension, nor more than 720 square inches (0.46 m²) in total area, and shall not weigh more than 15 pounds per square foot (175 kg/m²) unless approved. Exception: adhered veneer units weighing less than 3 pounds per square foot (35 kg/m²) shall not be limited in area.”
2. International Building Code (IBC) addresses the size and weight of tile units on exterior facades in the U.S. IBC-2012 edition:
 - Section 1405.10.1 –“Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be installed in accordance with Section 1405.10 and in accordance with the manufacturer's instructions.”

INTERIOR WALLS

– Acceptable MAPEI Mortars

1. **Granirapid® System** (meets ISO 13007 C2FS2P2 and ANSI A118.4/A118.11)
2. **Kerabond/Keralastic™ System** (meets ISO 13007 C2ES2P2 and ANSI A118.4/A118.11)
3. **Ultraflex™ LFT Rapid** (meets ISO 13007 C2TFS1P1 and ANSI A118.4/A118.11)
4. **Ultraflex LFT** (meets ISO 13007 C2TES1P1 and ANSI A118.4/A118.11)
5. ***MAPEI Ultralite™ Mortar** (meets ISO 13007 C2TES1P1 and ANSI A118.4/A118.11)
6. **Ultraflex™ RS** (meets ISO 13007 C2FP1 and ANSI A118.4/A118.11)

* MAPEI Ultralite Mortar is Green Squared Certified, meeting the standards criteria of ANSI A138.1.



Example of a thin-body, 4.5-mm (4,5 mm) porcelain tile installation on both an interior wall and ceiling header

EXTERIOR FACADES, CEILINGS AND SOFFITS

– *Acceptable MAPEI Mortars*

1. **Granirapid System** (meets ISO 13007 C2FS2P2 and ANSI A118.4/118.11)
2. **Kerabond/Keralastic System** (meets ISO 13007 C2ES2P2 and ANSI A118.4/A118.11)

Note 4: Due to the potential for thermal growth, shrinkage and vibration, it is recommended on exterior facade, ceiling and soffit installations to use a two-component cementitious mortar with an ISO 13007 classification of C2S2, for improved bond and high deformability.



Example of a thin-body, 4.7-mm (4,7 mm) porcelain tile installation on an exterior facade

SURFACE PREPARATION

Interior walls and exterior facades, ceilings and soffits must be structurally stable and capable of supporting the tile, setting system, and associated live loads and dead loads. Vertical and overhead substrates and existing tile are to be fully cured and free of soap scum, dust, dirt, oil, wax, sealers, paint, coatings, and any other substances that could reduce or inhibit proper adhesion performance.

Note 5: Refer to the MAPEI Reference Guide “Surface Preparation Requirements – Tile & Stone Installation Systems” (RGT0309) for specific surface preparation requirements.

1.) Walls, ceilings and soffits with the following criteria are considered suitable substrates:

- Cement and masonry block
- Cement backer units (CBUs) – The CBU should conform to the quality standard requirements of ANSI A118.9. It must be installed according to the CBU manufacturer's instructions and in strict accordance with ANSI A108.11 standards for interior and exterior installation of CBUs.
- Gypsum wall surfaces (for interior dry areas only) – Prime all drywall and plaster wall surfaces with an appropriate MAPEI multipurpose acrylic latex primer and let it dry completely before applying the mortar. Refer to the most current Technical Data Sheet (TDS) at www.mapei.com.
- Existing tile should be sound, stable, well-bonded and prepared using either of the following options:

Option 1: Mechanical abrasion with a carborundum disk followed by a clear water wash is recommended. Refer to the most current TCNA handbook, Method TR713; or the TTMAC Tile Installation Manual, Detail 323RW.

Option 2 (interior only): Prime the existing tile over concrete with MAPEI's *ECO Prim Grip™*. Refer to the most current TDS at www.mapei.com.

- MAPEI's *ECO Prim Grip™* per TCNA Environmental Classifications is limited to RES 3 or COM 3.

2.) Before installation – Wall flatness

The surface of the substrate must have the following flatness before installation:

All approved and properly prepared substrates shall have no more than a permissible variation of 1/8" in 10 feet (3 mm in 3 m) from the required plane; nor more than 1/16" in 12 feet (2 mm in 305 mm) when measured from high points in the surface with a straight edge.

TROWEL SELECTION

Use a trowel with a configuration that helps to obtain maximum mortar coverage between the substrate and the thin-body porcelain tile, evenly spreading the mortar across the bonding side of the tile and minimizing air pockets.

Either of the following trowels is acceptable to use (consult the Website of either Raimondi or European Tile Masters for specific ordering information):

1. European Tile Masters' Euro Notch Trowel (which comes in 3 models): 1Y- Euro Notch Trowel (rubber handle); 1YW- Euro Notch Trowel (wood handle); or 2YW- Euro Angle Trowel (ergonomic handle)



2. Raimondi's Flow Ridge, Slant Notch Trowel: Part # (183HFV8), with 5/16" x 5/16" (8 x 8 mm) notches



MECHANICAL EDGE-LEVELING SYSTEMS

Mechanical edge-leveling systems, such as the Tuscan Leveling System or Raimondi Tile Leveling System, will greatly assist in the installation of thin-body porcelain tile to reduce the effects of lippage, and subsequent "wall-washing effect." For the most current information on these mechanical edge-leveling systems, please visit the Website of either Tuscan or Raimondi.

Note 6: Mechanical edge-leveling systems are intended to be used in conjunction with good substrate preparation practices, not as a substitute for those practices. To demonstrate the use of a mechanical edge-leveling system, the Tuscan Leveling System will be referenced in this Reference Guide. However, it is up to the installer to decide which mechanical edge-leveling system will be used.



Example of various thin-body tiles being installed using a mechanical edge-leveling system on a vertical surface

SETTING THE TILE

1. Tile Preparation Before Placement on Walls

Mortar should be applied and notched to both the substrate and back of the tile. When tile is placed, care must be taken to ensure maximum coverage, avoiding voids and air pockets under the tile.

- **Tile Placement:** The troweled ridges on the back of the tile and the substrate should be combed in a straight line parallel to the **“shortest dimension”** of the tile so they are oriented in the same direction when the tile is placed.

2. Do not allow mortar to dry or skin over on either surface before setting the tile. This may require careful planning to ensure that sufficient personnel are on site to complete the installation.

3. Place tile into the fresh mortar and firmly press from the center of the tile outward to cause the ridges to flatten out and come together into a continuous void-free bed. Install desired spacers if grout joint design width is not the same as the Tuscan strap thickness.

4. Place the straps along the tile edge according to the recommended spacing and place the caps on the top of the strap, but do not seat them at this time.

5A. For thin-body porcelain tile of 3.6 to 6 mm (3,6 to 6 mm), lightly tamp the surface of the tile with a hard-rubber grout float to ensure good contact. (Do not use a rubber mallet.)

5B. For thin-body porcelain tile of 3 to 3.5 mm (3 to 3,5 mm), lightly vibrate the surface of the tile with an orbital sander to ensure good contact.

- Do not apply excessive pressure to the vibrator. Rather, allow it to float across the surface of the tile.
- Do not over-vibrate the tile. Excessive vibration can reduce mortar performance.

6. There should be full mortar coverage on the back of the tile. When a mechanical edge-leveling system is used, it is imperative to have sufficient mortar under the body of the tile and at the tile edges for full support. Fill any voids with the mortar for complete support.

7. Install adjacent tile.

8. Remove any excess mortar from grout joints as work progresses.

9. Using the installation tool, pull the caps down into contact with the tile face and apply recommended tension until the tile edges are in alignment. All edges should be fully supported. Continue this process with each tile across installation area, repeating steps 1 through 8 and checking edge alignment.

10. Specific to the Tuscan Leveling System: Allow the mortar has cured sufficiently, waiting at least 24 hours for traditional-setting mortar, and at least 3 to 4 hours for rapid-setting mortar. It is then possible to remove the strap and cap. Grip the strap above the cap with the installation tool, set the tension setting to “Strap” and squeeze the tool until the strap snaps off.

Note 7: A minimum grout joint width of 1/16" (2 mm) should be maintained through the entire installation.

Note 8: Any tile failure due to inadequate mortar transfer or coverage will not be covered by MAPEI's Limited Warranty program. Grout is not to be considered compensation for lack of coverage and should not be mixed to a loose consistency to attempt filling of gaps under the tile edge.

MOVEMENT JOINTS

Field movement joints are required within tile installations. Expansion, construction and contraction joints should be carried through the tile without exception. Refer to the most current TCNA handbook, Method EJ-171; or the TTMAC Tile Installation Manual, Detail 301MJ.)

GROUTING THE TILE

Grout joints with any of the following MAPEI grouts, according to installation needs. All grout joints should be packed full and free of voids.

- **Ultracolor[®] Plus** (meets ISO 13007 CG2WAF and ANSI A118.7)
- **Kerapoxy[®]** (meets ISO 13007 R2/RG and ANSI A118.3)

OPTIONAL LAYERING COMPONENTS

Waterproofing:

MAPEI's *Mapelastic™ 315*, *Mapelastic AquaDefense* or *Mapelastic 400* waterproofing can be installed on interior and exterior tile installations that are exposed to intermittent or continuous wet conditions. MAPEI's *Fiberglass Mesh* must be used with *Mapelastic 315*. With *Mapelastic 400*, MAPEI's *Reinforcing Fabric* must be used. With *Mapelastic AquaDefense*, MAPEI's *Reinforcing Fabric* is optional as part of the entire waterproofing installation.

- Meets ANSI A118.10
- IAPMO-listed (International Association of Plumbing and Mechanical Officials)
- TCNA Environmental Classifications RES 1-6 or COM 1-6; consult the most current TCNA Handbook to determine the appropriate Environmental Classifications for either an interior or exterior wall tile installation.

