

# Thin-Body Porcelain Tile

For interior floors 4.5 to 6 mm  
(4,5 to 6 mm) in thickness



## REFERENCE GUIDE RGT0112

### 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.

Installation of thin-body porcelain tile is different from standard-body porcelain tile, requiring special installation techniques to prevent breakage during and after installation. Special equipment may be required when placing and adjusting these large tiles. 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.

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.

**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.



**Figure 1:** Example of a thin-body, 5 mm porcelain tile

For the purpose of this reference guide, all testing data and recommendations are for interior floors only using thin-body porcelain tile measuring 4.5 to 6 mm (4,5 to 6 mm) thick.

**Note 2:** Refer to the thin-tile manufacturer for the maximum allowable service rating per the ASTM C627 test method.

Adhere to the following recommended steps:

1. Proper surface preparation
2. Proper material selection
3. Proper trowel selection
4. Use of a mechanical edge-leveling system

### SURFACE PREPARATION: FLOORS

Interior floors must be structurally stable and capable of supporting the tile, setting system, and associated live loads and dead loads. Concrete and existing tile over concrete 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 3:** Refer to MAPEI Reference Guide on “Surface Preparation Requirements – Tile & Stone Installation Systems” (RGT0309) for specific surface preparation requirements

#### 1) Floors with the following criteria are considered suitable substrates:

- Concrete slab, either on-grade or above-grade
- 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 Tile Council of North America (TCNA) handbook, Method TR712; or the Terrazzo Tile & Marble Association of Canada (TTMAC) Tile Installation Manual, Details 324 RF.

**Option 2:** Prime the existing tile over concrete with MAPEI's *ECO Prim Grip*™. Refer to the most current Technical Data Sheet (TDS) at [mapei.com](http://mapei.com).

#### **Note 4:**

##### Plywood and backerboard

Today, thin tiles are available in sizes up to 5 x 10 feet (1,52 x 3,05 m). Such large sizes have increased the potential for differential deflection over plywood and backerboard installations and diminished the breaking strength of thin tiles. Therefore, MAPEI recommends that installations over plywood and backerboard be restricted to methods that incorporate the criteria contained in F141-14 STONE or F250-14 STONE. MAPEI also recommends that installations over plywood and backerboard be restricted to tiles at least 5.5 mm (5,5 mm) thick.

##### Other industry substrates

Oriented strand board (OSB), gypsum underlayments and sheet membranes are not considered suitable substrates for this installation recommendation.

#### 2) Before Installation – Floor Flatness

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

The substrate receiving the thin-body porcelain tile should be prepared to a floor flatness (FF) of > 50. All approved and properly prepared substrates should have no more than a permissible variation of 1/8" in 10 feet (3 mm in 3,05 m) from the required plane; nor more than 1/16" in 24" (2 mm in 60 cm) when measured from high points in the surface with a straight edge.

It is important to note that FF numbers are generally taken within 72 hours of slab placement, after which time the slab conditions can change. Slab flatness requirements should be re-evaluated before installation of any thin-body porcelain tile.

To achieve the acceptable floor flatness, any MAPEI cementitious self-leveling underlayment (normal-setting or rapid-setting) can be used before installing the thin-body porcelain tile. Always use the appropriate MAPEI primer before application of the self-leveling underlayment.

**Note 5:** For further information on the correlation between FF numbers, tile size, grout joint size and traditional 10-foot (3,05-m) straight-edge measurements, refer to both the American Concrete Institute (ACI) 302.2R-06 "Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials," Section 1.5 – "Floor flatness changes with time;" and to the National Tile Contractors Association (NTCA) Technical Manual, Section 01/10, Floor Flatness, G-19.

## ACCEPTABLE MAPEI MORTARS

Interior floor applications:

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

**Note 6:** To help achieve maximum coverage with these mortars, mix to the higher water ratio limit according to the most current TDS at [www.mapei.com](http://www.mapei.com).

**Note 7:** MAPEI Ultralite Mortar contributes to LEED points with more than 20% recycled content. LEED contributions may be available for other MAPEI products listed in this reference guide. Please visit MAPEI's Website at [www.mapei.com](http://www.mapei.com) for the most current TDSs, Safety Data Sheets and LEED letter information.

## 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. The design of the system reduces and, in most cases, eliminates settling from shrinkage as well as minimizing the possibility of warping.

For the most current information on these mechanical edge-leveling systems, please visit the Website of either Tuscan or Raimondi.



**Figure 2:** Example of a thin-body tile being installed using a mechanical edge-leveling system to reduce lippage

**Note 8:** Mechanical edge-leveling systems are intended to be used in conjunction with good substrate preparation practices (FF > 50 or 1/8" in 10 feet [3 mm in 3,05 m]), 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 will be used.

## 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 bottom 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



## SETTING THE TILE

1. Mortar should be applied and notched to both the substrate and back of the tile. The trowel ridges on the tile back and the substrate should be troweled in a straight line such that they will be parallel to each other when the tile is placed on the substrate.
2. Do not allow mortar to dry or skin over on either surface before setting the tile. This may require careful planning to ensure sufficient personnel are on site to complete the installation.
3. Place tile into the fresh mortar and firmly press 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.

**Note 9:** A minimum grout joint width of 1/16" (1,5 mm) should be maintained through the entire installation.



**Figure 3:** Example of thin-body tile over existing tile during a renovation using a mechanical edge-leveling system

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.
5. Lightly tamp the surface of the tile with a hard rubber grout float to ensure good contact. (Do not use a rubber mallet.)
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.



**Figure 4:** Example of a thin-body porcelain tile with full coverage transfer from tile to substrate

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 1-8 and checking edge alignment.
10. Specific to the Tuscan Leveling System, when the mortar has cured sufficiently (wait at least 24 hours for traditional-setting mortar, and at least 3 to 4 hours for rapid-setting mortar), it is 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.
11. Light traffic can be allowed after at least 72 hours following installation for traditional-setting mortar. For rapid-setting mortar, allow at least 12 hours before opening to light traffic.

**Note 10:** 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

Perimeter and 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, Detail EJ171; or the TTMAC Tile Installation Manual, Method 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)
- **Opticolor™** (meets ISO 13007 RG and ANSI A118.3)\*

**Note 11:** For any applications with a higher rating than "light commercial" per ASTM C627 and approved by the thin-tile manufacturer, use *Kerapoxy* or *Opticolor*.\*

\* *Opticolor* is not available in Canada.

## OPTIONAL LAYERING COMPONENTS

### Waterproofing:

MAPEI's **Mapelastic™ 315** waterproofing can be installed on interior tile installations that are exposed to intermittent or continuous wet conditions.

MAPEI's **Fiberglass Mesh** must be used as part of the entire installation.

- Meets ANSI A118.10 standards
- Listed by IAPMO (International Association of Plumbing and Mechanical Officials)
- Rated with TCNA Environmental Classifications Res 1-3; consult the most current TCNA handbook for details regarding Environmental Classifications.



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