**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 of 3.5 to 4.4 mm (3.5 to 4.4 mm) in thickness 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, especially with handling the thinner tiles. Only tiles recommended and approved for interior floor applications by the thin-tile manufacturer should be considered for this installation procedure. Service ratings per ASTM C627 should be agreed upon and specified by the design professional and approved by the tile manufacturer.

**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.

**Note 2:** The manufacturer of the thin-body porcelain tile should be consulted before selection and installation to determine tile’s suitability for the service performance rating of the installation. The service performance rating is determined by the most current guidelines of the Tile Council of North America (TCNA) or the Terrazzo Tile & Marble Association of Canada (TTMAC).

**Example of a thin-body, 3.77-mm (3.77-mm) porcelain tile with fiber-reinforcing mesh**

**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
5. Vibration of tile into mortar bond coat
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 the MAPEI Reference Guide “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 TCNA handbook, Method TR712; or the TTMAC Tile Installation Manual, Detail 324RF.

**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.

**Note 4:** Substrates supported by wood structures, backerboard, oriented strand board (OSB), gypsum underlayments, or 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 feet (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) Reference Manual, Section 01/10, Floor Flatness, G-19.

INTERIOR FLOORS
– Acceptable MAPEI Mortars
- Granirapid® System (meets ISO 13007 C2FS2P2 and ANSI A118.4/A118.11)
- Kerabond/Keralastic™ System (meets ISO 13007 C2ES2P2 and ANSI A118.4/A118.11)
- Ultraflex™ LFT Rapid (meets ISO 13007 C2TFS1P1 and ANSI A118.4/A118.11)
- Ultraflex LFT (meets ISO 13007 C2TES1P1 and ANSI A118.4/A118.11)
- 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.

**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.

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.
Example of a thin-body tile being installed using a mechanical edge-leveling system to reduce lippage

**Note 7:** 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 system 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. **Tile Preparation Before Placement**
   
   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 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 8:** A minimum grout joint width of 1/16" (2 mm) should be maintained through the entire installation.
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 vibrate the surface of the tile with an orbital sander to ensure good contact. Start in the center of the tile and work to the outer edges.
   - Do not apply excessive downward pressure to the vibrator. Rather, allow it to float across the surface of the tile. See the above photo.

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 1-8 and checking edge alignment.

10. Specific to the Tuscan Leveling System: Allow the mortar to cure sufficiently, waiting at least 24 hours for a traditional-setting mortar, and at least 3 to 4 hours for a 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.

11. Light foot traffic can be allowed after at least 72 hours following installation for a traditional-setting mortar. For a rapid-setting mortar, allow at least 12 hours before opening the application to light traffic.

Note 9: 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 though the tile without exception. Refer to the most current TCNA handbook, Method EJ171; or the TTMAC Tile Installation Manual, Detail 301MJ.

**GROUTING THE TILE**

Grout the 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 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)
- TCNA Environmental Classifications RES 1-3; consult the most current TCNA handbook for details regarding Environmental Classifications.

**PROTECTION**

Always provide proper protection of finished floors from concentrated loads during and after construction.