



RE: Bonding to Porcelain and Glass Bodied Tiles

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Bonding porcelain and glass bodied tiles requires special attention to avoid installation problems.

Many porcelain and glass bodied tiles are fired at temperatures exceeding 2000°F resulting in tile that is dense, impervious, fine grained and very smooth. When tiles are created at high temperatures, they become vitrified or glass-like in nature. Porcelain tiles generally have a water absorption of 0.5% or less. These factors greatly reduce mechanical adhesion between the tile and bonding mortar.

To avoid bonding problems when installing porcelain and glass bodied tiles, especially 12 inches square and larger we recommend the following.

- Use a premium latex-Portland cement mortar system such as PST 948 acrylic additive in lieu of water with ThinSet 911 Mortar.
- Allow the mortar to slake before applying. Do not let the mortar skin over before placing the tile especially when temperatures are 80°F or above.
- Dampen properly prepared concrete, masonry or cementitious surfaces with cool clean water prior to placing bonding mortar. This is important when the substrate is absorptive and higher temperatures exist. This is also helpful when the substrate or the tile itself is warm to the touch.
- Use sufficient mortar to fully embed the tile. Use a minimum 1/2" x 1/2" notch trowel or larger to produce a finished mortar bed thickness of 3/32" to 3/16" after tile embedment.
- Trowel mortar in one direction. Avoid applying mortar in a swirl pattern. Press the tiles into place and move/slide the tiles perpendicular to the mortar ridges to establish proper contact. Beat-in alone of larger tiles generally is not effective. Voids under tile may result in cracks or bond loss.

- Remove any tile release agent, usually a whitish powder found on the tile back. This may be done by scrubbing with a nylon brush and water.
- Back-butter tile by keying latex-mortar into the tile back with flat side of trowel. Keying the latex-mortar into the substrate is also recommended. This aids in providing 100% contact of mortar to the tile and ensures superior contact between tile, bonding mortar and substrate.
- Consult the T.C.A. handbook for use of expansion, control and isolation joints. Bring all existing expansion joints up through the tilework. It is recommended that an expansion joint be present where tilework abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceilings and where changes occur in backing materials.
- Be aware that deflection occurs in nearly all floors. When bonding large porcelain and glass bodied tiles, which are relatively rigid, confirm with the owner, builder or specifier that the deflection does not exceed industry limits of 1/360 for both live and dead loads. Excessive deflection can lead to minor grout or tile cracks or complete delamination of floor tile.

As homes become larger with more of an open look to them, the spans/support beams once built into construction methods for deflection are becoming less rigid. Large kitchens with center islands and multipurpose rooms are areas in particular that may require special attention.

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