



Bonding Ceramic Tile or Stone Over Poured Gypsum Underlayments

TDS 148

Poured gypsum underlayments are typically used to level floors and encapsulate radiant heat systems. Lightweight gypsum underlayments pour fast, easy and economical, but if not prepared properly can lead to issues when receiving ceramic tile or stone as the finish.

Prior to the installation of tile over poured gypsum underlayments, make sure to check with the manufacturer of the poured gypsum underlayment for proper installation instructions. Confirm that their specific product can receive tile or stone as a finish, and determine the minimum cure period required before the tile or stone can be installed. Typically, the poured gypsum underlayment must reach a minimum compressive strength of 2,000 psi (13.8 MPa) when tested in accord with ASTM C472 (modified).

Systems, including the framing system and panels, over which tile or stone will be installed shall be in conformance with the International Residential Code (IRC) for residential applications, the International Building Code (IBC) for commercial applications, or applicable building codes. The project design should include the intended use and necessary allowances for the expected live load, concentrated load, impact load, and dead load including the weight of the finish and installation materials. In addition to deflection considerations, above-ground installations are inherently more susceptible to vibration. Consult grout, mortar, and membrane manufacturer to determine appropriate installation materials for above-ground installations. A crack isolation and higher quality setting materials can increase the performance capabilities of above-ground applications. However, the upgraded materials cannot mitigate structural deficiencies including floors not meeting code requirements and/or over loading or other abuse of the installation in excess of design parameters.

For thin-bed ceramic tile installations when a cementitious bonding material will be used, including medium bed mortar: maximum allowable variation in the tile substrate – for tiles with edges shorter than 15” (375mm), maximum allowable variation is 1/4” in 10’ (6mm in 3m) from the required plane, with no more than 1/16” variation in 12” (1.5mm variation in 300mm) when measured from the high points in the surface. For tiles with at least one edge 15” (375mm) in length, maximum allowable variation is 1/8” in 10’ (3mm in 3m) from the required plane, with no more than 1/16” variation in 24” (1.5mm variation in 600mm) when measured from the high points in the surface. For modular substrate units, such as exterior glue plywood panels or adjacent concrete masonry units, adjacent edges cannot exceed 1/32” (0.8mm) difference in height. Should the architect/designer require a more stringent finish tolerance (e.g. 1/8” in 10’ [3mm in 3m]), the subsurface specification must reflect that tolerance, or the tile specification must include a specific and separate requirement to bring the subsurface tolerance into compliance with the desired tolerance;

The preferred method of tile or stone installation over poured gypsum underlayments is to install a minimum 2” thick, non-bonded, wire-reinforced mortar bed (Tile Council of North America (TCNA) Handbook for Ceramic, Glass, and Stone Tile Installation method F111 or LATICRETE Architectural Guidebook method ES-F111) using LATICRETE® 3701 Fortified Mortar Bed; or, LATICRETE 226 Thick Bed Mortar Mix mixed with LATICRETE 3701 Mortar Admix.

Given a situation where sound, poured gypsum underlayments already exists and a non-bonded mortar bed is not possible, the best technique for installing tile by the thin bed method is as follows:

LATICRETE 125 Sound & Crack Adhesive can be used, without a skim coat or gypsum overspray, as the tile installation adhesive directly to the gypsum underlayment. LATICRETE 125 Sound & Crack Isolation Adhesive acts as the tile adhesive, an ANSI A118.12 compliant product and a sound control with a ΔIIC of 15.

An alternative method is as follows;

Thoroughly remove any surface residue or powder with a damp sponge. Apply a continuous latex or polymer-fortified skim coat nominal 1/16” thick (1.5mm) (e.g. LATICRETE 254 Platinum or LATICRETE 211 Powder gauged with LATICRETE 4237 Latex Additive) to the poured gypsum underlayment surface and allow to harden.

Note: This skim coat serves as a replacement for some poured gypsum underlayment manufacturer's overspray. Consult poured gypsum underlayment supplier for recommendations.

Most gypsum based underlayments are very sensitive to moisture and movement. If there is a chance of water or moisture getting to the poured gypsum underlayments from above the tile, install LATICRETE Hydro Ban™ or LATICRETE 9235 Waterproofing Membrane over the skim coat. Proper detailing at corners, coves, etc. is critical. Unforeseen moisture sources (e.g. condensation on pipes) can still soften a poured gypsum underlayment.

Consult with Poured Gypsum Underlayment manufacturer for their maximum allowable moisture content before proceeding with the membrane or tile installation.

Crack suppression is always recommended over poured gypsum underlayment; LATICRETE Blue 92 Anti-Fracture Membrane can be used for this purpose. The use of LATICRETE 125 Sound & Crack Adhesive, as both an anti-fracture material and as a tile adhesive, is an excellent option over the hardened skim coat or gypsum overspray.

Note: LATICRETE Hydro Ban and LATICRETE 9235 Waterproofing Membrane also serve as anti-fracture membranes.

Once the poured gypsum underlayment has been properly prepared and cured, install tile or stone with LATICRETE 254 Platinum or LATICRETE 211 Powder mixed with LATICRETE 4237 Latex Additive. Use LATAPOXY® 300 Adhesive for installing water sensitive marble, agglomerates, or resin-backed tile and stone.

Using either method requires accommodation of all movement joints and allowance for movement around the perimeter of the room. Expansion joints must be installed in accord with TCNA detail EJ171-current year.

Once tile is set firm, grout tile or stone with LATICRETE® SpectraLOCK® PRO Premium Grout*, LATICRETE SpectraLOCK PRO Grout; LATICRETE PermaColor™ Grout; or, either LATICRETE 1500 Sanded Grout or LATICRETE 1600 Unsanded Grout mixed with LATICRETE 1776 Grout Enhancer.

Refer to the LATICRETE 25-Year System Warranty (0025.0) for more information. For more information on installing tile or stone over gypsum underlayments refer to LATICRETE Architectural Guidebook Execution Statement/Specification ES-F200 for direct bond applications to poured gypsum underlayments over concrete, ES-F180 for direct bond applications to poured gypsum underlayment over wood framed construction, or ES-RH111 for poured gypsum underlayment with hydronic radiant heat. Visit www.laticrete.com/ag for more information on the LATICRETE Architectural Guidebook.

* United States Patent No.: 6881768 (and other Patents)

Technical Data Sheets are subject to change without notice. For latest revision, check our website at www.laticrete.com
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