



Ceramic Tile & Stone

Over New Concrete

TDS 128

Frequently, the question is asked: “How soon after concrete is placed can ceramic or stone tile be installed using a cement-based adhesive (thin-set mortar)?”

ANSWER: Using a premium LATICRETE® polymer-fortified thin-set mortar (e.g., 254 PLATINUM™, 254 PLATINUM Plus, MULTIMAX™ LITE or MULTIMAX 1), or a STRATA_MAT™ product, tile installations can be performed as soon as the concrete is sufficiently hardened to walk on, when used without a LATICRETE waterproofing or crack isolation membrane.

Basic requirements for applying tile on concrete must be observed:

1. Concrete should have a wood float finish or light steel trowel finish.
2. No curing compounds, sealers, or coatings shall be present on the concrete. If such materials are present, they must be removed by mechanical means (e.g., bead blasting, shot blasting, etc.) to eliminate all traces from the surface.

QUESTION: WHAT IS THE MAXIMUM ALLOWABLE HUMIDITY OR MOISTURE CONTENT IN A CONCRETE SLAB FOR INSTALLATION USING PORTLAND CEMENT-BASED ADHESIVES (THIN-SET MORTARS)?

ANSWER: There is no maximum limit to the moisture content when installation is performed using 254 PLATINUM, 254 PLATINUM Plus, MULTIMAX LITE MULTIMAX 1, or when using STRATA_MAT or STRATA_MAT XT, provided no cold-applied, liquid, latex-based waterproofing or crack isolation membrane (e.g., HYDRO BAN®, HYDRO BAN 1 9235 Waterproofing Membrane) is used.

BACKGROUND INFORMATION:

Many manufacturers of cement adhesive mortars recognize that these mortars are hard, inflexible, and rigid. Therefore, they often recommend that ceramic tile not be installed until concrete slabs are at least 28 days old.

A common misconception is that 28-day-old concrete is fully cured and has completed its shrinkage. While most concrete reaches approximately 80–90% of its strength within the first 28 days at 70°F (21°C), it is incorrect to assume that all excess water has dissipated. Even after 28 days, concrete may not have completed its shrinkage cycle.

Shrinkage occurs due to the loss of excess moisture within the concrete. During mixing and placement, concrete typically contains 15–50% (or more) water than is required for cement hydration. As a result, most concrete contains excess water at the time of placement. As this water evaporates—whether within the first 28 days or several months later—shrinkage occurs.

Controlled studies confirm that the greatest shrinkage occurs during the drying phase (loss of excess moisture). When concrete is placed directly on moist ground, or in cold weather within an unheated structure, much of the moisture may remain until the building is enclosed and environmental controls (heat or air conditioning) are activated. At that point, moisture begins to evaporate more rapidly, and significant shrinkage can occur. THIS MAY OCCUR MANY MONTHS OR EVEN YEARS AFTER PLACEMENT.

Concrete shrinkage places stress on rigid cement adhesive mortars, resulting in forces at the bond interface (tile-to-mortar or mortar-to-concrete). When these forces exceed the bond strength, bond failure can occur. Premium LATICRETE polymer-fortified mortars, however, exhibit enhanced flexibility. This allows internal movement within the mortar, reducing stress transmission to the tile and helping accommodate shrinkage—whether it occurs early or long after installation.

CAUTION:

All standard best practices for installing ceramic or stone tile using adhesive methods (thin-bed or large and heavy tile mortars) must be followed for both fresh and aged concrete:

1. Concrete must be clean and free of contaminants, curing compounds, sealers, or coatings.
2. The surface should have a wood float or light steel trowel finish.
3. Concrete may be several days old, one month old, or older and still provide a suitable substrate when using a premium LATICRETE® polymer-fortified adhesive mortar (e.g., 254 PLATINUM™, 254 PLATINUM™ Plus, MULTIMAX™ LITE or MULTIMAX 1), or when using STRATA_MAT™ or STRATA_MAT XT.

SUBSURFACE TOLERANCE:

For thick bed (mortar bed) ceramic and stone tile installations and self-leveling methods, maximum allowable substrate variation is $\frac{1}{4}$ " in 10' (6mm in 3m).

For thin-bed ceramic tile installations using cementitious bonding materials, including medium-bed mortars:

- For tiles with edges shorter than 15" (375 mm): maximum allowable variation is $\frac{1}{4}$ " in 10 ft (6 mm in 3 m), with no more than $\frac{1}{16}$ " variation in 12" (1.5 mm in 300 mm) measured from high points.
- For tiles with at least one edge 15" (375 mm) or longer: maximum allowable variation is $\frac{1}{8}$ " in 10 ft (3 mm in 3 m), with no more than $\frac{1}{16}$ " variation in 24" (1.5 mm in 600 mm) measured from high points.
- For modular substrate units (e.g., exterior glue plywood panels or adjacent concrete masonry units), adjacent edges must not exceed $\frac{1}{32}$ " (0.8 mm) in height difference.

If more stringent tolerances are required (e.g., $\frac{1}{8}$ " in 10 ft [3 mm in 3 m]), the project specifications must clearly define these requirements or include provisions to bring the substrate into compliance.

In addition to deflection considerations, above-ground installations are more susceptible to vibration. Consult grout, mortar, and membrane manufacturers for appropriate materials. The use of crack isolation membranes and higher-performance setting materials can improve performance; however, such materials cannot compensate for structural deficiencies, code noncompliance, or excessive loading beyond design parameters.

For further information on sub-surface tolerance, please refer to [TDS 233](#) "Floor Flatness (F_F) and Floor Levelness (F_L)".

CURING COMPOUNDS:

The general rule is that there should be no curing compounds or sealers on the concrete because this will interfere with the direct adhesion of any adhesive mortar to the concrete. Refer to [TDS 154](#) "Curing Compounds and Surface Hardeners" for more information.

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