



Ceramic Tile & Stone

Over New Concrete

TDS 128

Frequently the question is asked, "How soon after concrete is placed can we install ceramic or stone tile using a cement based adhesive (thin-set mortar)"?

ANSWER: Using a premium LATICRETE® Polymer-Fortified Thin-Set (e.g. 254 Platinum, 257 TITANIUM or MULTIMAX™ LITE); or, a STRATA_MAT™ product, tile installations can be made as soon as it is possible to walk on the concrete 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 applied to the concrete. If curing compounds, sealers or coatings are present then they must be scarified (e.g. bead-blast, shot-blast, etc...) to remove any trace of the compound from the concrete.

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

ANSWER: There is no maximum or limit to the moisture content when the installation is made with 254 Platinum, 257 TITANIUM or MULTIMAX™ LITE, or, the use of STRATA_MAT or STRATA_MAT XT, when used without a cold liquid applied, latex based waterproofing or crack isolation membrane (e.g. HYDRO BAN® XP, HYDRO BAN® or 9235 Waterproofing Membrane).

BACKGROUND INFORMATION:

Many manufacturers of cement adhesive mortars realize that these mortars are hard, inflexible and very rigid. Therefore, they state that ceramic tile should 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 finished shrinking. While most concrete pours will attain 80 – 90% of its strength in the first 28 days at 70°F (21°C), it would be difficult to assume that all of the excess water has dissipated. After 28 days, concrete may not have gone through the maximum shrinkage cycle. Shrinkage is due to the loss of excess moisture in the concrete. This water is introduced during the mixing and the placement of the concrete because concrete requires 15-50% (or higher) more water to place and make fluid than is necessary to actually hydrate or harden the cement content. As a result, most concrete has excess water when placed. When the concrete dries, which may be within the first 28 days or maybe as long as 6 or 8 months later, shrinkage will occur from the loss of excess moisture.

Controlled experiments have confirmed that the maximum amount of shrinkage occurs during the drying out period (loss of excess moisture). When concrete is placed directly on the earth which contains moisture or if it is placed during cold weather, in a building without heat, the bulk of the moisture may remain in the concrete until the building is totally enclosed, with the heat or air-conditioning turned on. At that time excess moisture will evaporate from the concrete. It is during the loss of bulk of moisture that most of the shrinkage occurs. **THIS CAN OCCUR MANY MONTHS OR YEARS AFTER THE POUR!**

The shrinkage of concrete results in a strain on the hard cement adhesive, the results are stresses at either the interface between tile and adhesive or adhesive to concrete. When the force exerted exceeds the bond strength of the mortar, the mortar breaks bond. When a premium LATICRETE polymer-fortified mortar is used, the mortar is flexible, not rigid. Therefore, the mortar can move internally to relieve some of the strain, or shrinkage movement, lessening the stress or force transmitted to the back of the tile. The result is that LATICRETE installations can accommodate concrete shrinkage whether it occurs in the first 28 days or in the months after installation.

CAUTION:

All normal cautions for good installations of ceramic or marble tiles by an adhesive method (thin bed or large, heavy tile mortar method) must be observed when installing on fresh or old concrete.

1. Concrete should be clean and free of contamination, curing compounds, sealers or coatings.
2. The concrete should have a wood float or light steel trowel finish.
3. Concrete can be several days old, one month old or older and will provide a suitable surface for installation of tile using a premium grade LATICRETE® Polymer-Fortified Adhesive Mortar (e.g. 254 Platinum, 257 TITANIUM™ or MULTIMAX™ LITE) or the use of STRATA_MAT™ or STRATA_MAT XT.

SUB-SURFACE TOLERANCE:

For thick bed (mortar bed) ceramic and stone tile installations and self-leveling methods: maximum allowable variation in the installation substrate to be ¼” in 10’ (6mm in 3m).

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 ¼” 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.

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 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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