

Tile & Stone Installation Systems

Multi-sided sealing for moisture-sensitive tile

What is multi-sided sealing?

Multi-sided sealing is the process of sealing the entire surface of the tile or stone prior to installing. The purpose of multi-sided sealing is to prevent or reduce water from absorbing into moisture-sensitive tiles/stones during the installation procedures. This process is also known as “six-sided sealing.”

From a technical point of view, the term “six-sided sealing” is somewhat inaccurate, as there can be several other shapes of tile and stone that don’t fit the six-sided definition, such as hexagonal, octagonal, oval, pebble and specialty designs, like fleur-de-lis. For argument’s sake, the process would be more appropriately called “multi-sided sealing.”

The benefits

There are several benefits to sealing the entire surface and all sides of the tile/stone with the right sealer before installation: By helping to reduce water absorption, pre-sealing significantly reduces picture framing, potential staining from grout pigment, the capillary migration of minerals (efflorescence), freeze/thaw damage and dimensional deformation (warping, cupping and doming). Pre-sealing also makes grouting easier and faster, by allowing for easier removal of grout residue during the grout cleanup process. Because the tile/stone surface has been sealed, the surface is protected from accidental spills, leaks and other contaminants that come in contact with the tile/stone immediately after the tiles have been installed.

Not all tiles/stones will benefit from multi-sided sealing. It is important to perform product mockups using the entire setting and sealing materials process before approving.

Building a complete water management system

As long as a complete water management system is incorporated into the installation, multi-sided sealing helps to reduce the risk of water-related problems such as freeze/thaw and dimensional deformation. The water present in the setting mortar alone is sufficient to stain or warp some tiles/stones after installation.

The quality of water used to mix mortars and clean the tiles during the setting procedures can also have adverse effects. The greater the amount of water present and the higher the pH (alkaline), the higher the risk of staining. This is particularly important during the initial installation, as most of the adhesives and mortars used are Portland-cement-based materials and are alkaline. It is for



The unsightly “picture framing” effect on this granite floor could have been prevented by using epoxy setting materials or by sealing all six sides of the tiles before installation.

these reasons that a complete water management system is needed to protect the tile or stone from staining due to moisture and mineral migration.

There are several components to consider when building a complete water management system.

- **Waterproofing membranes:** These are used to ensure that the substrate underneath the tile or stone is kept as dry as possible and that water isn’t allowed to pool or be stored in the substrate. There are two types of waterproofing membranes – sheet membranes that incorporate a “water in, water out” method and bonded, liquid-applied waterproofing membranes.

MAPEI waterproofing membranes include *Mapelastic® AquaDefense*, *Mapelastic WaterStop*, *Mapelastic 315* and *Mapelastic Smart*. During the installation of the moisture-sensitive tile or stone, waterproofing membranes can slow the curing of cement-based thin-set mortar, allowing the moisture-sensitive tile/stone to be exposed to water from the mortar for prolonged periods of time.

- **Proper drainage:** Water can enter the system from many exterior sources. For a successful installation, make sure that water is able to easily exit the system by sloping the substrate so that the membrane is applied at the proper pitch of 1/4" per foot (6 mm per 0,30 m).
- **Using the right adhesives and mortars:** When a sealer is applied to a porous tile/stone, it reduces the surface water absorption. This makes the tile or stone act like a denser surface, even though it may be a more naturally porous surface. Setting materials made for dense surfaces should be used.

Premium mortars that are polymer-modified and rapid-setting will also help reduce the amount of water introduced into the system. MAPEI offers several specialized mortars that are suitable for a multi-side sealed installation: *Granirapid®*, *Ultraflex™ RS*, *Ultraflex LFT™*, *Ultraflex LFT Rapid*, *Kerabond/Keralastic™*, *Kerabond® T / Keralastic®*, *Ultraflex 3*, *MAPEI Ultralite™ Mortar*, *MAPEI Ultralite S1 Quick* and *MAPEI Ultralite S2*. A 100%-solids epoxy may be required when installing certain moisture-sensitive tiles/stones. In addition, always choose a white rather than gray mortar.

- **Expansion joints:** Per TCNA EJ171 and TTMAC Specification Guide 09 30 00, Detail 301MJ, the placement of expansion joints is crucial because this allows the expansion and contraction of the tile installation.
- **Multi-sided sealing:** The MAPEI sealers referenced below have been thoroughly tested to ensure complete mortar bonding, while keeping the moisture in the mortar from absorbing into the tile/stone. If the wrong sealer is used to pre-seal a six-sided surface, the chances of bond interference between the mortar and tile increases. By pre-sealing your tiles before tile installation, you can effectively prevent the hassle of needing to address irreversible issues.

MAPEI's multi-sided sealing solutions

MAPEI offers two products in the *UltraCare™* line that can be used as multi-sided sealers:

UltraCare Penetrating SB Stone, Tile & Grout Sealer

- Best used when a "zero-moisture" installation is desired
- Premium, solvent-based sealer
- Maximum stain repellency
- Allows adhesion between mortar and treated tile
- Prevents moisture from entering tile

UltraCare Penetrating Stone, Tile & Grout Sealer

- Economical
- Low in VOCs and water-based
- Resists water-borne staining
- Allows adhesion between mortar and treated tile
- Prevents moisture from entering tile

How to seal on multiple sides

The needed equipment

Use a large plastic tray with a flat bottom. The tray must be big enough to allow tiles to sit totally submerged in the sealer. You will also need several colorfast white cotton or microfiber towels, a rubber squeegee, a clean sponge and/or paint pads, and a sealer.

The sealing process

There are several effective ways to apply a sealer to the entire body of a tile, such as with a brush, roller and sprayer. But the best method is to completely submerge the tile in the sealer and let the sealer absorb into the tile/stone from all sides.

Although the dipping method is ideal for most tiles/stones, it is impractical to dip large-format tiles and slabs. One of the suggested alternative methods mentioned above (brush, roller or sprayer) should be explored for these larger tiles/stones.

The tile/stone must be clean and dry before applying the proper MAPEI *UltraCare* sealer. It is important to conduct a test and build a mockup of the tile/stone, sealer and mortar combination to ensure suitability and approval of the chosen system before it is used.

Follow all container labels, Technical Data Sheets and Safety Data Sheets for proper use and handling of materials. Always wear proper protective equipment (PPE) when sealing.

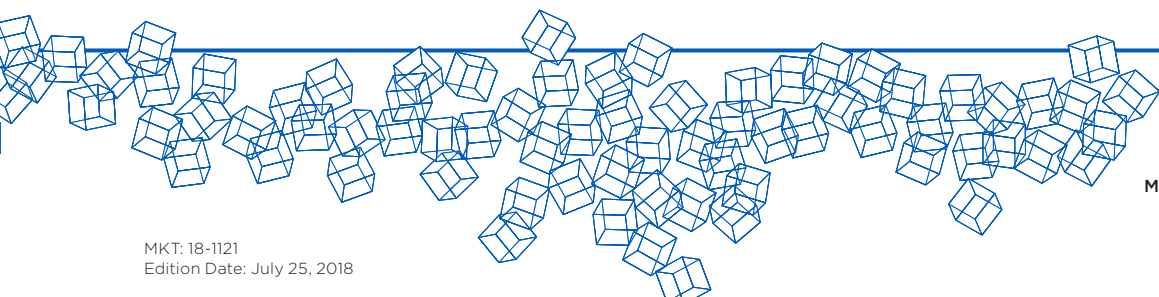
Steps for the dipping method are as follows:

1. Fill the pan with enough sealer to completely submerge the tile/stone. Maintain enough sealer throughout the entire dipping process to ensure that tiles/stones are fully submerged.
2. Allow the tile/stone to remain completely submerged for about two minutes.
3. Remove the tile/stone from the pan and remove any excess sealer. For larger tile/stone, use a squeegee to remove standing liquid and buff off the remaining sealer with a dry, absorbent cloth until 100% of all residue is removed from the surface.
4. To properly cure the sealed tiles/stones, place them on narrow supports or stand the tiles/stones on their edges in a clean, dry area with good ventilation and airflow but away from inclement weather. It is important that air moves across all sides of the sealed tiles while curing. Before the tiles/stones are stacked, the sealer must cure for at least 4 hours. Before they are installed, the tiles/stones should cure for at least 48 hours.

5. After 8 hours of curing, test the sealer by wetting all sides of the tile. If water is absorbed or a dark area appears immediately after the water test, apply an additional coat of sealer and repeat the curing process.
6. Be sure that the sealer has been successfully absorbed into all sides of the tile/stone after dipping, especially if the surface of the tile/stone is textured or contains open voids and holes.
7. If the treated tiles need to be cut using a wet saw before placement, wipe off any water caused by the wet saw, allow the tile/stone to thoroughly dry and re-treat the newly cut edge with sealer before installing. Allow newly applied sealer to dry for 48 hours before tile/stone installation. Consider using a dust-free, dry-cut saw.
8. After installation using a MAPEI mortar approved for moisture-sensitive tile/stone, apply *UltraCare* Penetrating Plus SB Stone & Porcelain Tile Sealer to the face of the tile as a final high-performance treatment to the tile/stone surface. Follow the Technical Data Sheet instructions to apply. Establish a proper maintenance protocol to keep the floor in optimal performance.

To finalize, keep the entire installation as dry as possible, both during and after the installation, to minimize water-related issues with moisture-sensitive tiles/stones. Installing moisture-sensitive tiles or stones in a wet environment can lead to potential problems.

Jobsite conditions vary and may present circumstances not covered in this document. For the most current product information, visit www.mapei.com or contact MAPEI's Technical Services Product Support Team.



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