

# Mapeguard UM

Underlayment Membrane for Ceramic Tile and Stone



## DESCRIPTION

*Mapeguard*<sup>®</sup> *UM* is a premium-performance, lightweight, waterproofing and vapor-pressure-equalizing underlayment membrane that provides crack suppression for use under ceramic tile and stone installations, for both residential and commercial applications. It is designed to perform over challenging substrates, such as young concrete and single-layer 3/4" (19 mm) plywood subfloors with joist spacing of up to 19.2" (49 cm) on center or up to 24" (61 cm) on center with double-layer plywood subfloors. The unique engineered tri-layered design of *Mapeguard UM* absorbs lateral stress from the substrate without transferring this force to the tile or stone, which maintains exceptional bonds.

## FEATURES AND BENEFITS

- Prevents transmission of in-plane substrate cracks up to 1/8" (3 mm)
- Recommended for use with polymer-modified mortars
- FastTrack Ready™: Approved for use over young (green) concrete and mortar beds
- Time-saving: Embed membrane then install tile immediately
- Engineered cavity design allows easy single-pass filling of surface core with less mortar
- Uncoupling, waterproofing and water vapor membrane up to 25 lbs. (11.3 kg) MVER and 100% relative humidity (RH)
- Compression resistance to support rolling loads
- Approved for radiant-heating applications

- Light green, translucent color shows mortar coverage under membrane
- Reduced “roll memory” and unique tri-layer construction keep membrane flat.
- Lightweight for easy handling and fast installation
- Easy to cut with standard utility knife
- Chalk and laser lines easily visible on surface
- Mesh-fabric top layer makes it easy to fill cavities with mortar.

## INDUSTRY STANDARDS AND APPROVALS

- ASTM C627 (Robinson): Extra Heavy Rating. See “Product Performance Properties” chart below.
- ANSI: Exceeds A118.10 (Waterproofing Membrane for Thin-Set Ceramic Tile)
- ANSI: A118.12, Section 5.1.3 – Achieves bond strength of 50 psi (0.34 MPa) or greater in 7 days per test method.
- ANSI: A118.12, Section 5.2.3 – Passes. Point load resistance after 28-day cure.

## WHERE TO USE

- Residential (homes, apartments and condominiums) and commercial (office buildings, restaurants, galleries and malls) floors, both interior and exterior
- Use as a replacement for cement backer board on plywood or oriented strand board (OSB) floors.
- Use for renovating older floors to address existing in-plane cracks in the subfloor.
- Use to isolate stresses beneath the flooring associated with expansion and contraction of substrate materials.
- Use to protect lateral stresses in industry-approved plywood or OSB floors from transferring to the finished tile floor.
- Offers an installation solution when the construction timeline requires installing tile over green or young concrete slabs before the full 28-day cure

## LIMITATIONS

- Do not use over cracks or control joints subject to out-of-plane movement, or subject to in-plane movement greater than 1/8" (3 mm). See the “Expansion Joints” section below.
- Do not use over substrates containing asbestos, plank wood flooring, presswood, particleboard, pressure- or oil-treated plywood, Lauan plywood, Masonite, self-stick tile, metal or fiberglass surfaces, epoxy floors or dimensionally unstable materials.
- Do not use when hydrostatic pressure exists.
- Do not use on vertical surfaces; as a roof deck membrane or wear surface; for submerged applications; or on plywood in exterior applications.
- When using *Mapeguard UM* over gypsum-based floor patching or leveling compounds, reference the technical bulletin “Tiling over gypsum” in the Tile & Stone Installation Systems section on MAPEI’s Website.
- Do not use premixed products such as mastic to set tile over *Mapeguard UM*.
- Ceramic, porcelain or glass tile or stone set over *Mapeguard UM* must be 2" x 2" (5 x 5 cm) or larger.
- Installations requiring seam tape to waterproof must be properly sloped to facilitate drainage and prevent standing water.
- Tile must be suitable for floor installations and have a minimum thickness of 5.5 mm.
- When used over young (green) concrete, the concrete must have cured for at least 7 days and be suitable to support tile installation traffic as determined by the project design professional, construction manager or general contractor.

- If the floor becomes wet during construction, it should be allowed to dry before application of finish flooring, including underlayment, hardwood flooring, ceramic tile, etc. After it is dry, the floor should be checked for flatness, especially at joints.

Note: On occasion, dimensionally weak natural stone tile that normally would not be categorized as moisture-sensitive (such as travertine, limestone, marble and agglomerates) can exhibit doming, cupping or curling when large-and-heavy-tile mortars (previously called “medium-bed mortars”) are used over impervious sheet membranes such as *Mapeguard UM* underlayment membrane. For this reason, areas requiring more than 3/8" (10 mm) buildup require the use of a self-leveling underlayment or cured mud-bed application before installation of *Mapeguard UM*. When installing natural stone, always do a mockup area of the proposed installation and allow materials to reach a full cure to ensure the desired effect. For details on these methods or materials, contact MAPEI’s Technical Services Department before installation or design.

## SUITABLE SUBSTRATES

- Concrete
- Cement mortar beds, self-leveling underlayment and leveling coats
- Young concrete
- Industry-approved exterior-grade plywood and APA Sturd-I-Floor, Exposure 1 OSB (interior, dry areas only)
- Approved backer units – see manufacturer’s installation guidelines
- Cement terrazzo (interior only)
- Existing ceramic tile or stone (interior only)
- Radiant-heat systems
- Existing vinyl flooring – vinyl composition tile (VCT), non-cushioned paper-backed/felt-backed sheet vinyl, luxury vinyl tile/plank (LVT/LVP)
- Epoxy terrazzo (with appropriate bond testing – interior only)
- Gypsum underlayment or lightweight concrete\*

\* Follow gypsum or lightweight concrete manufacturer’s recommendation regarding priming and/or special surface preparation before installing underlayment membrane. Reference the technical bulletin “Tiling over gypsum” in the Tile & Stone Installation Systems section on MAPEI’s Website.

## SURFACE PREPARATION

- All suitable substrates should be structurally sound, stable, dry, clean and free of any substance or condition that may reduce or prevent proper adhesion.
- Do not use chemical means (acid etching or stripping) to prepare approved substrates. Use mechanical methods only.
- Substrate and ambient temperature must be between 40°F and 95°F (4°C and 35°C) for protection after installation.
- Mechanically clean and prepare concrete substrates by diamond-cup grinding or other engineer-approved methods to obtain the minimum International Concrete Repair Institute (ICRI) concrete surface profile (CSP) of #1. When concrete requires more mechanical preparation than CSP 1, the final surface must be made smooth by applying *Mapecem*® *Quickpatch*. For large areas, consider using *Ultraplan*® *Extreme 2* self-leveling underlayment. See the respective Technical Data Sheets (TDSs) for more information.
- See the “Surface preparation requirements” reference guide in the Tile & Stone Installation Systems section of MAPEI’s Website.

### Regular and young (green) concrete

- All concrete substrates must be structurally sound, stable, dry, clean, and free of any substance or condition that may reduce or prevent proper adhesion. Concrete must be cured sufficiently to support tile installation traffic as determined by the design professional, construction manager or general contractor. The surface should be free of voids, sharp protrusions, loose aggregate, cement laitance, concrete sealers and curing compounds. All exterior applications must be properly and uniformly sloped to drains.

### Exterior-grade plywood and OSB

- Maximum allowable deflection for floor systems and substrates: Floor systems, whether wood-framed or concrete, over which the tile will be installed using the appropriate Tile Council of North America (TCNA) method, according to the Floor Tiling Installation Guide, must conform with the International Residential Code (IRC) for residential applications, the International Building Code (IBC) for commercial applications, or applicable building codes.

For ceramic tile installations, the maximum allowable floor member live load and concentrated load deflection for framed floor systems must not exceed  $L/360$ , where “L” is the clear span length of the supporting member per applicable building code. For natural-stone tile installations, maximum allowable floor member live load and concentrated load deflection for wood-framed floor systems shall not exceed  $L/720$ , where “L” is the clear span length of the supporting member, per applicable building code.

For other specialty flooring products, including marble and slate, refer to the manufacturer’s recommendations for the finish flooring. Enhanced structural performance may be required for ceramic and natural-stone floor products. See the TCNA Handbook for Ceramic Tile Installation.

1. Verify that the deflection under all live, dead and impact loads of interior plywood or OSB APA Sturd-I-Floor Exposure 1 floors complies with industry standards for ceramic tile or stone installations per ANSI A108.01, Section 2.3; TCNA’s “Maximum Allowable Deflection for Floor Systems and Substrates” under Substrate Requirements; or TTMAC’s installation notes for the specifier/section deflection.
2. Minimum construction for interior ceramic or porcelain tiled floors is as follows:
  - For single-layer plywood or OSB subfloor with joist spacing of 16" (41 cm) o.c. – Use tongue-and-groove plywood or OSB of 5/8" (16 mm) nominal thickness with a 1/8" (3 mm) gap required between sheets.
  - For single-layer plywood or OSB subfloor with joist spacing of 19.2" (49 cm) o.c. – Tongue-and-groove plywood or OSB of 3/4" (19 mm) nominal thickness with a 1/8" (3 mm) gap required between sheets.
  - For double-layer plywood or OSB subfloor with joist spacing of 24" (61 cm) o.c. – Use two layers of plywood or OSB consisting of a tongue-and-groove subfloor with a nominal thickness of 3/4" (19 mm) with a 1/8" (3 mm) gap required between sheets, and an underlayment with a nominal thickness of 3/8" (10 mm).\*\*

*\*\* The first subfloor layer should be 3/4" (19 mm) thick plywood or OSB, either plain with all sheet edges blocked or tongue-and-groove, over bridged joists spaced a maximum of 24" (61 cm) o.c. The second subfloor layer (underlayment) should be 3/8" (10 mm) thick, plugged-faced exterior plywood or OSB.*
3. For interior natural-stone tiled floors, the minimum subfloor construction requirement is double-layered, regardless of joist spacing. The maximum joist spacing is 24" (61 cm) o.c. The double-layer wood floor should consist of a tongue-and-groove subfloor with a nominal thickness of 3/4" (19 mm), and an underlayment with a nominal thickness of 3/8" (10 mm).
4. Use a MAPEI polymer-modified mortar meeting ANSI A118.11 or ANSI A118.15 standard or classified as ISO 13007 C2E or better for installing *Mapeguard UM* in the applicable interior installation.

## Lightweight concrete

- See the technical bulletin “Tiling over gypsum” in the Tile & Stone Installation Systems section on MAPEI’s Website.

## PRODUCT APPLICATION

### Applying the underlayment membrane

1. Inspect the subfloor before installing *Mapeguard UM* underlayment membrane to ensure that the substrate is acceptable for tile or stone installation.
2. Always pre-cut and dry-fit *Mapeguard UM* in place.
3. Mix a suitable MAPEI mortar for the substrate to a consistency on the high end of the recommended water range. The mortar should be able to hold a notched ridge while allowing for wetting out the fleece layer backing of *Mapeguard UM*.
4. With pressure, apply a coat by using the trowel’s flat side to key mortar into the substrate.
5. Apply additional mortar, combing it in a single direction using a 1/4" x 3/16" (6 x 4.5 mm) V-notched trowel. Coverage may vary as a result of mortar consistency, trowel angle, floor flatness, substrate absorption, etc. If full coverage is not achieved, it may be necessary to use a 1/4" x 1/4" x 1/4" (6 x 6 x 6 mm) square-notched trowel.
6. Spread only as much mortar that can be covered with *Mapeguard UM* before the mortar skins over. Open times vary with jobsite conditions and mortar choice.
7. Embed *Mapeguard UM* into the mortar, with the fabric side down. Using a rubber or wooden float, hand roller or preferably steel roller (not exceeding 75 lbs. or 34.0 kg), apply pressure to ensure proper embedding of the membrane. Areas of the membrane properly embedded into the mortar will appear darker.
8. Ensure that all edges or ends of each roll abut the edges or ends of other rolls without leaving gaps. To ensure a flat surface, do not overlap edges or ends from one roll onto another. Leave about 1/4" (6 mm) between the membrane and the edge of walls, columns, etc., for movement.
9. Lift the membrane occasionally to verify coverage. Proper installation results in full contact between the fleece layer backing and the tile-setting mortar.

### Waterproofing floors

After *Mapeguard UM* is embedded on the floor as directed, *Mapeguard WP ST* sealing tape can be used to waterproof the membrane seams with a MAPEI mortar that meets the ANSI A118.4, ANSI A118.11 or ANSI A118.15 standard, or is classified as ISO 13007 C2E or better.

1. Using a 1/4" x 3/16" (6 x 4.5 mm) V-notched trowel, key in the mortar to the adjoining seams with the trowel’s flat side, being sure to fill in any holes or voids.
2. Apply mortar on top of the seams with the trowel’s notched side. Center *Mapeguard WP ST* over the seam with at least 2" (5 cm) on each side of the seam and apply *Mapeguard WP ST*. Work the sealing tape into the thin-set with a grout float or the trowel’s flat side while the thin-set is still workable.
3. To waterproof around the walls of the installation area, take a pre-measured length of *Mapeguard WP ST* and fold it in half along its length. One side of the fold will be adhered to the floor and the other side will be adhered up the wall. To accomplish this, follow the installation methods detailed in steps 1 and 2.
4. Embed *Mapeguard WP ST* into the mortar with a grout float or the trowel’s flat side, taking care not to puncture the membrane.
5. For waterproofing edges and corners, pre-formed inside and outside corners may be used in conjunction with *Mapeguard WP ST* tape.

Note: If *Mapeguard UM* is to be used as a vapor management membrane, the seams must be sealed with *Mapeguard WP ST* tape, using the same installation instructions as for waterproofing seams.

## TILE INSTALLATION

### Ceramic, porcelain and stone tile

1. In accordance with the TCNA Handbook for Ceramic Tile Installation and with porcelain tile manufacturers, use a MAPEI polymer-modified mortar suitable for the tile being installed. The mortar should meet the ANSI A118.4, ANSI A118.11 or ANSI A118.15 standard, or be classified as ISO 13007 C2E or better. The engineered design of *Mapeguard UM* manages moisture dissipation to control drying of the mortar between the tile and the membrane.
2. For fast-track and exterior installations, use a rapid-setting MAPEI mortar.
3. First, skim the surfaces of *Mapeguard UM* using the flat side of the trowel, ensuring that the cavities and mesh fabric are completely filled.
4. Immediately apply additional mortar and comb over the membrane using the recommended notched trowel (and directional troweling method) suitable for the size and type of tile being installed.
5. Install tile in accordance with industry guidelines, checking frequently for adequate mortar coverage. Interior tile or stone installations can take place immediately after the *Mapeguard UM* installation. Exterior tile or stone installations must wait until the mortar for *Mapeguard UM* has properly hardened.
6. Grouting may be done once the mortar has cured enough to allow light traffic, which will depend upon the mortar used, tile size, tile type and jobsite conditions.

### Moisture-sensitive stone tile

1. Prefill the cavities in *Mapeguard UM* with an approved MAPEI polymer-modified mortar.
2. Allow the mortar to cure overnight.
3. Use *Kerapoxy*<sup>®</sup> 410 premium, 100%-solids epoxy setting mortar per its TDS recommendations to install moisture-sensitive stone over the prefilled *Mapeguard UM*.

## WOOD AND LVT INSTALLATIONS

When covered with a self-leveling underlayment, *Mapeguard UM* is approved for use under finished floor coverings such as engineered wood, solid wood, sheet vinyl, luxury vinyl tiles, luxury vinyl planks and laminate flooring, in residential construction.

For details, see the recommendation bulletin "*Mapeguard UM* approved for wood and vinyl flooring installations" on the *Mapeguard UM* page of MAPEI's Website.

## EXPANSION JOINTS

- Honor expansion joints through *Mapeguard UM*, tiles and grout per industry standards.
- When necessary, cut tiles along both edges of the expansion joints. Do not allow tiles and mortar to overlap the expansion joints.
- Provide for movement as required by TCNA Method EJ171 or TTMAC Specification Guide 09 30 00, Detail 301MJ.

## GROUTING

Select an appropriate MAPEI cement, ready-to-use or epoxy grout. For exterior installations, use MAPEI's *Ultracolor® Plus FA* rapid-setting grout. Allow for longer drying time before grouting when installing large-format tiles (that is, tiles greater than 15" or 38 cm on one or more sides).

## PROTECTION

- Provide for dry, heated storage on site and deliver materials at least 24 hours before tilework begins.
- Do not store *Mapeguard UM* in direct sunlight.
- Do not leave *Mapeguard UM* exposed for more than 72 hours; rather, protect it from other trades if tile will not be set immediately. If left exposed, *Mapeguard UM* should be covered with a recommended MAPEI thin-set mortar, troweled smooth.
- Protect *Mapeguard UM* from spills, contamination and damage before and during tilework to ensure a positive bond with the mortar.
- Always properly protect finished floors when heavy equipment (such as fork lifts or scissor lifts) is to be used during construction over installations involving underlayment membranes.
- Refer to the TDS of the selected MAPEI tile-setting mortar regarding protection from heavy traffic, frost and rain.

### Product Performance Properties

<b>Compressive strength</b>	About 0.37 N/mm <sup>2</sup>
<b>Permeance (ASTM E96)</b>	< 0.07

### ASTM C627 Service Rating (Robinson)

Floor System	Actual Rating
16" (41 cm) o.c., wood substrate	Extra Heavy
19.2" (49 cm) o.c., wood substrate (single layer)	Extra Heavy
24" (61 cm) o.c., wood substrate (single layer)	Residential***
24" (61 cm) o.c., wood substrate (double layer)	Heavy
Concrete slab	Extra Heavy

\*\*\* This installation method is not approved by TCNA. Contact MAPEI's Technical Services Department for document giving project approval.

## Shelf Life and Product Characteristics

Type of material	Polypropylene (PP) for all components (textured foil, backing fleece and mesh)
Chemical resistance	High
Material thickness	1/64" (0.5 mm), nominal
Membrane height	1/8" (3 mm), nominal
Membrane color	Light green (textured plastic) and white (backing fleece)
Storage and performance temperature range	-40°F to 176°F (-40°C to 80°C)
Shelf life	2 years when stored in a dry area in original shipping container at 73°F (23°C) and 50% RH

## Packaging and Coverage

Roll Size	Roll Coverage
39.4" x 16.4' (1 m x 5 m)	53.8 sq. ft. (5 m <sup>2</sup> )
39.4" x 98.4' (1 m x 30 m)	323 sq. ft. (30 m <sup>2</sup> )

## RELATED DOCUMENTS

- *Mapeguard UM* Installation Guide<sup>†</sup>
- Technical bulletin: "Tiling over gypsum"<sup>†</sup>

<sup>†</sup>At [www.mapei.com](http://www.mapei.com)

## ADDITIONAL INFORMATION

For information on MAPEI's commitment to sustainability and transparency, as well as how MAPEI products may contribute to green building standards and certification systems, contact [sustainability-durabilite@mapei.com](mailto:sustainability-durabilite@mapei.com).

## WARNING

The test results shown in the TECHNICAL DATA table were obtained in compliance with test methods and curing cycles, if applicable, defined in the industry standards referenced on the Technical Data Sheet. Please note that the use of test procedures or methods other than those indicated in the table could lead to different values and that, in such cases, any liability of our company is excluded.

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Before using, the user must determine the suitability of our products for the intended use, and the user alone assumes all risks and liability. **ANY CLAIM SHALL BE DEEMED WAIVED UNLESS MADE IN WRITING TO US WITHIN FIFTEEN (15) DAYS FROM DATE IT WAS, OR REASONABLY SHOULD HAVE BEEN, DISCOVERED.**

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1-800-42-MAPEI (1-800-426-2734)

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For the most current product data and BEST-BACKED<sup>SM</sup> warranty information,  
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