Version: June 1, 2010

MAPEI®

Planiseal VS™

Alkali-Resistant, Epoxy Moisture-Reduction Barrier

GREEN INNOVATION

For installation by authorized MAPEI Pinnacle installers only

DESCRIPTION

Planiseal VS is an alkali-resistant, two-component, 100%-solids epoxy coating that effectively stops moisture-related problems with floor coverings. In all cases, moisture vapor emission rates (MVERs) of up to 25 lbs. per 1,000 sq. ft. (11,3 kg per 92,9 m^2) per 24 hours are reduced to below the limit of 3 lbs. per 1,000 sq. ft. (1,36 per 92,9 m^2) required for many types of finished flooring, when the designated film thickness is applied.

Applied in a single-coat application system, *Planiseal VS* offers low viscosity with high-density resins that effectively reduce MVER by penetrating deep into the substrate and effecting consolidation well beneath the surface.

Planiseal VS also may be used to consolidate friable substrates such as weak gypsum-based underlayments or lightweight concretes before the application of floor finishes. Once installed, *Planiseal VS* is compatible with a wide number of primers and adhesives typically used with flooring installations, such as tile, vinyl composition tile (VCT), carpet, sheet vinyl, wood and other floor-finishing products.

FEATURES AND BENEFITS

- Low viscosity penetrates deep into the substrate for tenacious bond.
- Alkaline-resistance-tested for prolonged exposure in pH of 13 to 14
- Single-coat application for faster turnaround and lower installation costs
- Low-odor and VOC-compliant for use in interior, occupied environments
- Extended working time to allow trapped air to escape and ensure film integrity
- Cost-effective protection against the most severely MVER-challenged substrates

INDUSTRY STANDARDS AND APPROVALS

LEED Points Contribution	LEED Points
MR Credit 5, Regional Materials*	Up to 2 points
IEQ Credit 4.2, Low-Emitting Materials – Paints & Coatings	1 point

* *Using this MAPEI product may help contribute to LEED certification of projects in the categories shown above. Points are awarded based on contributions of all project materials.*

WHERE TO USE

For Professional Use

- Properly prepared sound and stable concrete substrates (at least 7 days old for conventional and at least 5 days old for post-tensioned concrete) with an MVER up to 25 lbs. per 1,000 sq. ft. (11,3 kg per 92,9 m^2) per 24 hours
- Sound, stable fully cured gypsum underlayments requiring consolidation
- Sound, stable fully cured lightweight concretes requiring consolidation

LIMITATIONS

- Substrate and ambient temperatures must be between 50°F and 86°F (10°C and 30°C).
- Test concrete substrates for MVER according to methods outlined in ASTM F1869 (calcium chloride test) or ASTM F2170 (relative humidity test).
- Verify substrate is free of bond-inhibiting or bond-breaking materials such as curing compounds and dust.
- Do not install topping, sloping, self-leveling underlayments or patching compounds below *Planiseal VS*.

- Repair all cracks and treat joints correctly to ensure system performance.
- Do not use on on-grade slabs that are subject to freeze/thaw cycles.
- *Planiseal VS* will bond to previously placed *Planiseal VS* when applied within 48 hours of first placement.
- Once *Planiseal VS* has been applied, protect the surface from traffic or damage until it is covered by subsequent product.

Consult MAPEI Technical Services for installation recommendations regarding any substrates and conditions not listed.

SUITABLE SUBSTRATES

- Properly prepared concrete substrates that have been mechanically prepared using dustless engineer-approved methods to an International Concrete Repair Institute (ICRI) concrete surface profile (CSP) of #2 to #3. Substrates with a profile greater than CSP #3 will realize lower coverage rates. Substrate profile should not exceed CSP #6.
- Sound, fully cured gypsum or lightweight substrates requiring consolidation before application of additional flooring systems (contact MAPEI's Technical Services for additional details)
- Weak concrete substrates (capable of a direct tensile pull of 75 psi [0,52 MPa] or greater) that require consolidation, or concrete substrates with hairline cracks that require treatment
- *Planiseal VS* may be installed on concrete substrates that have had at least 7 days to cure. When installing on green concrete, be aware that continued shrinkage in the substrate during cure may lead to the formation of substrate cracks that penetrate *Planiseal VS*. This is a natural risk associated with installations over green concrete, particularly with concrete that has a high water-to-cement ratio. Cracks generated by substrate movement are not covered by the MAPEI warranty.
- *Planiseal VS* may be used over substrates exhibiting a relative humidity of up to 100% (when tested in accordance with ASTM F2170). In all cases, the surface temperature of the prepared concrete slab must be at least 5°F (2.8°C) above the dew point to avoid condensation on the concrete surface as the *Planiseal VS* hardens.

SURFACE PREPARATION

- Do not use over any substrates containing asbestos.
- All substrates must be structurally sound, dry, solid and stable.
- Mechanically prepare the surface to obtain a CSP of #2 to #3 by shotblasting. Ensure that all old adhesives, contaminants, etc., are completely removed. Inadequate mechanical surface preparation and subsequent cleaning could leave cures and contaminants on the substrate surface, which may lead to pinholing and bubbling in the *Planiseal VS* application.
- Some substrates may require waiting 16 to 24 hours after shotblasting before applying *Planiseal VS*. This wait time is required to reduce outgassing from the shotblasted surface.
- Expansion and movement joints must be honored through the finished flooring system.
- Do not acid-etch surfaces before applying *Planiseal VS*.

Joint and Crack Treatment Before Application of *Planiseal VS*

Planiseal VS is designed for moisture mitigation only. Consult with an experienced engineer to determine the appropriate substrate repair procedures and joint treatment. The various treatments listed below represent procedures for consideration by a consultant or engineer to address contraction (including control or saw-cut), and potential movement, isolation and expansion joints. Regardless of treatment, MAPEI does not warrant against the appearance of cracks or debonding that results from subsequent substrate movement of any kind.

Mechanically prepare control and construction/expansion joints with a diamond crack-chasing/ concrete-cutting blade. Overcut the joint width to obtain a sound, clean edge. Clean cracks or joints with oil-free compressed air and/or vacuum with a dustless collection system to completely remove contaminants (follow ACI RAP Bulletin 2, "Crack Repair by Gravity Feed with Resin").

Crack repair

Repair cracks before application of the *Planiseal VS* using an appropriate high-modulus epoxy (*Planibond® EBA* or *Planibond CR 50*) mixed with sand if required (depending on the size of crack under repair). Cracks narrower than 1/8" (3 mm) may typically be filled with *Planiseal VS* neat. Cracks wider than 1/8" (3 mm) are to be repaired with a suitable high-modulus epoxy such as *Planibond EBA* or *Planibond CR 50* (consider an epoxy mortar if appropriate) filled to 1/8" to 1/4" (3 to 6 mm) shy of the substrate surface (just below flush).

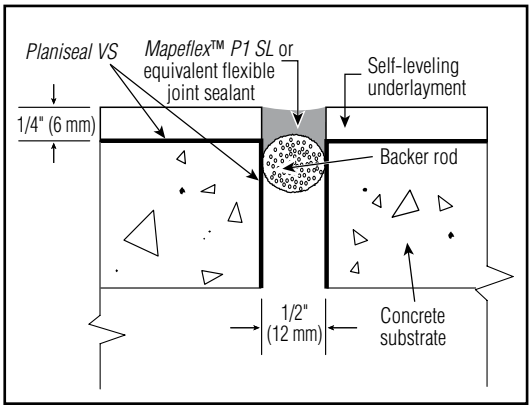
Avoid overfilling of cracks with high-modulus epoxies that will lead to epoxy spilling onto the substrate. Any epoxy that spills onto the substrate surface must be removed, and any remaining residue must be fully seeded with sand. The subsequent application of the *Planiseal VS* must take place after all loose sand has been vacuumed up off the floor, and fully encapsulate the epoxy utilized for crack repair.

Contraction, control or saw-cut joint treatment

Dormant control joints may typically be filled with *Planiseal VS*, or with an alternate high-modulus epoxy such as *Planibond EBA* or *Planibond CR 50* (consider an epoxy mortar if appropriate) before the installation of *Planiseal VS*. Fill the joints to within 1/8" to 1/4" (3 to 6 mm) shy of the substrate surface (just below flush). See comments above on crack filling for correct treatment of any exposed epoxy that "spills" onto the substrate.

Movement, expansion and isolation joint treatment

(See the following diagram.)



MIXING

1. Use appropriate safety equipment before use.
2. Premix Part A to a homogenous consistency (2 to 3 minutes) using a low-speed mixer (at 300 to 450 rpm) and a "jiffy" (paint mixer) mixing paddle.
3. Pour Part B into the Part A container and mix thoroughly to a smooth, homogenous consistency. Do not mix at high speeds, which can trap air within the mixed material.
4. Pour and spread the entire unit of any mixed *Planiseal VS* onto the substrate within 5 minutes of mixing.

PRODUCT APPLICATION

1. Wait at least 16 to 24 hours after mechanically abrading the surface before application of *Planiseal VS*.
2. Pour mixed *Planiseal VS* onto the surface of the properly prepared substrate within 5 minutes of mixing.
3. Spread the *Planiseal VS* mixture using a 3/16" to 1/4" (4,5 to 6 mm) squeegee, and back-roll with a caged roller that has a short nap (1/4" to 3/8" [6 to 10 mm]). Roll the material in north/south and east/west directions across the entire surface being treated, up to and around the perimeter of any restrained surfaces.
4. Construction, Expansion or Isolation Joint Treatment: Ensure that inside edges of these joints receive a consistent film of *Planiseal VS*, applied with a brush. Complete joint treatment by placing a backer rod and appropriate joint sealant before installing flooring.
5. Apply the entire contents of the mixed unit, working it aggressively into the concrete substrate to cover the substrate entirely with a wet film. Use a quality paintbrush for the hard-to-reach areas.
6. Ensure that all areas maintain an adequate wet film to realize the correct dry film thickness (DFT) for the substrate's relative humidity and/or MVER (see "Required Application Thickness and Associated Coverage" chart).

Addressing outgassing generated by porous substrates

- When applying *Planiseal VS* on very porous concrete subject to outgassing, apply *Planiseal VS* to the substrate and immediately pull it tight to the surface with a squeegee. This first pass effectively "self-primes" the substrate, driving the air out of the concrete. Follow within 15 minutes with an additional application of *Planiseal VS* to achieve the required DFT on the surface.

- Ensure that all voids and pinholes are filled/sealed before moving on to the next flooring phase. When applied over very porous concrete, *Planiseal VS* may exhibit what appear to be "air bubbles." This apparently trapped air is a function of the low-viscosity *Planiseal VS* having penetrated into the concrete pores, sealing them and forcing out the air to the surface. The path from the escaping air may manifest itself in the surface of the film as it crosslinks and hardens.
- If any doubt remains about the 100% sealing of these voids, apply a very "tight" or thin second coat of *Planiseal VS*. Before applying the second coat of *Planiseal VS*, "shave off" the "tops" of any bubbles that protrude off the surface of the floor, and then apply the additional *Planiseal VS* tightly over the surface. This action will allow additional material to "wick" into and seal the void(s) in question.

Applications over cured *Planiseal VS*

- Allow to dry until tack-free – typically for 5 to 6 hours at 73°F (23°C). Apply primers such as *Primer WE* before installation of a self-leveling underlayment, or *Primer E* or *Planiseal VS* using the sand broadcast method before installing a self-leveling topping. Subsequent primer must be applied to *Planiseal VS* within 48 hours of the *Planiseal VS* application. In cases where the 48-hour window is exceeded, contact MAPEI Technical Services for instructions.
- Floating or non-adhered floor systems can be installed directly over the cured *Planiseal VS* per the manufacturer's recommendations.
- Reactive adhesives may be direct-bonded to *Planiseal VS*. Water-based adhesives require application of a self-leveler before use. Due to the wide variety of adhesives, always complete a mockup and test to ensure the bond.
- If required, a second coat of *Planiseal VS* may be applied over the first application of *Planiseal VS* within 48 hours.
- In cases where the desired finish is *Ultratop*®, apply either *Primer E* or a second coat of *Planiseal VS* over the first (within 48 hours of the first). Apply at 6 to 8 mils (0,15 to 0,2 mm) wet and spread 20- to 30-mesh sorted, oven-dried sand with no fines using the sand-broadcast method. Seed the epoxy to rejection within 30 minutes of placement. Follow NIOSH safety standards when broadcasting with sand. Remove excess sand the following day by vacuum, and apply the *Ultratop* according to the Technical Data Sheet.

CLEANUP

Clean equipment before *Planiseal VS* cures to a hardened state using an appropriate solvent or cleaning material. Cured material can only be removed mechanically.

Product Performance Properties

Laboratory Tests	Results
Chemistry	2-part 100%-solids epoxy
Percent solids	100%
VOCs	46 g/L
Viscosity	190 to 230 cps
Density	65.6 lbs. per cu. ft. (1,05 g/cm^3)
Consistency	Pourable liquid
Color	Part A – transparent yellow Part B – transparent amber
Permeability	0.16 perms at 8 mils DFT; <.1 perm at 12 mils DFT
Reduction of moisture vapor	> 94% per ASTM E96-05 (8 mils DFT)

Shelf Life and Application Properties

Shelf life	2 years (store in cool dry place at 40°F to 95°F (4°C to 35°C)
Open time at 73°F (23°C)	90 minutes
Drying time at 73°F (23°C)	5 to 6 hours
Flash point (Seta flash)	> 199°F (93°C)

CSI Division Classifications

Dampproofing and Waterproofing	07 10 00

Packaging

Product Code	Size
Kit	3 U.S. gals. (11,3 L)
46364 46353	Part A, Pail: 2.20 U.S. gals. (8,33 L) Part B, Jug: 0.8 U.S. gal. (3,03 L)

Substrate Preparation	Recommended Application Tool
Concrete subfloor with CSP of 2 to 3	3/16" to 1/4" (4,5 to 6 mm) squeegee followed by 1/4" to 3/8" (6 to 10 mm) nap roller

Required Application Thickness and Associated Coverage	
Treating areas with up to 15 lbs. (6,80 kg) MVER per ASTM F1869, and/or up to 90% relative humidity per ASTM F2170	8 to 10 mils of DFT = typically 100 to 110 sq. ft. per 1 U.S. gal. (2,45 to 2,69 m^2 per L)**
Treating areas with 16 to 25 lbs. (7,26 to 11,3 kg) MVER per ASTM F1869, and/or 91% to 100% relative humidity per ASTM F2170:	12 to 14 mils of DFT = typically 70 to 90 sq. ft. per 1 U.S. gal. (1,71 to 2,20 m^2 per L)**

** *This is the typical number realized in field conditions. Coverage varies depending on the desired build as well as the profile and porosity of the substrate.*

Planiseal™ VS

RELATED DOCUMENTS

Crack Repair by Gravity Feed with Resin	ACI RAP Bulletin 2

Refer to the MSDS for specific data related to VOCs, health and safety, and handling of product.

STATEMENT OF RESPONSIBILITY

Before using, user shall determine the suitability of the product for its intended use and user alone assumes all risks and liability whatsoever in connection therewith. **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.**

We proudly support the following industry organizations:

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For the most current BEST-BACKED™ product data and warranty information, visit www.mapei.com.

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