

**A MOISTURE VAPOR EMISSIONS REDUCTION SYSTEM**
**DESCRIPTION**

VB 225™ is a one-coat moisture vapor reduction system, consisting of a unique combination of 100% solid epoxy resins and other chemical compounds. VB 225™ is formulated to prevent floor failures on concrete slabs containing elevated levels of moisture vapor emission. VB 225™ has no upper limits for water vapor emissions; it resists moisture levels (100% RH) and a sustained pH of 14. VB 225™ is extremely dense with a perm rating of 0,05 grains/ft<sup>2</sup>/hr in Hg<sup>-1</sup>. The low perm rating makes VB 225™ perfect as a primer for virtually all types of flooring, especially low-permeance flooring, such as sheet goods, rubber tile, and epoxy coatings. VB 225™ exceeds ASTM F3010-13 (requirements for two-component, resin-based, membrane-forming, moisture mitigation systems for use under resilient floor coverings.) VB 225™'s compliance with all state and federal VOC regulations with a VOC content of <10 g/l allows installation in sensitive areas, such as active hospitals, schools and grocery stores.

**RECOMMENDED FOR**

- ▶ Is formulated to treat new or existing concrete floors with moisture and/or alkaline conditions, which prevent or compromise the installation of floor covering systems.
- ▶ May be installed on concrete with moisture vapor emissions rates over 25+ lb/24hr/1000 ft<sup>2</sup> or 100% RH. Contact PENETRON HELLAS for MVE rates greater than 25 lb.
- ▶ Due to its properties, is unaffected by a pH of 14 and has a low permeability of 0.05 grains/1hr/ft<sup>2</sup> in Hg<sup>-1</sup>, which offers long term protection under VCT, sheet-vinyl, wood, rubber, epoxy, polyurethane and solid backed carpet.
- ▶ It may be used as a finished floor. Contact PENETRON HELLAS for finished floor limitations and details.
- ▶ Can be applied on concrete slabs in offices, hospitals, schools, super-markets, manufacturing facilities, airplane hangars, residential housing, and many other applications.
- ▶ VB 225™'s low odor and fast cure allow for application in occupied buildings with minimum disruption.

**ADVANTAGES**

- ▶ Easy to apply (squeegee or roller)
- ▶ Low vapor permeability
- ▶ Can be used as a vapor barrier to a variety of common floor covering
- ▶ Fast-curing within 8-12 hours
- ▶ Resists high moisture levels (100% RH) and sustained pH of 14
- ▶ Will not contribute to the growth of mold or mildew
- ▶ Can be installed on wet surfaces
- ▶ Environmentally friendly. Low VOC emissions

**TECHNICAL CHARACTERISTICS**

<i>Composition</i>	Epoxy resin mixture
<i>Color</i>	Clear
<i>Mixing ratio</i>	A : B = 5,87:3,8 L (1,55 : 1,0 gal)
<i>Solid Content</i>	100%
<i>VOC, mixed</i>	< 10 g/L
<i>Flash Point</i>	>93 °C (200 °F)
<i>Cure Time</i>	8-12 hours (may vary depending on temperatures)
<i>Pot Life</i>	Approximately 40 minutes. Immediately empty container on floor after mixing

## A MOISTURE VAPOR EMISSIONS REDUCTION SYSTEM

Characteristic	Test Result	Test Method
Water Vapor Transmission, $\text{grams h}^{-1} \text{m}^2$	0,021	ASTM E-96 (Wet Method)
Water Vapor Transmission, $\text{lb}/100\text{ft}^2/24 \text{ hrs}$	0,1	ASTM E-96 (Wet Method)
Avg. Measured Permeance, $\text{grains h}^{-1} \text{ft}^2 \text{in Hg}^{-1}$	0,05	ASTM E-96 (Wet Method)

All data are average values obtained under laboratory conditions. Impractical use, temperature, humidity and absorption of the substrate may influence the above given values.

## DIRECTIONS FOR USE

**Surface Preparation:** Concrete substrates to receive VB 225™ must be structurally sound, solid, absorptive and meet acceptable industry standards as defined in ACI Committee 201 Report "Guide to Durable Concrete". Surfaces must be free of adhesives, coatings, curing compounds, concrete sealers, efflorescence, dust, grease, oils and any other material or contaminant that may act as a bond breaker. Building envelope must be in place and environmentally stable prior to product application.

Older, existing concrete slabs should be cored and analyzed for various contaminants such as sulfurous salts, ASR (Alkali Silica Reaction), unreacted water-soluble silicates and any other deleterious compounds that may act as bond breakers (Water soluble silicates are found in some curing compounds, floor hardeners and other vapor reduction products.) Slabs that have existing flooring failures are strongly recommended to have core samples taken to identify the failure mode or identify any deleterious constituents in the concrete. Contact PENETRON HELLAS for additional details and guidelines, concerning this type of testing. All patching, leveling materials, adhesives and old coatings must be entirely removed prior to VB 225™ application. Consult with PENETRON HELLAS prior to installing any underlayments underneath VB 225™. Shot blast or mechanically prepare the substrate to an ICRI Concrete Surface Profile (CSP) of 3-4.

Acid etching is not permitted. Upon completion of the bead blasting and grinding, the concrete slab must be vacuumed free of all dust, dirt and debris prior to VB 225™ installation. Do not use sweeping compounds that may contain oil or other type chemical that may act as a bond breaker.

The concrete surface must be at least 3 °C (5 °F) above the Dew Point temperature. Avoid application in a dew point atmosphere or when the ambient relative humidity is above 95% or the concrete surface is wet. To prevent pinholes, dampen all areas to be treated 2-3 times with clean potable water prior to application. Bring prepared substrate to SSD (Saturated Surface Dry) with no puddling or water sheen on surface. Maintain SSD throughout application. Have a finish mop and wringer pail available, if excess water needs to be picked up. On projects that have experienced a flooring failure of any type, a minimum of a CSP-4 (medium shotblast) is recommended for surface preparation.

**NOTE:** Testing to determine the water vapor content of the substrate, either the calcium chloride tests (ASTM F-1869) or RH probe in situ tests (ASTM F-2170) may be used.

**Treating Cracks and Expansion Joints:** Prior to installing the VB 225™, cracks and voids should be completely cleaned out and repaired using SURFIX™ FEP or VB 225™ mixed with an appropriate epoxy thickening agent or with suitable mortar. Cracks on existing concrete slabs that may be contaminated should be cut out 1/4x1/4 inch (6x6 mm) to remove the contaminants from the side walls.

Prime the expansion joints with the appropriate primer (U-SEAL 110 for porous substrates). Apply a polyethylene backing rod, of the appropriate section (PENETRON® BACKING ROD) inside the joint and fill the joint with the appropriate sealer, U-SEAL or SiMP® SEAL.

**Mixing:** Open the Part A Resin (larger container) and thoroughly mix before adding the Part B Hardener (smaller container). Combine both components in total while continuously mixing; do not mix partial kits. Mix with a slow speed motor (<400 RPM) and "jiffy-type" mixing paddle, continuously for 3 minutes. Immediately after mixing, pour the fully mixed material onto the substrate. Do not scrape residual material from the pail, and do not leave pail upturned onto the substrate.

**Mixing ratios:** Mixing ratio of VB 225™ A+B is A : B = 5,87 : 3,8 L (1,55 : 1,0 gal).

**Application:** VB 225™ is applied in one coat using a squeegee and 1 cm (3/8") nap epoxy rated roller. VB 225™ is poured from the container upon completion of mixing and spread to the appropriate coverage rates using a squeegee. VB 225™ is then back rolled at right angles (90 degrees) to the squeegee application evenly distributing product across the area to be treated with no missed areas. As VB 225™ is absorbed and penetrates into the surface of the concrete slab, air is displaced in the concrete capillaries resulting in "out gassing". Out gassing channels are self-healed during the curing of VB 225™ and do not affect performance or warranties. High points created by the displacement can be scraped, lightly sanded, or skim coated if needed to produce an acceptable level, smooth surface. Concrete surface profile, absorption rate and moisture vapor rates will determine coverage requirement.

**Underlayments/Leveling Compounds:** Cementitious underlayments/leveling or skim coatings are not required over VB 225™ but are commonly used to smooth or level the VB 225™ coated surface in preparation for subsequent floor coverings and systems, as required. VB 225™ is not formulated to be a floor leveling product. All underlayments, leveling or skim coats must be applied on top of the cured VB 225™, unless otherwise specified. For proper adhesion, always use an appropriate primer for non-porous surfaces, such as PRIMER STX 100™, prior to the installation of any cementitious material. Contact PENETRON HELLAS, when using any other manufacturer's primers.

**Adhesives:** Most flooring systems and adhesives may be applied directly to the cured VB 225™. Adhesives must be designed and formulated for use over a non-porous substrate. There is no absorption of any fluid or solvents from the adhesive into the VB 225™ coated concrete. Apply adhesives to a test area to check for compatibility prior to overall application. Adhesives containing solvents (includes water) that are not allowed to flash off prior to the flooring installation may be applied to a minimum of 30 mm (1/8") of a cementitious underlayment. Contact PENETRON HELLAS for installation over an underlayment and the required thickness for use as a "blotter."

## COVERAGE

Spread and mil rates are approximate and may vary due to the porosity, absorption rate and surface profile (CSP) of any given concrete substrate.

### Vapor Testing per ASTM F 1869 (CACL) Protocol:

Up to 10 lb/1000 ft <sup>2</sup> /24 hr	3,7 m <sup>2</sup> /L (150 ft <sup>2</sup> /gal) approx. 0,25 mm (10 mils)
10 to 15 lb/1000 ft <sup>2</sup> /24 hr	3,1 m <sup>2</sup> /L (125 ft <sup>2</sup> /gal) approx. 0,3 mm (13 mils)
15 to 25 lb/1000 ft <sup>2</sup> /24 hr	2,45 m <sup>2</sup> /L (100 ft <sup>2</sup> /gal) approx. 0,4 mm (16 mils)

### Relative Humidity Testing per ASTM F 2170 or ASTM F 2420

Due to the disparity between the (slab) RH and the CA-CL moisture tests, there is no spread rate correlation between the two test protocols. Use the following table for approximate spread rate guidance, when using only the RH test values. Contact PENETRON HELLAS S.A. technical staff on any questions or concerns regarding product spread rates.

< 85% RH	3,7 m <sup>2</sup> /L (150 ft <sup>2</sup> /gal)
85-90% RH	3,1 m <sup>2</sup> /L (125 ft <sup>2</sup> /gal)
90-100% RH	2,45 m <sup>2</sup> /L (100 ft <sup>2</sup> /gal)

Product may be applied to concrete 5 – 7 days after placement. For on-grade and below grade applications, where concrete is placed per design and only specified water of convenience is present VB 225™ can be applied at the rate of 3,1 m<sup>2</sup>/L (125 ft<sup>2</sup>/gal) at 100% RH.

Proper ACI guidelines must be met for good concrete placing practices and slap vapor barriers, per ASTM E1745.

## A MOISTURE VAPOR EMISSIONS REDUCTION SYSTEM SPECIAL CONSIDERATIONS

Apply VB 225™ at substrate and ambient temperatures between 10 to 32 °C (50 to 90 °F).

Provide ventilation for VB 225™, during application and cure time. The maximum recoat window is 14 days.

Do not install VB 225™ over any gypsum-based products.

Prior to the installation of any subsequent flooring system, the cured VB 225™ must be clean and free of all dust, dirt and debris. Sanding is not required.

If VB 225™ application is to remain uncovered for an extended period of time, contact PENETRON HELLAS S.A. prior to installing floor covering systems. If installing MMA's or PMMA's, the maximum recoat window is 48 hours after VB 225™ has cured for 4 hours.

Clean up immediately with Xylene (or similar) after use.

Dispose of in accordance with current local, state and federal regulations. Collect with absorbent material.

Contact PENETRON HELLAS S.A. for further information, regarding your project.

## PACKAGING

VB 225™ A+B is available in 5,87+3,8 L (1,55+1,0 gal) containers.

## STORAGE / SHELF LIFE

12 months from the manufactured date. Always keep in cool/dry place unexposed to sunlight. VB 225™ must NOT be subject to freezing, both in shipping and storage.

## SAFE HANDLING INFORMATION

Wear appropriate eye, skin and breathing protection, when using this product. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. For further information please refer to Safety Data Sheet. PENETRON HELLAS S.A. has recently updated Safety Data Sheet on the safe use of PENETRON® products. Each Safety Data Sheet contains health and safety information for the protection of your employees and your customers.

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**WARRANTY – DISCLAIMER**

PENETRON HELLAS S.A. warrants that its products are manufactured under certified ISO Standard procedures, are of excellent quality and shall be free from material defects and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON HELLAS S.A. shall be limited to replacement of the material proven to be defective, since the standard application procedures have been met and the suitability of the product for the particular application have been proven. PENETRON HELLAS S.A. makes no warranty as to merchantability of fitness for a particular purpose. User, after contacting the distributor of the product, shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith. While every care has been taken, the information provided in this product's data sheet make no part of any contract. All recommendations, technical data and test data contained in this product's data sheet are based upon the results of control laboratory tests or in actual field tests. However, PENETRON HELLAS S.A. makes no warranty of any kind, concerning this data. In any case, this data is given in good faith based in the PENETRON HELLAS S.A. experience, till the publication of this sheet. Due to variance in storage, handling and applications of the materials, PENETRON HELLAS S.A. accepts no liability for the results obtained. It is suggested that potential users try small applications to determine the suitability of each individual product for their specific requirements. The users should always refer to the most recent edition of the product's data sheet. PENETRON HELLAS S.A. may particularly differentiate its versions of the product's data sheet compared with those of PENETRON INTERNATIONAL LTD or respective PENETRON companies worldwide. These changes are due to text formatting, different application weathering and procedures or different product names and aim at the optimal consumer information.

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