



## KOSTER VAP I® 2000

A system for the control of moisture vapor emission and alkalinity control

Technical guideline / Article number 6.03

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### Description:

The KOSTER VAP I® 2000 is a one-coat moisture vapor control system consisting of a unique combination of epoxy resins and other chemical compounds. KOSTER VAP I® 2000 is formulated to prevent floor failures on concrete slabs with elevated levels of moisture vapor emission. KOSTER VAP I® 2000 has no upper limits for water vapor emissions; it can be applied to concrete slabs with relative humidity (RH) of 100% and it provides protection from a sustained exposure to pH 14. KOSTER VAP I® 2000, due to its unique formulation, is extremely dense with a permeance of 0.09 perms. The low perm rating makes the KOSTER VAP I® 2000 perfect as a primer for virtually all types of flooring, including low permeance flooring, such as sheet goods and rubber tile.

KOSTER VAP I® 2000 is compliant with all state and federal VOC regulations with a VOC content of < 10 g/l. KOSTER VAP I® 2000 allows installation in sensitive areas such as hospitals, schools and grocery stores. LEED Indoor Environmental Quality Credits are available for EQ 4.2 (Low-Emitting Materials, Paints and Coatings).

### Material Properties:

Pot Life:	approx. 12 min. (Immediately apply material after mixing)
Cure Time:	approx. 12 h (depending on substrate and ambient temperatures)
Solid Content:	100%
VOC, mixed:	< 10 g/l
Flash Point:	>200° F

### Appropriate Applications:

KOSTER VAP I® 2000 is formulated to treat new or existing concrete floors with high moisture and/or high alkalinity in order to allow the installation of floor covering systems. KOSTER VAP I® 2000 may be installed on concrete with 100% RH. KOSTER VAP I® 2000 is unaffected even by a pH of 14. KOSTER VAP I® 2000's low permeability offers long term protection e. g. under VCT, sheet-vinyl, wood, rubber, epoxy, polyurethane and solid backed carpet. KOSTER VAP I® 2000 may also be used as a finished floor. Contact a sales representative or the KOSTER technical staff for finished floor details. KOSTER VAP I® 2000 has been applied on concrete slabs in offices, hospitals, schools, super-markets, manufacturing facilities, airplane hangers, residential housing, and many other applications.

KOSTER VAP I® 2000's low odor and low VOC content allow for application in occupied buildings with minimum disruption.

### Underlayments/Leveling Compounds:

Cementitious underlayments/leveling or skim coatings are not required over the KOSTER VAP I® 2000. They are commonly used to smooth or level the coated surface in preparation for subsequent floor coverings and systems as required. The KOSTER VAP I® 2000 is not a floor leveling product.

All underlayments, leveling or skim coats must be applied on top of the cured KOSTER VAP I® 2000 unless otherwise specified by the KOSTER American Technical team.

For proper adhesion always use an appropriate primer for non-

non-porous surfaces, such as the KOSTER VAP I® 06 Primer prior to the installation of any cementitious material.

Do not install KOSTER VAP I® 2000 over any gypsum-based products.

### Adhesives:

Most flooring systems and adhesives may be applied directly to the cured KOSTER VAP I® 2000. 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 KOSTER VAP I® 2000 coated concrete. Apply adhesives to a test area to check for compatibility prior to overall application.

Usually, if adhesives are used that contain solvents (includes water), a cementitious underlayment with a minimum thickness of 1/8 inch must first be installed over the KOSTER VAP I® 2000 coating.

In all cases, follow the adhesive manufacturer's recommendations for installation of their products over a non-porous substrate. Many adhesive manufacturers require a layer of a cementitious material of a certain thickness over which their water based adhesives can be applied.

### Moisture Testing:

Testing to determine the water vapor content of the substrate is recommended but not required by KOSTER. The two commonly used tests to determine water vapor emissions and content are the calcium chloride test (ASTM F-1869) and the relative humidity test (RH test) (ASTM F- 2170). The RH test is the preferred test method by most floor covering manufacturers.

### Surface Preparation:

Concrete substrates to receive a KOSTER VAP I® 2000 product must be structurally sound, solid, absorptive and meet acceptable industry standards as defined in ACI Committee 201 Report "Guide to Durable Concrete". Surfaces to be coated with KOSTER VAP I® 2000 products must be free of patching, leveling materials, adhesives, coatings, curing compounds, concrete sealers, efflorescence, dust, grease, oils and any other materials or contaminants that may act as bond breakers.

It is the owner or the owner's representative's responsibility to examine the slab for contaminants. Testing for contaminants is not required but recommended by KOSTER. Contact the KOSTER American technical team for additional details and guidelines concerning testing.

Consult with KOSTER technical team prior to installing any underlayments underneath the KOSTER VAP I® 2000. Underlayments which are installed underneath a vapor barrier have to be long term resistant to high moisture and alkalinity.

### Examining New Concrete Substrates:

KOSTER recommends submitting the mix design of the concrete to be coated to the KOSTER technical team for review to identify possible bonding issues that may be inherent in the mix design of the concrete. KOSTER also recommends to determine how the concrete was cured and what compounds if any were used and to submit the findings to the KOSTER technical team for review.

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## Examining Existing Concrete Substrates:

KOSTER recommends to take and analyze cores of older, existing concrete slabs, especially when the buildings history is unknown. The cores should be analyzed by a qualified laboratory for various compounds that may cause floor failures such as soluble salts, ASR (Alkali Silica Reaction), unreacted water soluble silicates, organic substances etc. (Water soluble silicates are found in some curing compounds, floor hardeners and some manufacturers vapor reduction products.)

Concrete slabs with existing flooring failures:

KOSTER strongly recommends identifying the cause of the failure. This usually requires cores to be taken and analyzed by a qualified laboratory.

Contact the KOSTER American technical team to discuss details of taking cores and/or to discuss the results of the analysis of the cores as well as for a recommendation based on the findings.

It is the owner or the owner's representative's responsibility to examine the slab for contaminants. These tests are not required by KOSTER. Contact the KOSTER American technical team for additional details and guidelines concerning testing.

## Surface Profiling:

All concrete surfaces that are going to be coated with a KOSTER VAP I® 2000 product need to be mechanically prepared to a ICRI Concrete Surface Profile (CSP) of 3. The preferred method to achieve this is shotblasting. Grinding is permitted only in areas inaccessible to shot blasting or for edging purposes.

More aggressive surface profiling may be required e. g. to remove contaminants.

Acid etching is not permitted.

Upon completion of the shotblasting and grinding, the concrete slab must be vacuumed free of all dust, dirt and debris prior to the KOSTER VAP I® 2000 installation. Do not use sweeping compounds that may cause bonding issues as most contain oil.

## Removing contaminants:

Concrete slabs are frequently burdened with contaminants that inhibit bonding of a vapor barrier to the concrete. The previously described testing is intended to provide information about which contaminants are present, at what concentration and depth. Based on these findings, a more aggressive surface preparation, removal of concrete from the surface or removal of organic substances from the concrete may be required.

## Mixing:

Use a slow speed electrical mixer (<400 RPM) and "Jiffy-type" mixing paddle to mix the material. Components A and B are mixed at a ratio of 2:1 by weight. Each unit of the material is packaged containing the components in the correct ratio.

Pre-mix the A component. Then pour the B component into the short-filled A component container while continually mixing. Mix for 3 minutes. Pour the fully mixed material onto the substrate immediately after mixing, emptying the container completely.

## Application:

KOSTER VAP I® 2000 is applied in one coat using a notched mil squeegee and 3/8" nap epoxy rated roller.

After mixing the material properly, it is immediately poured from the container onto the concrete floor and spread to the appropriate coverage rate using a notched squeegee. It is then back rolled with a 3/8" nap epoxy rated roller preferably at a right angle (90 degrees) to the direction of the squeegee application, evenly distributing the product across the area to be treated with no missed areas.

When KOSTER VAP I® 2000 is applied to the concrete surface, it may flow into voids and pin holes in the concrete that are connected to the surface. Air is displaced out of these cavities result-

-ing in "out gassing". If pin-holing occurs, re-coat. In severe cases, where re-coating is not sufficient, pin holes should be closed by troweling a mix of KOSTER VAP I® 2000 and a thickening agent (mixed at ratio to achieve paste like consistency) onto the pin holes. If excessive pin holing is encountered, contact the KOSTER American technical team.

Apply KOSTER VAP I® 2000 at substrate and ambient temperatures between 50° to 90°F.

Provide ventilation for the KOSTER VAP I® 2000 during application and cure time.

The maximum recoat time period is 14 days.

Prior to the installation of any subsequent flooring system, the cured KOSTER VAP I® 2000 must be clean and free of all dust, dirt and debris. Sanding is not required.

If the KOSTER VAP I® System is to remain uncovered for an extended period of time, contact the KOSTER American technical team prior to installing floor covering systems.

If installing MMA's or PMMA's, the maximum recoat window is 48 hours after KOSTER VAP I® 2000 has cured for 12 hours.

KOSTER VAP I® 2000 may be applied to concrete 5 – 7 days after placement.

To obtain KOSTER's 15 year warranty, KOSTER VAP I® 2000 products must be applied by KOSTER trained and approved installers.

## Coverage:

Minimum coverage at ICRI CSP 3: 150 ft<sup>2</sup>/gal

If standard concrete prepared to a CSP 3 is coated with KOSTER VAP I® 2000 at 150 sq ft / gal, the cured coating can be expected to have a layer thickness of 11 mils. A rougher surface profile and / or a porous or absorptive concrete will require the use of more material to achieve a sufficient layer thickness.

KOSTER VAP I® 2000 moisture control systems should be installed at a uniform layer thickness of at least 11 mils. Lower layer thickness results in a higher permeance of the cured coating.

ASTM E96 wet method testing shows the following relationship between coverage, layer thickness and permeability:

Spread rate at CSP 3	Layer thickness	Perm rating VAP I® 2000
sq ft / gal	mils	perms
150	11	
100	16	0.09

Contact KOSTER Technical Staff on any questions or concerns regarding product spread rates.

## Treating Cracks and Expansion Joints:

### Static, Non-Moving Voids and Cracks:

Cracks that are very narrow may be directly flooded with KOSTER VAP I® 2000 when the material is applied during the regular floor application.

Smaller voids and cracks can be treated after the surface preparation has been completed. They should be cleaned out using a wire brush and then vacuumed out. Narrow cracks may need to be widened to ¼ x ¼ inch, e. g. using an angle grinder. The flanks should be primed with KOSTER VAP I® 2000 and an appropriate epoxy thickening agent at a mixing ratio that results in a paste like consistency.



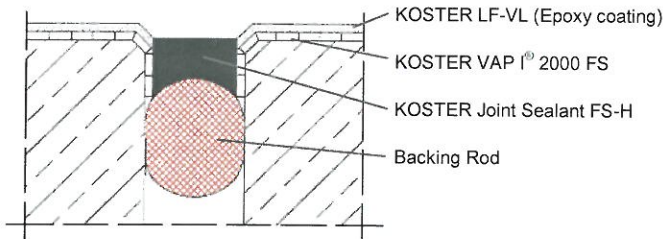
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Large voids and wide cracks have to be treated before the surface of the entire area is prepared by shotblasting. All debris, loose particles, dust, contaminants etc. should be removed. Pre-wet the concrete flanks and close the void using KOSTER Repair Mortar. Allow sufficient curing time before preparing the surface by shotblasting to CSP 3.

## Dynamic, Moving Joints and Cracks:

All dynamic, moving joints and cracks must be honored through the entire flooring system and filled with an elastic material that is suited for the general conditions, the usage of the facility and the kind and amount of motion that the joint or crack is exposed to.

If there is any doubt as to the integrity of any existing backing materials, it is always best to remove, clean and re-fill them. Clean the joint out completely and remove all remnants of the old elastic material from the flanks. Cracks on existing concrete slabs that have dirt, residue from the coating or other unwanted contaminants in it should be cut out ¼ x ¼ inch to remove the contaminants from the flanks. Clean the joint thoroughly until it is free of dust and debris. The flanks of the joint are coated with KOSTER VAP I® 2000 in the area where the joint sealant is intended to bond to the flank of the joint. Do not flood the joint. The elastic joint must be installed so that the joint runs through the entire flooring system, including all final floor coverings such as e. g. KOSTER LF-VL. Now the joint is fitted with a backing rod and a suitable elastic joint sealant e. g. KOSTER Joint Sealant FS-H is installed.



## Warranties:

KOSTER warrants that its product shall be in accordance with the specifications published in the current revision of the products data sheet. KOSTER covenants that in the event any of its products fail to meet their published specifications, KOSTER shall replace those products proved to be defective. KOSTER shall not be responsible for any incidental or consequential damages due to the breach of its warranties. Notwithstanding the foregoing, KOSTER's sole liability hereunder shall not exceed the cost of the defective product originally purchased. EXCEPT AS SET FORTH ABOVE, KOSTER MAKES NO OTHER WARRANTIES EXPRESS OR IMPLIED AND MAKES NO WARRANTY AS TO THE MERCHANTABILITY OR FITNESS OF THE PRODUCT FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. The user must determine if the product is suited for the intended use and the user must bear the risks and liabilities associated with it.

## Packaging:

2.4 gallon Combi-Pack

## Storage:

Between 50° F - 90° F

## Shelf Life:

1 year in original sealed container

## Clean Up:

Immediately with Xylene (or similar) after use

## Disposal:

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

## Safety Precautions:

Avoid skin and eye contact as well as prolonged exposure to vapors.

## First Aid:

Eye Contact – Flush immediately with water and consult physician.

Skin Contact – Wash immediately with soap and water.