



# Moisture Mitigation Guide

## Topical Moisture & pH Suppression Systems for Concrete Sub-floors

Volume 1.2 – October 2006

## Table of Contents

<b>1.0 Purpose</b>	<b>page 1</b>
<b>2.0 Background Information</b>	<b>page 1</b>
2.1 What is a Topical Moisture & pH Suppression System ?	page 1
2.2 Principal Sources of Moisture in a Concrete Sub-floor	page 1
2.3 Open & Closed Slab Systems	page 2
<b>3.0 System Categories</b>	<b>page 4</b>
3.1 Reactive Penetrants	page 4
3.2 Cementitious Densification	page 4
3.3 Sealers	page 5
3.4 Specialty Coatings	page 5
3.5 Dispersement Membranes	page 5
3.6 Combination Systems	page 5
<b>4.0 2006 Company and Systems Database</b>	<b>page 6</b>
4.1 Reporting Companies	page 6
4.2 Complete Company Database	page 6
<b>5.0 Discussion</b>	<b>page 6</b>
<b>6.0 Pre-System Selection, Slab Moisture Testing</b>	<b>page 7</b>
<b>7.0 Warranties</b>	<b>page 8</b>
<b>8.0 Appendix</b>	<b>page 9</b>

## 1.0 Purpose

The purpose of this manual is to provide information pertaining to the purpose, selection and relative cost of topically applied moisture & pH suppression systems for concrete sub-floors.

System pricing, when shown, is for reference purposes only and should not be used for estimating or quotation. For current, project specific pricing contact the manufacturer of the mitigation system directly.

## 2.0 Background Information

### 2.1 What is a Topical Moisture & pH Suppression System ?

A topical moisture and pH suppression system is a surface-applied treatment intended to mitigate a high moisture condition within a concrete sub-floor either before or after a flooring problem develops.

### 2.2 Principal Sources of Moisture in a Concrete Sub-floor

There are two principal sources of moisture that influence the level of moisture within a concrete sub-floor.

For slabs on metal deck, free-water is the principle source of moisture in the concrete. For slabs-on-ground, the initial source of moisture is free-water within the concrete.

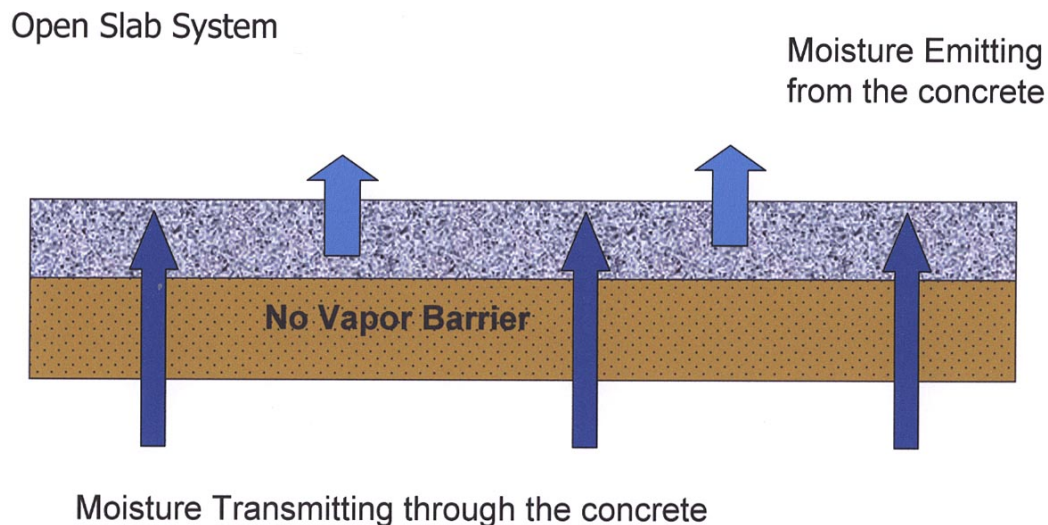
All conventional concrete contains water of convenience, or free-water that is necessary to produce a workable mixture. Free-water, as the term implies, is water that is not consumed in the process of cement hydration and remains as non-chemically bound water in the concrete. Time and suitable drying conditions are required to reduce the amount of free-water in a concrete slab to a level acceptable for a flooring installation.

The second major source of moisture in a slab-on-ground is that which originates below the slab. When an effective vapor barrier/retarder material has not been properly installed directly beneath the concrete, moisture vapor from below the slab will migrate upward to, and into the concrete. This natural process of water-vapor diffusion occurs beneath a concrete slab-on-ground regardless of the depth of the water table or presence of a capillary break.

### 2.3 Open and Closed Slab Systems

An **Open Slab System** (Diagram A) is where a concrete slab is placed directly in contact with the ground, without an effective below-slab vapor retarder in place directly beneath the concrete. In an **Open Slab System** not only does original free-water in the concrete provide a source of moisture but water vapor rising from below provides a continuing source of moisture that will cause the moisture level within the concrete to rise once the flooring is installed.

Diagram A.



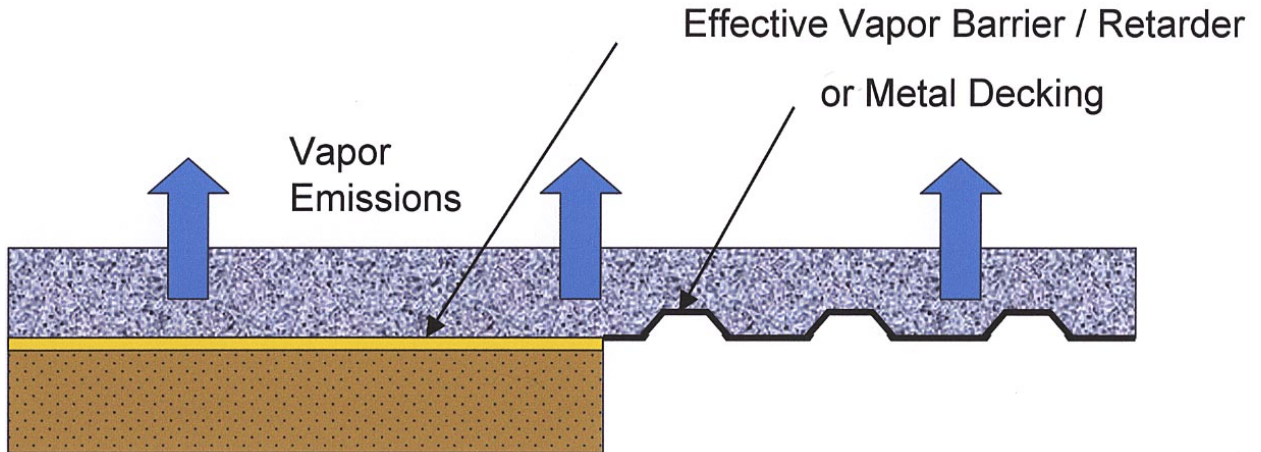
While still all too common, an **Open Slab System** does not comply with most industry recommendations for the design of a concrete sub-floor that is to receive an applied flooring material.

An **Open Slab System** is also the most challenging condition for a topical moisture & pH suppression system as moisture within the concrete will typically rise above the originally tested levels over time.

A **Closed Slab System** (Diagram B) is where an effective vapor retarder or non-perforated metal decking is in place directly beneath the concrete. In a **Closed Slab System** the only source of moisture is free-water originating from within the concrete itself.

Diagram B.

## Closed Slab System



When ample time and suitable drying conditions exist, a **Closed Slab System** may not require a topical moisture & pH suppression system.

In many cases ample drying time or suitable drying conditions are not available. In these cases a topical moisture & pH suppression system can be installed to protect the applied flooring materials from moisture-related conditions and allow the flooring installation to proceed on schedule.

A **Closed Slab System** presents far less of a challenge to the success of a topical moisture & pH suppression system.

There is also a third case where a vapor retarder has been used but it has been placed below a layer of granular fill or in some cases sand. This detail can prolong the time required to adequately dry a concrete slab and provide an avenue for moisture to enter and diffuse laterally beneath the slab if the vapor retarder is not turned up and effectively sealed at the perimeter. Unless one can be certain as to how the fill layer was sealed off, it is safest to consider slabs constructed in this fashion as an open slab systems.

### 3.0 System Categories

There are at least five system categories or material approaches being marketed to mitigate a high moisture or pH condition in a concrete sub-floor. Treatments range from single coat applications to multi-stage systems that combine two or more categories of materials.

#### 3.1 Reactive Penetrants

Reactive penetrants are fluid applied treatments designed to penetrate the concrete surface and react chemically with the concrete. The goal of such treatments is to reduce the moisture vapor emission rate (MVER) and to bind up soluble alkali such that high pH levels are not experienced at the concrete/adhesive interface.

The most common reactive formulations used for moisture & pH suppression are based on sodium silicate, potassium silicate or lithium silicate.

Before giving consideration to a silicate-based, reactive penetrant one must have thorough knowledge of the concrete composition and degree of surface carbonation. Concrete mixtures that contain pozzolanic materials such as Fly Ash or Slag can reduce available reactive material within the concrete and thus lead to incomplete reaction of the silicate-based treatment. Concrete that is more than superficially carbonated may produce a similar result. Not only will un-reacted silicates not achieve the desired reduction in the moisture vapor emission rate (MVER) but they can inhibit the bond of subsequent flooring or coating applications.

Reactive penetrants, as a stand alone treatment, are considered a very high risk approach to topical moisture and pH suppression.

#### 3.2 Cementitious Densification

Modified cementitious overlays are intended to isolate the concrete surface from adhesives or coatings applied above. Such systems are intended to lower moisture transfer and restrict soluble alkalis within the concrete sub-floor from reaching the adhesive/overlay interface.

### 3.3 Sealers

Fluid applied sealers are available to help reduce moisture transfer and isolate the concrete from the adhesive applied above. Most sealers have warranty limits of 8 lbs or less and should be considered for closed slab systems only.

### 3.4 Specialty Coatings

Hybrid epoxy-based or epoxy-modified coatings, specifically designed for high moisture/pH conditions, reduce the Moisture Vapor Emission Rate (MVER) and act as an isolation barrier to keep solutions of highly alkaline salts within the concrete from reaching the adhesive.

One, two and three coat systems are available. Multiple coats may be necessary to achieve sufficient mil thickness on shotblasted concrete.

Additional leveling or cementitious substrate material may be required over the coating. When such is necessary the materials and processes should be only those approved by the manufacturer of the coating system.

### 3.5 Dispersement Membranes

Dispersement membranes were historically one of the first approaches to topical moisture suppression that experienced a reasonable measure of success. Such systems utilize a special fabric adhered to the surface of the concrete which provides a lateral avenue for water vapor to diffuse.

### 3.6 Combination Systems

Several companies utilize a combination or “*Cocktail*” approach where two or more of the systems discussed above are combined.

## 4.0 2006 Company and Systems Database

### 4.1 Reporting Companies

Appendix A (pages 9-10) contains a list of companies that have responded to StarNet's inquiry for systems related information.

### 4.2 Complete Company Database

Appendix B (pages 11-13) contains a list of all companies currently known by StarNet to be in the field of topical moisture and pH suppression.

## 5.0 Discussion

Correcting a high slab moisture or pH condition is often a far more involved and costly process than most designers, owners and general contractors are aware of. In all too many cases the need for a topical moisture suppression system is not considered until the results of pre-installation moisture testing indicate that the slab is above an acceptable level. At this point the issue becomes who will pay for the system. It is beyond the scope of this document to totally answer the question as to who should pay for the mitigation system, except to say that in no case should the flooring installer be expected to cover the cost of a mitigation system unless contingency for such had been requested and included in the installer's original bid.

Moisture within a concrete slab is a design, construction and schedule issue beyond the control of the installer or manufacturer of the flooring material.

When a moisture mitigation system is needed, but not budgeted for, the tendency is to give consideration to the least costly approach. Selecting a system solely on the basis of cost is often a serious mistake. Consideration should be given to the nature and use of the area to be treated and the consequential costs associated with downtime or lost revenue should the system fail to perform as expected.

Consider carefully the warranty limitations of the system being considered and the design of the concrete slab system. It is best to limit consideration of systems with lower MVER warranty limits to closed-slab systems only.

## 6.0 Pre-System Selection Slab Moisture Testing

As most of the reporting companies currently tie their warranty to a Moisture Vapor Emission Rate, calcium chloride testing is necessary prior to system selection. However, a Moisture Vapor Emission Rate (MVER) is not a static number. The calcium chloride test method (ASTM F 1869) used to measure the MVER detects moisture in the top ½" to ¾" of the concrete only and is significantly affected by ambient conditions.

Concrete slabs-on-ground or on metal deck dry from the top down which means that the top portion of the slab is typically drier than the concrete below. Conducting calcium chloride tests on an open, vented slab surface as required by the current ASTM F 1869

test method will typically result in a MVER lower than if the tests were conducted shortly after removing a flooring material and adhesive. When a moisture suppression system is required, it is recommended that pre-system selection MVER testing be conducted in both a vented and un-vented condition. For vented testing, lightly dry, vacuum grind the concrete surface to remove any material on the surface that could inhibit the free release of moisture within the slab surface. For unvented testing, lightly dry-grind the concrete surface and cover the prepared area with an 18"x 18" PVC backed carpet tile. Leave the prepared area covered for at least two weeks before the start of testing. This allows moisture deeper within the concrete to rise and more closely reflect the moisture condition the flooring or mitigation system will experience after installation. Typically the un-vented MVER will be higher than the vented result.

System selection should be made on the basis of the higher MVER with a safety factor included.

## 7.0 Warranties

Please see Appendix C (Pages 14-23) for detailed warranty information on all products referenced in Appendix A (Pages 9-10) and Appendix B (Pages 11-13).

**Note Important Disclaimers:** Manufacturers of products included herein reserve the right to inspect any installation use of their products as it relates to settlement of warranty issues. Their warranties are strictly limited to stated terms (no implied warranty). Manufactures sell these products upon the condition that StarNet Members will conduct their own tests to determine the suitability of the products for the intended purpose. It is your responsibility to verify the application instructions and guidelines for each product with its Manufacturer as they are integral to the validity of the warranty offered. It is imperative all literature and guidelines regarding floor preparation are followed as they impact all warranties included in Appendix C.

Manufacturers may modify warranty terms and conditions or discontinue them entirely. Please verify all terms and conditions prior to offering any warranty to your client.

## 8.0 Appendix

### Appendix A - StarNet Preferred Vendor Participants

Company	System Name	MVER Limit	pH Limit	Warranty	Approx cost /sf (10msf open area)	Installation By:
Ardex	Ardex MC Moisture Control System	none	14	10 years	\$ 1.64 (Material Only) Excluding 1/4" underlayment)	Applicator Only
Koester American Corp	Vap 1 pH	10 lbs	14	10 years	\$ 1.55 (Installed not inc.underlayment)	Applicator Only
	Vap 1 2000	25 lbs	14	10 years	\$ 2.65 (installed not inc.underlayment)	Applicator Only
The Mohawk Group	NuSprayLok (Regular)	7	11	5 years	\$ .08 (Material only VCT applications)	Customer
	NuSprayLok (Platinum)	10	12	5 years	\$ 0.43 (Material only VCT applications)	Customer
XL Brands	Lee's Everseal	8	9	Varies	(Material only)	
	Evolution 2200	8	11	Varies	\$ .11 one coat for Action backing Approx cost /sf (10msf open area)	Customer

### Appendix A - Non StarNet Preferred Vendor Participants

Company	System Name	MVER Limit	pH Limit	Warranty	Approx cost /sf (10msf open area)	Installation By:
Advanced Moisture Control	Vapor-Guard LA	25 lbs	14	10 years	\$.80 (Material only)	Customer
	Vapor-Guard DC	Unlimited	14	15 years	\$1.00 (Material only)	Applicator Only
APAC	Encapseal Moisture Reduction/Warranted Bonding System	8 lbs	9	5 years	\$.25 (Material only)	Customer
	Encapseal ( When APAC Adhesive is used)	8 lbs	9	7 years	\$.25 (Material only)	Customer
	Encapseal ( 3 coat application beneath Breathable Backing)	10 lbs	9	5 years	\$.34 (Material only)	Customer
	Encapseal ( 3 coat application with APAC Adhesive used)	10 lbs	9	7 years	\$.34 (Material only)	Customer
Aquafin	Vaportight Coat SG2 (Applied at 115 sf/gal)	15	14	10 years	\$1.10 (Material only)	Customer
	Vaportight Coat SG2 (Applied at 75 sf / gal)	25	14	10 years	\$1.60 (Material only)	Customer
BOSTIK	Durabond D-250 Moisture Vapor Barrier Coating 1-coat	< 14 lbs	14	10 years	\$ 1.05 (Material only)	Customer
	Durabond D-250 Moisture Vapor Barrier Coating 2 coats	25 lbs	14	10 years	\$ 2.10 (Material only)	Customer
	Durabond D-261 Extreme Moisture Vapor Barrier Coating	25 lbs	14	10 years	\$ 2.20 (Material only)	Customer
	Durabond D-288 Hardwood Only	Unlimited	Unlimited	Life of Wood	Less than \$1.00 per sq. foot	Customer or Applicator
Dependable Floor Underlayments	Cutdown (When shotblasting not required)	8 lbs	9	5 years	\$.20 (Material only)	Customer
	Cutdown (Shotblasted using all Dependable Products)	8 lbs	9	10 years	\$.20 (Material only)	Customer
	Vaporseal (Applied at 115 sf/gal)	15 lbs	14	10 years	\$ 1.19 (Material only)	Applicator Only
	Vaporseal (Applied at 95 sf/gal)	20 lbs	14	10 years	\$ 1.44 (Material only)	Applicator Only
	Vaporseal (Applied at 75 sf/gal)	25 lbs	14	10 years	\$ 1.82 (Material only)	Applicator Only
Key Resin Co.	Urecon (Supervised customer or approved applicator)	12 lbs	14	5 years	\$ 1.75 (Material only)	See System
	Epocon (Supervised customer or approved applicator)	8 lbs	14	5 years	\$ 1.50 (Material only)	See System
	Epocon (Supervised customer or approved applicator)	15 lbs	14	5 years	\$ 2.50 (Material only)	See System
Mapei	Planiseal MRB	12 lbs	14	10 years	\$1.25 installed	Customer
Moxie International	Moxie Flooring Sealant II	None	14	12 years	\$.70 (Material only)	Applicator Only
Sealflex Industries	Sealflex pH Blocker/Adhesive System (Combined System)	8 lbs	14	5 years	\$.33 -\$.75 (Material & Adhesive Only)	Customer
	Sealflex Membrane System	11.5 lbs	14	10 years	\$ 3.25 (Installed Price)	Applicator Only
Sinak Corporation	V-Cure	none	14	10 years	\$ 1.50 (Installed not inc.underlayment)	Applicator Only

### Appendix B – Company Database – StarNet Preferred Vendors

Company	System Name	Address	City	State	Zip	Phone	Website	Contact
Ardex Engineered Cements	Ardex MC	400 Ardex Park Drive	Alquippa	PA	15001	724-203-5000	www.ardex.com	Bruce Newbrough
Koester American Corp	Vap 1 pH & Vap 1 200	2585 Aviator Drive	Virginia Beach	VA	23453	757-425-1206	www.koesterusa.com	Charlie King
The Mohawk Group	NuSprayLok	405 Virgil Dr.	Dalton	GA	30720	706-428-8197	www.mohawkind.com	Steve Gentry
						706-428-8116		Dewey Taylor
XL Brands	Lee's Everseal & Evolution 2200	237 Nance Road	Calhoun	GA	30701	706-625-0025	www.xlbrands.com	Brad Long

### Appendix B – Company Database – Non StarNet Preferred Vendors

Company	System Name	Address	City	State	Zip	Phone	Website	Contact
Advanced Adhesive Technology	AAT-1185	424 S. Spencer St.	Dalton	GA	30721	800-228-4583	www.attglue.com	Greg Wood
Advanced Moisture Control	Vapor-Guard LA & Vapor-Guard DC	6565 Westminster Blvd	Westminster	CA	92683	714-903-7086	www.advancedmoisturecontrol.com	Hank Brufodt
APAC	Encapseal	2424 Lakeland Dr	Dalton	GA	30721	800-747-2722	www.apacadhesives.com	Steven Chase
Aquafin	Vaportight Coat SG2	2505 Blue Ball Road #160	Elkton	MD	21921	410-392-2300	www.aquafin.net	Alfred Kessi
BOSTIK	Durabond D 250, Durabond D-261, & D-288 Hardwood Only	211 Boston Street	Middleton	MA	01949	800-726-7845	www.bostik-us.com	Scott Banda
CS 2000	Creteseal	P.O. Box 26279	Santa Ana	CA	92704	800-278-4273	www.creteseal.com	Andrew Munoz
Crown Polymers, LLC	CrownCoat Vaporbarrier 303	11111 Kiley Drive	Melrose Park	IL	60142	847-659-0300	www.crownpolymers.com	Floyd Dimmic
Dependable Chemical Co. Inc.	Cutdown & Vaporseal	P.O. Box 16334	Rocky River	OH	44116	800-227-3434	www.floorprep.com	Rich Tanski
Dex-O-Tex	Vapor Control Primer	516 S. William Street	Mt. Prospect	IL	60056	847-392-3607	www.dexotex.com	Rich Kroger
Floor Seal Technology	MES Systems	3211 W. MacArthur Park	Santa Ana	CA	92704	800-295-0221	www.floorseal.com	Bill Clyne
Forbo Industries	Moisture Limitor	P.O. Box 667	Hazleton	PA	18202	800-842-7839	www.forbolinoleumna.com	
Franklin International	Tilebond Moisture Control Sys	2020 Bruck Street	Columbus	OH	43207	800-347-4583	www.franklinflooring.com	Dale Zimmerman
General Polymers Corp	Recover 9000 & Fas Top MVT	145 Caldwell Drive	Cincinnati	OH	45216	513-761-0011	www.generalpolymers.com	Tom Murphy
Key Resin Company	Urecon & EpoCon	4061 Clough Woods Dr.	Batavia	OH	45103	513-943-4532	www.keyresin.com	Robert Cain

### Appendix B – Company Database – Non StarNet Preferred Vendors (Continued)

Company	System Name	Address	City	State	Zip	Phone	Website	Contact
Madewell Products Corp	Permaseal	7561-A Industrial Court	Alpharetta	GA	30004	770-475-8199	www.madewell.com	John Steele
MAPEI	Planiseal MRB	1144 E. Newport Center Dr	Deerfield Beach	FL	33442	800-426-2734	www.mapei.com	Mike Micalizzi
Moxie International	Moxie Flooring Sealant II	5710-B Roseville Road	Sacramento	CA	95842	916-652-1300	www.moxie-intl.com	Dennis Lee
Para-Chem	Para-Shield	P.O. Box 127	Simpsonville	SC	29681	800-763-7272	www.parabond.com	Grace
Sealflex Industries	pH Blocker/Adhesive System	2925 College Ave. Suite B4	Costa Mesa	CA	92626	800-651-2098	www.sealflex.com	Dennis Davis
Sika Corporation	Sikaguard 75 Epocem	201 Polito Ave	Lyndhurst	NJ	07071	800-933-7452	www.sikausa.com	
Sinak Corporation	V-Cure & VECT-R	1949 W. Walnut Ave	San Diego	CA	92101	800-523-3147	www.sinak.com	Craig Higgins
Stonhard	Stonfill OP2	1 Park Avenue	Maple Shade	NJ	08052	800-257-7953	www.stonhard.com	Todd Gore
Talbott Specialty Products	Hydro-Loc	425 South Lake Blvd.	Richmond	VA	23236	877-553-7025	www.hydro-loc.com	Herb Talbott
Valspar	Fast Track Primer & Vapor Block	2841 S. Ashland Drive	Chicago	IL	60608	800-637-7793	www.valsparflooring.com	Jeff Fleming
Vexcon Chemicals	MoistureBloc	7240 State Road	Philadelphia	PA	19135	215-332-7709	www.vexcon.com	Darryl Manuel
W.F. Taylor	Meta-Seal X-Treme Concrete	3601 US Highway 41 So.	Dalton	GA	30721	800-868-4583	www.wftaylor.com	Robert Ddamulira

### Appendix C – Detailed Warranty Information

Company	System Name	MVER & ALK	Warranty Information
Advanced Adhesive Technologies	AAT-1185	10 lbs/1000 sq ft/24 hrs	10 years from the date of original installation. When a floor covering is installed on a below grade, on grade, or above grade concrete slab treated with CS2000 according to manufacturing instruction. Creteseal (manufacturer of CS2000) shall warrant the floor covering system against failure due to moisture vapor migration or moisture-born contaminates. The warranty shall cover all labor and materials needed to replace all floor covering that fails due to moisture vapor emission & moisture born contaminates. Execution section is an internal part of this warranty.
Advanced Moisture Control	Vapor-Guard LA, Vapor-Guard DC	20 lbs/1000 sq ft/ 24 hrs	Written warranty, signed by manufacturer agreeing to: Warranty shall cover 100% of the cost to repair or replace areas damaged and include: a. installed topical vapor-alkalinity barrier b. floor covering systems or resinous materials c. adhesives, patching materials and installation accessories d. installation labor. 15 year covering manuf. defects. installation defects to topical barrier and moisture or alkalinity damage. Documentation pertaining to slab design and installation parameters and environmental conditions is required, ASTM F1869-04, ASTM F710-03, Factory certified installer, 15 year for man. defects, warranty shall not exclude due to non-conformance to ACI-318 and ACI-212 parameters, dew-point, concrete mix design, admixtures, concrete salts, resin/silicate surface treatments or cohesive failure,
APAC	EncapSeal and V-Block	8 lbs of moisture per 1000 sq ft	Warrants to the original owner of the installation the reduction of moisture emissions from 8 lbs to 3 lbs per 1000 sq ft as by ASTM 1869-98. Moisture emissions testing with results less than 8 lbs prior to installation of ENCapSeal, 5 year warranty for installation failure (loss of Adhesion) as the direct result of a product supplied by APAC, replace flooring and reasonable labor, extended to 7 year when premium APAC adhesives are used (listing available) warranty registration must be completed and returned within 15 days of installation, it is necessary to complete a form for each phase. APAC Smart Test must be attached to warranty registration and submitted with same to All Purpose Adhesive Co.
	V-Block Acrylic polymer	8 to 9 pH	Warrants to the original owner reduction of moisture emissions from 8 lbs to 3 lbs per 1000 sq ft as by ASTM 1869-98. Moisture emissions testing with results less than 8 lbs prior to installation of V-Block Primer-Sealer, 5 year warranty for installation failure (loss of Adhesion) as the direct result of a product supplied by APAC, replace flooring problem areas and reasonable labor, extended to 7 year when premium APAC adhesives are used (listing available) warranty registration must be completed and returned within 15 days of installation, it is necessary to complete a form for each phase. APAC Smart Test must be attached to warranty registration and submitted with same to All Purpose Adhesive Co.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
APAC	EncapSeal	a two coat application will suppress moisture vapor emission rates of 8 lbs of moisture per 1000 sq ft	Warrants to the original owner reduction of moisture emissions from 8 lbs to 3 lbs per 1000 sq ft as by ASTM 1869-98. Moisture emissions testing with results less than 8 lbs prior to installation of ENCapSeal, 5 year warranty for installation failure (loss of Adhesion) as the direct result of a product supplied by APAC, replace flooring problem areas and reasonable labor, extended to 7 year when premium APAC adhesives are used (listing available) warranty registration must be completed and returned within 15 days of installation, it is necessary to complete a form for each phase. APAC Smart Test must be attached to warranty registration and submitted with same to All Purpose Adhesive Co.
Aquafin	Vaportight Coat SG1	10 lbs/24 hrs/1000 sq ft to 3 lbs or less high alkalinity barrier (ph 13 - 14)	Warrants to the owner of premises at the time of installation for a period of 5 years to be free of manuf defects. We will replace or at our election refund the purchase price if proven to be defective. Based on industry standards and testing procedures. Aquafin makes no warranty as to merchantability or fitness for a particular purpose.
	Vaportight Coat SG1	1-coat application 12 lbs, 2-coat applications, 25lbx/24hrs/ 1000 sq ft	Warrants to the owner of premises at the time of installation for a period of 10 years to be free of manuf defects. We will replace or at our election refund the purchase price if proven to be defective. Based on industry standards and testing procedures. Aquafin makes no warranty as to merchantability or fitness for a particular purpose.
Ardex	Moisture Control System	20 lbs/1000 sq ft/24 hrs	10 year warranty must be pre-approved by Ardex Technical Department. The Pre-Installation Checklist must be completed and submitted for approval of the project to receive the 10 year warranty. Ardex products must be used together. 10 years under terms and conditions set forth, reduce moisture vapor emissions of treated concrete from max of 20 lbs/1000 sq ft/24hrs as determined by ASTM F1869 to no more than 3 lbs/1000 sq ft/24 hrs. No installation failures due to manuf defect. provide notice of any failure within 10 yrs. if warranted defect exists Ardex will pay for repair and replacement of floor covering, adhesive, underlayment or sealer and topping, and Ardex moisture control of defective area only. The floor must be used for the same general purpose throughout warranty. Liabilities not to exceed (1 1/2) times the cost. Notify in writing within (30 days) of discovery prior to the expiration of 10 years from the date of installation.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Bostik, Inc	Durabond D-250	14lbs to 25 lbs per 1000 sq ft	Not to exceed 10 years, warranty lists specific products that must be used. Defined ASA, the least amount of time warranted by any of the components being installed., ck application label instructions, do not use over concrete slabs treated with sealers or curing compounds, do not use with gypsum based systems, do not use in areas subject to hydrostatic head (the pressure at a given point in a liquid measured in terms of the vertical height of a column of the liquid needed to produce the same pressure), this is not a waterproofing or anti-fracture membrane. The sole remedy for noncompliance with this warranty shall be replacement of the product or refund of the purchase price.
	Durabond D-261	ph levels of 9 or lower	warranty registration must be registered with Bostik within 30 days of installation, for adhesion, moisture reduction and alkalinity control (prorated 10 years) must be applied according to directions and used only with Bostik's durabond brand adhesives and patches/underlayments - same instructions as above.
Creatseal 2-day system	CS 2000	not supplied	10 year period from the date of original installation against failure due to moisture vapor migration and moisture-born contaminants. Manufacturer shall provide written warranty for their system .The warranty shall cover all labor needed to replace all floor covering that fails due to moisture vapor emission & moisture born contaminates.
Crossfield Dex-O- Tex	VaporControl Primer 100	15 lbs/1000 sq ft/24 hrs	No warranty shall be effective until the terms and conditions of sale are set forth by Crossfield Products and invoices are met. Crossfield warrants to the purchaser that products are free from manufacturing defects and solely to the remedy of replacement in kind of any product which Crossfield sold which may prove defective in manufacture within one year from the date of installation. Provided said product was stored correctly and installed within the products shelf life, by the original purchaser and which Crossfield's examination discloses such defective.
Crown Polymers	CrownCote	not supplied	Warrants their product to be free of manufacturing defects, to be of good quality, and will meet Crown Polymers current published physical properties when applied in accordance with Crown polymers written directions and tested in accordance with ACI, ASTM, and Crown Polymers standards. Product proved to be defective will be replaced. There are no other warranties.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Dependable Floor Underlayment	CutDown	reduce emission rates (MVER) up to 8lbs/24hrs/1000 sq. ft.	5 year warranty to the original owner of the installation that Dependable Cutdown, when used in accordance with the current instructions and technical bulletins. Dependable must be given notice of failure within 5 years after installation and within 30 days after the first discovery of the defect attributed to such installation, whichever occurs first. In the event of damage or failure of flooring caused by excessive moisture emissions under this warranty, Dependable shall provide all labor and material to repair or remove and replace the floorcovering placed over Cutdown (including any cost of removal of old material) with a floor of similar quality for the same period of time and at the same proportion of replacement cost coverage as the manuf of the original floor covering material placed over Cutdown offers for the replacement of its product provided that Dependable is given proof of purchase of sufficient Cutdown to provide the recommended cove rate on the installed floor.
	Vaporseal	up to 13-14 pH	By prior application and written reply approval from Dependable before installation, Dependable will issue a limited 10 year "full floor" warranty to the project owner that moisture emission rates of up to 25lbs. MVER was reduced to 3 lbs or such higher level required by the floor covering to be applied for at least 10 years if the floor covering is applied by a certified Dependable installer or is inspected before and during installation by a Dependable representative or inspector.
FloorSeal	MES System	See Warranty info	Manufactured and installed by FloorSeal. You must contact FloorSeal for all information.
Forbo	Moisture Limitor	8 lbs/1000 sq ft/24 hrs to as low as 3 lbs/1000 sq ft/24 hrs	Forbo Moisture Limitor is not warranted to control MVE above 8 lbs/1000 sq ft/24 hrs. If subsequent to the application of Moisture Limitor, MVE exceed 8 lbs/1000 sq ft/24 hrs a failure by occur. Forbo Moisture Limitor is covered by a limited 10 year warranty only when used with Forbo Linoleum, Inc. flooring products and applied pursuant to all manufacturers' recommendations by a Forbo certified applicator. Forbo Linoleum, does not warrant the performance of Moisture Limitor when used with flooring products from other flooring manufacturers. In order to quality for this limited 10 year warranty, a completed warranty registration form must be submitted to Forbo Linoleum, for each phase of work performed on each project.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Franklin International	Titebond 531	Below 12 lbs/1000 sq ft/24 hrs	<p>Gold Warranty: 4 mils wet film thickness, Franklin warrants to its immediate commercial purchaser for resale that, for a period of 10 years for residential applications, or for 5 years from date of installation for commercial applications, engineered wood flooring products covered by a valid subfloor moisture warranty that are installed with Titebond urethane Wood flooring adhesives on a concrete subfloor that has been treated with the Titebond 531 MCS (the product), will be free of the following moisture related problems due to moisture from the concrete subfloor; cupping, buckling, surface discoloration and release from the subfloor. In addition, Franklin warrants that mold and mildew will not grow on the product itself for a period of 5 years after installation. In the event Franklin determines that the above warranty regarding moisture related problems has been breached, upon Franklin's request purchaser will obtain and furnish two written estimates from reputable flooring installers regarding the cost of repairs. Franklin will reimburse purchaser for costs actually incurred for labor and materials to repair or replace on time the affected area by the approved installer.(See Platinum warranty below)</p>
	Same as above	Same as above	<p>Platinum warranty; Franklin warrants to its immediate commercial purchaser for resale that, for a period of 10 years for residential applications, or for 5 years from the date of installation for commercial applications, engineered wood flooring products covered by a valid subfloor moisture warranty and solids up to 1/2" thick, 5" wide and 4' in length that are installed with recommended Titebond Wood Flooring adhesives on a concrete subfloor that has been treated with the Titebond 531 MCS (the product), will be free of the following moisture related problems due to moisture from concrete subfloor: cupping, buckling, surface discoloration and release from the subfloor. In addition, Franklin warrants that mold and mildew will not grow on the product itself for a period of five years after installation. In the event Franklin determines that the above warranty regarding moisture related problems has been breached, upon request purchaser will obtain and furnish to Franklin two written estimates from reputable flooring installers regarding cost of repairs. Franklin will reimburse purchaser for costs actually incurred for labor and materials necessary to repair or replace one time the affected areas of the installed wood flooring by the approved installer.</p>
General Polymers Sherwin Williams	Recover 9000	not supplied	<p>General Polymers makes no warranty, expressed or implied, based on this literature and assumes no responsibility. You must contact your General Polymers sales representative for each project. Warranties may be issued at General Polymers discretion depending on the project.</p>
	FasTop MVT	not supplied	<p>General Polymers makes no warranty, expressed or implied, based on this literature and assumes no responsibility. You must contact your General Polymers sales representative for each project. Warranties may be issued at General Polymers discretion depending on the project.</p>

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Key Resin	Urecon - SL	not supplied	Warranty of 1 yr from manuf defects. Replacement of any non-conforming material if notice is given to Key within 1 yr of delivery of materials. Key may refund the price in lieu of replacement. Must provide written notice containing full details of non-conformity. Key reserves the right to inspect.
	Urecon - TG-2	not supplied	Warranty of 1 yr from manuf defects. Replacement of any non-conforming material if notice is given to Key within 1 yr of delivery of materials. Key may refund the price in lieu of replacement. Must provide written notice containing full details of non-conformity. Key reserves the right to inspect.
	Epocon - 2	not supplied	Warranty of 1 yr from manuf defects. Replacement of any non-conforming material if notice is given to Key within 1 yr of delivery of materials. Key may refund the price in lieu of replacement. Must provide written notice containing full details of non-conformity. Key reserves the right to inspect.
Koester	VAP 1 ph	extreme alkalinity, PH 13-14	10 years against material defects. Will warrant water vapor transmission reduction as shown in literature. Warranty covers against failure due to concrete water vapor transmission and alkalinity up to Ph 14 and includes the following: 1. Koester approved adhesives 2. Approved cementitious underlayments 3. Floor covering systems (including epoxy and polyurethane systems) 4. All labor charges involved. Should the "structurally sound" clean areas fail to meet industry standards <b>at any time</b> as defined in ACI committee 201 report the warranty shall be void. If cohesive substrate failure occurs resulting in a delamination and or the concrete surfaces have been treated with any kind of penetrating surface sealer like silicates including ASR related conditions. The warranty shall be void if any cracks appear after the application. Liabilities not to exceed (1 1/2) times the cost . Written notice within thirty days of the discovery of a breach of this warranty in order to assert it's right to any repairs covered by this warranty.
	VAP 1 2000	extreme alkalinity, PH 13-14	10 years against material defects. Will warrant water vapor transmission reduction as shown in literature. Warranty covers against failure due to concrete water vapor transmission and alkalinity up to Ph 14 and includes the following: 1. Koester approved adhesives 2. Approved cementitious underlayments 3. Floor covering systems (including epoxy and polyurethane systems) 4. All labor charges involved. Should the "structurally sound" clean areas fail to meet industry standards <b>at any time</b> as defined in ACI committee 201 report the warranty shall be void. If cohesive substrate failure occurs resulting in a delamination and or the concrete surfaces have been treated with any kind of penetrating surface sealer like silicates including ASR related conditions. The warranty shall be void if any cracks appear after the application. Liabilities not to exceed (1 1/2) times the cost . Written notice within thirty days of the discovery of a breach of this warranty in order to assert it's right to any repairs covered by this warranty.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Lees	Everseal	8 lbs of moisture per 1000 sq ft	For this warranty to apply, calcium chloride test results must also be sent to Lee's Technical Services, along with the size of the installation and the amount of EverSeal purchased, either through a copy of the invoice from Lees Customer Service or documentation from the Lees authorized dealer. Lees also requires documentation of purchase of a Lees adhesive - Lees Wet Set Re, Lees Pressure Sensitive Adhesive or Lees NeoFloor Adhesive. 8 lbs per 1000 sq ft measured by calcium chloride test ASTM-1869-98, size of installation, amt of Everseal, Lee's adhesive, Lee's carpet, life time warranty, alkaline salts from rising providing slab cleaned with v/water, documentation of temp/humidity at time of application, test results must be sent to Lees Tech Services
Madewell	Permaseal Platinum	reduce to a rate of less than 1 lb/1000 sq ft/24 hrs	All technical data, recommendations and services are rendered by the Seller gratis. They are based on technical data which the Seller believes to be reliable and are intended for use by persons having skill and knowledge, at their discretion and risk. Sellers assumes no responsibility for results obtained or damages incurred from their use by the Buyer whether as recommended herein or otherwise. Such recommendations, technical advice or services are not to be taken as a license to operate or intended to suggest infringement of any existing patent. Madewell Products Corp makes no guarantee or warranties except as otherwise provided in writing, and disclaims any and all warranties of merchantability and fitness for a particular purpose.
Mapei	Plainseal MRB	12 lbs/1000 sq ft lower it to 3 lbs per 1000	1 year from date of purchase when they are installed, utilized and maintained in accordance with MAPEI's written instructions and printed literature, and industry standards. Should a product prove defective MAPEI will determine that it will make a payment under this warranty, the payment will be only for reasonable cost of material and reasonable labor for the removal and replacement of the defective portion. Any company can perform necessary compatibility testing of installation materials; however we recommend that you contact MAPEI's Tech Services Dept to determine if the installation is compatible. Improper compatibility testing or installing incompatible material voids the warranty, notify MAPEI within 15 days of discovery of defect.
Mohawk	NuSpraylok Standard	7 lbs per 1000 sq ft and 11 ph	Mohawk branded adhesives are required, and are the only approved adhesives that Mohawk will warrant. 2 years against adhesive breakdown ONLY. NuSpraylok will not prevent the buildup of alkalinity deposits or halt moisture flow on the sub floor.
	NuSpraylok Platinum	10 lbs per 1000 sq ft moisture and 12 ph	Mohawk branded adhesives are required, and are the only approved adhesives that Mohawk will warrant. 2 years against adhesive breakdown ONLY. NuSpraylok will not prevent the buildup of alkalinity deposits or halt moisture flow on the sub floor.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Moxie	Moxie Flooring Sealant II	16 to 26 lbs/1000 sq ft	20 years to stop moisture and vapor migration, prevent alkali and efflorescence attack, prevent corrosion of reinforcing steel, and to perform as stated in current published documentation, brochures, and company literature, within the given variances and supported by field, laboratory, customer test results, data and testimonial letters, when used by licensed contractors and must be used in strict accordance with current documented policies, procedures, standards and tests, ASTM, ACI, Uniform Building codes and Architectural specifications and Moxie International Inc. Deviation of these established polices, procedures, standards and tests, including but not limited to proper air content, max water/cement ratio, water quality, chemical composition of Portland Cement, as well as soil conditions at time of placement, aggregate/sand moisture content and products or admixes known to inhibit the effectiveness of Moxie will void the warranty. Moxie will be responsible to provide enough product to resolve said situation. Moxie must be provided with all test data when requested.
Sealflex	ph blocker/primers	not supplied	Warrants it's product to be of the highest quality. No other warranties are expressed or implied. Makes no warranty of merchantability or fitness for a particular purpose.
	Anti-fracture Membrane System	11.15 lb/1000 sq ft	10 years when applied by a trained and certified installer from Sealflex. Sealflex is warranted not to delaminate from concrete when exposed to vapor emission rate up to 11.5 lbs/1000 sq ft/24 hrs when tested with a prepackaged calcium chloride kit in accordance with ASTM F1869-03. Not responsible for structural failure, seismic action, vapor emissions above 11.5 in accordance ASTM F1869-03, dimensional stability, discoloration, water leakage, caustic solutions or water, seam failure, tears, rips, curing compounds, mold release agents, failure of leveling or patching compounds, improper installation or maintenance, adhesive failure, and other conditions beyond Sealflex's control. The warranty is for 10 yrs from the date of issue, and is limited only to replacement of Sealflex Membrane System materials, floor covering materials, labor and adhesives. The warranty covers affected areas only determined by Sealflex Ind, Inc. Sealflex makes no warranty of merchantability or fitness for a particular purpose and is at the sole discretion of the end user.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Sinak	V-Cure	not supplied	Sinak Corp warrants V-Cure will prevent flooring failure from alkalinity and/or moisture emanating from the concrete for a period of 10 yrs. V-Cure components must be mixed and applied by a Sinak certified Applicator, or under Sinak's supervision. The concrete must be in accordance with normally accepted standards and guidelines by ACI 302 and State and local building codes. Concrete containing the following is not covered by the warranty. Aggregate not in compliance with ASTM C-33, admixtures containing chlorides, silicates or water repellants; and chemicals and contaminants introduced by the underlying soil. 10 years prevent flooring failure from alkalinity and/or moisture emanating, concrete must be in accordance with accepted standards and guidelines by ACI 302. In case of failure, and in order to be covered by the warranty Sinak V-Cure must be delaminating from the concrete. In the event of failure from moisture and/or alkalinity emanating from the concrete, Sinak will provide materials and labor to retreat and/or recoat the affected area including replacement of floor covering in the affected areas.
Stonhard	Stonfil OP2	not supplied	Stonhard provides a single source warranty that covers both the products and installation. Stonhard makes no warranty, expressed or implied, based on this literature and assumes no responsibility. You must contact your Stonhard sales representative for each project. Warranties may be issued at Stonhard's discretion depending on the project.
Talbot Specialty	Hydro-Loc	Contact Talbot	You must contact Talbot direct at: 425 Southlake Blvd, Richmond, VA 23236 Tele: 804-423-6295
Taylor Adhesives	2012-Meta-Seal X-Treme	From 12 lbs/1000 sq. ft./ 24 hrs to 3 lbs/1000 sq ft/ 24 hrs	W.F. Taylor warrants for a period of 1 year after purchase, that its products are free from defects in materials and workmanship. Notification of claims for products involved in completed installations shall be in writing. The sole remedy against WF Taylor resulting from any cause shall be the receipt of an equal amount of material to replace the defective material, or at the option of WF Taylor the refund of the purchase price for such defective material. All claims are subject to inspection, no claims will be accepted for installations that have been repaid or replaced prior to inspection by a WF Taylor representative. In order to be considered for Taylor Lockdown System Lifetime Performance warranty contact WF Taylor as this is done on a per project basis.

### Appendix C – Detailed Warranty Information – Continued

Company	System Name	MVER & ALK	Warranty Information
Valspar	Fast Track Primer	8 lbs/to below the acceptable 3 lbs in a single coat.	Valspar makes no warranties unless Valspar agrees in writing. Valspar's only obligation for any defect in the product will be to replace the defective product, or to refund its product price at Valspar's option.
	Vapor Block	not supplied	Valspar makes no warranties unless Valspar agrees in writing. Valspar's only obligation for any defect in the product will be to replace the defective product, or to refund its product price at Valspar's option.
Vexcon	MoistureBloc	from 8-9 lbs to less than 3lbs/1000 sq ft/24 hrs	For a period of 5 years commencing on the date on which the concrete surface described herein is coated properly in accordance with manufacturers directions. Vexcon warrants to the owner that the products will remain adhered to the surface without cracking or peeling and will provide resistance to molds, fungi, and that water vapor levels do not exceed 3.0#/1000 sq ft/24 hrs. The warranty covers blistering, peeling or cracking due to water, water vapor or alkali content of concrete. Vexcon does not warrant the loss of adhesion of the tile adhesive unless caused by water vapor. In the event the coating fails to perform and as the exclusive remedy for any breach of this warranty, Vexcon will at it's own expense, supply sufficient Moisturebloc and reasonable labor, and floor covering to repair any such failure. This warranty requires a conference with Vexcon and completed job survey for, TN 144 must be completed. Any claim under this warranty must be presented during the warranty period and within 14 days after any covered condition has occurred. The warranty period shall not be extended by the replacement of materials under this warranty but the remaining warranty period shall continue in effect and be applicable to the re-coat. areas