dex·o·tex

VaporControl™

CROSSFIELD dex·o·tex PRODUCTS

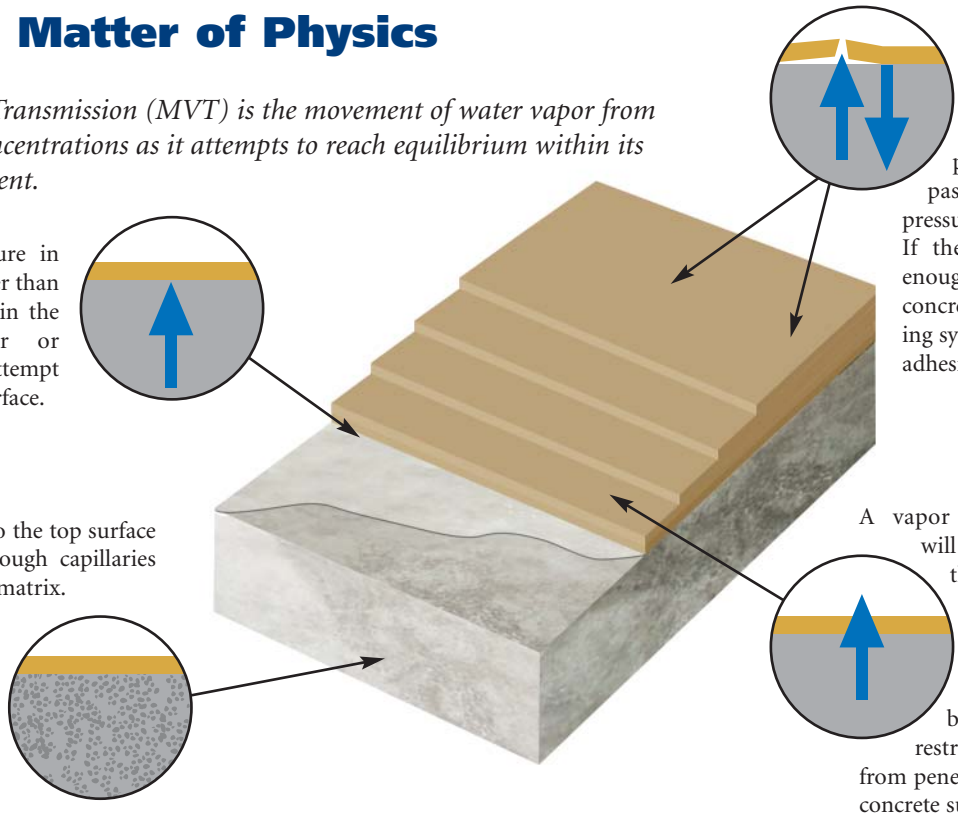
Scientifically Superior™ and Performance Proven Construction Products

Purely a Matter of Physics

Moisture Vapor Transmission (MVT) is the movement of water vapor from "high to low" concentrations as it attempts to reach equilibrium within its overall environment.

When vapor pressure in the concrete is higher than the vapor pressure in the atmosphere, water or water vapor will attempt to migrate to the surface.

Moisture migrates to the top surface of the concrete through capillaries within the concrete matrix.



A vapor impermeable flooring system or an impermeable adhesive component will prevent moisture from passing through, resulting in a pressure build up at the bondline. If the resulting pressure is great enough, disbondment between the concrete and the impervious flooring system, or cohesive failure of the adhesive will result.

A vapor permeable flooring system will allow moisture vapor to pass through in both directions. A properly designed, vapor permeable epoxy flooring system will allow moisture to out-migrate from the slab below, but it will severely restrict moisture in a liquid state from penetrating through it and into the concrete substrate.

At the Root of the Problem

Sources of capillary moisture (liquid or gaseous) are:

- High water table
- Drainage deposits
- Residual water from run-off, irrigation, etc.
- Broken plumbing
- Lack of, or the improper installation of a positive side (beneath the concrete slab) moisture vapor barrier
- Free moisture (moisture not used in the hydration of cement) in a relatively new concrete slab

Concrete Problems

Certain conditions in the concrete slab can aggravate MVT related problems.

- **ASR (Alkali Silica Reactivity):** Silica aggregate within the concrete reacts with other minerals in the concrete and forms a silica gel. The gel is expansive. In extreme cases, it creates internal pressure, putting the moisture into compression, which can lead to hydraulic pressure and lifting at the bondline. Not only is ASR deleterious to the concrete substrate, it may cause blistering or buckling of an impervious flooring system. ASR failures are latent, since they usually start on the underside of the concrete substrate and progress through time to the surface.
- **pH:** Alkalinity pH problems are noticeable as white efflorescent powder residue carried in an aqueous solution that is deposited on the substrate, especially joints and cracks, after evaporation of the water carrier. It is a sign that excessive moisture is present.
- **Capillary Action:** The capillaries in concrete are created as "left-behind" pores that are formed by the out-migration of water not used for the hydration of cement during its initial cure. Additional moisture is drawn into the concrete and upward through capillary action.

Far Reaching Problems

Moisture Vapor Transmission problems …

- Cost the construction industry and facility owners millions to billions of dollars each year
- Attack impervious and permeable flooring materials (including wood, vinyl, tile, urethane, epoxy, carpet and impervious adhesives)
- Result in disbondment, blistering, pin holes, chipping and pitting, adhesive reversion, and cracking and heaving
- Compromise even the most meticulously installed flooring system
- Damage the reputations of the specifier, contractor and manufacturer
- Create potentially unsafe tripping obstacles
- Introduce health concerns associated with Sick Building Syndrome
  - ~ Aid the growth of algae, bacteria, mildew and mold
  - ~ Induce rot and efflorescent residue
  - ~ Airborne microorganisms contribute to indoor air contamination that have a negative effect on computer systems, laboratories and clean room facilities

Mounting Problems

MVT related problems have escalated due to a number of reasons.

- Fast track construction (getting "on" the slab too early)
- Use of vascular (lightweight) aggregates
- Tighter building envelopes
- EPA and AQMD restrictions
- Land limits (results in building on marginal lands with correspondingly high water tables)
- Changes in concrete mix designs

Diagnosing MVT

Moisture concentrations in sound and durable concrete in excess of 3.0 pounds per 1,000 sq. ft. per 24 hours when tested in accordance with ASTM F1869 or with relative humidity in excess of 75% as set forth in ASTM F2170, have been known to cause failures of impervious, properly installed flooring systems. Slightly higher values may be permissible depending on the test method selected. Testing for MVT should be conducted in accordance with the two most commonly accepted test procedures.

ASTM F1869

Standard Test Method for Determining Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride measures the weight gained by a desiccant (calcium chloride) in a petri dish that sits directly on a properly prepared concrete slab covered by an impervious housing that is bonded to the concrete for a prescribed period of time.

ASTM F2170

Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes measures the relative humidity within a concrete slab using probes inserted to a specific depth in pre-drilled holes.

Note: Both tests are influenced by the temperature, humidity and atmospheric condition of the concrete slab.

VaporControl Impermeable Primer

The Scientifically Superior impermeable (non-breathing) VaporControl 100 Primer should be used when MVER (moisture vapor emission rates) exceed 3.0 pounds per 1,000 sq. ft. per 24 hour period per ASTM F1869 or when the concrete substrate's relative humidity internally exceeds 75% per ASTM F2170.

Architects, designers and engineers can now specify the commercial flooring product (carpet, tile, vinyl and wood) of their choice on top of VaporControl Primer 100 and be assured that it will not fail when subjected to moisture vapor emission up to 15 pounds.

VaporControl Primer 100 and approved commercially available flooring products are warranted for ten years to resist delamination failure from MVT at values up to 15 pounds per ASTM F1869 and relative humidity up to 89% per ASTM F2170. Use VaporControl 100 Primer under approved Dex-O-Tex Systems and commercially available carpet, epoxy, terrazzo, tile, urethane, vinyl and wood flooring.

Request complete supplemental warranty information from Crossfield Products Corp.

VaporControl Permeable Systems

The Scientifically Superior permeable (breathing) Cheminert VP Self-Leveling, Cheminert VP Troweled and Cheminert VP Terrazzo should be used when MVER (moisture vapor emission rates) exceed 3.0 pounds per 1000 sq. ft. per 24 hour period per ASTM F1869 or when the concrete substrate's relative humidity internally exceeds 75% per ASTM F2170.

Cheminert VP Systems are warranted for five years to resist delamination failure from MVT at values up to 10 pounds per ASTM F1869 and relative humidity up to 85% per ASTM F2170.

UV Resistance

Unlike other epoxy flooring systems, Cheminert VP Systems are ideal for indoor and outdoor (non-freeze-thaw environments) use, since they are vapor permeable and ultra-violet light degradation resistant.

VaporControl™ Primer 100 Impermeable, Non-breathable	**VaporControl** **Cheminert VP Self-Leveling** **Cheminert VP Troweled** Permeable, Breathable	**VaporControl** **Cheminert VP Terrazzo** Permeable, Breathable
Eliminates effects of moisture vapor emissions. Can be applied over concrete that is not fully cured.	Can be applied over concrete that is not fully cured.	Can be applied over concrete that is not fully cured.
Can be applied over on grade concrete that is emitting moisture vapor up to 15.0 lbs. or less per 1,000 sq. ft. per 24 hours per ASTM F1869 or emitting 89% relative humidity per ASTM F2170.	Can be applied over on grade concrete that is emitting moisture vapor up to 10.0 lbs. or less per 1,000 sq. ft. per 24 hours per ASTM F1869 or emitting 85% relative humidity per ASTM F2170.	Can be applied over on grade concrete that is emitting moisture vapor up to 10.0 lbs or less per 1,000 sq. ft. per 24 hours per ASTM F1869 or emitting 85% relative humidity per ASTM F2170.
Installation at minimum profile of 14 mils (about double the thickness of conventional epoxy primers).	Installs easily and rapidly with excellent handling characteristics.	Installs easily and rapidly with excellent trowelability characteristics.
High compressive, flexural and tensile strengths.	Increased UV stability makes it less prone to UV attack when compared to most other epoxy systems and is ideal for use outdoors or indoors, in non-freeze-thaw environments.	Increased UV stability makes it less prone to UV attack when compared to conventional epoxy terrazzo systems and is ideal for use outdoors or indoors in non-freeze-thaw environments.
Environmentally friendly, zero VOC, low odor during placement and cure.	Environmentally friendly, zero VOC, low odor during placement and cure.	Environmentally friendly, zero VOC, low odor during placement and cure.
Can be applied at temperatures down to 40°F (4°C).	Can be applied at temperatures down to 40°F (4°C).	Can be applied at temperatures down to 40°F (4°C).
Installed only by Professional Factory Trained Dex-O-Tex Contractors.	Installed only by Professional Factory Trained Dex-O-Tex Contractors.	Installed only by Professional Factory Trained Dex-O-Tex Contractors.

Understanding Dex-O-Tex VaporControl Solutions

Dex-O-Tex SYSTEM DESCRIPTION	METHOD OF APPLICATION	MAXIMUM RECOMMENDED POUNDS OF MOISTURE VAPOR EMISSION RATE WHEN TESTED IN ACCORDANCE WITH ASTM F1869 OR MAXIMUM RELATIVE HUMIDITY RATES PER ASTM F2170										System Over VaporControl Primer 100	
System	***Application**	**3 lbs**	**75%**	**4.5 lbs**	**76%**	**6 lbs**	**78%**	**8 lbs**	**80%**	**10 lbs**	**85%**	**15 lbs**	**89%**
Aero-Flor II & III	C	X										X	
Chem-Rez N	T/PT			X								X	
Cheminert CFS	S/B	X										X	
Cheminert HD Slurry	S	X										X	
Cheminert IC	S	X										X	
Cheminert K	T/PT			X								X	
Cheminert L	S	X										X	
Cheminert SC Membrane	M/C	X										X	
Cheminert Terrazzo	T/PT	X										X	
Cheminert VP Self-Leveling	S									X		n/a	
Cheminert VP Troweled	T									X		n/a	
Cheminert VP Terrazzo	T/PT									X		n/a	
Colorflake L	B	X										X	
Conductive Cheminert K	T/PT	X										X	
Decor-Flor Broadcast	B	X										X	
Decor-Flor Troweled	T/PT	X										X	
Dex-O-Cote (All Systems)	C/B/S/SB/T	X										X	
Quik-Glaze	C		X									X	
Elastatex 500	C	X										X	
Electro-Flor 100 CD	C	X										X	
Electro-Flor 100 SD	C	X										X	
Electro-Flor CRU CD	C	X										X	
Electro-Flor CRU SD	C	X										X	
Posi-Tred CR	C	X										X	
Posi-Tred O	C	X										X	
Tek-Crete SL	S					X						n/a	
Tek-Crete SL CQ & SL B	S/SB					X						n/a	
Tek-Crete TT	T/PT							X				n/a	
Terracolor	T/PT	X										X	
VaporControl Primer 100	C											X	
Other Surfacings (Contact Crossfield Products Corp. for Additional Information)													
Carpet (Adhesive Bonded)		X										X	
Ceramic Tile Grout Bed		Depends on mortar composition (cement, epoxy, furan, latex)										X	
Vinyl (Adhesive Bonded)		X										X	
Wood (Adhesive Bonded)		X										X	

*** Method of Application Key**
C = Coating, B = Broadcast, M = Membrane, S = Slurry, S/B = Slurry/Broadcast, T = Trowel, PT = Power Trowel

Ten Year Warranty (Abridged)

VaporControl Primer 100 Limited Supplemental Warranty

Crossfield Products Corporation (CPC) warrants VaporControl Primer 100 (as well as the pre-approved flooring systems placed above it, including wood, urethane, tile, epoxy, carpet, adhesives, etc.) for a duration of ten (10) years from failing due to moisture vapor pressure, when installed in compliance with the published guidelines by a Dex-O-Tex Factory Trained Applicator.

The term "fail" or "failure" as used herein shall mean the loss of adhesion to the properly prepared concrete substrate when exposed to MVER levels up to, and including, 15 lbs per 1000 sq. ft./24 hours, as measured in accordance with ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride requirements.

In the event a moisture-vapor induced failure occurs this supplemental warranty shall be limited to the repair, removal and/or replacement of the failed area(s) only, including labor and materials in connection with such corrective measures, provided that such cost for any repair, removal and/or replacement of the failed area(s) shall not exceed the proportionate amount of the original purchase price of both systems as originally installed that such failed area bears to the entire area of the installation.

See the Complete and Unabridged VaporControl Primer 100 Limited Supplemental Warrant for Extent of Warranty, which in all events, supercedes this Abridged Warranty.

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