REDDUCING MOISTURE VAPOR EMISSIONS IN CONCRETE CONSTRUCTION

A FACT-BASED GUIDE ON MOISTURE VAPOR PROTECTION

MAXXON® MVP
Moisture Vapor Protection

MAXXON® DPM
Damp Proof Membrane
Moisture vapor is a hot topic in any type of construction where you have concrete on, above, or below grade. Moisture vapor emissions through a concrete slab in any building can contribute to costly floor good failures, down time, and slow construction schedules.

Over the past 20 years, the frequency of moisture vapor emission issues has increased. Several contributing factors include:

- The loss of asbestos as an ingredient in resilient flooring
- The loss of solvents from adhesive and coating systems
- Increased use of water for easier placement of structural and lightweight concrete
- Fast track construction schedules

High pH (alkalinity) can be extremely detrimental to latex-based adhesives as well. Moisture vapor moving through the concrete to the surface will accumulate at the bond line between adhered flooring material and the concrete. The combination of moisture and salts present in the concrete combine to create a high pH environment. The high pH condensate begins to break down the water-based adhesive, resulting in a floor good failure.
In order to address the prevalence of floor good failures relating to inadequate moisture vapor barriers, ASTM Committee F06 on Resilient Floor Coverings developed and approved ASTM F3010-13 – “Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings”.

This new standard applies specifically to two-component, resin-based moisture mitigation systems. It discusses the application of these moisture vapor barriers over concrete floors with high moisture content. ASTM F3010-13 also discusses the properties and performance requirements of these products prior to installation of resilient floor coverings.

In order to meet ASTM F3010-13 these products need to meet the following criteria:

1. Reduce moisture transmission to no more than 0.1 perm.
2. Must define perm as grains/hr/ft²/in•Hg.
3. Manufacturer must specify mil thickness required to meet the 0.1 perm rating.
4. Products must be tested in accordance with ASTM E96.

ASTM F3010-13 does not cover the following membrane-forming and non-membrane-forming moisture mitigation systems:

- Systems that chemically react with any component of the concrete forming a gel or crystalline substance within the concrete
- Penetrating, water- or solvent-based compounds forming a discontinuous membrane on the concrete surface
- Water-based membrane-forming systems

Gym floor failure due to moisture vapor emissions.

Treatment with surface applied moisture vapor barrier will help protect the new gym floor.
BREACHABLE

Rocks, shoes, wire, rebar, heavy equipment, etc. can cause tears and holes, compromising the barrier.

DELAYED VAPOR RELEASE

While the below-slab system prevents ground moisture from coming through the slab, this system does nothing to reduce moisture vapor emissions from new concrete which often releases moisture months after installation.

DOES NOT ADDRESS pH LEVELS

Because the barrier is under the slab, it does nothing to address pH levels in the concrete itself.

PRECIPITATION RESETS DRYING TIME

Concrete slabs take approximately 30 days per 1" of concrete under ideal conditions to reach acceptable moisture levels for installation of floor goods. If the slab is further exposed to precipitation, the clock resets.
SURFACE-APPLIED MOISTURE VAPOR BARRIERS

COMPLETE COVERAGE

Cannot be torn, resulting in complete, durable coverage.

REDUCES MOISTURE VAPOR FROM ALL MATERIALS

Because the barrier is applied to the top of the concrete, it stops moisture vapor emissions from concrete, ground and environmental conditions.

PROVIDES A pH BARRIER

Not affected by pH and does not allow alkalines to concentrate at the new bond layer.

VERIFIED INDEPENDENT TESTING

Meets ASTM F3010, which requires a perm rating of no greater than 0.1 grains/hr/ft²/in•Hg. Verify manufacturer’s required mil thickness to achieve perm rating.
BREATHABLE

Allows moisture to penetrate slab.

ADHESIVE MANUFACTURERS REQUIRE REMOVAL

Adhesives will not bond to penetrants/silicates.

ONLY LOWERS pH ASSOCIATED WITH CALCIUM HYDROXIDE

pH levels associated with sodium hydroxide and potassium hydroxide remain.

LIMITED INDEPENDENT TESTING

Does not meet ASTM F3010 perm rating. ASTM F3010 now requires a perm rating of no greater than 0.1 grains/hr/ft²/in•Hg (0.1 perm).

NOT SPECIFICALLY DESIGNED FOR THIS APPLICATION

Originally designed for exposed concrete, moisture vapor emissions is secondary use.
SURFACE-APPLIED MOISTURE VAPOR BARRIERS

HIGHEST MOISTURE VAPOR REDUCTION CAPABILITIES

Can reduce MVER rates of up to 25 lbs to 3 lbs or less, tested using a Calcium Chloride test.

EASILY APPLIED

Installation is permanent and application on most jobs is finished within a few hours.

BEST RESISTANCE TO ALKALINITY UP TO pH 14

Offers protection from the high pH levels associated with adhesive failures due to moisture vapor emissions.

VERIFIED INDEPENDENT TESTING

Meets ASTM F3010, which requires a perm rating of no greater than 0.1 grains/hr/ft²/in•Hg. Verify manufacturer’s required mil thickness to achieve perm rating.

FORMULATIONS DESIGNED FOR MOISTURE MITIGATION

Product was developed for the application, resulting in greater success.
DISPERSGIVE MEMBRANES

MATS CAN ONLY BE USED WITH CERTAIN FLOORING SYSTEMS

The flexible nature of the mats limits floor good choices.

NOT CONDUCIVE TO HEAVY TRAFFIC

Since the mats are pliable, they cannot withstand heavy traffic/point loads.

POTENTIAL FOR BACTERIAL GROWTH

Moisture can condense on organic material left on the concrete presenting the potential for bacterial growth.

MEDIUM pH RESISTANCE

Chemical reactions between moisture and elements in concrete create high pH environments.

VERY LITTLE INDEPENDENT TESTING

Does not meet ASTM F3010 perm rating. ASTM F3010 now requires a perm rating of no greater than 0.1 grains/hr/ft²/in•Hg (0.1 perm).

ADDS THICKNESS TO THE FLOOR

This system adds thickness to the floor before any floor goods are installed.
SURFACE-APPLIED MOISTURE VAPOR BARRIERS

FOR USE WITH ANY FLOOR GOODS
Design possibilities are not limited by flooring compatibility when paired with an underlayment system.

CAN WITHSTAND HEAVY TRAFFIC
A solid surface that can withstand most traffic.

NO POTENTIAL FOR BACTERIAL GROWTH
Materials provide no source for bacterial growth.

BEST RESISTANCE TO ALKALINITY UP TO pH 14
Offers protection from the high pH levels associated with adhesive failures due to moisture vapor emissions.

VERIFIED INDEPENDENT TESTING
Meets ASTM F3010, which requires a perm rating of no greater than 0.1 grains/hr/ft²/in•Hg. Verify manufacturer’s required mil thickness to achieve perm rating.

NO ADDED FLOOR HEIGHT
Surface applied moisture vapor barriers do not add thickness to the overall floor height.
DEHUMIDIFICATION

Moisture released through Dehumidification

Commercial Dehumidifier

Concrete

ONLY ADDRESSES MOISTURE IN THE TOP OF THE SLAB

Moisture can exist throughout slab, not only the top.

MAY OR MAY NOT BE SUCCESSFUL

There is no test data/guarantee it will work as a permanent solution.

NO PREDETERMINED SCHEDULE

No idea how long moisture reduction process can take.

NO EXTENDED WARRANTY

Since it only addresses the symptom, not the source, moisture may reappear.

CANNOT BE USED ON NEW CONCRETE

Accelerates drying which can cause cracking, curling and physical property loss.
SURFACE-APPLIED MOISTURE VAPOR BARRIERS

MITIGATES MOISTURE VAPOR EMISSIONS

Since it creates a barrier, moisture vapor emissions are reduced significantly.

PROVEN SOLUTION

Proven on projects with a variety of applications throughout North America and backed by independent lab testing.

SCHEDULED PROGRAM

Construction schedules stay on track with an installation schedule.

WARRANTIED SYSTEM

Backed by manufacturer’s warranty.

NEW OR OLD CONSTRUCTION

Can be used in new construction, including 5 days after concrete installation.
Maxxon® Corporation now offers Maxxon® DPM (Damp Proof Membrane) and Maxxon® MVP (Moisture Vapor Protection), surface applied moisture vapor barriers that prevent the passage of moisture vapor through slabs on, below or above grade.

Maxxon DPM and Maxxon MVP reduce moisture vapor emissions of up to 25 lbs. to 3 lbs. or less and provide a high alkalinity barrier (up to pH 14), preventing the delamination of adhesives, floor coverings and coatings. Maxxon DPM also prevents capillary infiltration of oil or other chemicals from the ground and can be used to treat oil contaminated slabs.

Maxxon DPM and Maxxon MVP install quickly and are ready to receive an approved Maxxon Underlayment the day after installation. Ideal for old buildings without a vapor barrier or new buildings, covering even five-day-old concrete:

- Industrial/retail facilities
- Hospitals and schools
- Gym floors
- Office buildings
- Residential slabs
- Food processing plants

When Maxxon DPM/Maxxon MVP is topped with a Maxxon Underlayment,* the system offers a single source warranty — our assurance to you that in the unlikely event issues should arise, we will stand behind the entire system.

*Must be installed to required mil thickness according to manufacturer’s recommended yield necessary to meet ASTM F3010 perm rating.