



The Leaders in Integral Concrete Protection

# Vapor Lock™ 20/20

MVRA - MOISTURE VAPOR REDUCING ADMIXTURE

- For Warranted & Insured Flooring, Roofing & Architectural Coatings



03 00 00 - CONCRETE

03 05 13 - CONCRETE MOISTURE VAPOR REDUCING ADMIXTURE

09 00 00 - FINISHES

09 65 13 - MVRA WARRANTY & INSURANCE

## Product Description

Vapor Lock is a clear liquid concrete admixture that works as a pozzolan in Portland cement-based concrete to produce relatively large amounts of additional calcium silicate hydrate (c-s-h) gel within the first 7 - 10 days. Vapor Lock provides a permanent capillary break within concrete; down to a warranted and insurable level, less than 0.174 US Perms (usually in the 0.02 US Perm range). It is the Best, Fastest and Least Expensive way to :

- Maintain all Critical Paths involving Flooring, Roofing, and Architectural Coatings - on slabs, walls, and roofs, **ELIMINATING THE POSSIBILITY OF FAILED ADHESIVES & COATINGS!**
- Guarantee pristine Indoor Air Quality and Moisture Control inside a building; **ELIMINATING ATMOSPHERIC CORROSION OF COMPUTER BOARDS** and "Sweating Slab Syndrome".
- Provide Ultra Low Permeability and Shrinkage Reduction concrete.



## Product Advantages

Vapor Lock uses naturally occurring elements within concrete and does not add any harsh or foreign chemicals to the concrete mix. It is the most effective, and fast-acting Porosity Inhibiting and Densifying admixture available today. It does **NOT**:

- Add any harsh or expansive components, nor dangerous chemicals that change the surface tension of water,
- Require mid/high range water reducers or difficult low water:cement ratio mix design restrictions,
- Change the set or physical characteristics of the mix. (i.e. lower compressive strengths, retard set, etc.)

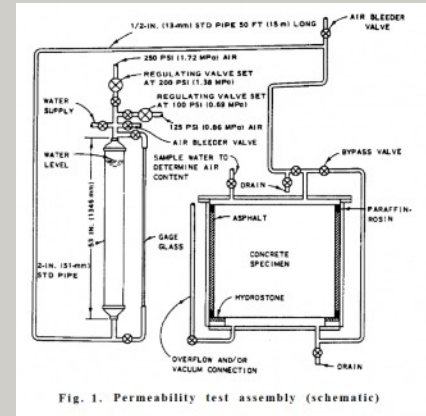


- affords the opportunity to design any and every kind of floor covering imaginable, while eliminating the worry and expense that accompany normal construction and installations.

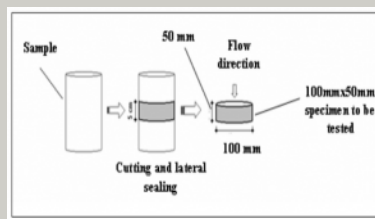
# Protocol 1 ~ Permeance vs. Permeability

For years we've searched for the most accurate and practical measure of a concrete's ability to withstand water and deleterious material passing through it; either as an effective barrier around steel or as a *water resistant* barrier protecting what's inside. The crystal growth industry uses older Army Corp protocols like CRD-C48 and marginal "sorptive" protocols that condition specimens using boiling water and asphalt ignition ovens.

We have hung our hat on ASTM D8084 - Coefficient of Permeability. A repeatable, qualitative 23-page protocol that measures water movement in centimeters per second. A very small number, then multiplied by a constant, gives us easy to compare US Perm rating.

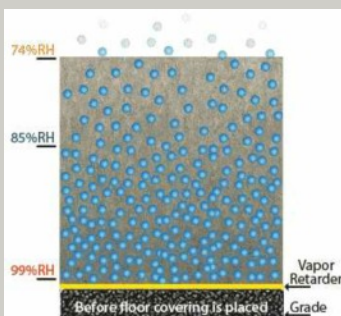


Army Corp. Apparatus, circa 1992



Coefficient of Permeability (which is actually measuring concrete *permeance*) allows for about 6 different ways to take a falling head pressure reading of the ability of water to move through concrete. 2" by 4" samples conveniently come from 4"x 8" cylinders, epoxied around the sides, and water is forced from one end to the other by pressure, over 6 hours.

**Vapor Lock™ 20/20** is Warranted and Insured  
to have a permeance no higher than 0.174 US Perms or ( $1 \times 10^{-8}$  cm/sec.)



Back story - since 2002, when the inventories of solvent-based adhesives ran out, water-based adhesives proved to be much more susceptible to the least bit of moisture, in the form of vapor (from within the concrete itself, and/or from the earth below). The norm now, is using a Class A vapor retarder (properly aged and tested per ACI) to act as a barrier, with concrete being placed directly on top of it. Allowing the one-way movement of water from curing/hydrating/drying (3 distinct processes) to leave the concrete matrix. The flooring and adhesive manufacturer have sung in chorus, first, calcium chloride, and more recently, in-situ RH. Neither take into account any remaining

moisture (in the middle and bottom of the slab) that quickly redistributes and fouls flooring, roofing, architectural coatings and indoor air quality.

Contrary to years of preaching and holly recital, these are merely *recommendations*....and **NEVER** lead to a **warranty**.

Inversely, Vapor Lock can never be miss-installed and always ends with a 10-Year Plus, substantial 15 Million dollar 3<sup>rd</sup> Party Insurance.

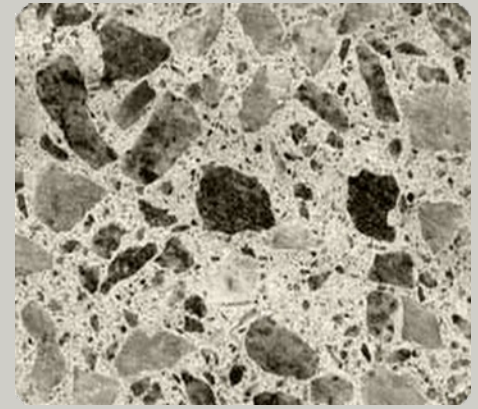




## Protocol 2 ~ Surface Penetration

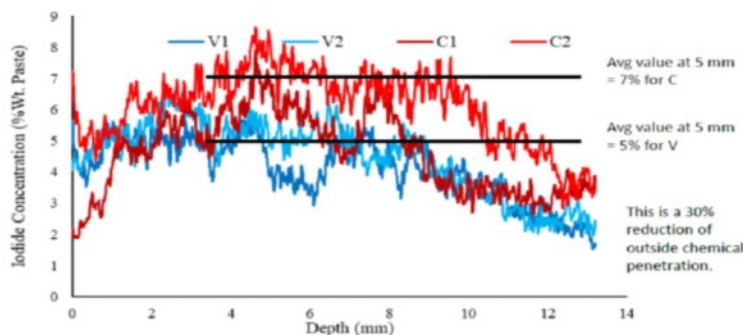
Another bellwether practice is **ASTM C1152 - Standard Test Method for Acid-Soluble Chloride in Mortar and Concrete**. Slowly grind away layers of concrete, processing the dust by boiling/drying and measuring chlorides.

We've found a superior modification - **Nano X-Ray Fluorescence, Depth of Saturation Testing**. Potassium Iodide solution penetrating surface of concrete specimen, while taking periodic X-Rays. Below are the results of a 4,500 psi, 1" mix; control and Vapor Lock enhanced samples.



### Overall Comparison

Concentration profiles of all the samples after 10 days of ponding.

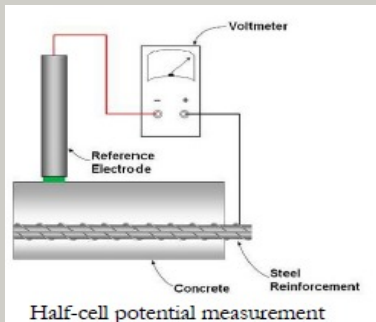


### Summary

- Two cores were tested from each cylinder.
- Both cores showed good agreement with each other for sample C and V.
- There is a 30% reduction at 10 days of exposure for sample V when compared to C. Similar results were found at 5 days of exposure.

**RESULTS** - Relatively High Performance mixes tested at 75-85 days - **Vapor Lock showed a 30% reduction in penetration.**

## Protocol 3 ~ Bulk Resistivity



To test the "transport" potential of a concrete specimen, we look towards **ASTM C876 – Standard Test Method for Corrosion Potentials of Uncoated Reinforcing Steel in Concrete; also known as AASHTO T259**. In cracked beam specimens, containing 3 pieces of #4 rebar (in a standing triangle pattern), reservoirs are filled weekly with 20% sodium chloride, and a wetting/drying pattern is set. Chloride corrosion is certain and sudden. A Half-Cell device (a voltmeter connected to the top rebar, and continued by a cooper-sulfate electrode. The falling (negative) millivolts are measured periodically. The corresponding results are based against the Corrosion Potential chart.

Measured Potential (mV/CSE)	Probability of Steel Corrosion Activity
> -200	Less than 10%
-200 to -350	Uncertain
< -350	More than 90%

**Vapor Lock showed a 35.4% improvement over the control mix, and 32.7% improvement over the calcium nitrite mix; both at 120 days.**

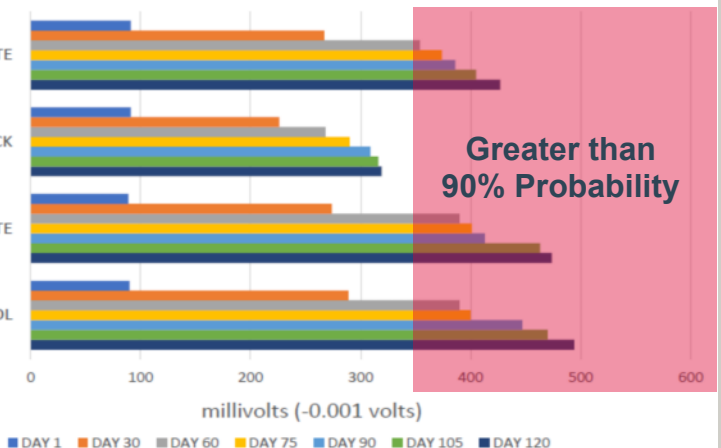
### CORROSION POTENTIAL

CRYSTAL GROWTH CONCENTRATE

VAPOR LOCK

CALCIUM NITRITE

CONTROL



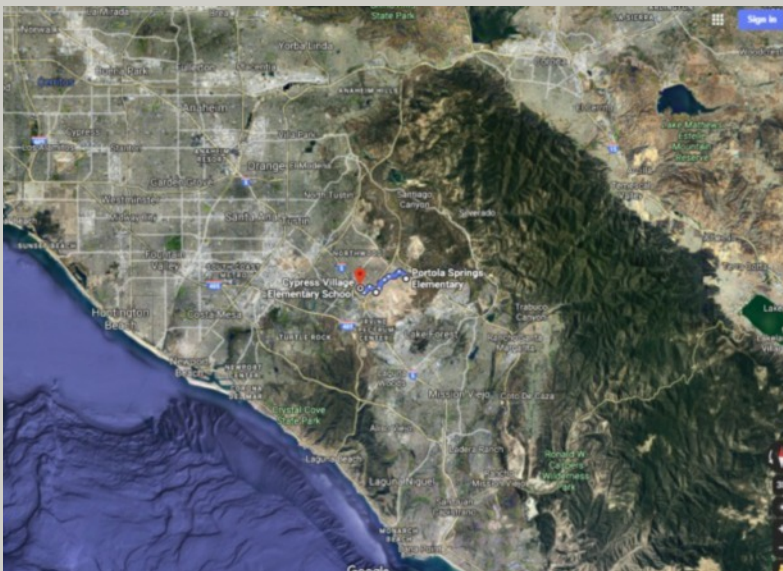
*Vapor Lock 20/20 can be budgeted at the eleven cents (\$0.11) a sq.ft., per inch of concrete thickness, installed, range for owners and developers. It is sold as part of your concrete mix design by all commercial ready-mix producers throughout North America. It is a timely and economic answer to all indoor moisture/vapor related issues that manifest themselves through re-emulsifying adhesives to mold and fouled indoor air quality.*



## CASE STUDY

CW Driver, a well-known, quality General Contractor in the Southern California marketplace had opportunity to use Vapor Lock as part of their mix design offered by the project Architect on Cypress Village Elementary in 2013. They declined; as the vct and carpet tile flooring requirements seemed obtainable. Unfortunately, during the last month of construction, they had to spend \$7.00 a square foot to “topically remediate” to accommodate their flooring installations.

Fast forward almost a year later, faced with a similar Portola Springs Elementary, 4 miles away (similar soil hydraulics), they chose the Vapor Lock MVRA Insured & Warranted system; with the vapor retarder/barrier, just under \$1.00 a sq.ft., Installed. They felt the substantial third-party insurance (not by a manufacturer or distributor) by Lloyds of London at around \$16 Million (non-aggregate) and the flawless record was a prudent choice. We agreed.



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