



STOP CONCRETE COATING FAILURES ONCE AND FOR ALL.



THE MOST ADVANCED CONCRETE COLOR SYSTEM EVER.

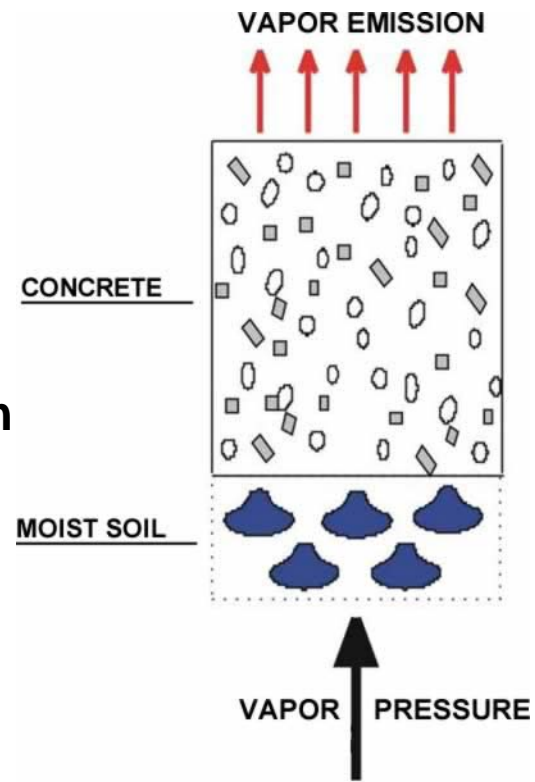




VAPORPROOFING

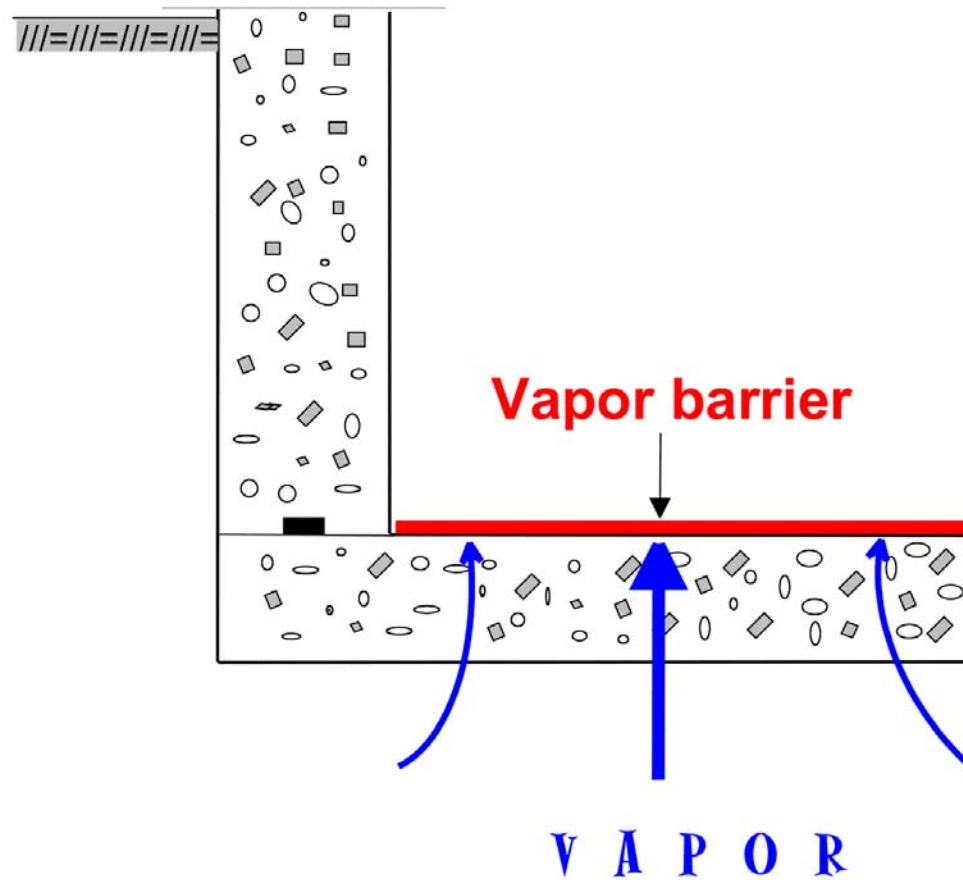
Is Preventing **WATER** IN **VAPOR FORM** From Passing Through Concrete or Concrete Masonry.

It is Defined as a MVER
Moisture Vapor Emission Rate
(“Vapor Pressure”), Measured in
lbs/1000 ft² per 24 hrs.





“NEGATIVE SIDE”, “SURFACE APPLIED” or “POST-INSTALLED” **VAPOR BARRIER**





WHY **VAPOR** PROBLEMS?

- **NEW BUILDING: With a Damaged Vapor Barrier or the Sand Fill was Subjected to a Water Event**

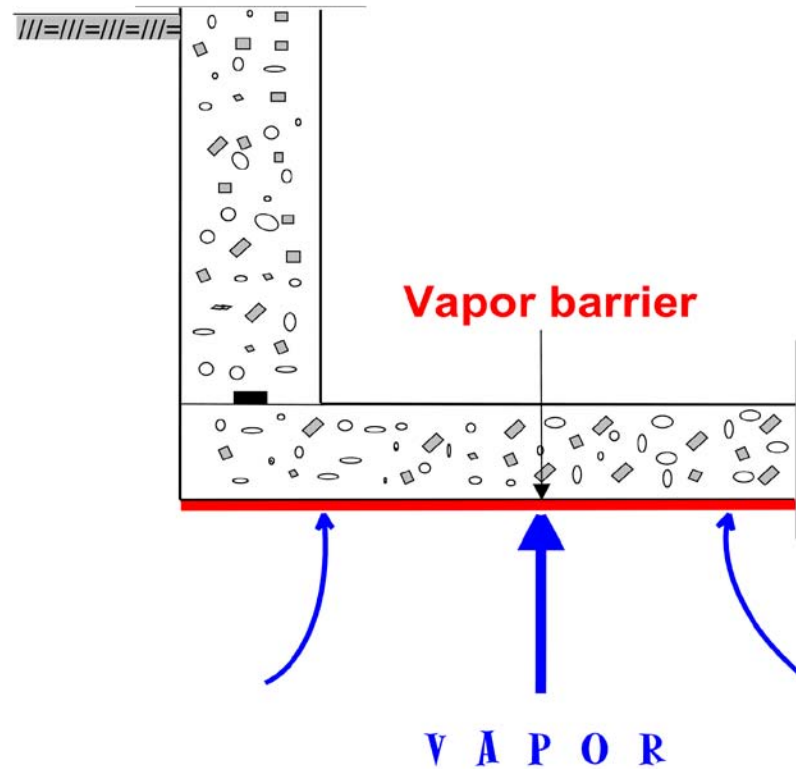


WHY **VAPOR** PROBLEMS?

- **NEW BUILDING:** With a Damaged Vapor Barrier or the Sand Fill was Subjected to a Water Event
- **OLD BUILDING:** Without a Vapor Barrier or Has a Vapor Barrier That is Deteriorated



POSITIVE SIDE **or** EXTERIOR INSTALLED VAPOR BARRIER



**Typical 6 to 12-mil Polyethylene Sheet or
Membrane Type Vapor/Moisture Barrier**



WHY **VAPOR** PROBLEMS?

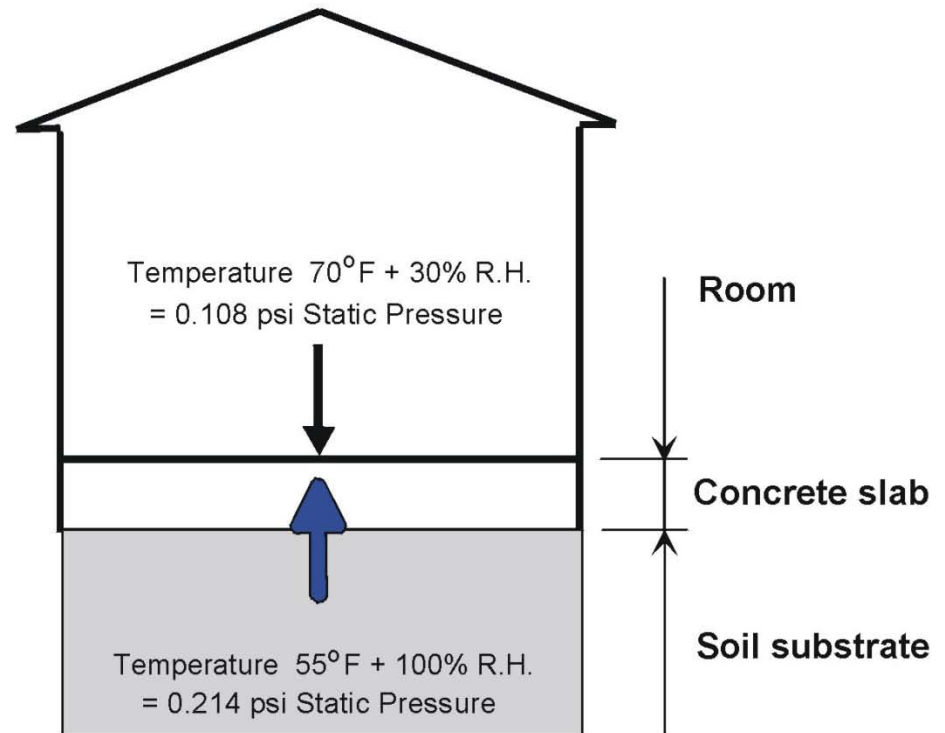
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- **FAST TRACK JOB:** No Time to Wait for Concrete to Fully Cure or Dry



Moisture Movement Through Slabs in Buildings

Result:

Moisture moves from lower temperature and high humidity to higher temperature and lower humidity



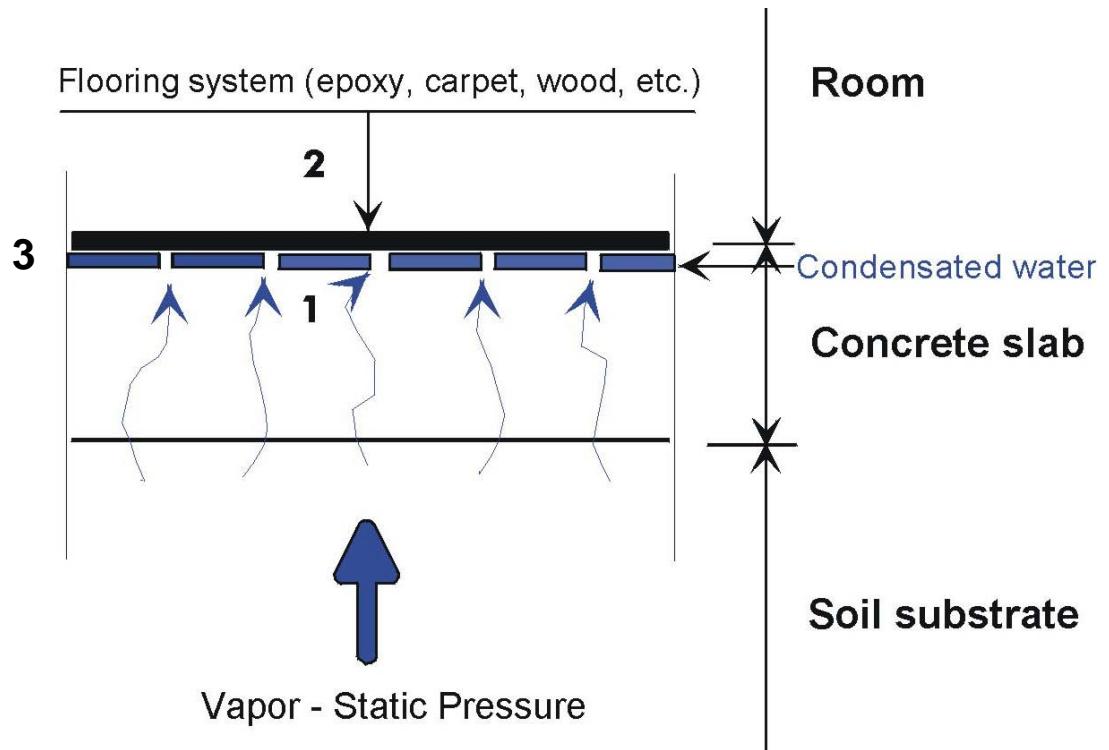
Data reference: U.S. Housing Authority

Note: VAPOR EMISSION Varies Throughout the Slab



Moisture Emission Condensates to Water Adversely Affecting Flooring System

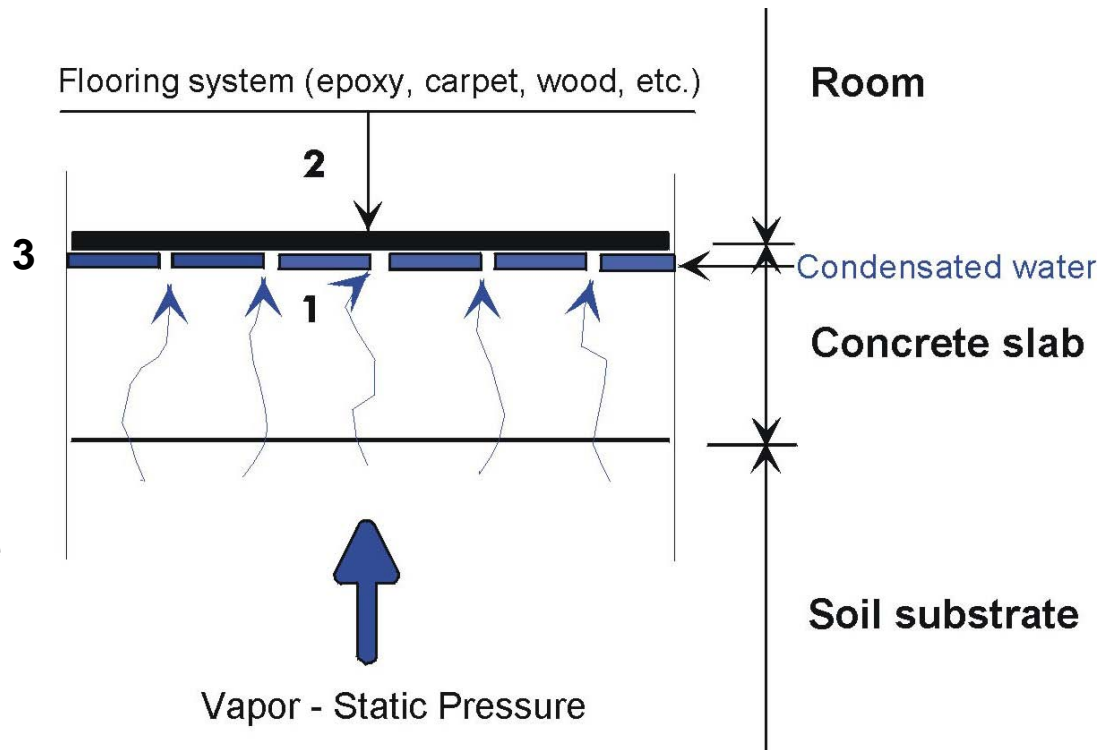
1. **Moisture vapor migrates through concrete**
2. **Flooring system = vapor barrier prevents moisture vapor from escaping**
3. **Results: Moisture vapor condensates to liquid (water) and reduces adhesion of flooring system. Liquid has high alkaline content in pore water (pH 13)**





Moisture Emission Also Transports Minerals (salts) Through Slabs

1. **Moisture Vapor Transports Minerals (salts) From Within the Concrete to the Surface.**
2. **Flooring System Acting as a Vapor Barrier Prevents Moisture Vapor From Escaping.**
3. **Results: Where Alkali Aggregate is Present, it Reacts With the Condensed Water and Minerals in the Cement Paste to Create an Alkali Silicate Reaction (ASR), Which Can Destroy the Concrete Substrate. The Resulting Mineral Solution can also create Flooring System Failure!**





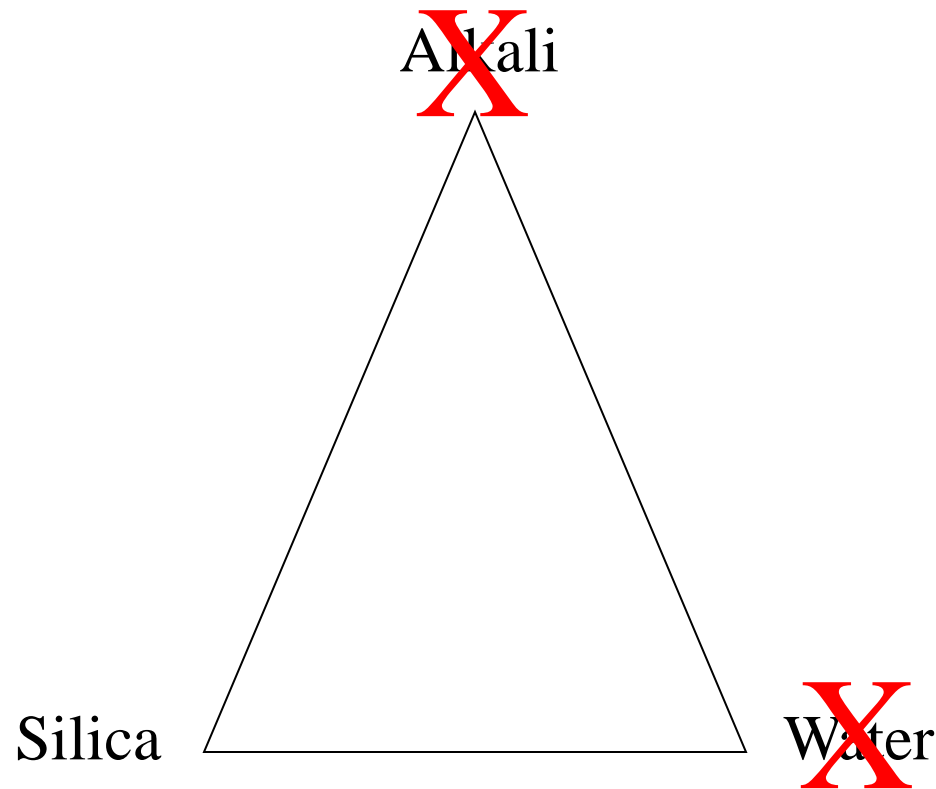
What is ASR?

- Alkali-Silica Reaction (ASR)
 - A chemical reaction which occurs between alkali, primarily Sodium and Potassium, and certain reactive types of Silica when moisture is introduced.



Elements of ASR

Eliminated by InnerSeal DPS and
InnerSeal Densi-Dye





Failure of VCT Adhesive Due to **Moisture Vapor** Emission



Photo courtesy of Construction Technology Laboratories, Inc."



Failure of Epoxy Coating Due to **Moisture Vapor** Emission





Failure of Epoxy Coating Due to **Moisture Vapor** Emission





How is **Moisture Vapor Emission** Measured?



**Typical Calcium Chloride
Test Kit**

- Moisture Vapor Transmission is Measured in LBS Per 1000 S.F. Per 24 Hours
- 3 to 5 LBS MVER is the Maximum Acceptable Condition for almost ANY Floor Covering!



Proper Test Procedures

ASTM 1869-04 Requires 3 Kits for the 1st 1000 S.F. Then 1 Kit for Each Additional 1000 S.F.





Measuring MVER

IMPORTANT!!!!

When Performing Calcium Chloride Tests:
Remember Readings Taken During One Season
Can and Do Differ from Test Performed in
Another Season Due to Environmental Changes

It Should Be Recorded When Test Were Performed
and the Resulting Impact on the Project Should
Also Be Considered!



WHEN A SURFACE APPLIED **VAPOR** BARRIER?

MVER (Moisture Vapor Emission Rate)

is

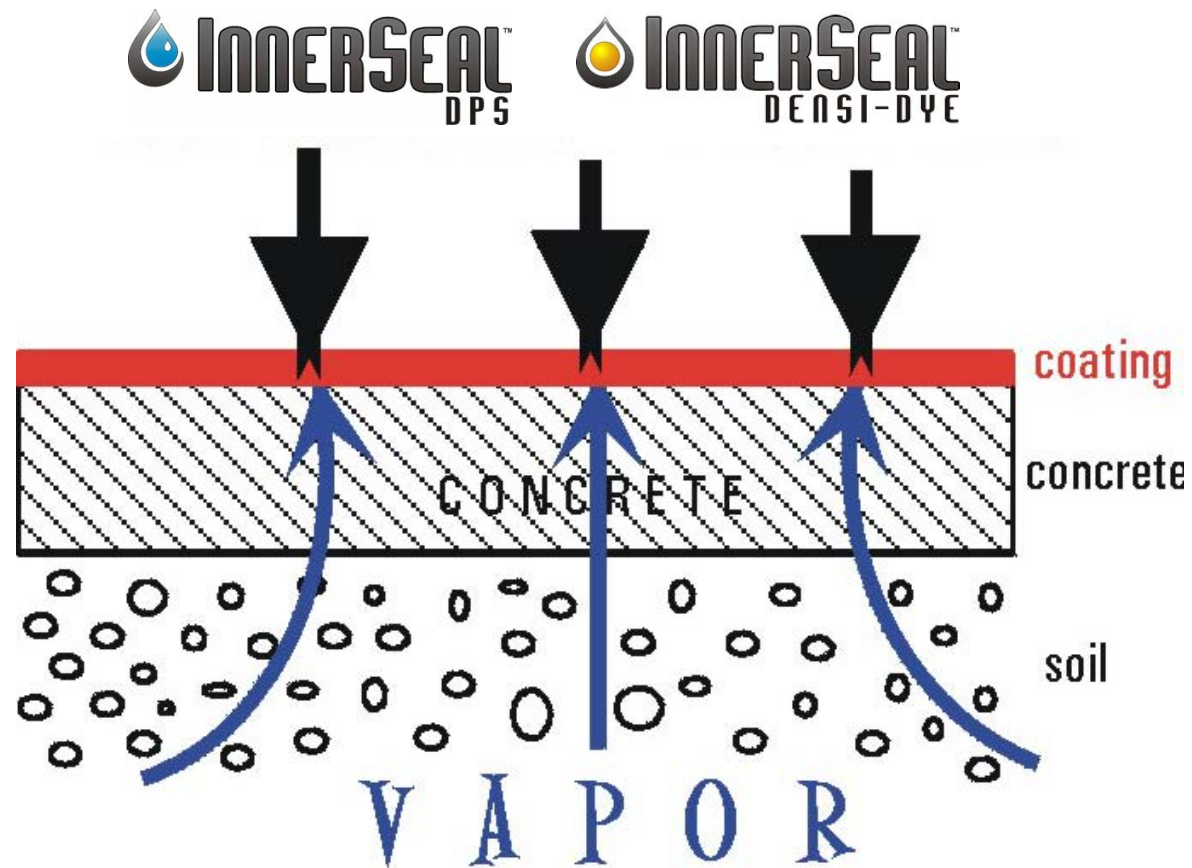
**Greater Than 3 or 5 lb/24 hr per 1000
SF**

(As Per Floor Covering or
Coating Manufacturer)

**WHY InnerSeal DPS or
InnerSeal Densi-Dye?**



InnerSeal Prevents De-Bonding of Flooring Systems and Coatings Due to High MVER



(1) Fast Turn-Around (2) Application Versatility



DEW POINT TEMPERATURE

Floor Coverings or Adhesives Should NOT be Installed Any Time the Air Temperature or if the Application Substrate Temperature is Within 5°F Above the Dew Point.

Does This Apply to InnerSeal DPS & InnerSeal Densi-Dye?



NO!!

InnerSeal is Formulated to
be Applied Over **Damp**
Concrete Surfaces



pH

- Typical pH of **Fresh** Concrete is 12 to 13
- Typical pH of **Aged** Concrete is 8 to 10
- **A pH Above 9 Will Cause Failure of Most Flooring Adhesives and Epoxies**

**DOES THIS AFFECT InnerSeal
DPS & InnerSeal Densi-Dye?**



NO!!

InnerSeal is Formulated for
Application Over Substrates With High
pH Levels of **13 or 14**



After Curing/Hardening **InnerSeal** has
a **pH Rating of 7 to 8** Making it Safe
for Flooring Adhesives and **pH**
Sensitive Flooring Systems



CARBONATION

- Airborne CO₂ Reacts With Hydrated Cement When Moisture is Present and Can Reduce the pH of the Hardened Portland Cement Paste to pH of 8.3 or Lower
- The Reduced pH Concrete Can No Longer Protect the Reinforcement Steel From Corrosion
- Carbonation Also Densifies the Affected Areas Preventing Many Vapor Barriers from Bonding

DOES IT AFFECT InnerSeal DPS & InnerSeal Densi-Dye?



NO!!

If the Substrate is Properly Prepared (By Shot Blasting or Diamond Grinding) **InnerSeal Will Chemically and Mechanically Bond and Prevent Moisture Penetration Into the Substrate.
Arresting Further Carbonation**



Example of Various Flooring Systems Compatible With

- **Cementitious Underlayment**
- **Colored Quartz**
- **Carpet**
- **Epoxy**
- **Epoxy Terrazzo**
- **Linoleum**
- **Polyurea**
- **Synthetic/Rubber**
- **VCT**
- **Urethane**
- **Polyester**



Example of Various Floor Coatings

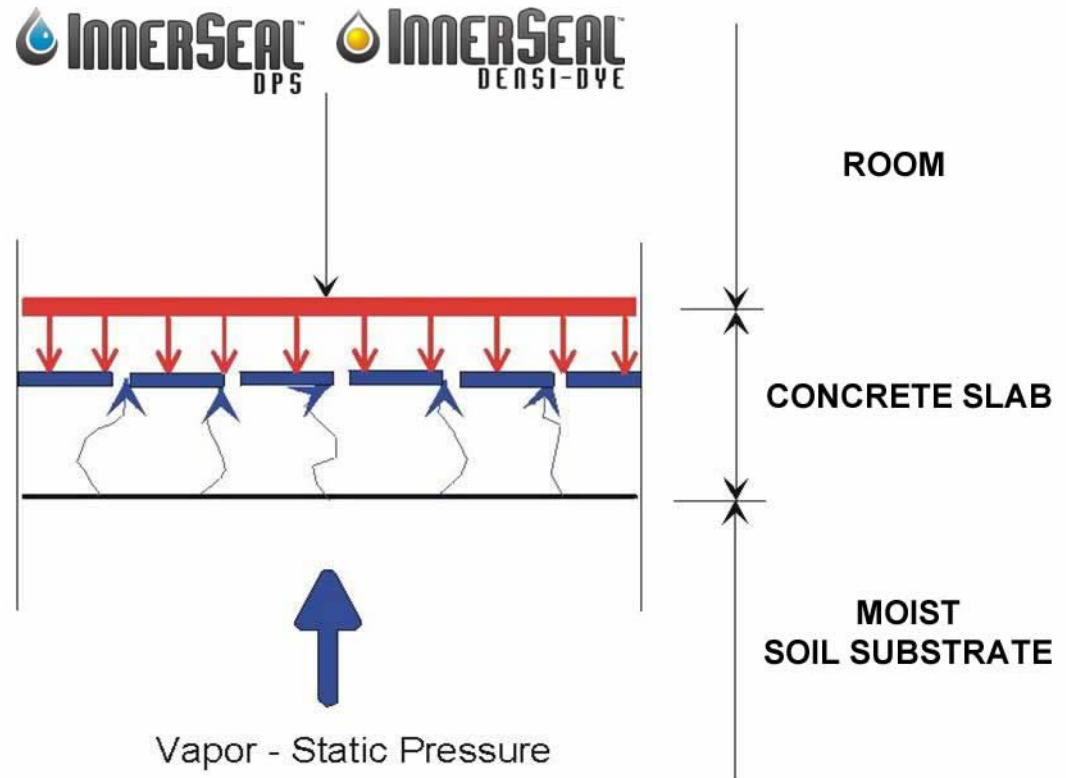
Compatible With  **INNERSEAL™**
DENSE-DYE

- Epoxy
- Polyurea
- Urethane
- Polyester



How InnerSeal Works

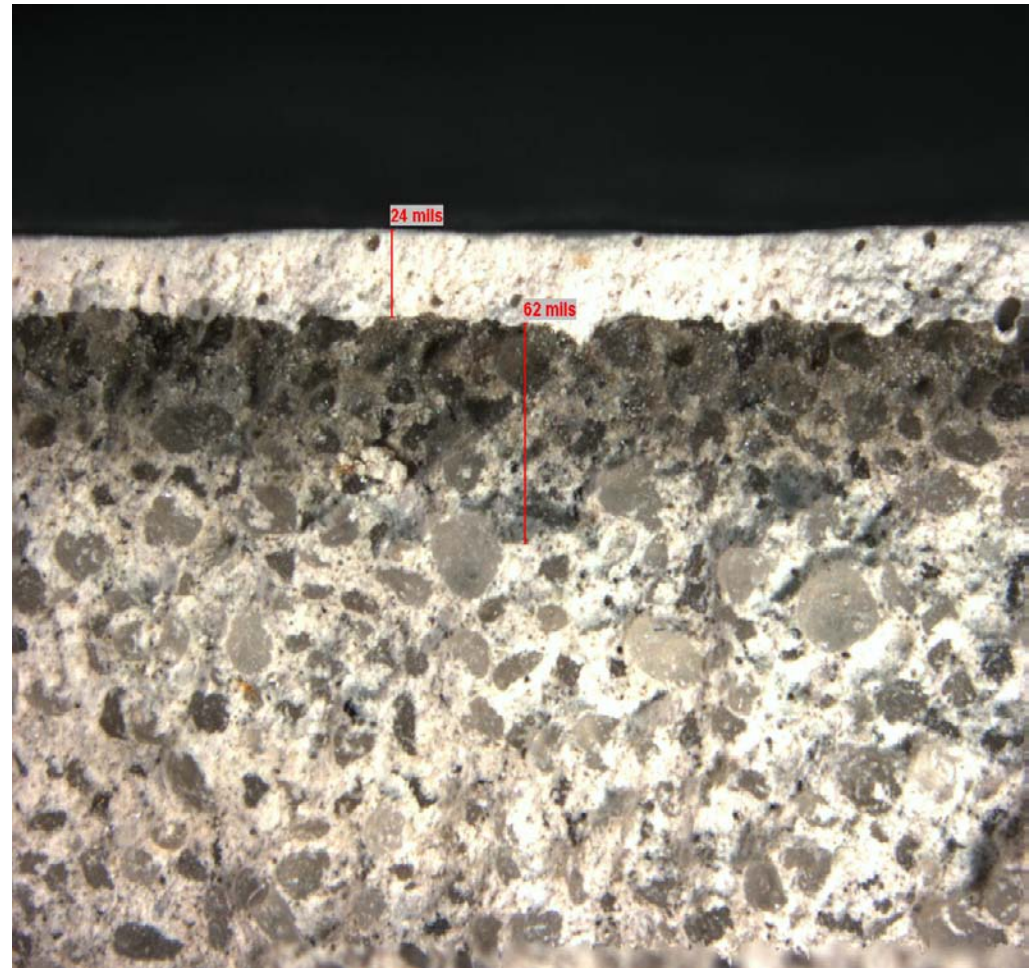
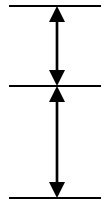
1. **InnerSeal** Deeply Penetrates Into Concrete
2. **InnerSeal** Reduces the MVER to Acceptable Levels
3. **Result:**
Moisture and Minerals Can No Longer Reach the Concrete Surface.
InnerSeal Protects the Coating or Flooring System from Attack





InnerSeal Penetration

Thickness
Penetration
will vary



Microscopy Showing Concrete Slab



Corrosion of Steel Reinforcement in Concrete





MCRI-1000

MIGRATORY CORROSION RUST INHIBITOR

Available in



REDUCES RUST AND CORROSION BY 70%



MCRI-1000

MIGRATORY CORROSION RUST INHIBITOR

Where To Use:

MCRI-1000 Is Recommended For:

- All reinforced, precast, prestressed, post-tensioned or marine concrete structure.
- Steel- Reinforced concrete bridges, highways, and streets exposed to corrosive environments (carbonation, deicing salts, and atmospheric attack).
- Parking decks, ramps, and garages.
- All reinforced marine concrete structures.
- Concrete piers, piles, pillars, pipe and utility poles.
- Restoration and repair of all reinforced concrete commercial and civil engineered structures.



MCRI-1000

MIGRATORY CORROSION RUST INHIBITOR

Advantages:

- Offers engineers, owners, contractors, DOT's and government agencies a time proven, corrosion inhibiting technology that will extend the life of all reinforced concrete structures.
- Protects against the harmful effects of corrosion even in the densest concrete.
- Does not affect the physical properties of the concrete.
- Required dosage is not affected by chloride concentration.
- Does not contain any calcium nitrite.
- Organic, safe and environmentally friendly.
- Lab and field tested.
- Protects both anodic and cathodic areas.
- Will migrate to adjacent areas to protect surrounding metals.
- Concentrated for cost effectiveness on all projects



How INNERSEAL DPS™ Works

Day 1





How INNERSEAL DPS™ Works

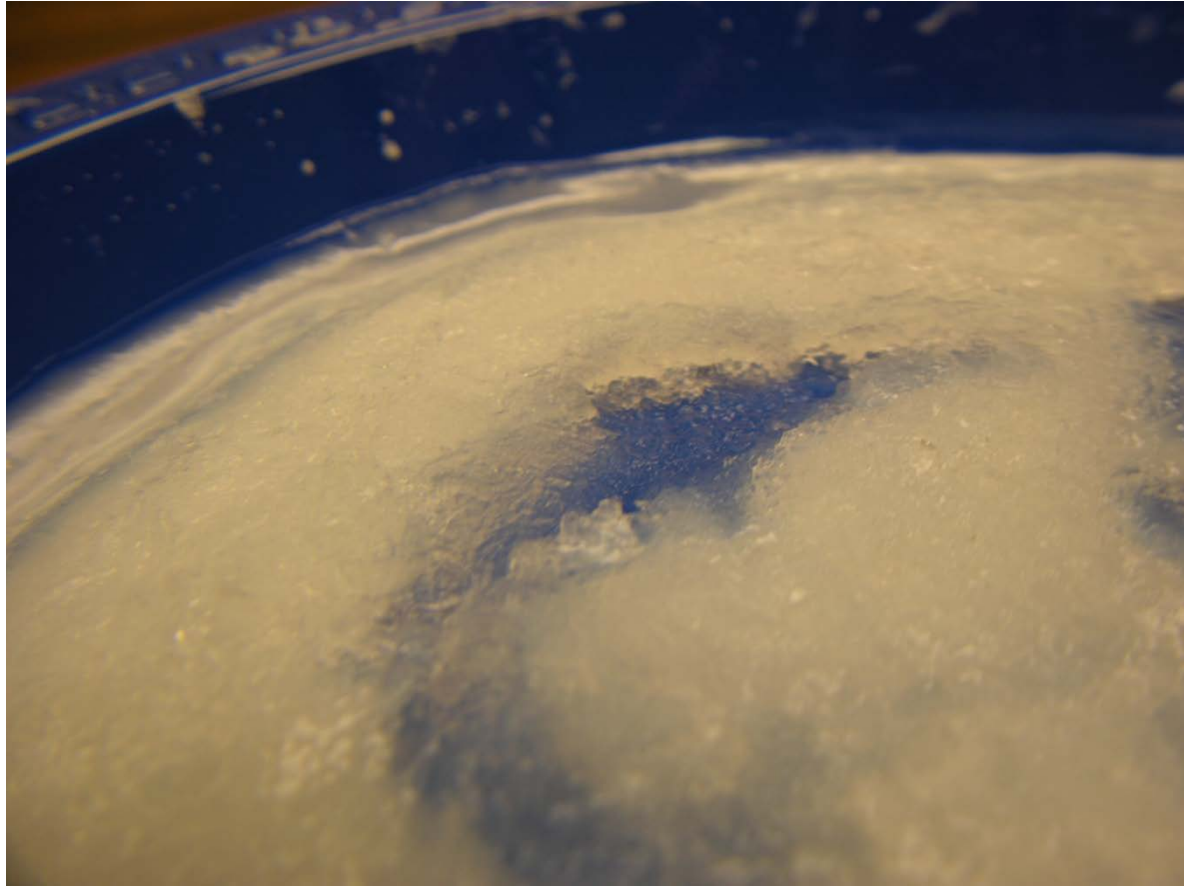
Day 2





How INNERSEAL DPS™ Works

Day 3





How INNERSEAL DPS™ Works

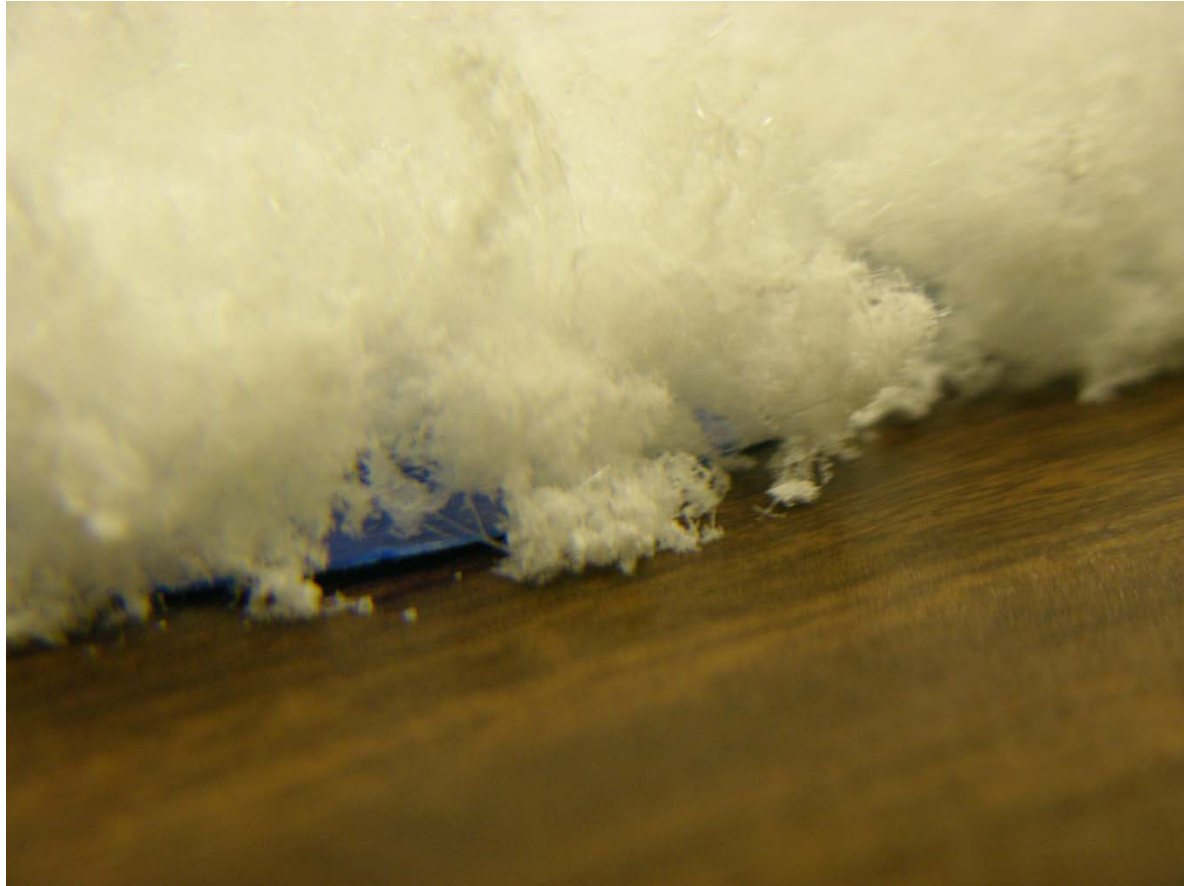
Day 4





How INNERSEAL DPS™ Works

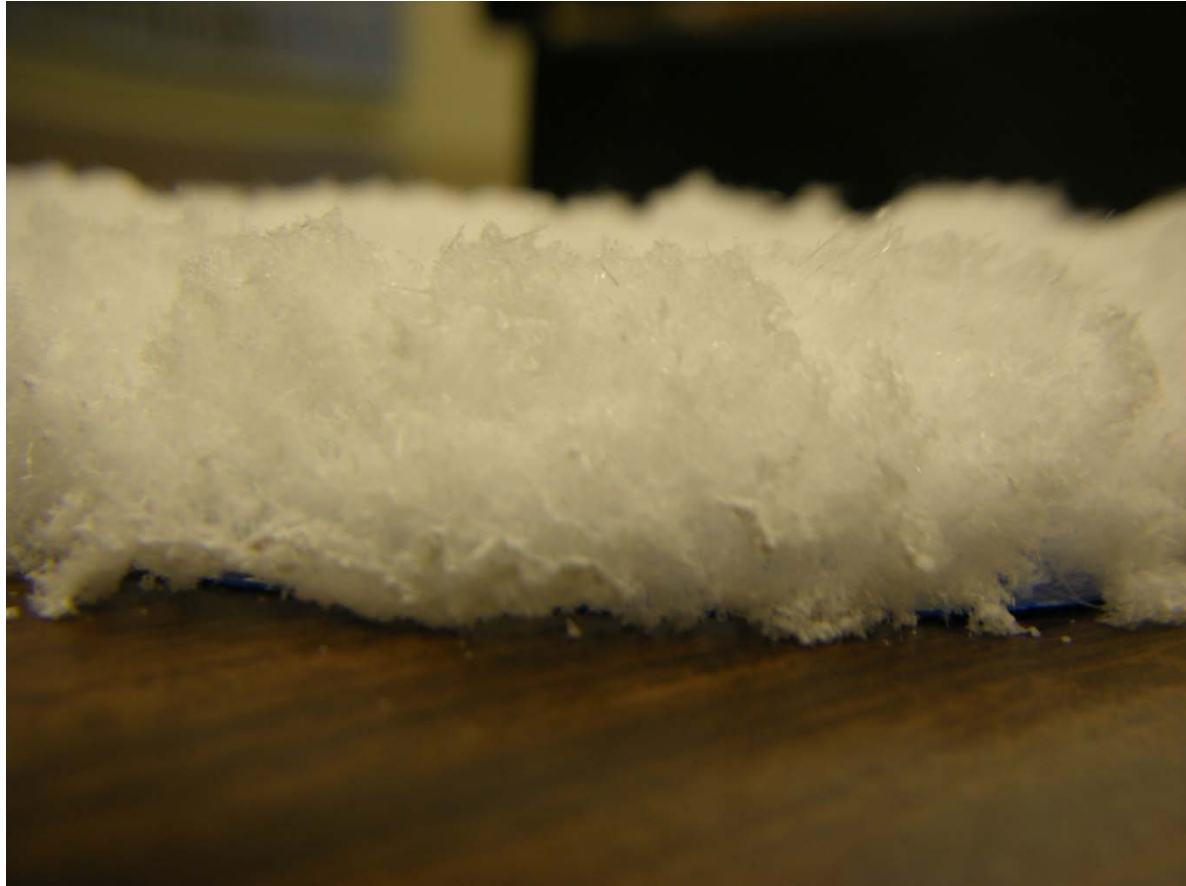
Day 5





How INNERSEAL DPS™ Works

Day 6



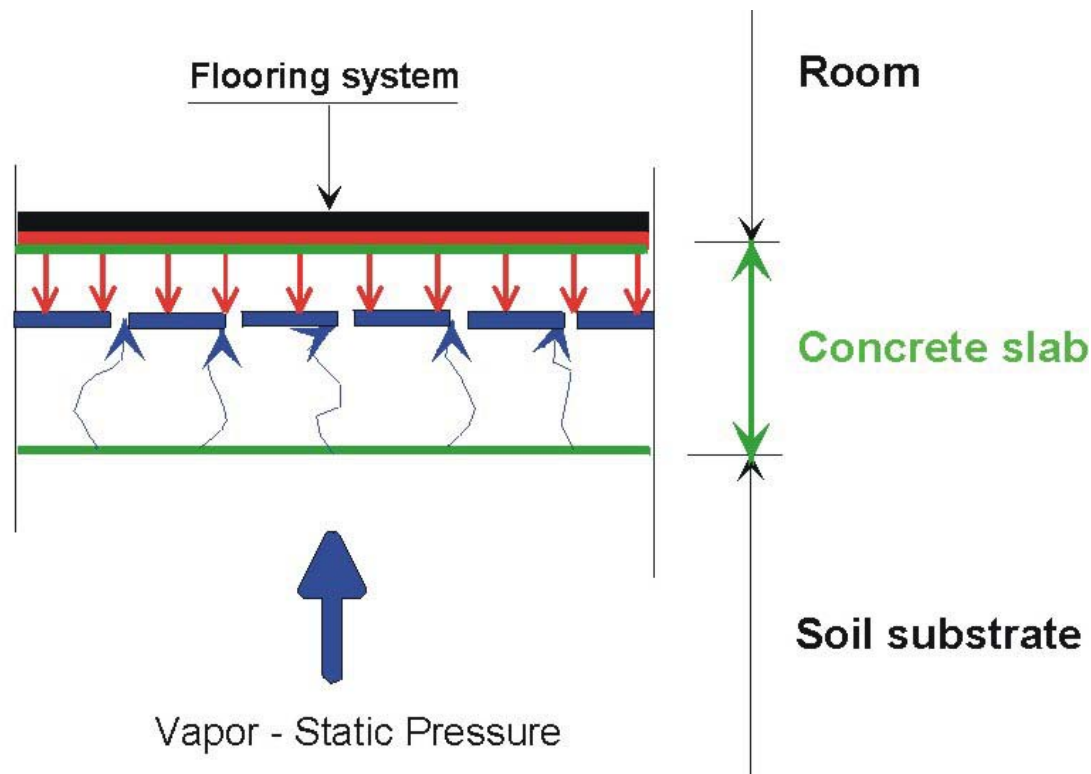


Safe Installation of Flooring System

Over **InnerSeal DPS** or **InnerSeal Densi-Dye**

1. **InnerSeal** Effectively Reduces Moisture Emission Rates from:
25 lbs/24 hrs • 1000 SF to
5lbs or less/72 hrs • 1000 SF

2. Result:
Safe Installation of Floor Coating or
Flooring System over **InnerSeal**





WHERE CAN **VAPOR** EMISSION PROBLEMS APPEAR?

- **SLABS ON GRADE**



WHERE CAN **VAPOR** EMISSION PROBLEMS APPEAR?

- SLABS ON GRADE
- **SLABS ABOVE GRADE**



WHERE CAN **VAPOR** EMISSION PROBLEMS APPEAR?

- SLABS ON GRADE
- SLABS ABOVE GRADE
- SLABS **BELOW** GRADE



FAST TRACK JOB:

Rule of Thumb for Concrete Drying Time:
ONE MONTH PER 1" OF SLAB THICKNESS
(Double in Winter)

Light Weight Concrete: Even Longer Drying
Times

InnerSeal DPS

Can Be Applied Over **3-Day Old** Concrete



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- **FAST TRACK JOB:** No Time to Wait for Concrete to Fully Cure or Dry
- **OIL CONTAMINATED SLAB: Special Case**

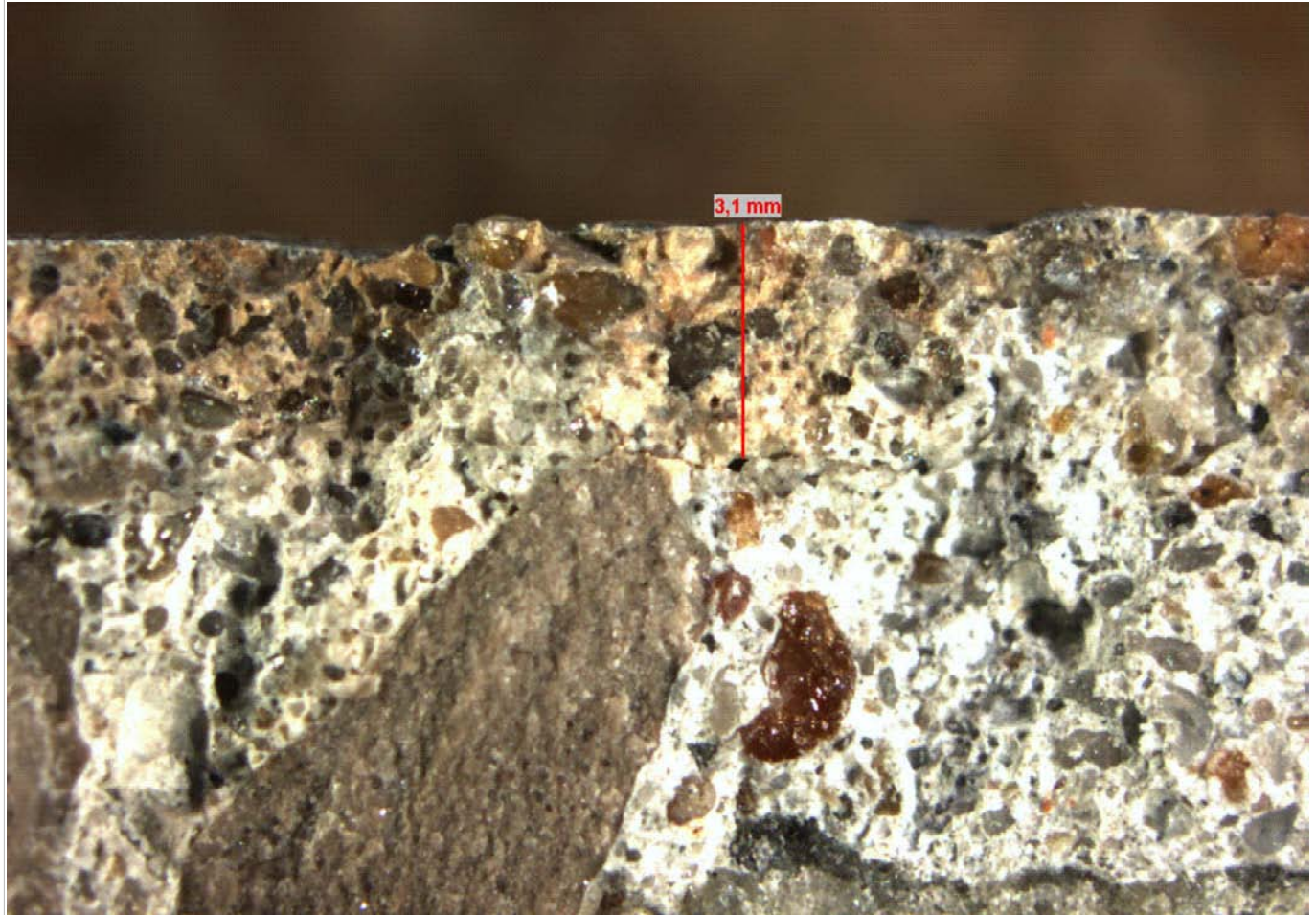


OIL CONTAMINATED SLAB





OIL CONTAMINATED SLAB



10 x Magnification Through Concrete Core



How is InnerSeal DPS Installed?

Procedure for a Typical InnerSeal DPS Installation



Evaluate Existing Project



(1) Absorptive (2) Free of any Sealers (3) Sound Concrete



What Were the Reasons for Failure?



Close-Up of Delamination



Surface Preparation



Steel Shot Blasting, Scarifying or Grinding (Degreasing)



Surface Preparation



Removing Contaminants With Clean Water



Surface Preparation



Remove Excess Water to Surface Saturated Damp



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Questions?