

PERMEABILITY AND SUSTAINABILITY

Portland Cement

- Components:
 - Tricalcium silicate = 50%
 - Dicalcium silicate = 25%
 - Tricalcium aluminate = 10%
 - Tetracalcium aluminoferrite = 10%
 - Gypsum = 5%
- Concrete's strength is the result of 5 chemical reactions here are 2:

Tricalcium silicate + water =

calcium silicate hydrate + calcium hydroxide
(provides early strength, 7 days)

Dicalcium silicate + water = calcium silicate hydrate + calcium hydroxide (provides long term strength, 28 days)







Free Water





Capillary Formation Channels

Bleed

- Route of Moisture Vapor
- Emission
- Heavier Materials Settle
- Water is Pushed out, Bleed Channels
- Free Water/Moisture Vapor Emission has Perfect Path to Follow
- External Intrusion-Perfect Path







- P=Protection
- Present & Future
- Improve IAQ/IEQ
- Water-Based Materials
 - Paint
 - Flooring Adhesives
 - Topical Treatment-VOC
- Pitfalls & Challenges
 - Owner's & End-User's
 - Design Professionals
 - GC's & Sub-Contractors







Architectural Firm - 100% Failed – 4 Years Moisture Testing



RA

- 243,106 Litres
 - 4" 64.4 Litres of Free Water every 7.5 sq/M
 - 6" Slab 364,660 Litres
 - Concrete Drying Times-40 days per inch
 - Ideal Conditions
 - Mix Design w/cm impacts Drying Times
 - External Conditions-Rain, Snow Melt, Sprinkler installer, plumber, tile guy

UNC REX HEART AND VASCULAR HOSPITAL 28,430 SQUARE METERS



Solution-Concrete Chemistry

- Components:
 - Tricalcium silicate = 50%
 - Dicalcium silicate = 25%
 - Tricalcium aluminate = 10%
 - Tetracalcium aluminoferrite = 10%
 - Gypsum = 5%

Tricalcium silicate + Mix Water = calcium silicate hydrate (CSH) + calcium hydroxide Dicalcium silicate + Mix Water = calcium silicate hydrate (CSH) + calcium hydroxide Vapor Lock + CH + Free Water = calcium silicate hydrate gel (CSH)

- WVRA creates the additional CSH needed to:
 - Eliminates the negative effects of the "free water"
 - Close the capillary system, which is the main source of moisture related construction issues and concrete degradation in <u>similar fashion to flyash and other SCM's</u>.

Ready Mix & Vapor Lock

- 94 successful projects
- Flooring, roofing & fluid applied air barriers
- Including Houston Methodist
- Top building Vapor Lock \$750,000.00 to Argos
- Bottom building no Vapor Lock \$3.5 M on topical
- 7 days after roof concrete placed LWT roof installed 3 days later Hurricane Harvey happened roof fine









6254 Skyway Road, PO Box 915 Smithville, Ontario, LOR 2A0, Canada 877.957.4626

Manufacturers' Warranty: Vapor LockTM 20/20

The Specialty Products Group (manufacturer) warrants its product, Vapor LockTM 20/20, to be free from material defects and that the product conforms to its current applicable specifications of stopping moisture vapor emission from the concrete itself, for a period of ten years. The warranty period starts from the date of the substantial completion. This warranty covers only those Flooring or patching compound failures associated with moisture vapor emission related bond loss and is provided if the Vapor LockTM 20/20 is installed according to, and in compliance with the instructions and the requirements of the manufacturer. In the event there is a moisture vapor emission related bond loss claim, manufacturer reserves the right to inspect and test any and all materials to determine the source of the problem. The sole and exclusive remedy of purchaser for any claim concerning Vapor Lock TM 20/20, including, but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is the labor and materials (like the original installed products) required for the removal, replacement or repair of floor covering materials damaged by moisture vapor emission. Manufacturer shall be responsible for the application of a fully warranted topical moisture remediation system in the event of a moisture related failure. Repair or replacement of the damaged flooring material is at the sole discretion of the manufacturer. The manufacturer shall in no way be responsible for any acts of nature, inferior workmanship, inferior concrete, concrete additives, design flaws, conditions of excess high or low temperature, excessive swings in relative humidity, contaminates in the concrete, cracks or voids resulting after the product application, any incidental or consequential damage, including without limitation, damage for lost profits, business interruption, property damage, economic loss or injuries to the person. Manufacturer shall not be liable to the buyer for contribution, or indemnity, or for other losses arising from the use of Vapor LockTM 20/20. Any and all disputes or claims arising out of these products or relating to the provisions of the warranty must be arbitrated utilizing the services of a neutral dispute resolution service upon which buyer and seller agree in the state or province where the project is located. In the unlikely event of litigation SPG agrees to a venue where the project is located and agrees to abide by the rulings of a local court having jurisdiction. Manufacturer claims policy is as follows: Claims will not be considered until the flooring material and adhesive has been inspected by one or more of the following: Company representative, or independent inspection service of manufacturer's appointment. There are no other warranties expressed or implied including, but not limited to, any implied warranty of merchantability or warranties of fitness for a particular purpose. All accounts must be paid in full prior to any warranty being issued or enforced. There is an expanded Warranty that must accompany this certificate Warranty, refer to the expanded Warranty for any special conditions, exclusions, or considerations in this project.

Project Name:

Vapor Lock TM20/20 Project #:

Scott Bergsbaken, President

Date

Greg Hart, CEO

Date

CERTIFICATE OF INSURANCE							DATE (MWDD/YY) April 15, 2017			
BROKER					instead as a m	atter of information				
-					no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies below.					
Brokerlink Gueton ON N1H 182				ISSUING COMPANIES AFFORDING COVERAGE						
INS	URED'S FULL NAME AND MAILING AD	ORESS			Provided by Certain Lloyd's of London Underwriters					
	Specialty Products Group Inc.	SPG		COMPANY						
8254 Skyway Drive PO Box 916		Specialty Products Group**		COMPANY						
Smithville ON. LOR 240		Vapor L@ck [*]		COMPANY D						
CON	/ERAGES				I					
This is to certify that the policies of insurance listed below have been issued to the insured named above for the policy period indicated.										
Notwithstanding any requirements, term or condition of any contract or other document with respect to which this certificate may be issued or may petitish, the insurance effective to the second herein is subject to all the terms, suchaining and monitorian all such architectures.										
LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.										
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None					AUTHORIZED REPRESENTATIVE					
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Quality process vapor lock 20-20 & 40-40

- Project must be registered with SPG. This will be done by SPG personnel.
- Concrete supplier will be certified to use Vapor Lock 20/21 and adhere to all requirements specified in certification process.
- Finisher will be certified to use Vapor Lock 40/40 and adhere to all requirements specified in certification process.
- SPG approval of mix design.
- Notification of concrete placement minimum 5 days prior to placement by General Contractor or other responsible parties is necessary to ensure the job is manned by SPG Representative. The earlier this can be scheduled the better for all parties.
- ASTM D 5084-Minimum requirements, 6*10-8 cm/s Permeability.
- Moisture testing conducted by manufacturer (SPG). Approval must be in writing from manufacturer (SPG) prior to installation of moisture sensitive coatings and adhesives in order to maintain warranty.
- Bond test of moisture sensitive coatings and adhesive materials installed by contractor under similar conditions and materials used in final installation, this installation must be pulled off by SPG personnel to verify strength of bond. Adhesive selection should be for non-porous substrates.
- Concrete must be free of laitance and if detected must be removed.
- Ph testing will be conducted by SPG personnel to ensure Ph is in line with flooring manufacturers' tolerance.
- Authorization to proceed must be obtained in writing prior to installation of Warranted moisture sensitive coatings and adhesives.
- All requested information for purposes of Warranty documentation must supplied to SPG as requested.
- Verify with manufacturer use of current technical bulletins. This will be supplied in writing prior to issuance of authorization to proceed.

New QC Program-Temp Humidity









Vapor Lock CONCRETE ADMIXTURE Benefits

- Eliminates the capillary action and moisture vapor emission
- Waterproofs concrete (.0017 US Perms)
- Outperforms crystalline growth waterproofing by 500%
- NSF 61 approved for use in potable water applications
- Internal wet curing virtually eliminates shrinkage and dry cracking in concrete, slab curl
- Outperforms an SRA up to 27%.
- Reduces ASR 52.6%
- Improved Durability/Extreme Freeze/Thaw Resistance
- Reduce the heat of hydration (8% Test Results)
- No need for sealers to stop dusting
- Flatness-Slab curl
- · Warranties installation of additional coatings
- Third party underwritten by Lloyd's of London for \$20,000,000.00 (CAD) per project, policy is direct to end user and general contractor

Vapor Lock 40/40

- All the benefits of Vapor Lock + Corrosion Inhibitor
- Will not cause flash setting
- No calcium nitrite in it
- Will not cause problems with air content
- This product is a 3 in 1
 - Corrosion Control
 - Water proofer
 - SRA



CORROSION POTENTIAL

■ DAY 1 ■ DAY 30 ■ DAY 60 ■ DAY 75 ■ DAY 90 ■ DAY 105 ■ DAY 120

Corrosion Control CNI vs Vapor Lock 40/40

Vapor Lock 40/40

- Excellent Workability
- Permanent
- Bonds to & Protects Steel
- Waterproofs Concrete
- Internal wet curing agent
- Improved abrasion
- VOC Free

CNI

- Problematic workability
- Sacrificial
- Ph High limited time
- No Contribution to WP
- No contribution
- No contribution

Vapor Lock 20/21 & 40/41

- Warranted Waterproofing
 admixture
- 500% more effective than crystal growth material
- NSF Approved
- Extreme densification
- Exterior Warranty





of Years for a drop of water to pass through this slab



Crystalline Growth Material

- Powder Form
 - Back Loaded
- No Warranty for internal applications
- Does not address Heat of

Hydration – 8%

- Does not strengthen
- Capillaries still created
 - Let's concrete breathe
- Slows Doesn't Stop
 - WVRAs show 500% improvement



CSH Gel is formed fills the capillary system, shutting down vapor emission Using Free Water

Measurement of Water Permeability

 The measurement of permeability in the laboratory is very simple. The side of test specimen are sealed and water under pressure is applied to top surface only. The quantity of water flowing through a given thickness of concrete in a given time is measured and the permeability is expressed as a coefficient of permeability k given by Darcy's equation.





COKE PILE SEALING



