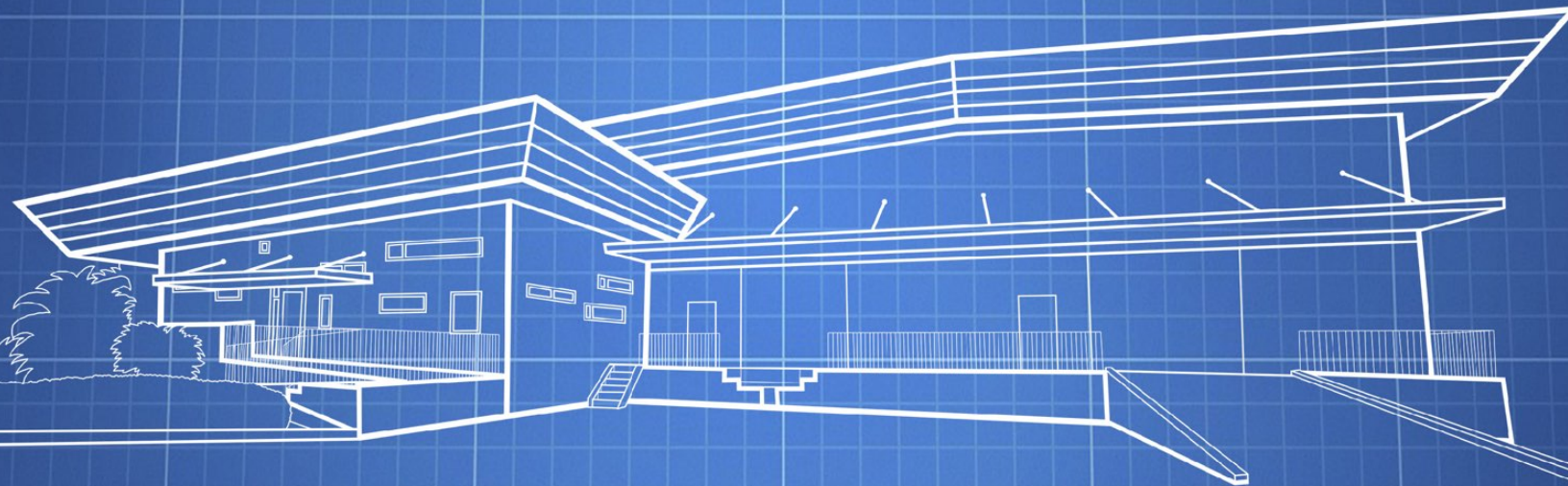




# BARRIER ONE

## CONCRETE ADMIXTURES



Product Brochure

[WWW.BARRIERONE.COM](http://WWW.BARRIERONE.COM)



# CONCRETE ENHANCEMENT TECHNOLOGY

Porosity Inhibiting Admixtures (PIA's) are the latest development of our Concrete Enhancement Technology® (CET) Research and Development Program. Porosity Inhibiting Technology holds multiple distinctions over traditional industry solutions for managing and mitigating the adverse effects of concrete moisture in Building Envelopes and Interior Flooring Systems.

## **Top 10 Sustainability & Multi-Purpose Attributes:**

- Carbon Footprint Reduction
- 100% Recyclable
- Waterproofing: Permeability Reducing Admix for Hydrostatic Conditions (PRAH)
- Dampproofing
- Vaporproofing
- Shrinkage Reducing Admixture
- Corrosion Inhibiting Admixture
- Alkali Silica Reactivity Inhibiting Admixture
- Interior Topical Moisture Mitigation Systems
- Efflorescence Control Admixture

## **Top 10 Product Performance Features:**

- 10-Times Less Permeable Than Moisture Vapor Reduction Admixtures (MVRA's)
- Increases Overall & High-Early Strength Utilizing Type 1L Cement
- Shrinkage Reducer That Minimizes Cracking, Warping, and Curling
- Lower Coulombs (Rapid Chloride Permeability)
- Alkali Silica Reactivity Inhibiting
- Freeze Thaw Resistance: Reduces Deterioration Caused by Deicing Compounds
- Allows Coatings, Sealers, Adhesives to Be Installed 7-Days After Concrete Placement
- ASTM D-5084 Permeability Testing (Virtually Impermeable)
- Promotes The Bonding of Adhesives, Coatings, Sealers, Epoxies, and Primers to Concrete
- Concrete Life Cycle Extension by Minimum of 50%



# PIA versus MVRA

## PERFORMANCE:

- PIA's are 10-times more effective at blocking moisture vapor emissions than MVRA's
- PIA's completely stop moisture vapor emissions redistribution in concrete, MVRA's reduce moisture vapor emissions
- PIA's increase "High-Early Strength" gains with Type 1L Cements
- Cement Optimization: PIA's reduce cement between  $\frac{1}{4}$  to  $\frac{3}{4}$  sack per cubic yard to attain the same PSI requirements
- Average Strength Increase with Type 1L Cements: PIA @ 22% vs. MVRA-CPS @ 12%
- Shrinkage: PIA @ 86% vs. MVRA-CPS @ 37%
- Corrosion (Ponding): PIA @ 80% Reduction vs. MVRA @ 68% Reduction
- Expanded Water To Cementitious Ratio: PIA (0.31 – 0.52) "75% Greater Than" MVRA-CPS (0.40 - 0.52)

## DAILY TESTING:

- When PIA's are used, the project team gets verified performance through project-specific daily cylinder collections and testing for permeability, which verifies the performance of the concrete as installed.
- Some MVRA products have limited daily sample collections, but no testing. Others have no verification program.
- Based on Barrier One's (PIA) daily cylinder collection, well over 12,000 project samples have been tested for permeability via ASTM D5084 or CRD-48. Twenty percent (20%) of test show no permeability at all on equipment that measures as low as  $1 \times 10^{-9}$  cm/sec (the equivalent of taking 323 years to move through a 4 inch slab).

## WARRANTY PROCESS:

- Barrier One's (PIA) warranty guarantees if there are any proven concrete moisture vapor or concrete moisture redistribution related issues, your flooring system will be fully replaced with labor, materials, and a moisture mitigation system.
- Review Barrier One's Concrete Admixtures "FAQ 804" for our complete warranty process.
- Most MVRA warranties do not cover full system replacements, only covering bonded material or purchased costs.
- Adhesion Guarantees: All PIA and MVRA manufacturer's offer some variation of an adhesion guarantee or bond warranty.

## BUDGET COST DIFFERENCES:

- 3,500 PSI (4" Slab): Based on a 564# Total Cementitious Mix
  - PIA: \$0.70 to \$0.80 Per Square Foot
  - MVRA-CPS: \$0.55 to \$0.65 Per Square Foot
- 3,500 PSI (6" Slab): Based on a 564# Total Cementitious Mix
  - PIA: \$1.05 to \$1.20 Per Square Foot
  - MVRA-CPS: \$0.80 to \$1.00 Per Square Foot



# WARRANTY REQUIREMENTS

## **Project Information Required For Porosity Inhibiting Admix (PIA) Warranty**

- (1) Concrete Ready-Mix Producer Project Mix Design(s) Verifying:
  - a. Water To Cementitious Material Ratio (0.31 to 0.52)
  - b. No Additional Shrinkage Admixtures
  - c. No Additional Corrosion Inhibiting Admixtures
  - d. No Additional Permeability Reducing Admixtures for Hydrostatic Conditions (PRAH's)
  - e. No Additional PIA or MVRA Admixtures
- (2) General Contractor or Construction Manager:
  - a. Contact Information for Owner Selected Onsite Concrete Testing Firm
  - b. Technical Data Sheet & Photo of Installed ASTM E-1745 Vapor Retarder
  - c. Link or PDF of the Plans and Specifications
  - d. Contact Information for Concrete Subcontractor
  - e. Building Owners Contact Information

## **Project Information Required For MVRA-CPS Warranty**

- (1) Concrete Ready-Mix Producer Project Mix Design(s) Verifying:
  - a. Water To Cementitious Material Ratio (0.40 to 0.52)
  - b. No Additional Shrinkage Admixtures
  - c. No Additional Corrosion Inhibiting Admixtures
  - d. No Additional Permeability Reducing Admixtures for Hydrostatic Conditions (PRAH's)
  - e. No Additional PIA or MVRA Admixtures
- (2) General Contractor or Construction Manager:
  - a. Technical Data Sheet & Photo of Installed ASTM E-1745 Vapor Retarder
  - b. Link or PDF of the Plans and Specifications
  - c. Contact Information for Concrete Subcontractor
  - d. Building Owners Contact Information



# TESTING DATA

		PIA Technology	MVRA Technology
ACI 212.3R	Permeability Reducing Admix for Hydrostatic Conditions (PRAH)	Yes	Yes
ASTM D-5084	Hydraulic Conductivity of Saturated Porous Materials	$<1.0 \times 10^{-9}$	$<1.0 \times 10^{-8}$
CRD C48-92	Standard Test Method for Water Permeability of Concrete	Pass	Pass
ASTM C-494	Type S Admixture	Pass	Pass
ASTM C-39	Type (1L Cement) (Average Strength Increase)	22%	12%
ASTM C-157	Drying Shrinkage (Average Reduction in Shrinkage)	86%	37%
MIP Testing	Mercury Intrusion & Porosimetry (Reduction of Pore Structure) (Normal Mix) (Pore Structure Reduction)	15.00%	
MIP Testing	Mercury Intrusion & Porosimetry (Reduction of Pore Structure) (Self Consolidating-SCC Mix) (Pore Structure Reduction)	36.00%	
ASTM C232	Bleed Water in Concrete (Reduction)	19.20%	
ASTM C-1543 & AASHTO T-259	Reduction in Corrosion (Ponding)	80%	68%
ASTM C-1202 & AASHTO T-277	Reduction in Chloride Ion Penetration (Coulombs) (Chloride Permeability Rating)	Very Low	
ASTM C-666	Freeze Thaw Resistance (Reduction in Mass Change)	63%	45%
ASTM C-672	Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals	No Scaling	No Scaling
ASTM G-109	Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments	No Notable Corrosion	No Notable Corrosion
ASTM C-1152	Acid Soluble Chloride in Mortar and Concrete	Pass	Pass
ASTM C-1260	Potential Alkali Reactivity of Aggregates (Mortar Bond Method) (Average Reduction in ASR Expansion %)	Pass	Pass
ASTM C-1567	Potential Alkali Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar Bond Method)	Pass	Pass
W/CM Ratio	Water To Cementitious Materials Ratio Range	0.31 - 0.52	0.40 - 0.52
Promotes Bonding	Concrete Surface Contamination: Additional Salts or Deleterious Materials or Compounds that Inhibit Bonding	No Contamination	No Contamination
Entrained Air	Use With OR Without Entrained Air	Yes	Yes
Fly Ash	Use With OR Without Fly Ash	Yes	Yes
Slag	Use With OR Without Ground Blast Furnace Slag	Yes	Yes
Lightweight	Use With OR Without Lightweight Aggregate	Yes	Yes



# POROSITY INHIBITING ADMIXTURE (PIA)

Architects

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Increases Overall and "High Early" Strength

Designed For Slab on Grade and Elevated Deck Applications

Offers Concrete Enhancement for all Flooring Types:

- Burnished, Polished, Stained, Sealed, and Adhered

Life of the Concrete Warranty for Moisture

Flooring Adhesive Bond Warranty

Apply Adhesives, Sealers, and Primers 7-Days After Concrete Placement

Avoid Change Orders Resulting From High Concrete Moisture

Avoid Schedule Delays Resulting From High Concrete Moisture

Minimizes Efflorescence

Reduces Surface Cracking

Industry Options For Concrete Moisture Mitigation		Barrier One (PIA) Porosity Inhibiting Admix	Barrier One (MVRA CPS) Moisture Vapor Reduction Admix	Other MVRA's	High Relative Humidity Flooring Adhesives (Plus Slab Prep)	Epoxy Moisture Mitigation Systems
1	National Average Ready Mix Supplier Delivered Cost Per SF (4-Inch Slab)	\$0.80	\$0.50	\$0.60	\$1.50 to \$3.00	\$4 to \$10
2	National Average Ready Mix Supplier Delivered Cost Per SF (6-Inch Slab)	\$1.20	\$0.75	\$0.90		
3	National Average Cost Per Cubic Yard of Concrete	\$65.00	\$40.00	\$50.00		
4	Carbon Footprint Reduction Via Cement Optimization	YES	NP	NP	NP	NP
5	Concrete Life Cycle Extension By A Minimum Of 50%	YES	NP	NP	NP	NP
6	Increases "High Early" Strength (PSI)	YES	NP	NP	NP	NP
7	Demonstrated Mercury Intrusion Porosimetry (MIP) Results	36%	NP	NP	NP	NP
8	Certified Concrete Shrinkage Reducing Admixture	80%	36%	NP	NP	NP
9	Certified Concrete Corrosion Inhibitor	86%	68%	NP	NP	NP
10	Certified Alkali Silicate Reaction Inhibitor (ASR)	78%	NO	NP	NP	NP

## Project Specific Quality Control Process & Life of the Concrete Warranty

1	Review all Mix Designs Containing Barrier One PIA	YES	Limited	NO	NO	NO
2	ASTM 1745 Vapor Retarder Confirmation (2nd Party)					
3	ASTM D5084 or CRD-48; Daily Cylinder Collection & Testing of All "PIA" Concrete Placements for Internal Quality Control					
4	Certified Internal Permeability Testing Warranty Confirmation					
5	"Life of the Concrete Warranty" with Adhesion Guarantee					



# CSXTREME

Architects

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Increases Overall and "High Early" Strength

Permeability Reducing Admix For Hydrostatic Conditions (PRAH)

Natural Autogenous Self Healing Integral Waterproofer

Designed for Below Grade and Exterior Applications:

- Matte Slabs, Tilt Walls, Roof Decks, Parking Decks, and Elevator Pits

Apply Coatings, Sealers, and Primers 7-Days After Concrete Placement

ASTM C-1543: Rapid Chloride Ion Penetration (Salt Ponding)

ASTM C-666: Resistance Of Concrete To Rapid Freezing and Thawing

Concrete Life Cycle Extension By A Minimum of 50%





# POROSITY INHIBITING ADMIXTURE (PIA)

Concrete Ready Mix Producers

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Increases Overall and "High Early" Strength

Liquid Admixture (Decanting Not Required)

Compatible With Steel and Composite Fibers

Works With Normal Weight, Light Weight, and Self Consolidating Mixes

Expanded Water To Cementitious Materials Ratio (0.31 to 0.52)

Works with Fly Ash and Ground Blast Furnace Slag

Certified Shrinkage Reducing Admixture and Corrosion Inhibitor

Certified Alkali Silicate Reaction Inhibitor (ASR)

Concrete Life Cycle Extension By A Minimum of 50%

Life of the Concrete Warranty for Moisture





# CSXTREME

Carbon Footprint Reduction Via Cement Optimization

Permeability Reducing Admix For Hydrostatic Conditions (PRAH)

Designed for Below Grade & Exterior Applications:

- Matte Slabs, Tilt Walls, Roof Decks, Parking Decks, and Elevator Pits

ASTM C-39: Increased Compressive Strength

ASTM C-1543: Rapid Chloride Ion Penetration (Salt Ponding)

ASTM C-666: Resistance Of Concrete To Rapid Freezing and Thawing

ASTM C-1260 and C-1567: Alkali Silica Reactivity Inhibitor (ASR)

ASTM C-672: No Scaling

Reduces Deicing Compound Concrete Deterioration

Liquid Admixture (Decanting Not Required)

Compatible With Steel and Composite Fibers

Works With Normal Weight, Light Weight, and Self Consolidating Mixes

Expanded Water To Cementitious Materials Ratio (0.31 to 0.52)

Works with Fly Ash and Ground Blast Furnace Slag

Concrete Ready Mix Producers







Barrier One Concrete Admixtures is at the forefront of the Concrete Enhancement Technology® (CET) industry internationally. Through well-designed concrete admixtures and meticulous testing, our firm has created industry-leading products that continue to revolutionize concrete construction.





Barrier One Concrete Admixtures Home Office  
Winter Garden, Florida 34787



# POROSITY INHIBITING ADMIXTURE (PIA)

## Structural Engineers

Increases Overall Strength

Increases "High Early" Strength

Carbon Footprint Reduction Via Cement Optimization

Concrete Life Cycle Extension By A Minimum Of 50%

Compatible With Steel and Composite Fibers

Expanded Water To Cementitious Materials Ratio (0.31 to 0.52)

Works with Normal Weight, Light Weight, and Self Consolidating Mixes

Certified Shrinkage Reducing Admixture

Certified Corrosion Inhibitor

Certified Alkali Silicate Reaction (ASR) Inhibitor

Designed for Slab On Grade and Elevated Deck Applications





# CSXTREME

Structural Engineers

Carbon Footprint Reduction Via Cement Optimization

Permeability Reducing Admix For Hydrostatic Conditions (PRAH)

Natural Autogenous Self Healing Integral Waterproofers

Designed for Below Grade and Exterior Applications:

- Matte Slabs, Tilt Walls, Roof Decks, Parking Decks, and Elevator Pits

ASTM C-39: Increased Compressive Strength

ASTM C-1543: Rapid Chloride Ion Penetration (Salt Ponding)

ASTM C-666: Resistance Of Concrete To Rapid Freezing and Thawing

ASTM C-1260 and C-1567: Alkali Silica Reactivity Inhibitor (ASR)

ASTM C-672: No Scaling

Concrete Life Cycle Extension By A Minimum of 50%

Reduces Deicing Compound Concrete Deterioration





# POROSITY INHIBITING ADMIXTURE (PIA)

## General Contractors

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Increases Overall and "High Early" Strength

Integral To The Concrete, Therefore No Added Labor

Apply Adhesives, Sealers, and Primers 7-Days After Concrete Placement

Offers Concrete Enhancement for all Flooring Types:

- Burnished, Polished, Stained, Sealed, and Adhered

Flooring Adhesive Bond Warranty

Daily Permeability Testing Per ASTM D-5084

Avoid Change Orders Resulting From High Concrete Moisture

Avoid Schedule Delays Resulting From High Concrete Moisture





# CSXTREME

General Contractors

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Increases Overall and "High Early" Strength

Integral To The Concrete, Therefore No Added Labor

Permeability Reducing Admix For Hydrostatic Conditions (PRAH)

Natural Autogenous Self Healing Integral Waterproofer

Designed for Below Grade and Exterior Applications:

- Matte Slabs, Tilt Walls, Roof Decks, Parking Decks, and Elevator Pits

Apply Coatings, Sealers, and Primers 7-Days After Concrete Placement

Concrete Life Cycle Extension By A Minimum of 50%

Reduces Deicing Compound Concrete Deterioration

Integral Waterproofing Admixture Comparison Chart	CSXtreme By Barrier One	WPX Waterproofing By Barrier One	Crystalline WaterProofing Admixtures
Promotes Autogenous Self- Healing Of Concrete	YES	YES	YES
Permeability Reducing Admixture for Hydrostatic Conditions (PRAH)	YES	YES	YES
Water Source Required To Activate Product	NO	NO	YES
Carbon Footprint Reduction Via Cement Optimization	YES	NO	NO
Concrete Life Cycle Extended By Minimum of 50%	YES	NO	NP
Increases "High Early" Concrete Strength (PSI)	YES	YES	NO
Certified Shrink Reducing Admixture	80%	36%	Some
Certified Corrosion Inhibitor	86%	68%	Some
Certified Alkali Silicate Reaction Inhibitor (ASR)	78%	NP	NP
Freeze Thaw Durability	YES	YES	YES
Potable Water Exposure	NO	NO	YES
Can Cause Accelerated Or Retarded Concrete Sets	NO	NO	YES
Offers Epoxy & Coating Bond Warranty	YES	YES	NO
Apply Coatings, Sealers, Primers 7-Days After Concrete Placement	YES	YES	NO
Reduces Deicing Compound Concrete Deterioration	YES	YES	NP
ASTM C-672: Surface Scaling Test	No Scaling	NP	NP
ASTM C-1543: Surface Ponding - Corrosive Element Penetration	80% Reduction	NP	NP
ASTM C-1202: Integral Rapid Chloride Penetration	42% Reduction	NP	NP



# POROSITY INHIBITING ADMIXTURE (PIA)

## Concrete Subcontractors

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Increases Overall and "High Early" Strength

Integral To The Concrete, Therefore No Added Labor

20% Less Bleed Water

Creamier Finishing Paste

Easy to Pump

High Density

Compatible With Steel and Composite Fibers

Works With Normal Weight, Light Weight, and Self Consolidating Mixes

Works with Fly Ash and Ground Blast Furnace Slag

Certified Shrinkage Reducing Admixture and Corrosion Inhibitor

Certified Alkali Silicate Reaction Inhibitor (ASR)





# POROSITY INHIBITING ADMIXTURE (PIA)

Carbon Footprint Reduction Via Cement Optimization

Cost Effective

Concrete Life Cycle Extension By A Minimum of 50%

Avoid Change Orders Resulting From High Concrete Moisture

Avoid Schedule Delays Resulting From High Concrete Moisture

Life of the Concrete Warranty for Moisture

Flooring Adhesive Bond Warranty

Daily Permeability Testing Per ASTM D-5084

Reduces Efflorescence

Minimizes Surface Cracking

Building Owners





# MOISTURE VAPOR REDUCTION ADMIXTURE (MVRA CPS)

## **Project Advantages**

Cost Effective

Increases Strength

Apply Adhesives, Sealers, and Primers 7-Days After Concrete Placement

Integral To The Concrete, Therefore No Added Labor

Designed For Slab on Grade and Elevated Deck Applications

- Burnished, Polished, Stained, Sealed, and Adhered

Minimizes Efflorescence

Reduces Surface Cracking

Avoid Change Orders Resulting From High Concrete Moisture

Avoid Schedule Delays Resulting From High Concrete Moisture

Flooring Adhesive Bond Warranty

## **Concrete Application Benefits**

Works With Normal Weight, Light Weight, and Self Consolidating Mixes

Compatible With Steel and Composite Fibers

Expanded Water To Cementitious Materials Ratio (0.40 to 0.52)

Works with Fly Ash and Ground Blast Furnace Slag

Certified Shrinkage Reducing Admixture & Corrosion Inhibitor

Certified Alkali Silicate Reaction Inhibitor (ASR)

The Only MVRA USA Sourced and Manufactured In-House



# WPX WATER PROOFING ADMIXTURE

## Project Advantages

Cost Effective

Increases Strength

Permeability Reducing Admix For Hydrostatic Conditions (PRAH)

Natural Autogenous Self Healing Integral Waterproofer

Designed for Below Grade and Exterior Applications:

- Matte Slabs, Tilt Walls, Roof Decks, Parking Decks, and Elevator Pits
- Lagoons, Fish Farms, Aquariums, Plaza Decks, Containment, and Dams

Apply Coatings, Sealers, and Primers 7-Days After Concrete Placement

Reduces Efflorescence

Minimizes Surface Cracking

## Concrete Application Benefits

Liquid Admixture (Decanting Not Required)

Works With Normal Weight, Light Weight, and Self Consolidating Mixes

Compatible With Steel and Composite Fibers

Expanded Water To Cementitious Materials Ratio (0.40 to 0.52)

Works with Fly Ash and Ground Blast Furnace Slag

Certified Shrinkage Reducing Admixture and Corrosion Inhibitor

Certified Alkali Silicate Reaction Inhibitor (ASR)





# BARRIER ONE

## CONCRETE ADMIXTURES



**BARRIER ONE PIA**  
POROSITY INHIBITING CONCRETE ADMIXTURE



**CSXTREME**  
INFRASTRUCTURE AND REPAIR ADMIXTURE



**MVRA-CPS ADMIX**  
MOISTURE VAPOR REDUCTION ADMIXTURE



**WPX ADMIXTURE**  
WATERPROOFING ADMIXTURE



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