Waterproofing & Chemical Protection

Wastewater Collection and Treatment

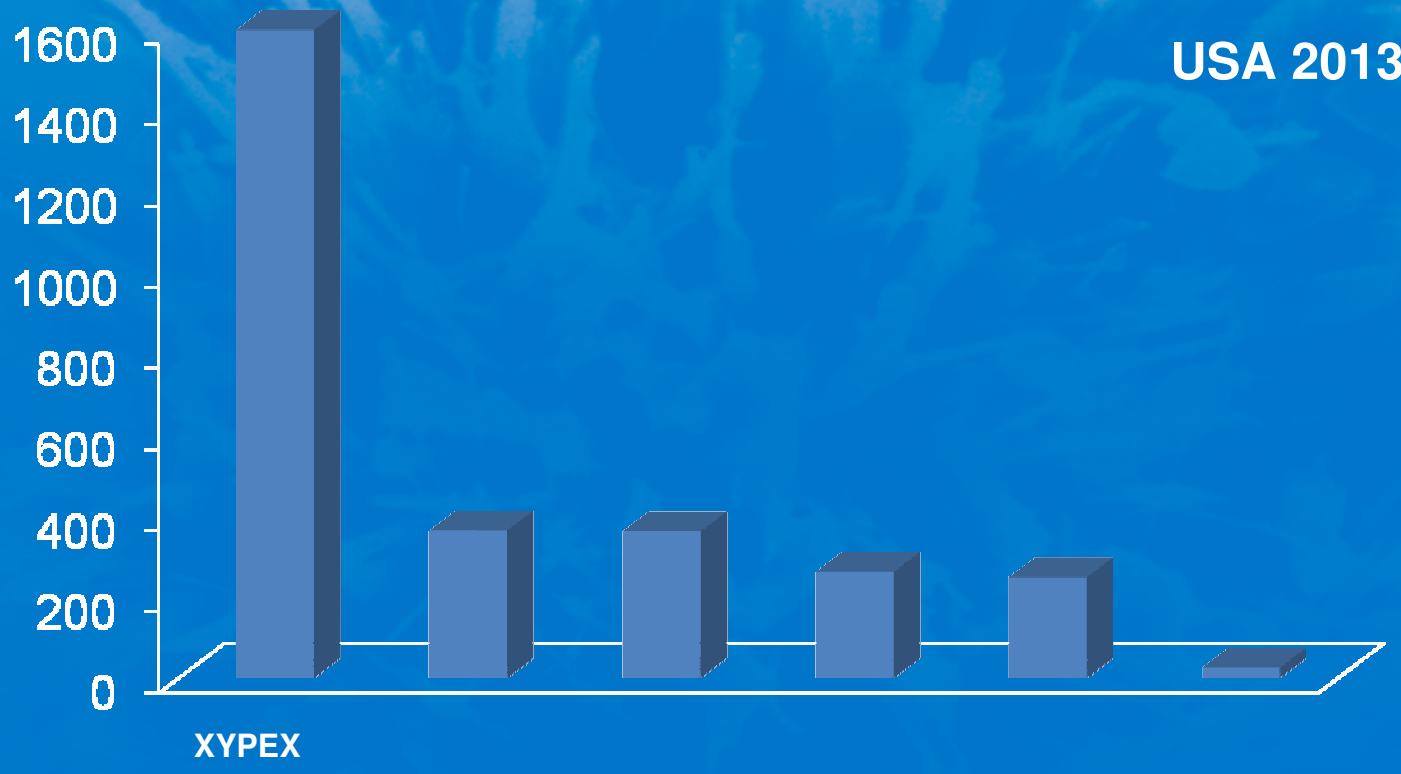
XYPEX®

Xypex Chemical Corporation

- Founded 1969 in Vancouver, British Columbia
- Concrete Waterproofing & Protection by Crystallization
- Present in over 80 countries worldwide
- Worldwide manufacturing base in 12 locations

Leader

Number of specifications of Xypex Crystalline Technology



USA 2013

McGraw Hill Construction Network

XYPEX®

Xypex products and services are available in over 80 countries.

Outline

- Industry Challenges
- Current Solutions
- The Nature of Concrete
- Xypex Crystalline Waterproofing Technology
- Proven Performance
- Xypex Products
- Xypex Projects

The Problems

Problems

	Structures	Costs
Primary		
Water infiltration	Manholes, joints, service line connections	Unnecessary treatment of groundwater Flow capacity issues
Water egress	Tanks, reservoirs	Cost of water loss
Microbial induced corrosion and sulfate attack	Manholes, pipes, turns, lifts stations, head works, digesters	Decreased service life, unplanned maintenance and rehabilitation
Interconnected Porosity		
Cracking, poor consolidation, tie holes, constructions joints	Manholes, pipes, lift stations, head works, tanks, reservoirs,	Expensive reworking and repair Decreased service life, unplanned maintenance and rehabilitation
Additional		
Carbonation Corrosion of reinforcing steel	Manholes, pipes, lift stations, head works, tanks, reservoirs,	Decreased service life, unplanned maintenance and rehabilitation

Key Problems and Costs

Four Phases of concrete corrosion

Phase 1	Design, construction and concrete curing	$ 1
Phase 2	Corrosion initiation processes are underway, but increased damage has not yet begun	$ 5
Phase 3	Increase in damage has just begun	$ 25
Phase 4	Increase in corrosion is advanced with extensive damage clearly evident.	$125

Equivalent cost of $1 spent in Phase 1

Source: The Australian Concrete Repair Association

Current Solutions

Concrete Surface Protection

	Advantages	Limitations
Liners		
HDPE, PVC, PE 	•Impermeable •Excellent chemical resistance especially in areas where pH is lower than 3.0 •Visible protection system	•Errors in workmanship •Seam failure •False spark test •Liners can be affected by negative side pressure •One breach can affect the integrity of the entire system •Expensive
Cement Based Liners		
Portland, high alumina, speciality 	•Reduce inflow •Structural integrity •Some corrosion protection •Withstand negative side pressure •No VOCs	•Physical permeability barrier •Application requires expertise •Specialized equipment •Residual overspray material difficult to remove

Liner Problems

Spark Test

Seams

Concrete Surface Protection

	ADVANTAGES	LIMITATIONS
COATINGS		
Epoxies, urethanes, polyurethanes, coal tar epoxies 	• Impermeable • Good chemical resistance • Visible protection system	• Costly surface preparation required • Installation errors leading to pin holes and thin spots • No crack healing • Concrete needs to be dry • Limited abrasion resistance • Single breach affects integrity of entire system • Performance deteriorates over time • Do not resist negative side vapour and liquid pressure
CEMENT BASED COATINGS		
Polymer cement mortars 	• Easy application • Inexpensive • Can be applied to moist concrete	• Significant and costly surface preparation required • Limited resistance to hydrostatic pressure • Can be pushed off by negative side hydrostatic pressure • Limited abrasion resistance • Poor crack bridging, no crack healing • Limited chemical resistance • “One scratch” affects integrity of entire system • Performance deteriorates over time

Coating Problems

Negative side water pressure

Pinholes

Blistering

Limited Lifespan

Admixtures

	Advantages	Limitations
Hydrophobic admixtures		
• Long-chain fatty acids (ammonium or calcium stearate) • Vegetable oils • Petroleum derivatives (mineral oils, paraffin wax, bitumen emulsions)	• Added at batch plant • Low labor costs • Low risk of error • Water repelling • Effective where no presence of hydrostatic pressure	•Low performance under hydrostatic pressure •Diminishing performance over time •Not recommended by ACI for concrete under hydrostatic pressure •No crack bridging or healing properties
Anti-microbial agents		
Anti-microbial agents dosed into concrete at time of batching	•Interrupts the microbial induced corrosion process •Can be added to concrete	•Provides corrosion protection only, does not stop water infiltration or ex-filtration

Chemical Treatment

	Advantages	Limitations
Chemical Treatment		
Dosing of Chemicals into sewage lines	• Attacks hydrogen sulfide generation or neutralizes surface pH • Reduces odor	• Provides corrosion protection only, does not stop water infiltration or ex-filtration • Structures still need to be repaired • Expensive

Repair systems

	Advantages	Limitations
Injection systems		
• Epoxy • Polyurethane	• Epoxies reinstate structural integrity • Polyurethanes allow movement • Polyurethanes can be applied on wet concrete • Effective for wider cracks	• High cost • Requires high level of application expertise • Requires specialty equipment • Poor aesthetics of typical injection job • Complicated re-working • Will not heal new cracks
Rout & Repair		
Chipping out of crack then filling with cement-based mortar	• Inexpensive • Can be applied to wet or moist concrete & actively leaking cracks • Moderate level of expertise required • No special equipment needed	•Not a full depth repair •Will not cure future cracking •Not suitable for continuously moving cracks

Injection Systems Limitations

Poor aesthetics

Our System

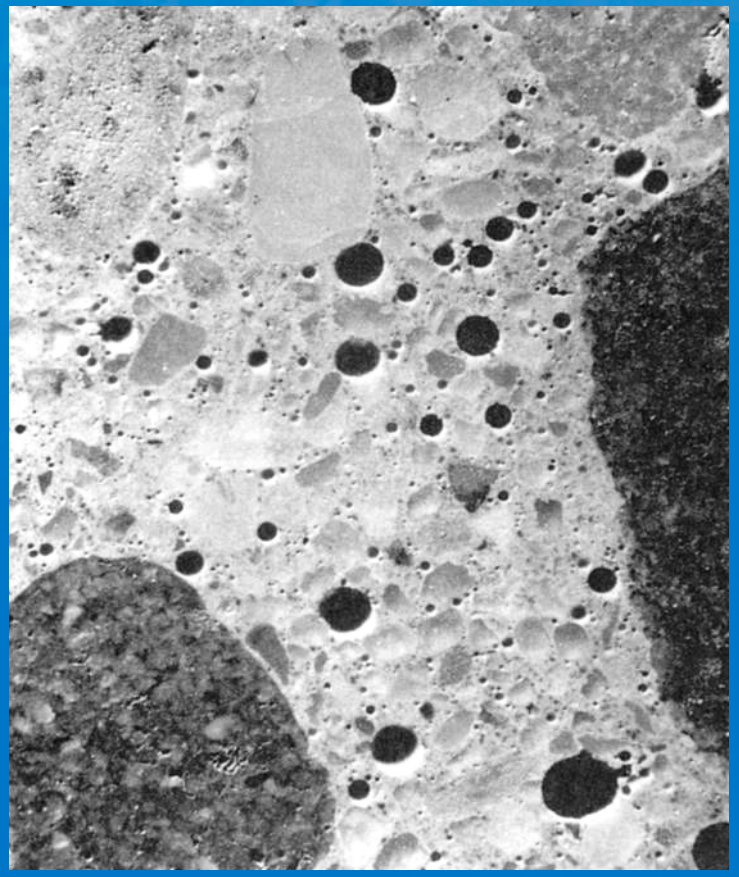
XYPEX®

Concrete Waterproofing by Crystallization

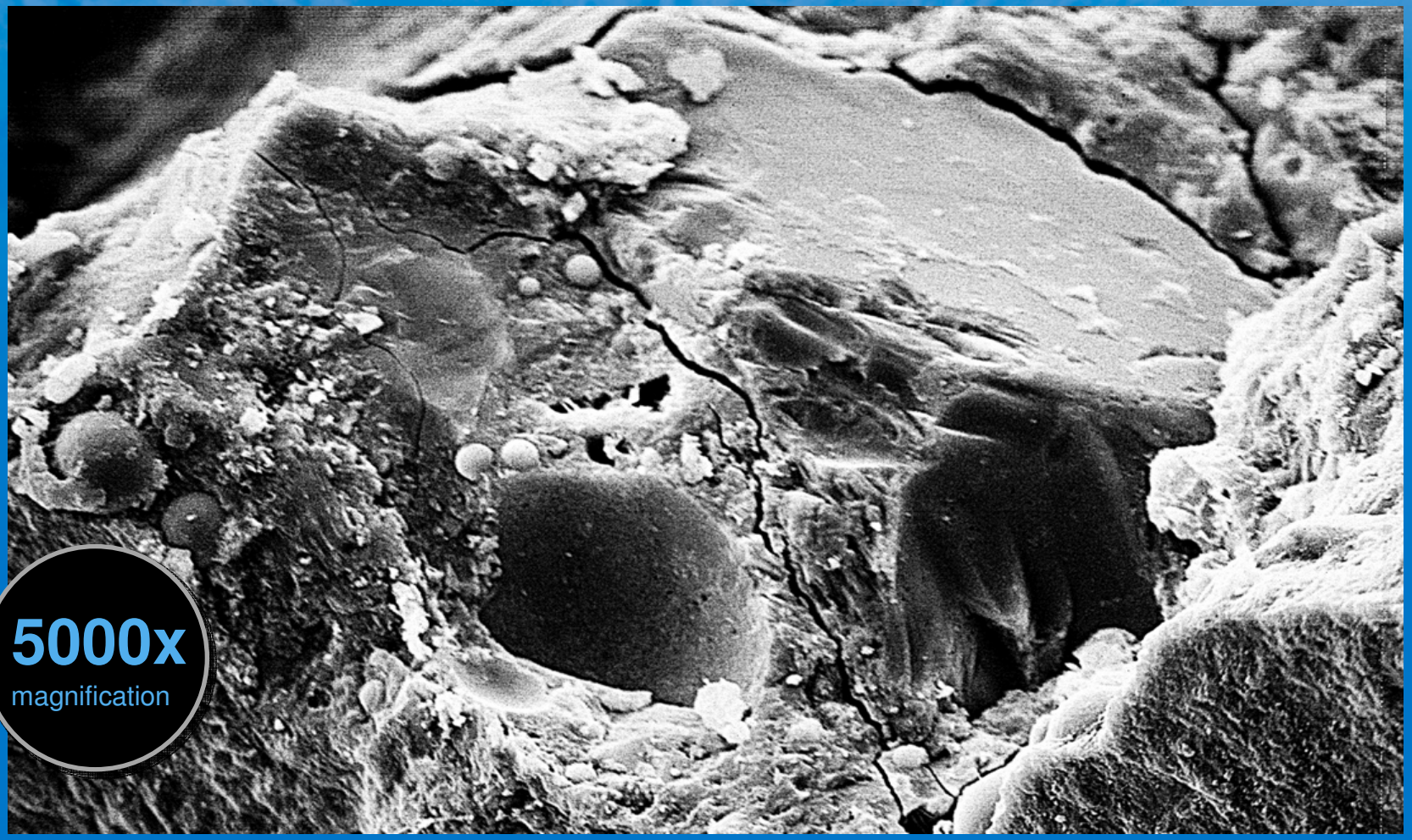
The Nature of Concrete

Composition & Characteristics

- Composed of a mixture of rock, sand, cement and water.
- To be workable, more water than needed for cement hydration is used.
- Excess water bleeds out and leaves a network of capillaries and pores.
- As it dries, concrete shrinks and changes volume causing micro and macro cracks.

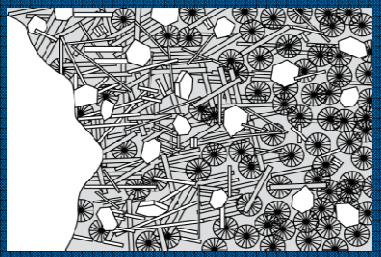
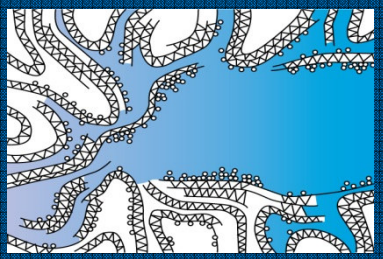


Micro Cracks



The nature of concrete can be determined by petrographic examination.

Permeability

Entrapped Void		***1mm to 10mm***
Crack		***0.1mm to 3mm***
Micro Crack		***<0.0001mm to 0.1mm***
Transition Zone		***0.01 mm to 0.05 mm***
Capillary Pore		***0.0001mm to 0.001 mm***

Permeable in several, different size scales.

Xypex Crystalline Technology

What is Xypex?

Coating

Admixture

Dryshake

How It Works

Calcium Hydroxide
and other by-products
of cement hydration

+

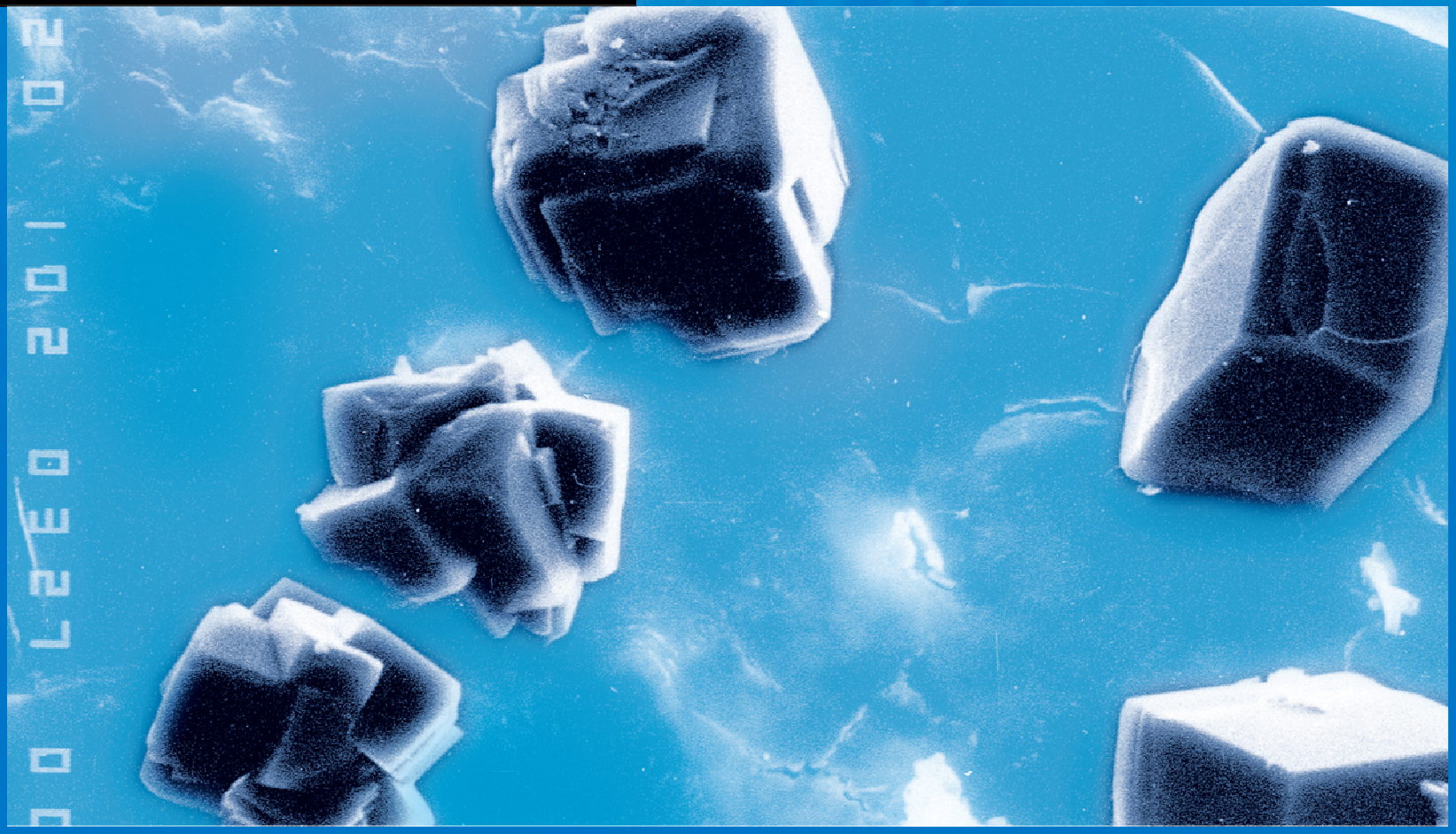
Crystalline
Waterproofing
Chemicals

=

Non-soluble crystalline formation permanently fixed within the concrete's pore structure

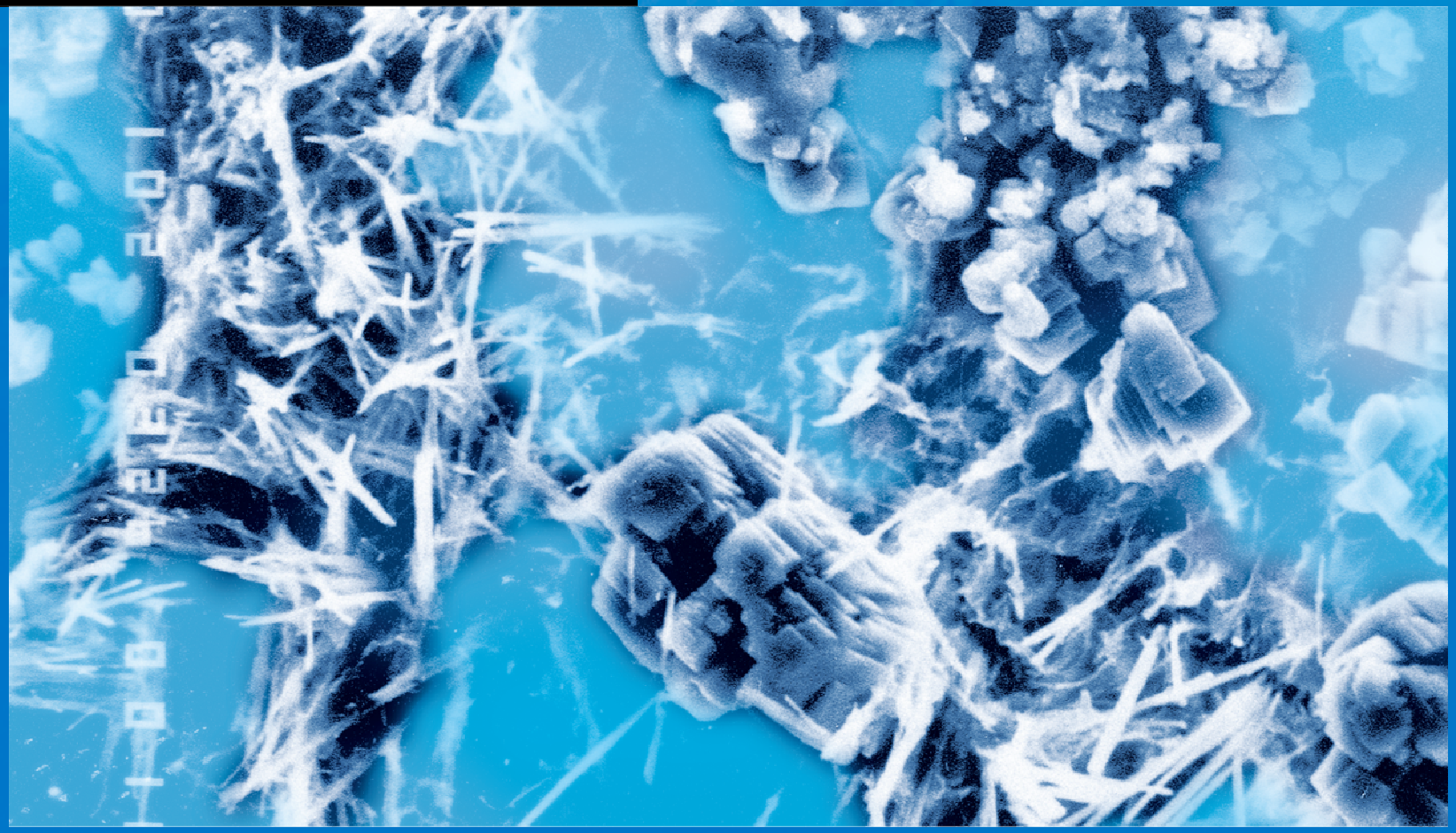
Crystalline Formation

By-products of cement hydrations



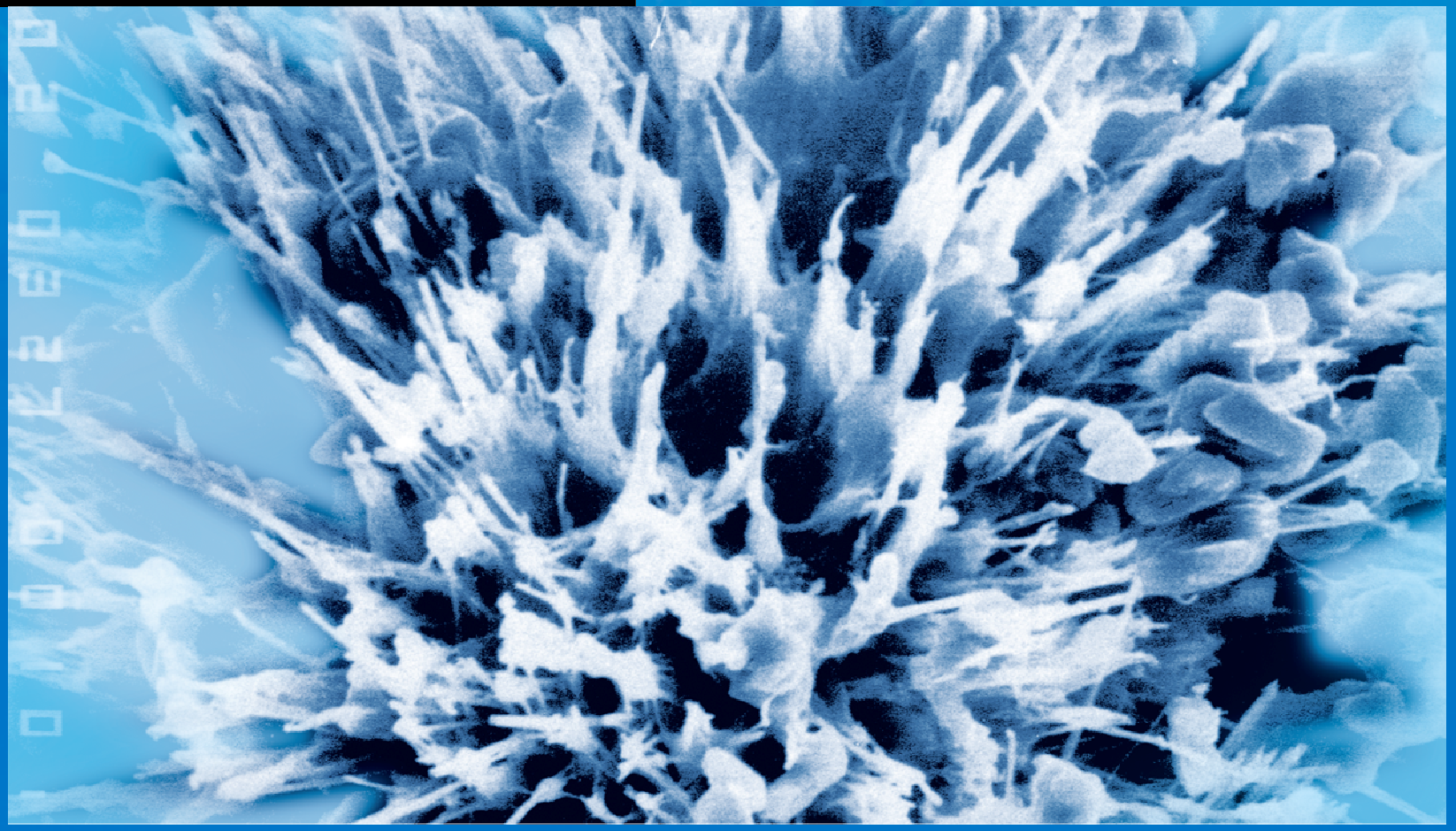
Crystalline Formation

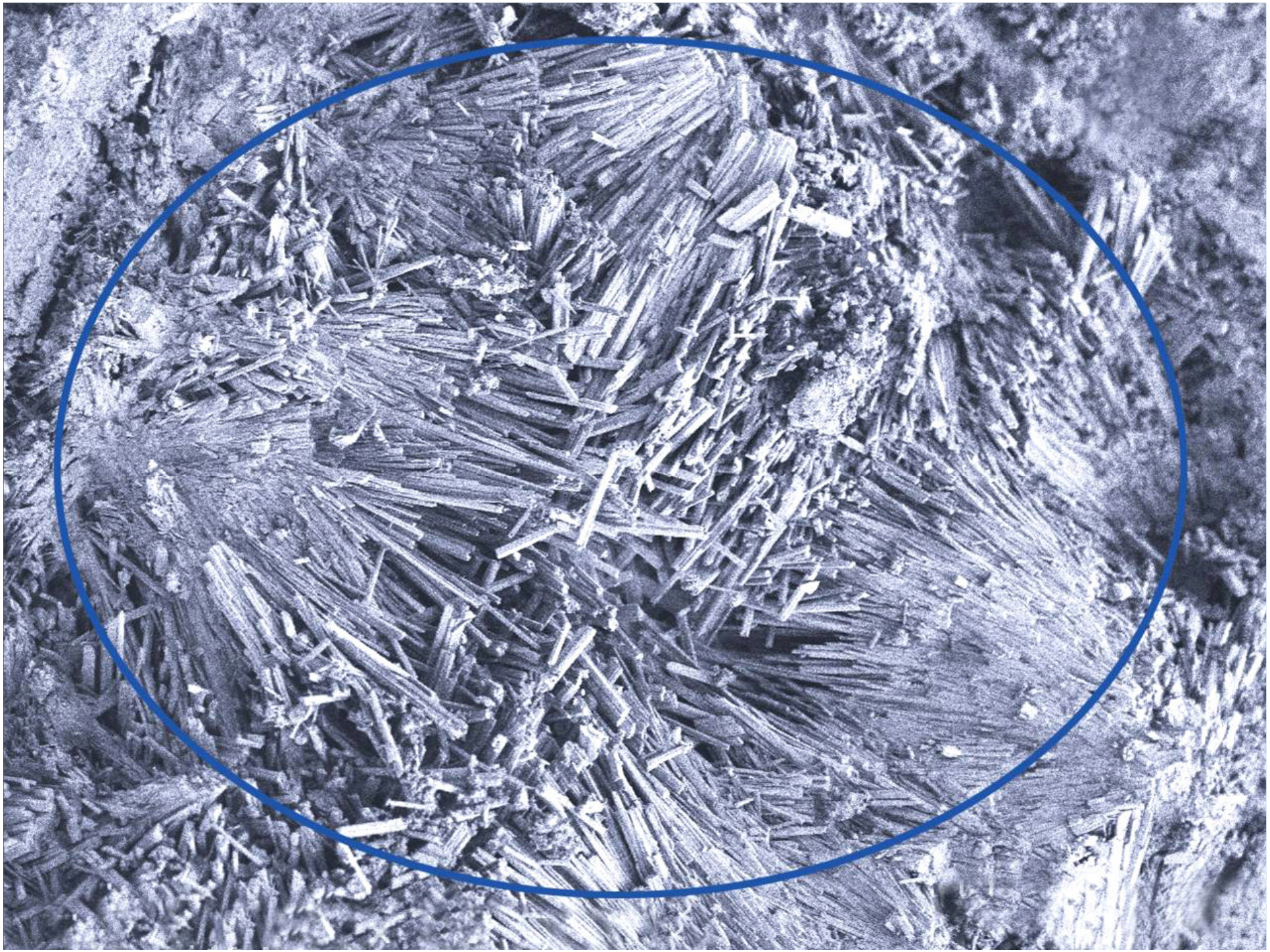
By-products + Xypex



Crystalline Formation

Non-soluble crystalline structure





What is Xypex?

- Becomes an integral, permanent part of the concrete matrix.
- Seals concrete from the penetration of water and other liquids from both the negative and positive side, even when subjected to hydrostatic pressure.
- Heals static cracks up to 0.4 mm.
- Highly resistant to chemicals where the ph range is from 3.0 - 11.0 in constant contact and 2.0 - 12.0 in periodic contact.
- Cannot be punctured or damaged like a liner or surface coating.
- Enhances the durability of concrete.

Additional Advantages

- Not affected by humidity, ultraviolet light and oxygen levels
- Protects from freeze thaw
- Increased compressive strength
- Reduced shrinkage cracking
- Is non-toxic
- Does not contain VOCs
- Does not produce any fumes
- Approved for use in potable water structures

Where is Xypex used?

- Hydrostatic Pressure
  - High Water Table
  - Tanks, Pools, Reservoirs, Dams
  - Tunnels
- Harsh Chemical Environments
  - Marine
  - Industry & Agriculture
  - Waste Water Collection & Treatment
  - Carbonation and Sulphate Attack
- Repair and Rehabilitation
  - Negative side after coating or membrane failure
  - Wet/Most concrete

Xypex and Concrete Properties

Xypex will have no negative effect on

- Slump
- Set time*
- Air
- Shrinkage
- Compressive strength

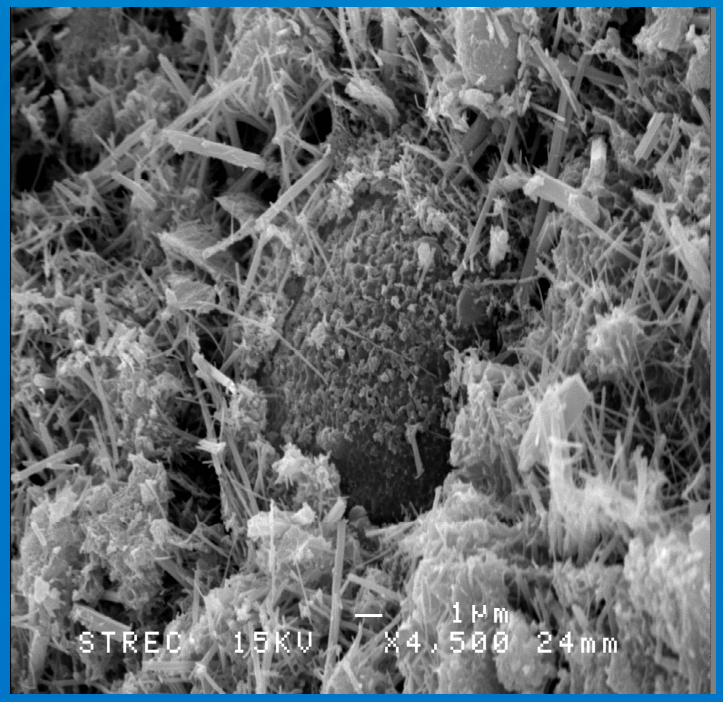
*Xypex has three different Admixtures offering different set-times, including neutral-set

SCMs & Other Additives

Xypex can be used in conjunction with SCMs and additives

- Fly-ash
- Slag
- Silica fume
- Set retarders
- Water reducer
- Super plasticizers
- Air-entrainers

Trial batches always recommended



Proven Performance

Independent Testing

Xypex has been extensively and successfully tested worldwide by independent laboratories

- Permeability
- Chemical Resistance
  - Acids
  - Sulfates
- Carbonation
- Compressive Strength
- Crack Sealing
- Scanning Electron Microscopy (SEM)

Wastewater Applications

Xypex Applications

New Construction – Sewage Systems

STRUCTURE	XYPEX ADMIX	XYPEX COATING
Manholes	✔	✔
Sewer Pipe	✔	
Pump/Lift Station	✔	✔
Sewer Overflow	✔	✔

Xypex Applications

Rehabilitation – Sewage Systems

STRUCTURE	XYPEX COATING	MEGAMIX I & II	XYPEX PATCH 'N PLUG
Manholes	✔	✔	✔
Sewer Pipe	✔	✔	✔
Pump/Lift Station	✔	✔	✔
Sewer Overflow	✔	✔	✔

Xypex Applications

New Construction – Wastewater Treatment Plants

STRUCTURE	XYPEX ADMIX	XYPEX COATING	XYPEX DS1/DS2 *floor
Manholes	✔	✔	✔
Precast Pipes	✔	✔	✔
Lift Stations	✔	✔	✔
Head Works	✔	✔	✔
Grit Chamber	✔	✔	✔
Primary Clarifier	✔	✔	✔
Aeration Tank	✔	✔	✔
Secondary Clarifier	✔	✔	✔
Digester	✔	✔	✔
Disinfection	✔	✔	✔

Xypex Applications

Rehabilitation – Wastewater Treatment Plants

STRUCTURE	XYPEX COATING	MEGAMIX I	MEGAMIX II	PATCH'N PLUG
Manholes	✔	✔	✔	✔
Precast Pipes	✔	✔	✔	✔
Lift Stations	✔	✔	✔	✔
Head Works	✔	✔	✔	✔
Grit Chamber	✔	✔	✔	✔
Primary Clarifier	✔	✔	✔	✔
Aeration Tank	✔	✔	✔	✔
Secondary Clarifier	✔	✔	✔	✔
Digester	✔	✔	✔	✔
Disinfection	✔	✔	✔	✔

Summary of Xypex

- **Waterproofs and protects concrete**
  against acidic attack.
- **Heals cracks up to 0.4 mm**
  and reactivates any time a crack occurs.
- **Permanent, integral solution**
  for new systems and rehabilitation.
- **Advantages of barrier systems,**
  with none of the disadvantages.
- **Proven worldwide**
  through thousands of projects successfully completed and independent testing.

Summary of Xypex

- **Extends service life**

  amortizing investments over a longer period.
- **Reduces maintenance costs**

  allowing for significant savings.
- **Makes concrete more environmentally friendly**

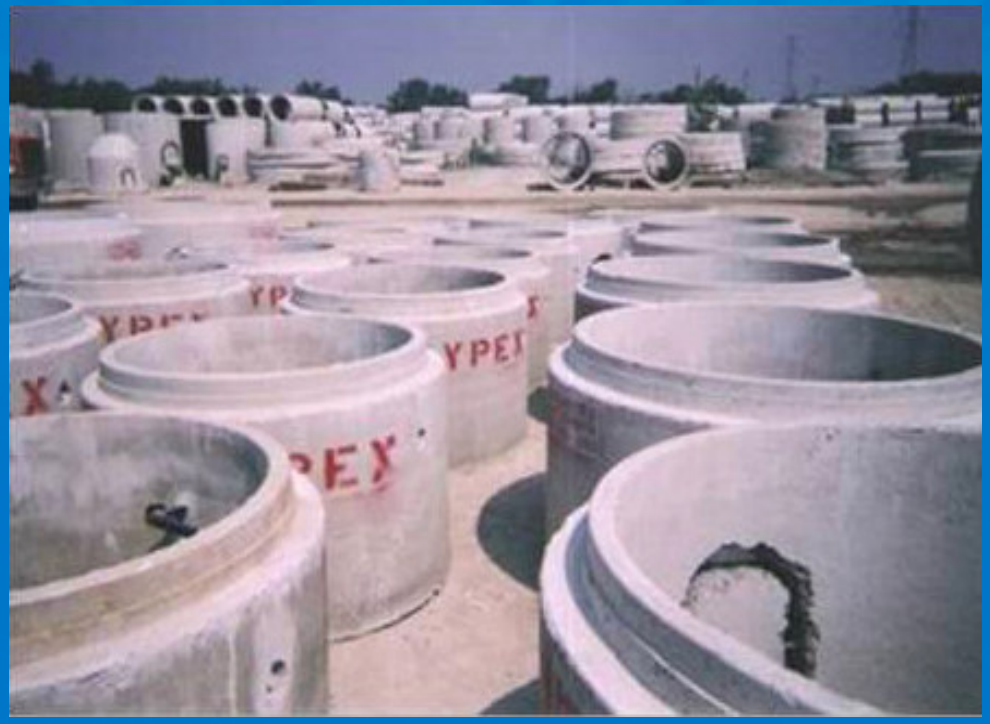
  amortizing it's footprint over a longer period.
- **Adds value to owners, engineers and contractors**

  all around the globe.

XYPEX Projects

Pipe

Genesee County Sewage System, USA



- Precast sewer line
- Waterproofing
- Chemical resistance
- Xypex Admix C-1000, Admix C-500
- 5,100 m (17,000 ft.)

Pipe

Frasher Pipe Rehabilitation, USA

- Precast pipe
- 1.5m (5 ft) diameter
- 670m (2,200 ft)
- Surface deterioration
- Rehabilitation
- Xypex Concentrate, Megamix I

Tunnel

Estoril Sewage System, Portugal

- Sewage tunnels
- New construction
- Hydrostatic pressure
- Chemical resistance
- 21 km (12 miles)
- Xypex Concentrate, Modified
- Spray application onto gunite surface

Manholes

Terrebonne Sewage System, Louisiana, USA

- 1999
- Precast manholes
- Hydrostatic pressure, chemical attack
- Xypex Admix C-1000 Red
- 2010 inspection: Xypex-treated manholes in excellent condition.

Manholes

Hrusevje Manhole Repairs, Slovenia

- Repair
- Hydrostatic pressure, chemical protection
- Xypex Concentrate, Patch’n Plug
- Joints, leaks
- 10 manholes protected – total of 120 sq. m.

Lift/Pump Station

Santa Rosa Sewage System, USA

- Precast pump station structures
- Xypex Admix

Lift/Pump Station

Erd Wastewater Treatment Plant, Hungary

After

- Hydrostatic pressure, chemical resistance
- Xypex Concentrate, Patch'n Plug
- Sealing of pipe penetration

Before

Siphon

La Crosse Sanitary Siphon, Wisconsin, USA

- Repair
- 1936 Structure
- 3.5 mgd siphon
- 75mm-100mm (3'' – 4'') loss of cover
- Hydrogen Sulfide, Microbial Induced Corrosion (MIC)
- Original spec. PU coating with 5-year warranty
- Concrete too wet to receive liner

Siphon

La Crosse Sanitary Siphon, USA

- Water-based abrasive cleaning
- Some re-bar replacement
- Xypex Megamix II
- 144 sq.m (1,600 sq. ft.)

Box Culverts

Boston Sewage System, USA

- Boston City sewer upgrade
- Precast box culverts
- 6m (20 ft) below grade
- Xypex Admix C-500

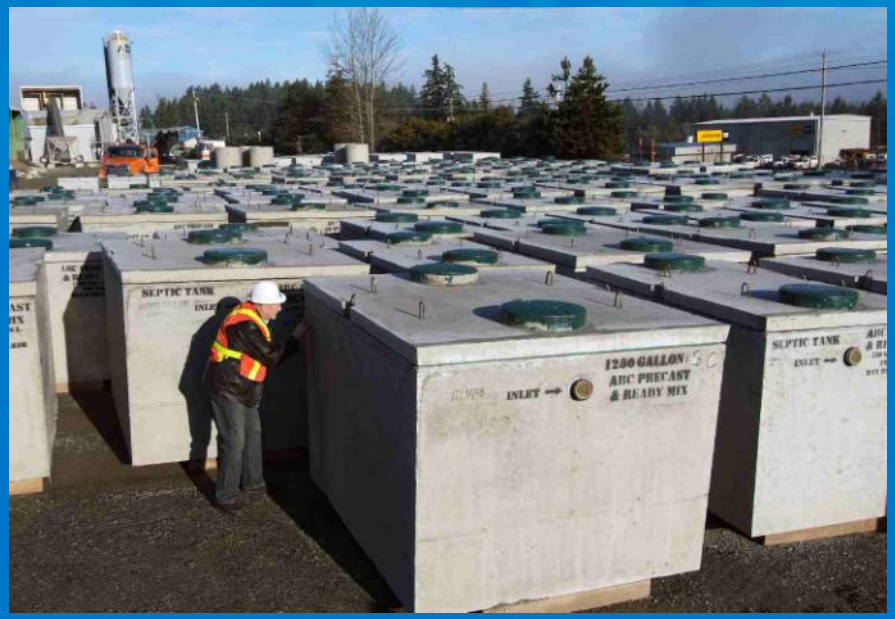
Overflow / Interceptor

Eastern Delta Sewer Interceptor, USA

- New construction
- Sewer interceptor, control chamber
- Xypex Admix C-1000

Septic Tanks

ABC Precast Septic Holding Tanks, Canada



- Precast
- 320 litre (1,200gallon) septic holding tanks
- Xypex Admix C-500 (3% dosage for resistance to chemical attack)

Settling Tanks

Elektrenai Waste Oil Settling Tanks, Lithuania

- Industrial Wastewater
- Repair
- Hydrostatic pressure, chemical protection
- Xypex Concentrate, Modified

Sedimentation

Szarvas Bio-filtration Basin, Hungary

- Hydrostatic pressure
- Basin walls/floor
- Xypex Concentrate

Anaerobic Digesters

Bailonggang Water Purification Plant, China

- Hydrostatic pressure
- Basin walls/floor
- Xypex Concentrate (1,110 kg)

Anaerobic Digesters

Bailonggang Water Purification Plant, China

- Chemical resistance
- Xypex Concentrate
- May 2010

- 8 pre-stressed sludge digesters
- 25m (75ft) x 44m (132ft), 12m (36ft) below grade

Anaerobic Digesters

Ramos Arizpe Wastewater Treatment Plant, Mexico

- Repair of digester tanks
- Xypex Patch ‘n Plug, Concentrate

Biogas Plant

Biogas Plant in Tartu, Estonia

- New-build repairs
- Reservoir
- Xypex Patch’n Plug, Concentrate
- 1,860 m^2

Silt Deposition Reservoir

Silt Deposition Reservoirs, Lithuania

- Chemical resistance and waterproofing
- Xypex Concentrate, Modified

Wastewater Treatment Plant

Alegria Wastewater Treatment Plant, Brazil

- New construction
- Hydrostatic pressure
- Chemical resistance
- Xypex Concentrate, Modified
- 35,000 sq.m (378,000 sq.ft) foundation walls and slabs

Wastewater Treatment Plant

Fukashiba Sewage Treatment Plant, Japan

- Repair
- Xypex Megamix II

Wastewater Treatment Plant

Novgorod Wastewater Treatment Plant, Russia

- Repair
- Xypex Concentrate, Modified, Patch ‘n Plug
- 7,080 sq. m (76,208 sq. ft) total application area + 1,100 m (3,600 ft) of joints

Wastewater

JAPAC Wastewater Treatment Plant, Mexico

- Rehabilitation
- Xypex Patch’n Plug, Concentrate

Are there any questions?

Xypex Chemical Corporation • Tel: (604) 273-5265 • www.xypex.com

The following slides include:

- **Proven Performance**
- **Products**
- **Application and Installation Methods**

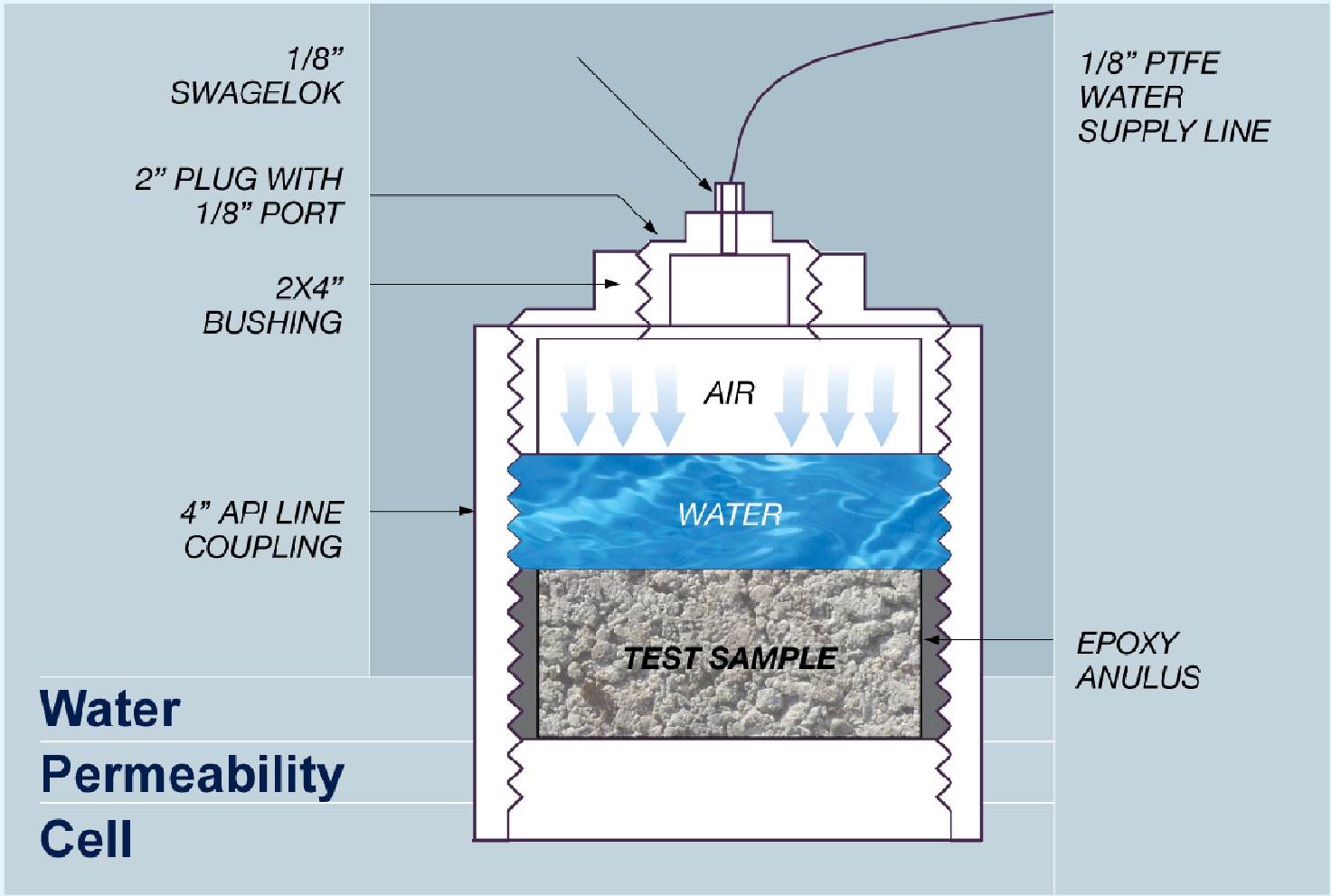
Proven Performance

Independent Testing

Xypex has been independently tested worldwide for these characteristics

- Permeability
- Chemical Resistance
  - Acids
  - Sulfates
- Carbonation
- Compressive Strength
- Crack Sealing
- Scanning Electron Microscopy (SEM)

Permeability



Permeability

Taywood Engineering, CRDC C48-73, Singapore

Sample Reference		Control Concrete						Xypex-treated Concrete					
Date of Cast		22/01/97						14/01/97					
Date of Coring		30/01/97			20/02/97			22/01/97			2/12/97		
Age of Curing (days)		8			29			8			29		
Specimen Size (mm)		150 x 50						150 x 50					
Specimen Reference		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Volume of water moving through the sample (mL):													
At 1 bar on	1st day	0	0	0	0	0	0	0	0	0	0	0	0
At 2.4 bar on	2nd day	0	0	0	0	0	0	0	0	0	0	0	0
At 4.2 bar on	3rd day	0	0	0	0	0	0	0	0	0	0	0	0
At 7.0 bar on	4th day	0	0	0	0	0	0	0	0	0	0	0	0
	5th day	10	0	4	10	0	0	0	0	0	0	0	0
	6th day	30	20	25	74	13	0	0	0	0	0	0	0
	7th day	65	20	60	78	20	0	0	0	0	0	0	0
	8th day	70	30	60	45	10	0	0	0	0	0	0	0
	9th day	70	30	60	35	10	0	0	0	0	0	0	0
	10th day	70	30	60	46	10	0	0	0	0	0	0	0

Permeability

DIN 1048, Bautest, Germany,

Treated

bautest Corporation for research and testing of building materials

To determine water impermeability
After DIN 1048

Order Number: A 362/80

Customer: XYPEX Kemptenerstr. 55, 8900 Augsburg

Water permeable concrete with coating — Part: Coated with Xypex

General Data

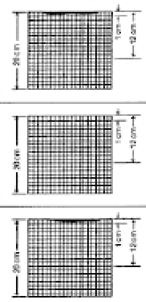
Order from: 26.11.79 — Received: 26.11.79

Type of material to be tested: WU Blocks 20 x 20 x 12 cm — Test date: 18.1.80

Test submitted: 26.11.79 by Customer

Testing results

DESCRIPTION	MANUFACTURING DATE	START OF TEST	END OF TEST	LARGEST PENETRATION	REMARKS
1	26.11.79	14.1.80	18.1.80	6	With Coating
2	26.11.79	14.1.80	18.1.80	0	With Coating
3	26.11.79	14.1.80	18.1.80	7	With Coating
				4	



Strength of coating about 1mm. Placed through customer.

Certified True & Correct
BERLITZ SCHOOL
VANCOUVER, B.C.
V6C 1J8

bautest GmbH

Augsburg: 25.3.1980

Tests carried out by: Th/Gro

(2)

Untreated

bautest Corporation for research and testing of building materials

To determine water impermeability
After DIN 1048

Order Number: A 362/80

Customer: XYPEX Kemptenerstr. 55, 8900 Augsburg

Water permeable concrete without coating — Part: O - Test untreated

General Data

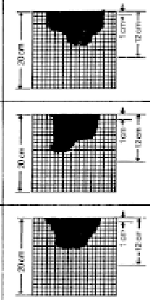
Order from: 26.11.79 — Received: 26.11.79

Type of material to be tested: WU Blocks 20 x 20 x 12 cm — Test date: 18.1.80

Test submitted: 26.11.79

Testing results

DESCRIPTION	MANUFACTURING DATE	START OF TEST	END OF TEST	LARGEST PENETRATION	REMARKS
3	26.11.79	14.1.80	18.1.80	82	
5	26.11.79	14.1.80	18.1.80	92	
5	26.11.79	14.1.80	18.1.80	78	
				84	



Strength of coating about 1mm. Placed through customer.

Certified True & Correct
BERLITZ SCHOOL
VANCOUVER, B.C.
V6C 1J8

bautest GmbH

Augsburg: 25.3.1980

Tests carried out by: Th/Gro

PERM-200

Untreated control sample had average 84 mm of water penetration. Xypex treated control sample had average 6 mm of water penetration. Hydrostatic pressure equivalent to 224 ft of hydraulic head .

Chemical Resistance

Sulfuric Acid Exposure

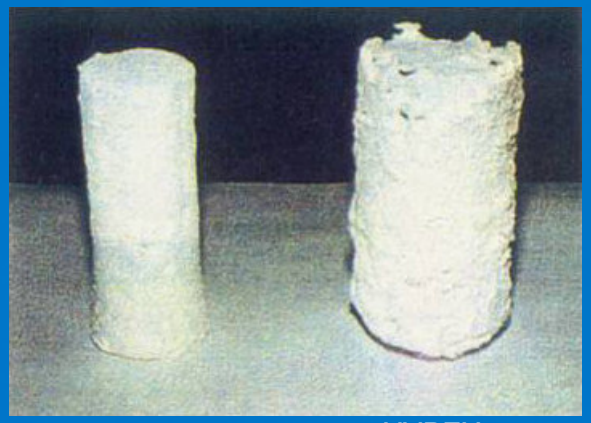
Chemical Durability, Iwate University, Tokyo, Japan

The typical means of evaluating the ability of the Xypex treatment to provide chemical resistance include: measuring amount of mass loss, length change or relative dynamic modulus of elasticity.

Before Soaking

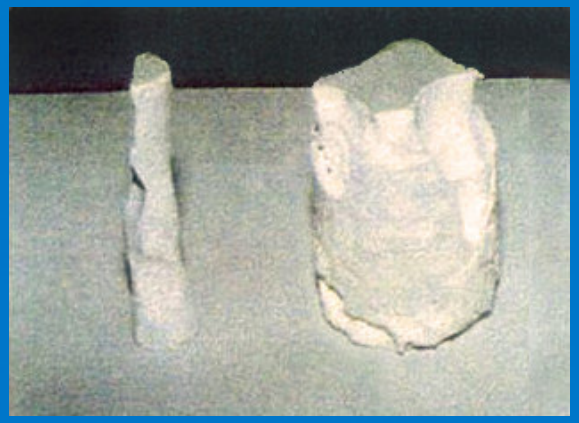
UNTREATED XYPEX

5 Weeks



UNTREATED XYPEX

10 Weeks



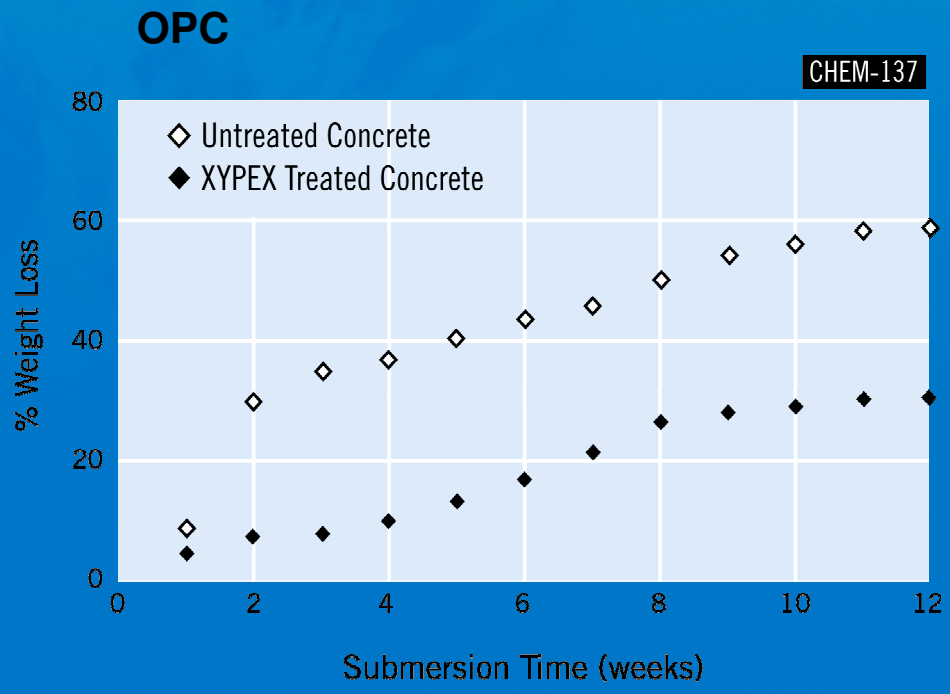
UNTREATED XYPEX

Chemical Resistance

Protects concrete in acidic conditions

Sirindhorn International Institute of Technology, Thammasat University, Bangkok

- Mortar (0.50 w/c)
- ASTM C-267
- 5% sulphuric acid for 12 weeks (pH<0.54)
- Mass loss of Xypex treated sample 48% less for OPC mortar and 53% less for 30% fly-ash mix



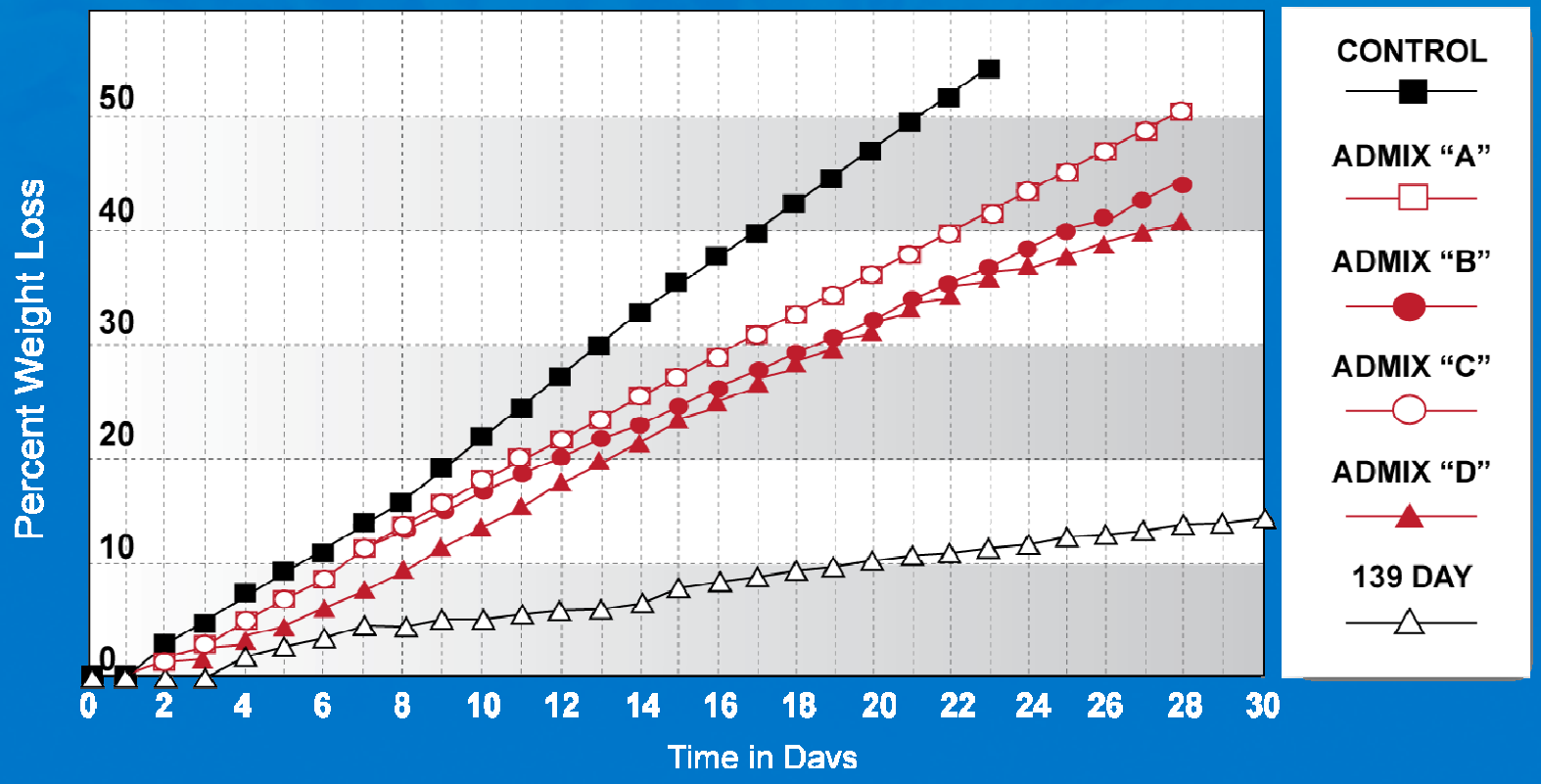
CHEM-137

Chemical Resistance

Sulfuric Acid Exposure

Aviles Engineering, Texas, USA

- 40 day cure acid comparison test in 7% $H_2(SO_4)$
- Control, 3%, 5% and 7% Admix (Regular Grade)
- Curing periods were varied to determine effects



Chemical Resistance

Protects concrete in sulphate conditions

Betonconsult, Building Materials Testing Laboratory, Prague, Czech Republic.

- C30/37 concrete cubes
- 36,000 mg/l sulphate solution, 4 months
- Mass loss for Xypex treated samples 5-50 g/m^2
- Mass loss for control samples 4,860 g/m^2
- Xypex sample achieved same sulphate resistance levels as XA3 (3,000 – 6,000 mg/l) (EN 206)

Control

Xypex treated

CHEM-132

Chemical Resistance

Ammonium Sulfate Exposure

Taywood Engineering, Sydney, Australia

- 1 molar - 132 g/l
- Six mixes: control, low slag cement, silica fume, high slag cement, silica fume cement, Xypex Admix

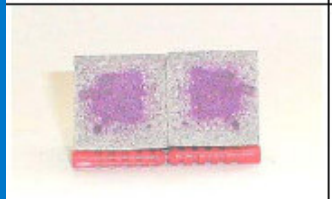
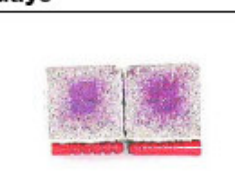
Results of Exposure Trials						
	MIX DESIGNATION					
Component	GB80	GP	LH	SR	SF	ADMIX
Total Percentage Weight Loss	14.60	12.00	28.40	7.20	8.80	8.80
Loss Percentage Length Change	0.01	–	0.12	0.00	-0.01	-0.02

Note 1: Total Percentage Weight Loss is given for 25 weeks exposure.
Note 2: Percentage Length Change is given as the change compared to the GP mix, at 25 weeks.

Carbonation

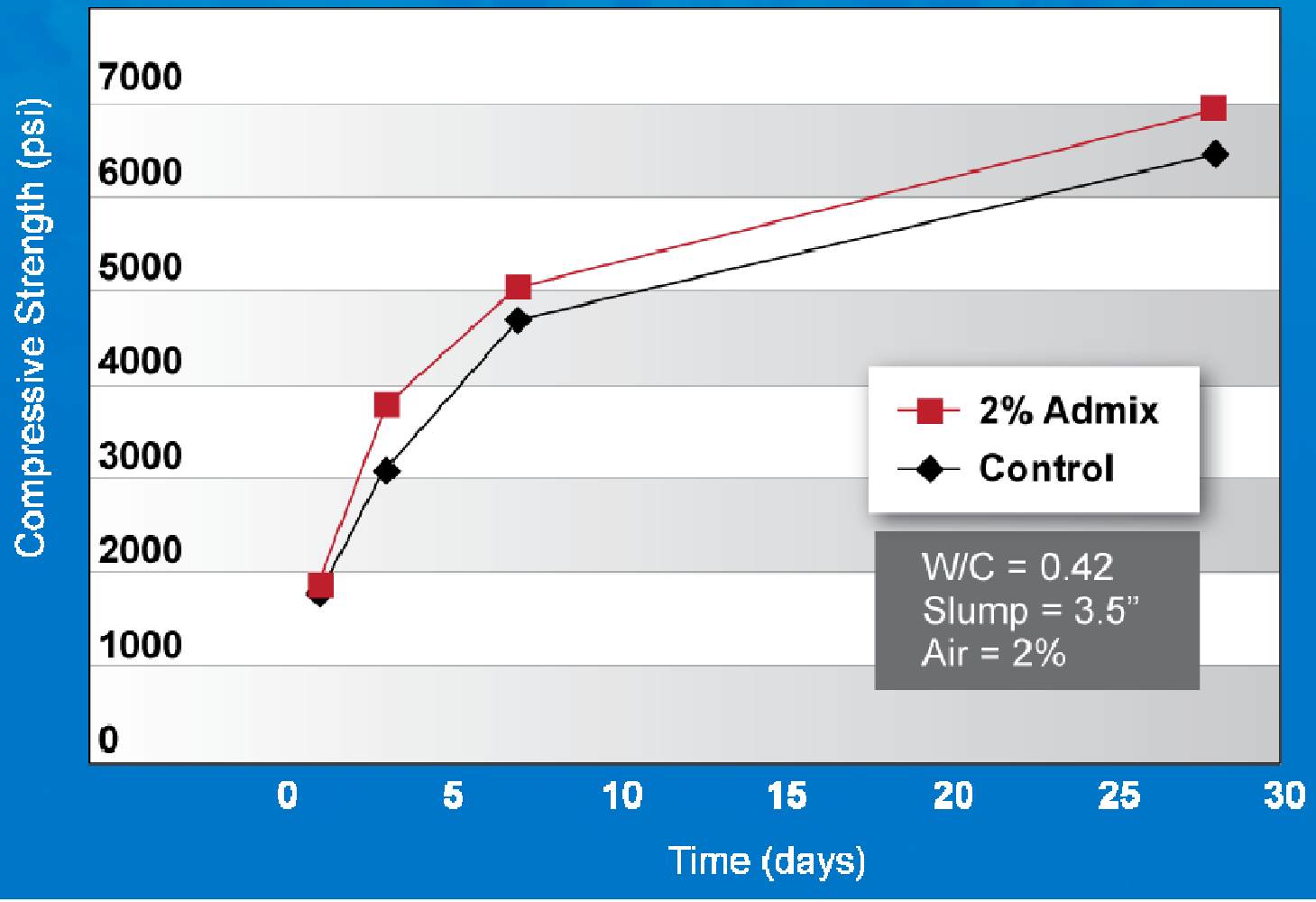
Resistance to carbonation

Slovenska Akademia Vied, Institute of Construction and Architecture (Bratislava 2002)

Plain Mortar (51)	Mortar with 1 Coat (52)	Mortar with 2 Coats (53)
 3 days	 3 days	 3 days
 7 days	 7 days	 7 days
 14 days	 14 days	 14 days

Compressive Strength

Kleinfelder Laboratories, San Francisco, California, USA



Crack Sealing Test

The Construction Bureau of Chubu District, Japanese Ministry of Construction (Sept 1996)

Photo 1: Evidence of cracking in concrete on underside of the deck slab

Crack Sealing Test

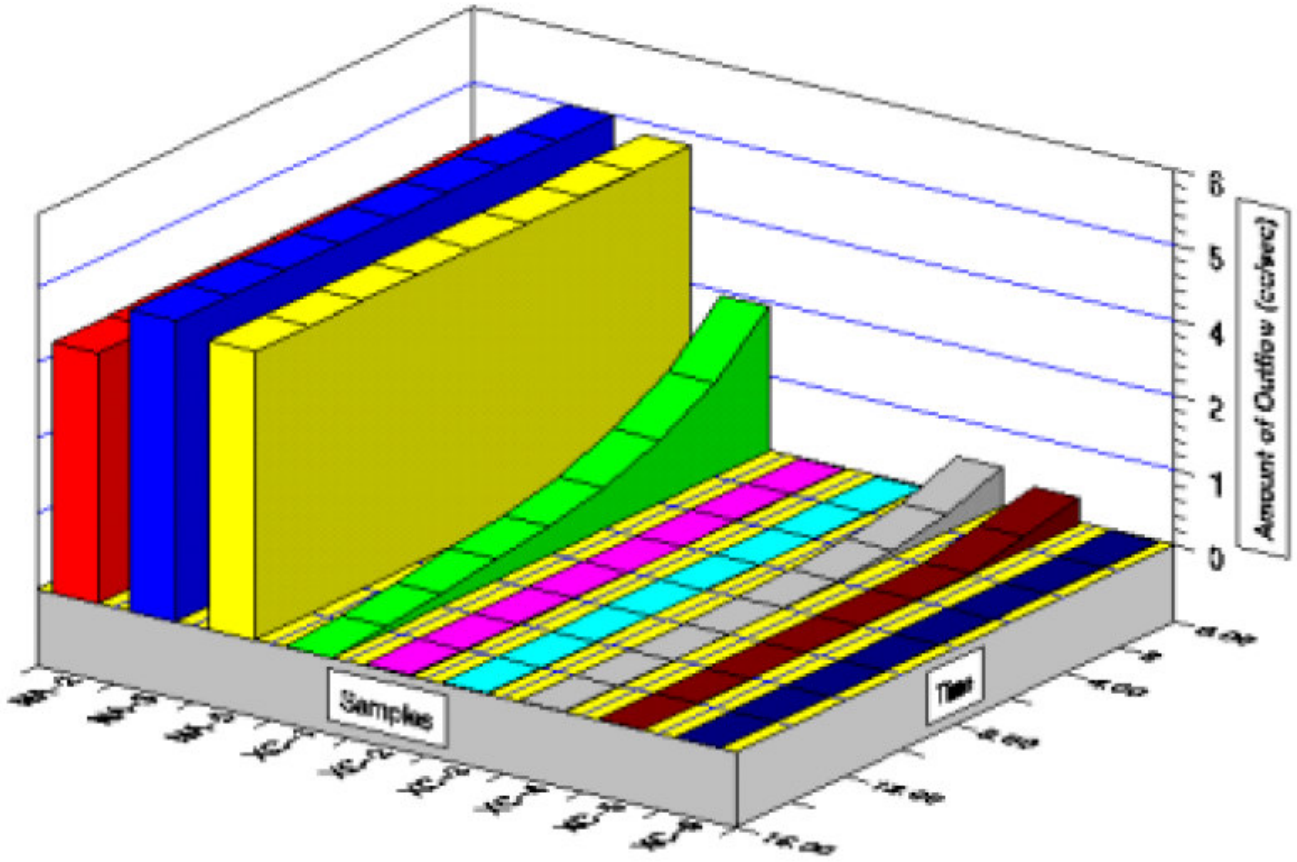


Figure 3: Change in Amount of Outflow with Time

XYPEX

Xypex Testing

Xypex products have been extensively and successfully tested by leading, independent scientific laboratories throughout the world for durability permeability and chemical resistance.

AVLES ENGINEERING CORP

BBA BRITISH BOARD OF AGREMENT TECHNICAL APPROVALS FOR CONSTRUCTION

PACIFIC TESTING LABORATORIES STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

bautest

KLEINFELDER

MAHAFFEY ASSOCIATES

KAUNO TECHNOLOGIJOS UNIVERSITETAS

CSIRO

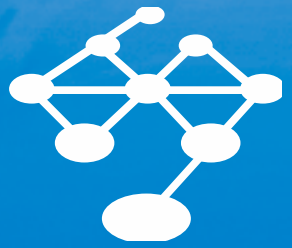
SETSCO

TSUS

UNSW THE UNIVERSITY OF NEW SOUTH WALES

XYPEX®

Potable Water Approvals



Agriculture and
Agri-Food Canada

Department of Water and Cleanliness

MAIRIE DE PARIS

Australian
Water
Quality
Centre

WRAS
Water Regulations Advisory Scheme

TZW

SSIS

dwi

XYPEX

Potable Water Approvals

EPA

OhioEPA

VDH VIRGINIA DEPARTMENT OF HEALTH

CDPH

FLORIDA DEPARTMENT OF HEALTH

NSF®

Helsedirektoratet

STATE OF NEW YORK DEPARTMENT OF HEALTH

TEXAS Department of State Health

XYPEX Products

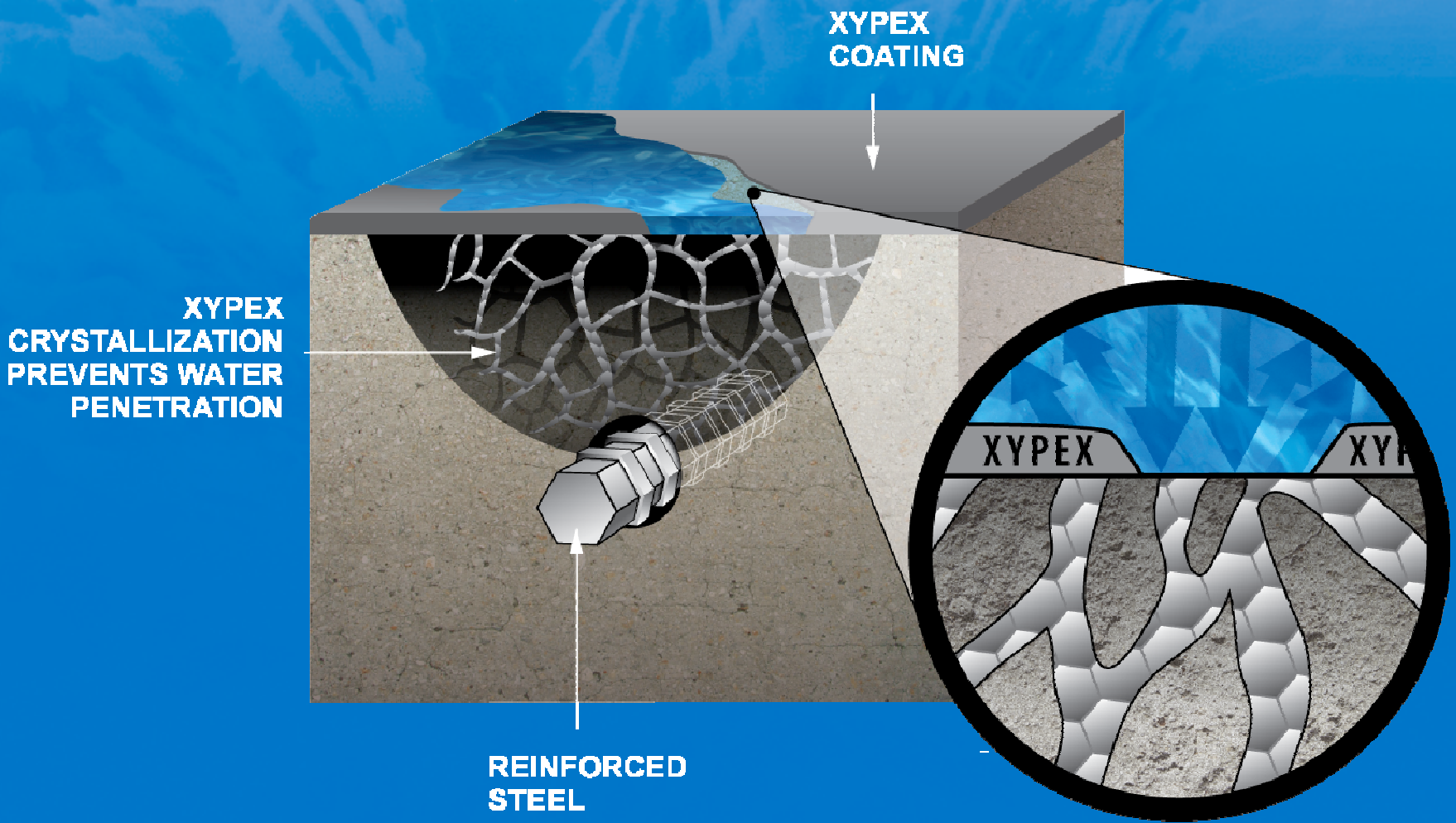
Coating

- Concentrate
- Modified

Spray Applied

Brush Applied

Coating


XYPEX
COATING
XYPEX
CRYSTALLIZATION
PREVENTS WATER
PENETRATION
REINFORCED
STEEL
XYPEX

Coating

Crystalline waterproofing chemicals can penetrate to a depth of 12”.

Coating

- Does not require costly surface priming and leveling
- Does not require a dry surface
- Sealing, lapping or finishing is not needed
- Can be applied to both positive and negative side
- No protection required during back-filling
- Can be applied in confined spaces – no VOCs
- Crystalline waterproofing penetrates deeply into the concrete substrate and becomes an integral part of the concrete.
- Does not depend on surface adhesion like barrier systems and does not have seams that come apart.
- Permanent, one-time only treatment

Admixture

Dry batch
Central Mix

Pre-cast

- Admix C-500
- Admix C-1000
- Admix C-2000

Also available in NF (no fines) and non-soluble bags.

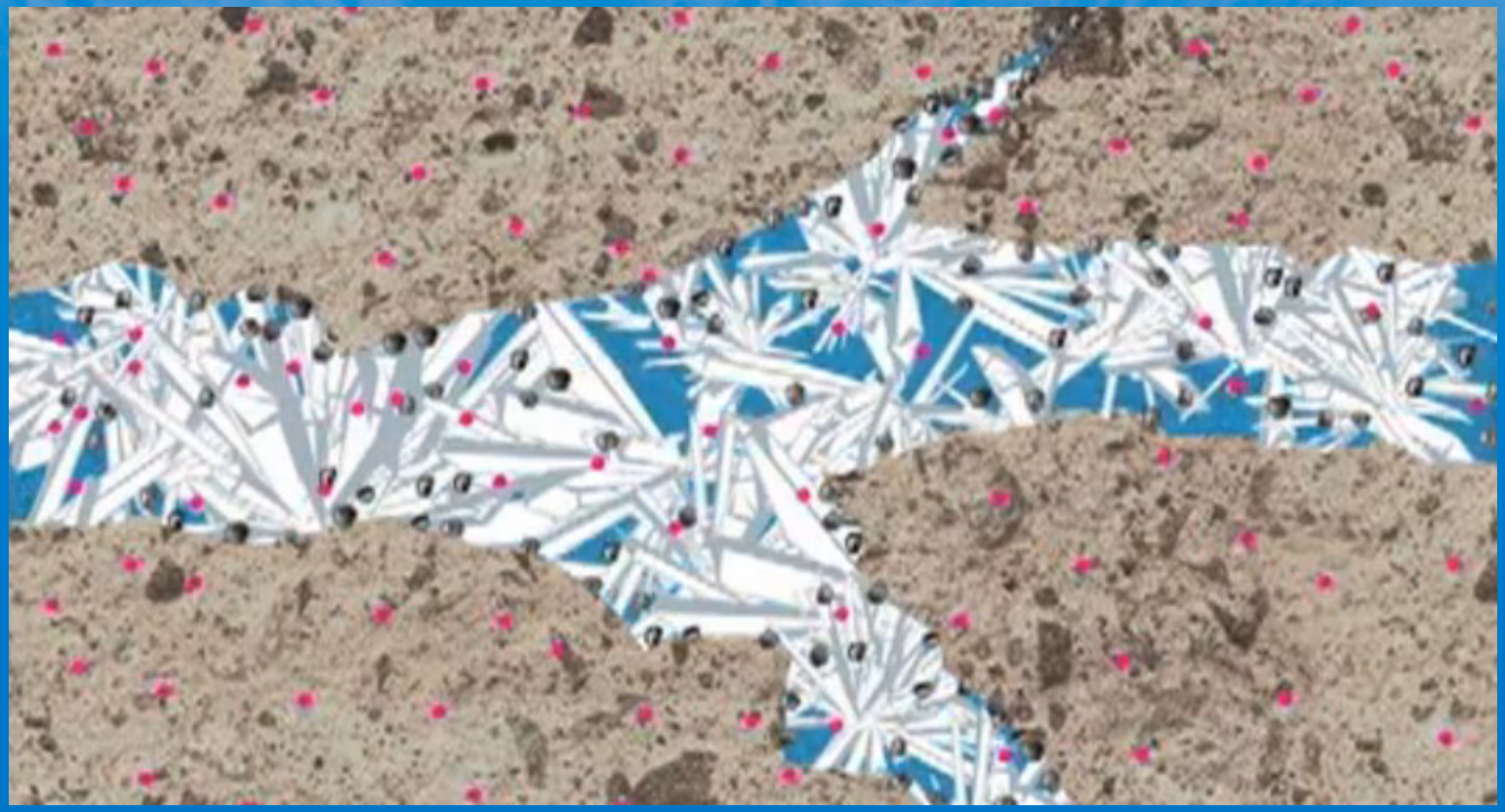
Admixture

Ready-mix Concrete

Precast Concrete

Shotcrete

Admixture



Admixture

Admix Type	For Normal Waterproofing and Durability	For Extra Chemical Protection or Special Applications
C-500 **C-1000** **C-2000***	2%	3%
C-500 NF **C-1000 NF** **C-2000 NF***	1%	1.5%

Based on % of cement or cement + pozzolan/slag depending on mix design

Admixture

May be used in conjunction with other admixtures

- Set retarders
- Water reducer
- Superplasticizers
- Air-entrainers

Trial Batching is always recommended

Admixture

- Added at time of batching.
- Minimizes installation costs
- Takes a trade off the job site
- Shortens construction schedule

Patching & Repair

- Patch'n Plug
- Megamix I and II
- FCM 80
- Xycrylic Admix
- Gamma Cure

Patching & Repair

Patch ‘n Plug

- Fast setting
- For crack repair and mortar joints with flowing water

Patching & Repair

Megamix I and II

- Xypex Crystalline Technology
- Excellent adhesion and bond
- Low shrinkage, fiber reinforced
- Low chloride penetration
- Chemical durability
- High strength
- Designed for either structural repair or protective coating

Raccoon Creak Water Treatment Plant

Patching & Repair

Megamix I

- A thin parge coat for waterproofing or resurfacing vertical masonry or concrete surfaces or as a cap coat for Xypex Concentrate.
- Lining of swimming pools, tunnels and tanks.
- Finished surface or good for painting.
- Applied by brush or notch trowel. Rapid set.
- Application thickness
  1.5 mm (1/16”) to 10 mm (3.8”).

Patching & Repair

Megamix II

- High strength concrete repair mortar and a structural chemical resistant cement liner for horizontal and vertical applications.
- Application thickness 10 mm (3.8”) to 50 mm (2”).
- For water tanks and reservoirs, concrete pipes, manholes and vaults, tunnels, bridges and marine structures.
- Low pressure sprayed or trowel applied.

Application & Installation Methods

How to Use Xypex

Xypex Coating and accessory products are used for:

- For new construction where a coating method is preferred
- The repair of defects in concrete structures
- The rehabilitation of deteriorated structures from exposure to aggressive environments

Xypex Admix products are utilized for:

- New construction
- Cast-in-place
- Precast or shotcrete installations

1. Surface Preparation

Examination

The surface must be free of foreign substances and should be examined for cracks and other defects that need to be repaired before application of Xypex.

Preparation

Water blast to clean and open the surface of the concrete and remove damaged substrate material.

2. Structural Repair

Rout out the cracks with pneumatic chipping gun to form a “U” shaped slot or groove.

2. Structural Repair

Apply a slurry coat of Xypex Concentrate to entire slot.

2. Structural Repair

Fill slot to surface with Concentrate Dry-Pac.

2. Structural Repair

Compress the Dry-Pac with pneumatic packing hammer followed by a slurry coat of Concentrate.

2. Structural Repair

Patching Defects in Concrete Where There is an Active Leak

Seepage should be stopped using Xypex Patch ‘ Plug prior to the application of the Xypex repair system. Where there is an active leak, a bleeder hose may be used to redirect the water while Patch’n Plug is applied.

2. Structural Repair

Installing Patch'n Plug Against the Flow of Water

3. Wetting Concrete

Wet down concrete surface with water to achieve a saturated substrate and damp surface prior to the Xypex coating application.

4. Mixing for Slurry Coat

Mix 5 parts Xypex powder with 2 parts clean water to a creamy consistency (like a pancake batter).

5. Applying Xypex

Apply Xypex with a brush or spray equipment to a uniform coating 1.5mm (1/16”) thick. Where a second coat is required it should be applied after the first coat has reached an initial set but before it begins to dry.

6. Curing

Xypex applications must be kept damp for a minimum of 48 hrs. In most cases it is sufficient to spray the application with a light mist 3 times a day. It should also be protected against heavy rain or puddling of water. Xypex can also provide Gamma Cure for applications subject to harsh weather conditions.