BRIDGES



XYPEX®

CONCRETE WATERPROOFING
BY CRYSTALLIZATION

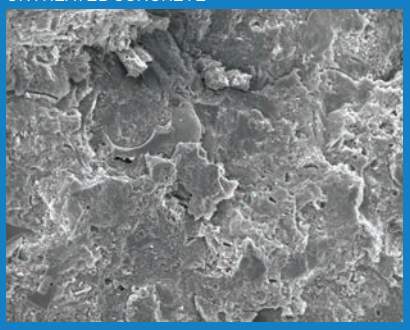
XYPEX

WATERPROOFING & ENHANCED DURABILITY FOR BRIDGES

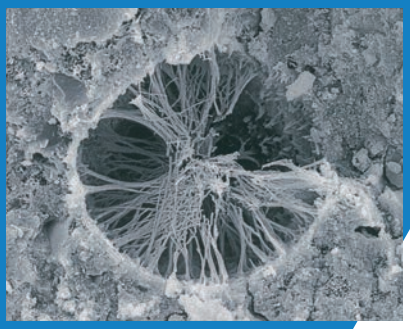


William R. Bennett Floating Bridge, Kelowna, Canada

UNTREATED CONCRETE



CRYSTALLIZATION INITIATED



CRYSTALLIZATION MATURE



REACTIVATES AND SELF-HEALS CRACKS UP TO 0.5 mm WHEN WATER IS PRESENT

EXTENDED SERVICE LIFE

WATERPROOF UNDER EXTREME HYDROSTATIC PRESSURE

XYPEX CRYSTALLINE TECHNOLOGY

Xypex Crystalline Technology works inside the concrete. It blocks chloride ingress, extends service life, and self-heals when water is present.

For bridge infrastructure, integral waterproofing provides measurable, verifiable durability advantages. Trusted in over 100 countries for more than 55 years, Xypex protects concrete from the inside out and extends the service life of bridges.

INTEGRAL WATERPROOFING AND INCREASED SERVICE LIFE

Xypex reacts with the by-products of cement hydration and water to form a non-soluble crystalline structure deep within the pores and capillary tracts of the concrete matrix. In this condition, the concrete becomes impermeable to water and aggressive agents from any direction.

The chemical-resistant crystalline matrix prevents chloride ingress and mitigates sulphate attack. It has also proven effective against carbonation and can self-heal static cracks up to 0.5 mm (0.02 in), ensuring long-term concrete performance even under harsh environmental conditions.

- Permanent increase in durability and extended service life
- Reduces chloride ingress
- Increase resistance against sulphate attack and carbonation
- Self-heals static cracks up to 0.5 mm
- Can be used in new structures or in maintenance and rehabilitation of bridges

XYPEX

COMPREHENSIVE PROTECTION ACROSS ALL BRIDGE COMPONENTS

Bridges are exposed to a unique combination of deterioration mechanisms that act simultaneously on different structural elements. Xypex Crystalline Technology addresses these threats through a single, permanent solution — applicable to every concrete component, in both new construction and rehabilitation.

Reduces Permeabiity
Blocks water and the ingress of aggressive ions

Supports Crack Self-Healing
Enables self-healing of cracks up to 0.5 mm

Extends Service Life
Reduces deterioration and maintenance costs over the life of the bridge



DECKS

Primary Exposure:
Freeze/Thaw, De-icing salts.

Key Risk:
Chloride ingress from de-icing salts causes reinforcement corrosion and accelerates deck deterioration.

Xypex Benefit:
Reduces concrete permeability and crack infiltration, helping delay corrosion initiation and extend service life.

PARAPETS

Primary Exposure:
Moisture, Freeze/Thaw.

Key Risk:
Shrinkage cracking and freeze/thaw exposure accelerate moisture penetration and surface deterioration.

Xypex Benefit:
Supports crack self-healing and reduces moisture ingress in exposed bridge elements.

BEAMS

Primary Exposure:
Carbonation, Chlorides, Moisture.

Key Risk:
Carbonation and chloride migration increase the risk of reinforcement corrosion.

Xypex Benefit:
Reduces the movement of water and aggressive ions through the concrete microstructure.

APPROACH STRUCTURES

Primary Exposure:
Freeze/Thaw, Moisture, De-icing salts.

Key Risk:
Water infiltration and freeze/thaw cycling accelerate deterioration at transitions and joints.

Xypex Benefit:
Provides integral waterproofing protection that supports long-term durability and reduced maintenance.

ABUTMENTS

Primary Exposure:
Moisture, Carbonation, Wet/Dry Cycling.

Key Risk:
Water infiltration and carbonation contribute to reinforcement corrosion and concrete deterioration.

Xypex Benefit:
Creates an integral waterproofing barrier within the concrete matrix while supporting long-term durability under wet/dry cycling.

PIERS & FOUNDATIONS

Primary Exposure:
Sulphates, Chlorides, Hydrostatic Pressure.

Key Risk:
Sulfates, chlorides, and continuous moisture exposure contribute to long-term durability loss.

Xypex Benefit:
Enhances resistance to aggressive groundwater and reduces permeability under hydrostatic conditions.

DESIGNED FOR DURABILITY. ENGINEERED FOR PERFORMANCE.

Xypex Crystalline Technology works within the concrete to provide lasting protection deep inside the structure, today and for decades to come.



Chishi Bridge
Yizhang County, China

XYPEX

PROTECTS AGAINST THE CRITICAL DETERIORATION MECHANISMS

Xypex reduces concrete deteoriation caused by against water ingress, chlorides, cracking, carbonation, sulphate attack, ASR, and freeze/thaw damage. By reducing permeability and enabling self-healing, it significantly extends the service life of bridge structures.



Xypex Reduces Permeability and Slows Corrosion

- Crystalline reduces concrete's permeability and makes concrete impermeable to water
- Improves long-term durability and lowers lifecycle deterioration
- Significantly reduces the effective chloride diffusion coefficient
- Extends time to corrosion initiation and requires fewer repairs over the sevrvice life
- Studies show reduced corrosion rate by >40% (uncracked) and up to 70% (cracked)



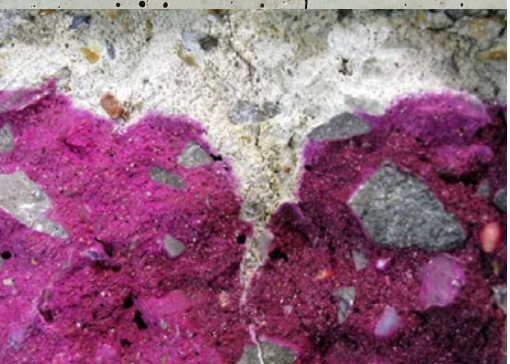
Xypex Mitigates Sulphate Attack and Reduces Rate of ASR Damage

- Reduces water ingress, slowing chemical deterioration mechanisms
- Reduction of up to >95% reduction in sulphate attack in high-exposure conditions
- Extends structural performance in aggressive soils
- Proven to reduce rate of AAR damage



Durability Improved by Xypex Self-Healing

- Xypex heals cracks up to 0.5 mm through crystalline growth to manitain watertightness
- Continues to react until water is no longer present
- If water re-enters, the chemistry reactivates to enable continuous self-healing



Xypex Slows Carbonation and Protects Reinforcement

- Increased carbonation resistance due to reduced permeability
- Increased alkalinity and maintenance of steel passivation layer

XYPEX ADMIX
FOR NEW CONSTRUCTION

Xypex Admix is added directly to the concrete mix at time of batching, it becomes a permanent part of the concrete matrix.



Second Orinoco River Bridge
Ciudad Guayana, Venezuela



ADMIX ADVANTAGES

- Incorporated during batching
- Suitable for cast-in-place, precast, and shotcrete
- Permanent integral protection, no reapplication
- Compatible with SCMs, fly ash, silica fume, slag
- Contains the proprietary ***Xypex VDS*** tracer, a built-in marker that lets engineers and inspectors independently confirm the presence of Xypex throughout the hardened concrete, with no need for additional testing.

VDS Visual Detection System



XYPEX
SURFACE APPLIED AND REPAIR

Xypex can be used to increase the durability of existing bridge structures through the use of Xypex Surface Applied and repair materials.



SURFACE APPLIED ADVANTAGES

- Compatible with all concrete bridge elements
- Existing structures requiring enhanced durability regardless of age
- Elements damaged during construction — applied to save the element in lieu of full replacement
- Structural rehabilitation of localized areas

XYPEX FOR REPAIR OF CONSTRUCTION DEFECTS

Reinstates the integrity of the areas subject to construction defects.

- Restores the integrity of concrete affected by construction defects
- Restore the structure to its original design
- Fast-setting repair for active leaks and spalled or honeycombed concrete
- Rehabilitate defective concrete without full replacement





ZUIDHORN RAILWAY BRIDGE

Zuidhorn, Netherlands

The use of Xypex Concentrate to protect the railway bridge over the Van Starkenborgh Canal not only helped keep the project on schedule but provided a significant cost savings and extended service life.

XYPEX

EXTENDED SERVICE LIFE: ENGINEERED FOR SUPERIOR PERFORMANCE

Concrete permeability is the primary predictor of service life in bridge infrastructure. It directly governs the rate of chloride ingress, reinforcement corrosion, carbonation, and sulphate attack — the leading causes of premature deterioration in bridges.

Xypex Crystalline Technology reduces concrete permeability within its microstructure. Global independent testing confirms consistent, measurable performance improvement.



Shenyang Changbal Island Sanhao Bridge
Shenyang, China

LIFECYCLE ADVANTAGE

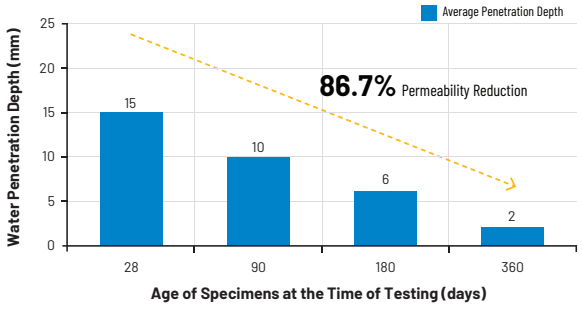
Xypex's integral waterproofing extends the active service life of bridge structures, increases the time to first repair, and lowers total lifecycle costs. These are critical factors for infrastructure requiring a service life of 100+ years.

For more information scan the QR code.

86.7% PERMEABILITY REDUCTION

Continued Reactivity

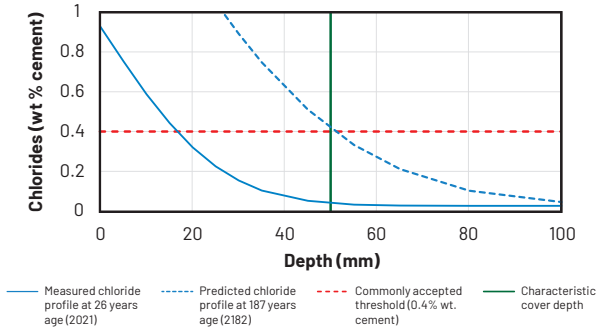
This 11-year study shows that the water permeability of Xypex-treated concrete continues to improve over time. While the average water penetration at 28 days was already low, the depth of penetration was further reduced by 86.7% at 360 days.



100+ YEARS SERVICE LIFE WITHOUT REPAIR

Verified Real-World Performance

Service life modeling is critical for infrastructure; however, real-world performance does not always align with predictive models. Independent service life assessments of two marine structures confirm that Xypex-treated concrete outperforms expectations. After 19 and 26 years in service, testing shows exceptionally low chloride concentrations, with a predicted service life exceeding 100 years without repair — reaching 187 years at Lascelles Wharf based on Fick's second law of diffusion.



SIGNIFICANTLY REDUCES CORROSION RATE

University of Kansas / Oklahoma Department of Transportation Bridge Deck Study

This University study of reinforcing steel corrosion in bridge decks, commissioned by the US State DOT, confirms that Xypex-treated concrete reduces rebar corrosion rates by 40% in uncracked concrete and by up to 50% in cracked concrete. Corrosion loss was reduced by up to 67% in cracked specimens, attributed to Xypex's crack-healing capability.

Measured Corrosion Rate (µm/yr)		
	Cracked Specimen	Uncracked Specimen
Control	20	10
Xypex-Treated	10	6
% Improvement with Xypex	**50%**	**40%**
Measured Corrosion Loss (µm)		
	Cracked Specimen	Uncracked Specimen
Control	18.6	11.9
Xypex-Treated	6.14	6.74
% Improvement with Xypex	**67%**	**43%**

Independent evaluation of Xypex-treated concrete bridge decks under aggressive chloride exposure confirmed that the time to first repair significantly increased and the structure required fewer repairs over its designed service life.

	Time Until Repair (Years)				
	1	2	3	4	5
Epoxy-coated reinforcement	22.0	44.1	66.1	88.2	
Conventional galvanized reinforcement	19.2	38.4	57.7	76.9	96.1
Continuous hot-dip galvanized reinforcement	26.1	52.1	78.2		
Epoxy-coated reinforcement	32.4	64.7	97.1		
Conventional galvanized reinforcement	27.6	55.1	82.7		
Continuous hot-dip galvanized reinforcement	39.8	79.6			

XYPEX

A MORE SUSTAINABLE SOLUTION

For more information, visit xypex.com/sustainability or scan the QR code.

Sustainability

Our crystalline technology provides permanent concrete waterproofing that supports resilient infrastructure, extends service life, and enables circular construction practices. Central to our commitment is helping projects reduce their carbon footprint while achieving their durability and sustainability objectives.

EXTENDS SERVICE LIFE

UP TO **187** YEARS

RED LIST COMPLIANT

REDUCES REPAIRS

Permanent one time application

SELF HEALS CRACKS UP TO 0.5 MM

100%

RECYCLABLE & REUSABLE

packaging & concrete

NO VOCs

LCA

Life Cycle Assessment

"FROM CRADLE TO GRAVE"

~60%

LOWER CARBON FOOTPRINT

than typical waterproofing technology

SAFE FOR ENVIRONMENTALLY SENSITIVE AREAS



MEGYERI BRIDGE

Budapest, Hungary

Xypex Concentrate surface applied was used in select areas of the Megyeri Bridge, constructed on 2008.



PENNSYLVANIA TURNPIKE

Pennsylvania, USA

Xypex Admixwas used for 150 miles of precast median barriers and 5 miles of retaining walls — providing permanent chloride and freeze-thaw protection across one of North America's most demanding highway environments.

Certified to ISO 9001:2015

XYPEX®

enquiry@xypex.com
www.xypex.com

HEAD OFFICE
13731 Mayfield Place
Richmond, BC
V6V 2G9 Canada
+1 604 273 5265

Xypex Germany GmbH
Ludwigsluster Chaussee 5
D-19370 Parchim, Germany
+49 3871 687 4500

Xypex Australia
76 Merkel Street,
Thurgoona, NSW
2640, Australia
+61 2 6040 2444

Xypex Thailand
Soi Phatthanakan 69
Prawet, Bangkok
10250, Thailand
+66 2321 7172

