



CONCENTRATE

07160 CEMENTITIOUS CRYSTALLINE

Concrete Waterproofing

Description

Xypex is a unique chemical treatment for the waterproofing, protection and repair of concrete. XYPEX CONCENTRATE is the most chemically active product within the Xypex Crystalline Waterproofing System. When mixed with water, this light grey powder is applied as a cementitious slurry coat to above ground or below ground concrete, either as a single coat or as the first of a two-coat application. It is also mixed in Dry-Pac form for sealing strips at construction joints, or for the repairing of cracks, faulty construction joints and honeycombs. Xypex prevents the penetration of water and other liquids from any direction by causing a catalytic reaction that produces a non-soluble crystalline formation within the pores and capillary tracts of concrete and cement-based materials.

Recommended for:

- Reservoirs
- Sewage and Water Treatment Plants
- Underground Vaults
- Secondary Containment Structures
- Foundations
- Tunnels and Subway Systems
- Swimming Pools
- Parking Structures
- Roof Decks

Advantages

- Resists extreme hydrostatic pressure from either positive or negative surface of the concrete slab
- Chloride protection in marine environment
- Becomes an integral part of the substrate
- Can seal hairline cracks up to 0.4 mm
- Allows concrete to breathe
- Highly resistant to aggressive chemicals
- Non-toxic
- Does not require a dry surface
- Cannot puncture, tear or come apart at the seams
- No costly surface priming or leveling prior to application
- Does not require sealing, lapping and finishing of seams at corners, edges or between membranes
- Can be applied to the positive or the negative side of the concrete surface
- Does not require protection during backfilling or during placement of steel, wire mesh or other materials
- Less costly to apply than most other methods

- Not subject to deterioration
- Permanent

Packaging

Xypex Concentrate is available in 4 kg, 10 kg, and 20 kg buckets.

Storage

Xypex products must be stored dry at a minimum temperature of 7°C. Shelf life is one year when stored under proper conditions.

Coverage

For normal surface conditions, the coverage rate for each Xypex coat is 0.65 - 0.8 kg/m².

Test Data

PERMEABILITY

U.S. Army Corps of Engineers (USACE) CRD C48-73
“Permeability of Concrete” Pacific Testing Labs,
Seattle, USA

Two inch (51 mm) thick, 2000 psi (13.8 MPa) Xypex-treated concrete samples were pressure tested up to a 405 ft. (124 m) water head (175 psi/1.2 MPa), the limit of the testing apparatus. While untreated samples showed marked leakage, the Xypex-treated samples (as a result of the crystallization process) became totally sealed and exhibited no measurable leakage.

DIN 1048 “Water Impermeability of Concrete”
Bautest – Corporation for Research & Testing
of Building Materials, Augsburg, Germany

Twenty cm thick Xypex-treated concrete samples were pressure tested up to 7 bars (230 ft./70 m water head) for 24 hours to determine water impermeability. While the reference specimens measured water penetration up to a depth of 92 mm, Xypex-treated samples measured water penetration of zero to an average of 4 mm.

ÖNORM B 3303 “Water Impermeability of Concrete”
Technologisches Gerwerbemuseum, Federal Higher
Technical Education & Research Institute,
Vienna, Austria

Xypex-treated concrete samples were pressure tested to a maximum 7 bars (230 ft./70m water head) for 10 days. Test revealed that while 25 ml of water had penetrated the untreated concrete samples, zero ml had penetrated the Xypex-treated samples. Test specimens were then bro-



ken and showed water penetration to a depth of 15 mm on untreated samples but no measurable water penetration on the Xypex-treated samples.

CSN 1209/1321 “Impermeability and Resistance to Pressurized Water” Institute of Civil Engineering, Technology and Testing, Bratislava, Slovak Republic

Xypex-treated and untreated concrete samples were exposed to 1.2 MPa of pressure to determine water permeability. Results showed the Xypex-treated samples provided effective protection against hydrostatic water pressure. Treated and untreated samples were also subjected to contact with silage juices and various petroleum products (e.g. diesel oil, transformer oil, gasoline) at 14 kPa for 28 days. The Xypex-treated samples significantly reduced the penetration of these solutions.

COMPRESSIVE STRENGTH

Durability of Concrete Modified by Crystalline Materials, Sirindhorn International Institute of Technology, Thammasat University, Thailand

When measured against control samples, the Xypex Concentrate treated samples (OPC and OPC + fly ash @ 0.5 and 0.6 w/b ratios) showed an improved compressive strength of between 3.25% and 4.46%.

CHEMICAL RESISTANCE

ASTM C 267-77 “Chemical Resistance to Mortars” Pacific Testing Labs, Seattle, USA

Xypex-treated cylinders and untreated cylinders were exposed to hydrochloric acid, caustic soda, toluene, mineral oil, ethylene glycol, pool chlorine and brake fluid and other chemicals. Results indicated that chemical exposure did not have any detrimental effects on the Xypex coating. Tests following chemical exposure measured an average 17% higher compressive strength in the Xypex-treated specimens over the untreated control samples.

IWATE University Technical Report “Resistance to Acid Attack” Morioka, Japan

Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H₂SO₄ solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

CHLORIDE RESISTANCE

Durability of Concrete Modified by Crystalline Materials, Sirindhorn International Institute of Technology, Thammasat University, Thailand

At 28 days of age, the paste specimens were submerged in a chloride solution of 1.82% by weight. The chloride distribution profiles were measured after 1, 3, 6 and 9 months of submersion and indicated substantially reduced chloride profiles in both normal OPC and fly ash blend samples.

CARBONATION RESISTANCE

Durability of Concrete Modified by Crystalline Materials, Sirindhorn International Institute of Technology, Thammasat University, Thailand

(Test method complied with RILEM CPC-18 [14].) The average depths of carbonation were measured at 28, 56, 77 and 91 days after initial exposure, which occurred at the age of 7 days.

‘With regard to the carbonation resistance aspect, the resistance of concrete incorporating the crystalline coating material is substantially improved over fly ash concretes, with a resulting, apparent increase in the alkalinity of carbonated concrete.’

FREEZE/THAW DURABILITY

ASTM C 672 “Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to De-icing Chemicals” Twin City Testing Lab, St. Paul, USA

Xypex-treated samples restricted chloride ion concentration to below the level necessary to promote electrolytic corrosion of reinforcing steel. Visual examination of untreated panels after 50 freeze/thaw cycles showed a marked increase in surface deterioration compared to Xypex-treated samples.

JIS A 6204 “Concrete Freeze/Thaw” Japan Testing Center for Construction Materials, Tokyo, Japan

The resonating frequency of both untreated and Xypex-treated concrete samples were measured throughout 435 freeze/thaw cycles. At 204 cycles, the Xypex-treated samples showed 96% relative durability compared to 90% in the untreated samples. At 435 cycles, the Xypex-treated samples measured 91% relative durability compared to 78% in the untreated reference samples.

POTABLE WATER EXPOSURE

AS/NZS 4020 “Products For Use In Contact With Drinking Water”, Australian Water Quality Centre, Adelaide, South Australia

NSF 61 “Drinking Water System Component-Health Effects” NSF International, Ann Arbor, USA

Exposure testing of potable water in contact with Xypex-treated samples indicated no harmful effects.

RADIATION RESISTANCE

U.S.A. Standard No. N69 “Protective Coatings for the Nuclear Industry” Pacific Testing Labs, Seattle, USA

After exposure to 5.76 x 10⁴ rads of gamma radiation, the Xypex treatment revealed no ill effects or damages.

Application Procedures

1. SURFACE PREPARATION Concrete surfaces to be treated must be clean and free of laitance, dirt, film,

paint, coating or other foreign matter. Surfaces must also have an open capillary system to provide “tooth and suction” for the Xypex treatment. If surface is too smooth (e.g. where steel forms are used) or covered with excess form oil or other foreign matter, the concrete should be lightly sandblasted, waterblasted, or etched with muriatic (HCL) acid.

2. STRUCTURAL REPAIR Rout out cracks, faulty construction joints and other structural defects to a depth of 37 mm and a width of 25 mm. Apply a brush coat of Xypex Concentrate as described in steps 5 & 6 and allow to dry for 10 minutes. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block. Dry-Pac is prepared by mixing six parts Xypex Concentrate powder with one part water to a dry, lumpy consistency.

NOTE:

i. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch'n Plug then Xypex Dry-Pac followed by a brush coat of Xypex Concentrate (refer to Xypex Specification and Application Manual for full details).

ii. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

3. WETTING CONCRETE Xypex requires a saturated substrate and a damp surface. Concrete surfaces must be thoroughly saturated with clean water prior to the application so as to aid the proper curing of the treatment and to ensure the growth of the crystalline formation deep within the pores of the concrete. Remove excess surface water before the application. If concrete surface dries out before application, it must be re-wetted.

4. MIXING FOR SLURRY COAT Mix Xypex powder with clean water to a creamy consistency in the following proportions:

For Brush Application

0.65 - 0.8 kg/m²

5 parts powder to 2 parts water

1.0 kg/m²

3 parts powder to 1 part water

For Spray Application

0.65 - 0.8 kg/m²

5 parts powder to 3 parts water

(ratio may vary with equipment type)

Do not mix more Xypex material than can be applied in 20 minutes. Do not add water once mix starts to harden. Protect hands with rubber gloves.

5. APPLYING XYPEX Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces) or specialised spray equipment. The coating must be uniformly applied and should be just under 1.25 mm. When a second coat (Xypex Concentrate or Xypex Modified) is required, it should be applied after the first coat has reached an initial set but while it is still “green” (less than 48 hours). Light pre-watering between coats may be required due to drying. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 4°C. For recommended equipment, contact Xypex Australia or your nearest Xypex distributor.

6. CURING A misty fog spray of clean water must be used for curing the Xypex treatment. Curing should begin as soon as the Xypex has set to the point where it will not be damaged by a fine spray of water. Under normal conditions, it is sufficient to spray Xypex-treated surfaces three times per day for two to three days. In hot or arid climates, spraying may be required more frequently. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 2°C for a period of not less than 48 hours after application. If plastic sheeting is used as protection, it must be raised off the Xypex to allow the coating to breathe. Xypex Gamma Cure may be used in lieu of water curing for certain applications (consult with Xypex Australia's Technical Department or your local Xypex representative).

NOTE: For concrete structures that hold liquids (e.g. reservoirs, swimming pools, tanks, etc.), Xypex should be cured for three days and allowed to set for 12 days before filling the structure with liquid.

Technical Services

For more instructions, alternative application methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Department of Xypex Australia or your local Xypex representative.

Safe Handling Information

Xypex is alkaline. As a cementitious powder or mixture, Xypex may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex buckets and packaging. The Manufacturer also maintains comprehensive and up-to-date Material Safety Data Sheets on all its products. Each sheet

contains health and safety information for the protection of your employees and customers. Contact Xypex Australia or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

Warranty

Concrete Waterproofing Manufacturing Pty Ltd (trading as Xypex Australia) (the "Manufacturer") warrants that the products manufactured by it shall be free from material defects and of a consistent quality. Should

any of the products be proven defective, the liability of the Manufacturer shall be limited to replacement of the product ex-factory. The Manufacturer gives no warranty as to fitness of the products for any particular purpose. The user shall: determine the suitability of the product for its intended use; comply with the directions for use and safe handling information available from Xypex; where necessary, engage an experienced Xypex applicator; and assume all risks and liabilities in connection with the use of this product.

Sustainability

Both GreenTag LCARate and GreenRate are recognised third party certification schemes for Green Star® in Australia and NZ and can certify in a single certificate all Materials Calculators, VOCs, Formaldehyde Reduction, Best Practice PVC and Post Consumer Recycled Content credits. GreenTag is a unique Australian Competition and Consumer Commission (ACCC) approved National Certification Mark and is also registered as a Certification Mark in the EU and UK and is also the Preferred Certifier for the EarthCheck Eco-hospitality certification program.



ecospecifier global GREEN TAG CERTIFIED  GOLD PLUS		See website for more information and disclaimers. Sustainability Assessment Category – AVERAGE SCORES Building Synergy → 0.00 Health & Ecotoxicity → 0.25 Biodiversity → 0.00 LCA Score → 0.05 GHG = 0.628kgCO ₂ e/m ² → 0.25 Social Responsibility → 0.65 Low Score = Better Performance (Score Range -1 to +1)								
Green Tag EcoPOINT	0.22	<table border="1"> <tr> <td>Company</td> <td>Xypex Australia</td> </tr> <tr> <td>Product</td> <td>Xypex Concentrate</td> </tr> <tr> <td>Licence No.</td> <td>XYPT002-A -2012</td> </tr> <tr> <td>Product Category</td> <td>Building Product</td> </tr> </table> ecospecifier global GREEN TAG www.ecospecifier.com.au	Company	Xypex Australia	Product	Xypex Concentrate	Licence No.	XYPT002-A -2012	Product Category	Building Product
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GREENRATE LEVEL (GBCA Approved Scheme ID = A18)	A	Comments: GHG figure based on cradle to gate LCA, calculated in accordance with ISO14064. The LCA study was conducted in accordance with the ISO 14040/44 standard.								

