



CATTLE FARM AND SILAGE STORAGE, HUNGARY

Meeting the Challenge

Protecting Agriculture Structures

Agricultural concrete structures are often exposed to hydrostatic pressure and attack from animal waste, fertilizers, silage liquids, feedstuffs and other aggressive chemicals. Without proper protection, the concrete's structural integrity is soon compromised, leading to expensive remediation efforts and a shortened service life. Once corrosion initiates in the reinforcing steel, an expansive oxidation process begins to take place, forming cracks and spalling in the concrete. Cracking combined with weathering effects, such as freeze/thaw damage or accelerated corrosion in hot weather climates, speed up concrete deterioration. With over 50 years of experience in 90 countries around the world, Xypex Crystalline Technology will waterproof, protect, repair and enhance the durability of both pre-cast and cast-in-place concrete. In this challenging environment, Xypex is a highly respected partner in extending the service life of agricultural structures.





The Structures – The Problems

Xypex products play a key role to waterproof and protect concrete against water penetration due to hydrostatic pressure, and aggressive chemical attack – problems typically associated with the reduced service life of concrete agricultural structures.



Chemical Attack

Agricultural concrete structures are subject to attack from a variety of chemicals. Some of these chemicals include, nitrates and chlorides in fertilizers, sulphuric or formic acid in silage, lactic acid, acetic acid, chlorides and sulphates in feedstuffs as well as other chemicals used for pest control and cleaning. Manure and liquid slurry containing sulphides and sulfates, and ground soils surrounding agricultural concrete containing sulfates will also be subject to chemical attack. The diffusion of chemicals through porous concrete can cause problems such as corrosion of the reinforcing steel, cracking, and spalling of the concrete.



Containment Issues

Concrete in agriculture is often used in containment settings such as tanks, channels, silos and other storage structures. The failure of concrete to contain water or other liquids will result in lost efficiency and higher running costs as well as potential environmental issues if the structure contains animal waste or chemicals. On the other hand the failure of concrete to protect the contents of storage structures will result in high costs as well as disposal of damaged feedstuffs and crops. The eventual loss of structural integrity may end with collapsing structures or early demolition and replacement.

The Structures

Pre-cast Structures



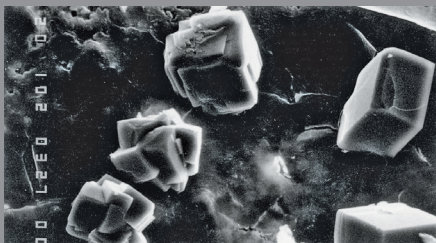
- Bunker silo walls
- Feed bunks
- Slats
- Manure pits and covers
- Scraper alley tubes
- Retaining walls
- Water tanks
- Fisheries tanks

Cast-in-Place-Concrete

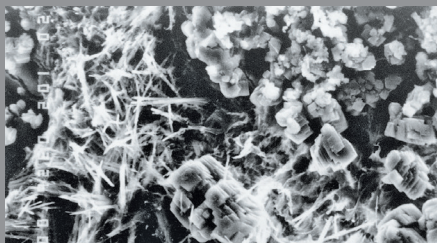


- Silos
- Silage pads
- Cow foot baths
- Manure pits and covers
- Crop storage floors
- Livestock yards and barns
- Milking parlour slabs
- Retaining walls
- Water tanks
- Fisheries tanks
- Biogas facilities

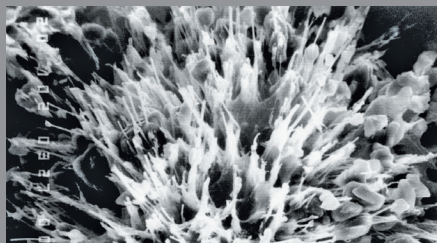
The Permanent Solution



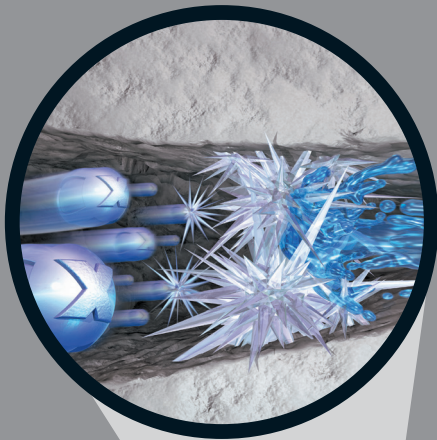
CONCRETE UNTREATED



CRYSTALLIZATION INITIATED



CRYSTALLIZATION MATURE



Xypex Crystalline Technology

Xypex products use the natural porosity of concrete and chemical diffusion to penetrate the pores and capillaries. Inside the concrete, Xypex chemicals react with un-hydrated cement particles and the by-products of cement hydration to form a non-soluble crystalline structure deep within the substrate. In this condition, the concrete becomes impermeable, preventing liquid and chemical penetration from any direction even under extreme hydrostatic pressure. The chemical resistant properties of the crystalline structure will mitigate the attack of chlorides, sulfates, nitrates, acids and other aggressive chemicals. In prolonging the concrete durability, Xypex will self-heal static cracks up to 0.5 mm (0.02 in) and also improve the freeze-thaw durability of concrete.



Proven Performance Worldwide

Comprehensive quality systems and standards along with thorough testing in the lab and the field have resulted in Xypex's highly respected position in the concrete industry. Xypex has been extensively tested by independent testing laboratories in the U.S., Canada, Australia, Japan, Europe and other countries.



The Xypex Advantage

Xypex Crystalline Technology works inside the concrete, thus avoiding typical problems associated with traditional barrier products.

✓ Permanent and reactivates whenever water is present	✓ Not subject to deterioration problems encountered by surface coatings and membranes
✓ Resistant to chemical attack	✓ May be applied on negative or positive side of concrete surface
✓ Self-heals static cracks up to 0.5 mm (0.02 in)	✓ Non-toxic; approved for use with potable water

The Right Products

Xypex Admix Advantages

- Permanent integral waterproofing
- Enhances concrete durability
- Value engineering
- Non-toxic
- Non-combustible
- Resists damaging effects of water penetration and chemical attack



Xypex Admix for New Concrete Construction

Xypex Admix is the preferred choice for installing Xypex Crystalline Technology into most new concrete agricultural structures. Because Xypex Admix is blended at the time of batching, it becomes an integral part of the entire concrete matrix, thus reducing the potentially damaging effects of water penetration as well as attack from acids, sulfates and other aggressive chemicals. Adding Xypex Admix to concrete is a highly effective method of enhancing the durability of concrete structures.



Precast



Cast-in-place



Shotcrete

Xypex Coating Advantages

- Doesn't require a dry surface
- Apply to either side of the concrete
- Won't puncture, blister or tear
- No costly surface priming or leveling
- Sealing, lapping & finishing, protection during backfilling not required
- Permanent waterproofing
- Enhanced concrete durability
- Doesn't contain VOCs
- Non-toxic and non-combustible
- Can be applied safely in confined spaces

Other Accessory Products

- FCM 80
- Megamix I & II
- Gamma Cure
- Xycrylic Admix

Rehabilitation & Repair

Xypex's coating systems and repair products enable owners, engineers and contractors to economically and confidently repair structures damaged by water ingress due to hydrostatic pressure, acid and sulphate attack or exposure to aggressive chemicals. Xypex Concentrate and Modified are applied as slurry coatings to the concrete's surface. Unlike other materials that need a dry substrate, Xypex products require a moist surface. This type of environment is conducive to the Xypex Crystalline process. Xypex Patch'n Plug, Concentrate Dry-Pac and Megamix products are specifically designed to permanently repair concrete defects such as static cracks and faulty cold or construction joints. Xypex Megamix returns structural integrity to severely damaged concrete, whilst maintaining the same protective properties of Xypex-treated concrete.



Coating
Concentrate & Modified



Plugging
Patch'n Plug



Rehabilitation
Patch'n Plug & Megamix



Visit us online at xypex.com
for more info & product details.



Podlesice Animal Barn, Czech Republic



Red Bud, Illinois, USA



Akazto Fishery, Hungary



Tartu Biogas Plant, Estonia



Calafate S.A. Cereal Storage Silos, Argentina

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