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## XYPEX PRODUCTS

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## Coating System

Xypex Coating products, for surface application, are part of the Xypex concrete waterproofing and protection system and represent one of three different ways to install Xypex Crystalline Technology into concrete.



### Xypex Concentrate

Xypex Concentrate is applied as a cementitious slurry to the surface of existing above-or-below-grade structures to waterproof and protect the concrete against high hydrostatic pressure.

- apply with a semi-stiff nylon bristle brush or spray machine
- also mixed in Dry-Pac form for sealing construction joints and repairing cracks and tie-holes

#### Packaging

- Pails**
- 20 lb. (9.1 kg)
- 60 lb. (27.2 kg)
- Bags**
- 50 lb. (22.7 kg)



### Xypex Modified

Xypex Modified can be applied as a second coat to chemically reinforce Concentrate, or as a single coat for the damp-proofing of exterior foundation walls.

- as a second coat, apply after the Concentrate coating has reached an initial set
- produces a harder finish

#### Packaging

- Pails**
- 60 lb. (27.2 kg)
- Bags**
- 50 lb. (22.7 kg)



## Additive Series

Xypex Additive products, added to the concrete at time of batching, are part of the Xypex concrete waterproofing and protection system and represent one of three different ways to install Xypex Crystalline Technology into concrete.



### Xypex Admix C-500, C-1000, C-2000

Xypex Admix products are added to concrete or mortar at the time of batching. Admix C-500, C-1000, and C-2000 have been formulated to satisfy specific concrete mix designs, diverse project requirements and ambient temperature variations. The Admix is also available in a “No Fines Grade” (NF).

- installation methods: shotcrete, precast, poured
- convenient, cost-effective
- meets varying project and temperature conditions
- better control over construction schedule

#### Packaging

**Pails**  
C-1000 & C-2000  
60 lb. (27.2 kg)

**Bags**  
C-500, C-1000 & C-2000  
50 lb. (22.7 kg)



### Xypex Admix Soluble Bags

Xypex Admix C-500 and C-1000 are available in soluble bags to make installation and dosing easier and more convenient.

- convenient
- cost-saving
- improves quality control

#### Packaging

**Soluble Bags in Cartons**  
C-500 & C-1000  
10 lb. (4.5 kg)  
12 lb. (5.5 kg)  
15 lb. (6.8 kg)



## Dry Shake Series

Xypex Dry Shake products, for horizontal surfaces, are part of the Xypex concrete waterproofing and protection system and represent one of three different ways to install Xypex Crystalline Technology into concrete.



### Xypex Concentrate DS-1

Xypex DS-1 is a special dry shake formulation of Xypex Concentrate and is designed specifically for horizontal concrete surfaces such as parking decks and floor slabs. DS-1 is trowelled into fresh concrete prior to finishing.

- applied by hand or mechanical spreader
- reduces the risk of scaling, dusting and delamination that is typically associated with coatings

#### Packaging

**Pails**  
60 lb. (27.2 kg)



### Xypex Concentrate DS-2

Xypex DS-2, like DS-1, is also designed for horizontal concrete surfaces but is used where, in addition to waterproofing, greater resistance to abrasion is required.

- applied by hand or mechanical spreader
- increases abrasion resistance

#### Packaging

**Pails**  
60 lb. (27.2 kg)  
**Bags**  
60 lb. (27.2 kg)



**CONCRETE REPAIR & ACCESSORY PRODUCTS**



**Concrete Repair & Accessory Products**

Xypex provides a number of specialized products for a wide range of concrete repair applications such as stopping flowing water, patching, resurfacing, and rehabilitating concrete as well as the repairing of cracks.



**Xypex Patch'n Plug**

Xypex Patch'n Plug is formulated as a crystalline, fast-setting hydraulic cement compound for concrete patching and repair. It stops flowing water in seconds and is used to seal cracks, fill tie-holes and other defects in concrete.

- fast-setting, non-shrinking
- high bond strength

**Packaging**

**Pails**  
 20 lb. (9.1 kg)  
 60 lb. (27.2 kg)



**Xypex Megamix I and II**

Xypex Megamix I is a thin parge coat for the waterproofing and resurfacing of vertical masonry or concrete surfaces, as a cap coat for Xypex Concentrate, or as an architectural rendering. Megamix II is a thick repair mortar for the patching and resurfacing of deteriorated concrete.

- superior bonding
- chemical durability
- high strength

**Packaging**

**Pails**  
 Megamix I & II  
 60 lb. (27.2 kg)  
**Bags**  
 Megamix II only  
 55 lb. (25 kg)

**CONCRETE REPAIR & ACCESSORY PRODUCTS**



**Xypex Restora-Top 50, 100, 200**

Xypex Restora-Top products are designed specifically for the repair and rehabilitation of horizontal concrete surfaces such as warehouse floors, decks, curbs, and walkways where the repaired area must be returned to normal service within two to four hours of the completed repair.

- rapid setting and strength gain
- excellent adhesion, superior durability

**Packaging**

**Pails**  
55 lb. (25 kg)



**Xypex FCM 80**

Xypex FCM is designed for repairing cracks subject to movement, sealing construction joints, restoring deteriorated concrete and waterproofing concrete structures. FCM is a two component product consisting of a liquid polymer dispersion and a cementitious powder component.

- exceptional adhesive and elongation characteristics
- often used in conjunction with the Xypex Crystalline Concrete Waterproofing System

**Packaging**

**Liquid**  
5.3 gal. (20 litre) pails

**Powder**  
27.5 lb. (12.5 kg) bags

FCM 80 is also available in a carton as a unit (kit), which includes:  
1.06 gal. (4 litre) bottle  
22 lb. (10 kg) pail

**CONCRETE REPAIR & ACCESSORY PRODUCTS**

**Xypex Gamma Cure**

Xypex Gamma Cure is a curing agent designed specifically for Xypex crystalline waterproofing products. Its use may eliminate the need for water curing the Xypex coating in some cases.

- where water-curing is not possible
- vertical surfaces; hot, dry, windy conditions

**Packaging**

**Bottles**  
1 U.S. gal. (3.79 litres)

**Pails**  
5 U.S. gal. (18.95 litres)


**Xycrylic Admix**

Xycrylic Admix is a water-based polymer dispersion designed for fortifying Portland cement compositions. The liquid is milky-white in colour and has a high solids content. Can be used with Xypex Patch'n Plug to increase bond strength.

- enhances bond, reduces shrinkage cracking
- excellent water and weather resistance

**Packaging**

**Bottles**  
1 U.S. gal. (3.79 litres)

**Pails**  
5 U.S. gal. (18.95 litres)


**Xypex Quickset**

Xypex Quickset is a water-soluble liquid blend of silicates, neutralizers and penetrating agents specially compounded to harden, dustproof and seal the surfaces of fresh or newly cured concrete floors.

- enhances abrasion resistance
- recommended for concrete slabs where hard, dustproof surface is required

**Packaging**

**Bottles**  
1 U.S. gal. (3.79 litres)

**Pails**  
5 U.S. gal. (18.95 litres)





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**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

**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-grade or below-grade 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

**Advantages**

- Resists extreme hydrostatic pressure
- 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 20 lb. (9.1 kg) pails, 60 lb. (27.2 kg) pails and 50 lb. (22.7 kg) bags.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (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 6 to 7.2 sq. ft./lb. (1.25 - 1.5 lb./sq. yd. or 0.65 - 0.8 kg/m<sup>2</sup>).

**Test Data**

**PERMEABILITY**

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

Two in. (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./70 m 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 broken 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.

**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 chemi-

cal 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", Tokyo, Japan**

Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H<sub>2</sub>SO<sub>4</sub> solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

**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**

**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 10<sup>4</sup> 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, water-blasted, or etched with muriatic (HCL) acid.

**2. STRUCTURAL REPAIR** Rout out cracks, faulty construction joints and other structural defects to a depth of 1.5 in. (37 mm) and a width of 1 in. (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 Specifications and Applications 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**

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>)  
5 parts powder to 2 parts water

2.0 lb./sq. yd. (1.0 kg/m<sup>2</sup>)  
3 parts powder to 1 part water

**For Spray Application**

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>)  
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 specialized spray equipment. The coating must be uniformly applied and should be just under 1/16 in. (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 40°F (4°C). For recommended equipment, contact Xypex Chemical Corporation 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 36°F (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 Chemical Corporation or your nearest Xypex distributor).

**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 Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

**Description**

Xypex is a unique chemical treatment for the waterproofing, protection and repair of concrete. XYPEX MODIFIED can be applied as a second coat to reinforce Xypex Concentrate, or applied by itself to damp-proof the exterior of foundation walls. Applied as a second coat, Xypex Modified chemically reinforces Xypex Concentrate where two coats are required and produces a harder finish. Where damp-proofing is required, a single coat of Modified may be used as an alternative to a spray/tar emulsion. 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:**

Xypex Modified is recommended as a single coat for the damp-proofing of foundations or as a second coat with Xypex Concentrate for the following applications:

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

**Advantages**

- Resists extreme hydrostatic pressure
- Becomes an integral part of the substrate
- Allows concrete to breathe
- Resistant to aggressive chemicals
- Non-toxic

- Does not require dry weather or 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 Modified is available in 60 lb. (27.2 kg) pails and 50 lb. (22.7 kg) bags.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Coverage**

For normal surface conditions, the coverage rate for each coat is 6 - 7.2 sq. ft. per lb. (1.25 - 1.5 lb. per sq. yd. or 0.65 - 0.8 kg/m<sup>2</sup>).

**Test Data**

When used in conjunction with Xypex Concentrate:

**PERMEABILITY**

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

Two in. (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 Permeability 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./70 m 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 broken 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.

**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", Tokyo, Japan**

Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H<sub>2</sub>SO<sub>4</sub> solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

**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.

**POTABLE WATER EXPOSURE**

**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 10<sup>4</sup> 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 1.5 in. (37 mm) and a width of 1 in. (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 Specifications and Applications 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**

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>)  
5 parts powder to 2 parts water

2.0 lb./sq. yd. (1.0 kg/m<sup>2</sup>)  
3 parts powder to 1 part water

**For Spray Application**

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>)  
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 specialized spray equipment. The coating must be uniformly applied and should be just under 1/16 in. (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 40°F (4°C). For recommended equipment, contact Xypex Chemical Corporation 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 36°F (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 Chemical Corporation or your nearest Xypex distributor).

**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 Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

**Description**

Xypex is a unique chemical treatment for the waterproofing, protection and improvement of concrete. XYPEX ADMIX C-500 is added to the concrete mix at the time of batching. Xypex Admix C-500 consists of Portland cement, very fine treated silica sand and various active, proprietary chemicals. These active chemicals react with the moisture in fresh concrete and with the by-products of cement hydration to cause a catalytic reaction which generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete. Thus the concrete becomes permanently sealed against the penetration of water or liquids from any direction. The concrete is also protected from deterioration due to harsh environmental conditions.

**Xypex Admix C-Series**

The Admix C-Series has been specially formulated to meet varying project and temperature conditions. **Xypex Admix C-500** is specifically formulated to meet modern concrete practices that incorporate additives such as fly ash and slag. For most concrete mix designs adding the Admix C-500 will have minimal or no effect on setting time. **Xypex Admix C-1000** is designed for typical Portland cement-rich concrete, where normal to a mild retarded set is desired. **Xypex Admix C-2000** is designed for projects where extended retardation is required due to high ambient temperatures or long ready-mix delivery times. See Setting Time and Strength for more details. Consult with a Xypex technical services representative for the most appropriate Xypex Admix for your project.

**Recommended for:**

- Reservoirs
- Sewage and Water Treatment Plants
- Secondary Containment Structures
- Tunnels and Subway Systems
- Underground Vaults

- Foundations
- Parking Structures
- Swimming Pools
- Precast Components

**Advantages**

- Resists extreme hydrostatic pressure from either positive or negative surface of the concrete
- Becomes an integral part of the substrate
- Highly resistant to aggressive chemicals
- Can seal static hairline cracks up to 0.4 mm
- Allows concrete to breathe
- Non-toxic
- Less costly to apply than most other methods
- Permanent
- Added to the concrete at time of batching and therefore is not subject to climatic restraints
- Increases flexibility in construction scheduling

**Packaging**

Xypex Admix C-500 is available in 50 lb. (22.7 kg) bags and in cartons containing 10 lb. (4.5 kg), 12 lb. (5.5 kg), and 15 lb. (6.8 kg) soluble bags. For specific projects, contact the manufacturer for availability of custom sized packaging.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Dosage Rates**

**Xypex Admix C-500:**

2 - 3% by weight of cement

**Xypex Admix C-500 NF (No Fines Grade):**

1 - 1.5% by weight of cement

**NOTE:** Under certain conditions, the dosage rate for No Fines Grade may be as low as 0.8% depending on the quantity and type of total cementitious materials. The maximum use level is 2% by weight of cement for potable water applications.

Consult with Xypex's Technical Services Department for assistance in determining the appropriate dosage rate and for further information regarding enhanced



chemical resistance, optimum concrete performance, or meeting the specific requirements and conditions of your project.

## Test Data

### PERMEABILITY

**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Aviles Engineering Corp., Houston, USA**

Two concrete samples containing Xypex Admix at 3% and 5% respectively, and an untreated control sample were tested for water permeability. Both the treated and untreated samples were subjected to a pressure of 150 psi (350 ft. water head). Results showed moisture and permeated water throughout the untreated sample after 24 hours. However, the Xypex Admix samples showed no leakage, and water penetration of only 1.5 mm after 120 hours (5 days).

**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Setsco Services, Pte Ltd., Singapore**

Six Xypex Admix-treated and six untreated concrete samples were tested for water permeability. Pressure was gradually increased over five days and then maintained at 7 bars (224 ft. water head) for 10 days. While the six reference samples showed water leakage beginning on the fifth day and increasing throughout the test period, the Xypex Admix samples showed no water leakage at any time during the test.

**DIN 1048, "Water Impermeability of Concrete", DICTU S.A., Dept. of Engineering and Construction Mgt., Santiago, Chile**

Concrete samples 120 mm thick containing Xypex Admix were tested with the same size reference samples for water impermeability. Samples were subjected to hydrostatic pressure for 28 days. Water totally permeated the untreated samples but no water penetration was detected in any of the Xypex Admix-treated samples.

### COMPRESSIVE STRENGTH

**ASTM C 39, "Compressive Strength of Cylindrical Concrete Specimens", HBT Agra, Vancouver, Canada**

Concrete samples containing Xypex Admix at various dosage rates (1%, 2% and 5%) were tested against an untreated concrete control sample. Compressive

strength test results after 28 days indicated a significant strength increase in the samples incorporating Xypex Admix. The compressive strength increase varied between 5% and 20% (depending on the Xypex Admix dosage rate) over that of the reference sample.

**ASTM C 39, "Compressive Strength of Cylindrical Concrete Specimens", Kleinfelder Laboratories, San Francisco, USA**

At 28 days, the compressive strength test of the concrete containing Xypex Admix measured 7160 psi as compared to the reference sample at 6460 psi (a 10% increase).

### CHEMICAL RESISTANCE

**JIS, "Chemical Durability Test", Japanese Utility Company, In-house Test Report, Tokyo, Japan**

Concrete samples containing Xypex Admix were tested against five samples containing other admixtures and against a control sample, to determine resistance to corrosion and deterioration caused by contact with aggressive chemicals. All samples were soaked in a 5% sulfuric acid solution at 20°C for six months. Various evaluations and measurements were assessed every month during the test period, including: photographic comparisons, relative dynamic modulus of elasticity, percentage change in length, weight and flexural rigidity. Although the Xypex Admix sample was subjected to acid conditions well outside its published range, the results confirmed Xypex with the best performance among the seven samples tested.

**"Sulfuric Acid Resistance Test", Aviles Engineering Corporation, Houston, USA**

Concrete samples containing Xypex Admix at different dosage rates (3%, 5% and 7%) were tested against untreated control samples for sulfuric acid resistance. After immersion in the sulfuric acid, each sample was tested for weight loss on a daily basis until a weight loss of 50% or a definite response trend was obtained. The percentage weight loss of the samples containing Xypex Admix tested significantly lower than the control samples.

**"Sulphate Resistance Test", Taywood Engineering Ltd., Perth, Australia**

Xypex Admix-treated concrete samples were immersed in an ammonium-sulphate solution and tested for "resistance in a harsh environment". The performance

of the Xypex crystalline technology was compared with five other concretes, including one containing a sulphate-resistant cement. Each of the test samples was cured for seven days and then placed in an ammonium-sulphate solution (132 g/litre) for 180 days. The rate of corrosion was determined by measuring weight loss, and length change was noted on a weekly basis. The Xypex crystalline technology substantially improved concrete performance as compared to the reference concrete and tested very similar to the sulphate-resistant concrete. The Xypex Admix-treated samples also provided the highest level of protection as measured by change in length.

**FREEZE/THAW DURABILITY**

*ASTM C 666, "Freeze/Thaw Durability", Independent Laboratory, Cleveland, USA*

After 300 freeze/thaw cycles, the Xypex Admix-treated samples indicated 94% relative durability.

**POTABLE WATER EXPOSURE**

*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.

**Directions for Use**

Xypex Admix C-500 must be added to the concrete at the time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment:

**1. READY MIX PLANT - DRY BATCH OPERATION**

Add Xypex Admix in powder form to the drum of the ready-mix truck. Drive the ready-mix truck under the batch plant and add the balance of the materials in accordance with standard concrete batching practices. Mix materials for a minimum of 5 minutes to ensure that the Xypex Admix has been thoroughly dispersed throughout the concrete.

**2. READY MIX PLANT - CENTRAL MIX OPERATION**

Mix Xypex Admix with water to form a very thin slurry (e.g. 15 - 20 lb./6.75 - 9 kg of powder mixed with 3 U.S. gallons/13.6 litres of water). Pour the required amount of material into the drum of the ready-mix truck. The aggregate, cement and water should be

batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready-mix truck). Pour the Admix slurry into the truck and mix for at least 5 minutes to ensure even distribution of the Xypex Admix throughout the concrete.

**3. PRECAST BATCH PLANT** Add Xypex Admix to the rock and sand, then mix thoroughly for 2 - 3 minutes before adding the cement and water. The total concrete mass should be blended using standard practices.

**NOTE:**

i. It is important to obtain a homogeneous mixture of Xypex Admix with the concrete. Therefore, do not add dry Admix powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.

ii. Concrete containing the Xypex Admix does not preclude the requirement for design of crack control, construction joint detailing and measures for repairing defects in concrete (i.e. honeycombing, tie holes, cracks beyond specified limits).

For further information regarding the proper use of Xypex Admix for a specific project, consult with a Xypex technical services representative.

**Setting Time and Strength**

The setting time of concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Xypex Admix C-500 is specifically formulated to meet modern concrete practices that incorporate additives such as fly ash and slag. For most concrete mix designs adding the Xypex Admix C-500 will have minimal or no effect on setting time. Concrete containing the Xypex Admix C-500 may develop higher early and ultimate strengths than plain concrete particularly where fly ash and slag are used. Trial mixes should be carried out under project conditions to determine the setting time and strength of the concrete dosed with Xypex Admix C-500. Consult with a Xypex technical services representative for the most appropriate Xypex Admix for your project.

### Limitations

When incorporating Xypex Admix, the temperature of the concrete mix should be above 40°F (4°C).

### Technical Services

For more instructions, alternative installation methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

**Description**

Xypex is a unique chemical treatment for the waterproofing, protection and improvement of concrete. XYPEX ADMIX C-1000 is added to the concrete mix at the time of batching. Xypex Admix C-1000 consists of Portland cement, very fine treated silica sand and various active, proprietary chemicals. These active chemicals react with the moisture in fresh concrete and with the by-products of cement hydration to cause a catalytic reaction which generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete. Thus the concrete becomes permanently sealed against the penetration of water or liquids from any direction. The concrete is also protected from deterioration due to harsh environmental conditions.

**Xypex Admix C-Series**

The Admix C-Series has been specially formulated to meet varying project and temperature conditions. **Xypex Admix C-500** is specifically formulated to meet modern concrete practices that incorporate additives such as fly ash and slag. For most concrete mix designs adding the Admix C-500 will have minimal or no effect on setting time. **Xypex Admix C-1000** is designed for typical Portland cement-rich concrete, where normal to a mild retarded set is desired. **Xypex Admix C-2000** is designed for projects where extended retardation is required due to high ambient temperatures or long ready-mix delivery times. See Setting Time and Strength for more details. Consult with a Xypex technical services representative for the most appropriate Xypex Admix for your project.

**Recommended for:**

- Reservoirs
- Sewage and Water Treatment Plants
- Secondary Containment Structures

- Tunnels and Subway Systems
- Underground Vaults
- Foundations
- Parking Structures
- Swimming Pools
- Precast Components

**Advantages**

- Resists extreme hydrostatic pressure from either positive or negative surface of the concrete
- Becomes an integral part of the substrate
- Highly resistant to aggressive chemicals
- Can seal static hairline cracks up to 0.4 mm
- Allows concrete to breathe
- Non-toxic
- Less costly to apply than most other methods
- Permanent
- Added to the concrete at time of batching and therefore is not subject to climatic restraints
- Increases flexibility in construction scheduling

**Packaging**

Xypex Admix C-1000 is packaged in 60 lb. (27.2 kg) pails and 50 lb. (22.7 kg) bags. Admix C-1000 is also available in cartons containing 10 lb. (4.5 kg), 12 lb. (5.5 kg), and 15 lb. (6.8 kg) soluble bags. For specific projects, contact the manufacturer for availability of custom sized packaging.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Dosage Rates**

**Xypex Admix C-1000:**

2 - 3% by weight of cement

**Xypex Admix C-1000 NF (No Fines Grade):**

1 - 1.5% by weight of cement

**NOTE:** Under certain conditions, the dosage rate for No Fines Grade may be as low as 0.8% depending on the quantity and type of total cementitious materials. The maximum use level is 2% by weight of cement for potable water applications.

Consult with Xypex's Technical Services Department for assistance in determining the appropriate dosage rate and for further information regarding enhanced chemical resistance, optimum concrete performance, or meeting the specific requirements and conditions of your project.

## Test Data

### PERMEABILITY

**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Aviles Engineering Corp., Houston, USA**

Two concrete samples containing Xypex Admix at 3% and 5% respectively, and an untreated control sample were tested for water permeability. Both the treated and untreated samples were subjected to a pressure of 150 psi (350 ft. water head). Results showed moisture and permeated water throughout the untreated sample after 24 hours. However, the Xypex Admix samples showed no leakage, and water penetration of only 1.5 mm after 120 hours (5 days).

**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Setsco Services, Pte Ltd., Singapore**

Six Xypex Admix-treated and six untreated concrete samples were tested for water permeability. Pressure was gradually increased over five days and then maintained at 7 bars (224 ft. water head) for 10 days. While the six reference samples showed water leakage beginning on the fifth day and increasing throughout the test period, the Xypex Admix samples showed no water leakage at any time during the test.

**DIN 1048, "Water Impermeability of Concrete", DICTU S.A., Dept. of Engineering and Construction Mgt., Santiago, Chile**

Concrete samples 120 mm thick containing Xypex Admix were tested with the same size reference samples for water impermeability. Samples were subjected to hydrostatic pressure for 28 days. Water totally permeated the untreated samples but no water penetration was detected in any of the Xypex Admix-treated samples.

### COMPRESSIVE STRENGTH

**ASTM C 39, "Compressive Strength of Cylindrical Concrete Specimens", HBT Agra, Vancouver, Canada**

Concrete samples containing Xypex Admix at various dosage rates (1%, 2% and 5%) were tested against an untreated concrete control sample. Compressive strength test results after 28 days indicated a significant strength increase in the samples incorporating Xypex Admix. The compressive strength increase varied between 5% and 20% (depending on the Xypex Admix dosage rate) over that of the reference sample.

**ASTM C 39, "Compressive Strength of Cylindrical Concrete Specimens", Kleinfelder Laboratories, San Francisco, USA**

At 28 days, the compressive strength test of the concrete containing Xypex Admix measured 7160 psi as compared to the reference sample at 6460 psi (a 10% increase).

### CHEMICAL RESISTANCE

**JIS, "Chemical Durability Test", Japanese Utility Company, In-house Test Report, Tokyo, Japan**

Concrete samples containing Xypex Admix were tested against five samples containing other admixtures and against a control sample, to determine resistance to corrosion and deterioration caused by contact with aggressive chemicals. All samples were soaked in a 5% sulfuric acid solution at 20°C for six months. Various evaluations and measurements were assessed every month during the test period, including: photographic comparisons, relative dynamic modulus of elasticity, percentage change in length, weight and flexural rigidity. Although the Xypex Admix sample was subjected to acid conditions well outside its published range, the results confirmed Xypex with the best performance among the seven samples tested.

**"Sulfuric Acid Resistance Test", Aviles Engineering Corporation, Houston, USA**

Concrete samples containing Xypex Admix at different dosage rates (3%, 5% and 7%) were tested against untreated control samples for sulfuric acid resistance. After immersion in the sulfuric acid, each sample was tested for weight loss on a daily basis until a weight loss of 50% or a definite response trend was obtained. The percentage weight loss of the samples containing Xypex Admix tested significantly lower than the control samples.

**“Sulphate Resistance Test”,  
Taywood Engineering Ltd., Perth, Australia**

Xypex Admix-treated concrete samples were immersed in an ammonium-sulphate solution and tested for “resistance in a harsh environment”. The performance of the Xypex crystalline technology was compared with five other concretes, including one containing a sulphate-resistant cement. Each of the test samples was cured for seven days and then placed in an ammonium-sulphate solution (132 g/litre) for 180 days. The rate of corrosion was determined by measuring weight loss, and length change was noted on a weekly basis. The Xypex crystalline technology substantially improved concrete performance as compared to the reference concrete and tested very similar to the sulphate-resistant concrete. The Xypex Admix-treated samples also provided the highest level of protection as measured by change in length.

**FREEZE/THAW DURABILITY**

**ASTM C 666, “Freeze/Thaw Durability”,  
Independent Laboratory, Cleveland, USA**

After 300 freeze/thaw cycles, the Xypex Admix-treated samples indicated 94% relative durability.

**POTABLE WATER EXPOSURE**

**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.

**Directions for Use**

Xypex Admix C-1000 must be added to the concrete at the time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment:

**1. READY MIX PLANT - DRY BATCH OPERATION**

Add Xypex Admix in powder form to the drum of the ready-mix truck. Drive the ready-mix truck under the batch plant and add the balance of the materials in accordance with standard concrete batching practices. Mix materials for a minimum of 5 minutes to ensure that the Xypex Admix has been thoroughly dispersed throughout the concrete.

**2. READY MIX PLANT - CENTRAL MIX OPERATION**

Mix Xypex Admix with water to form a very thin slurry (e.g. 15 - 20 lb./6.75 - 9 kg of powder mixed with 3 U.S. gallons/13.6 litres of water). Pour the required amount of material into the drum of the ready-mix truck. The aggregate, cement and water should be batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready-mix truck). Pour the Admix slurry into the truck and mix for at least 5 minutes to ensure even distribution of the Xypex Admix throughout the concrete.

**3. PRECAST BATCH PLANT** Add Xypex Admix to the rock and sand, then mix thoroughly for 2 - 3 minutes before adding the cement and water. The total concrete mass should be blended using standard practices.

**NOTE:**

i. It is important to obtain a homogeneous mixture of Xypex Admix with the concrete. Therefore, do not add dry Admix powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.

ii. Concrete containing the Xypex Admix does not preclude the requirement for design of crack control, construction joint detailing and measures for repairing defects in concrete (i.e. honeycombing, tie holes, cracks beyond specified limits).

For further information regarding the proper use of Xypex Admix for a specific project, consult with a Xypex technical services representative.

**Setting Time and Strength**

The setting time of concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Xypex Admix C-1000 is designed for typical Portland cement-rich concrete, where normal to a mild retarded set is desired. Concrete containing the Xypex Admix C-1000 may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine the setting time and strength of the concrete dosed with Xypex Admix C-1000.

Consult with a Xypex technical services representative for the most appropriate Xypex Admix for your project.

### Limitations

When incorporating Xypex Admix, the temperature of the concrete mix should be above 40°F (4°C).

### Technical Services

For more instructions, alternative installation methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

**Description**

Xypex is a unique chemical treatment for the waterproofing, protection and improvement of concrete. XYPEX ADMIX C-2000 is added to the concrete mix at the time of batching. Xypex Admix C-2000 consists of Portland cement, very fine treated silica sand and various active, proprietary chemicals. These active chemicals react with the moisture in fresh concrete and with the by-products of cement hydration to cause a catalytic reaction which generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete. Thus the concrete becomes permanently sealed against the penetration of water or liquids from any direction. The concrete is also protected from deterioration due to harsh environmental conditions.

**Xypex Admix C-Series**

The Admix C-Series has been specially formulated to meet varying project and temperature conditions. **Xypex Admix C-500** is specifically formulated to meet modern concrete practices that incorporate additives such as fly ash and slag. For most concrete mix designs adding the Admix C-500 will have minimal or no effect on setting time. **Xypex Admix C-1000** is designed for typical Portland cement-rich concrete, where normal to a mild retarded set is desired. **Xypex Admix C-2000** is designed for projects where extended retardation is required due to high ambient temperatures or long ready-mix delivery times. See Setting Time and Strength for more details. Consult with a Xypex technical services representative for the most appropriate Xypex Admix for your project.

**Recommended for:**

- Reservoirs
- Sewage and Water Treatment Plants

- Secondary Containment Structures
- Tunnels and Subway Systems
- Underground Vaults
- Foundations
- Parking Structures
- Swimming Pools
- Precast Components

**Advantages**

- Resists extreme hydrostatic pressure from either positive or negative surface of the concrete
- Becomes an integral part of the substrate
- Highly resistant to aggressive chemicals
- Can seal static hairline cracks up to 0.4 mm
- Allows concrete to breathe
- Non-toxic
- Less costly to apply than most other methods
- Permanent
- Added into the concrete at time of batching and therefore is not subject to climatic restraints
- Increases flexibility in construction scheduling

**Packaging**

Xypex Admix C-2000 is packaged in 60 lb. (27.2 kg) pails and 50 lb. (22.7 kg) bags. For specific projects, contact the manufacturer for availability of custom sized packaging.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Dosage Rates**

**Xypex Admix C-2000:**

2% by weight of cement  
 (do not exceed recommended dosage rate)

**Xypex Admix C-2000 NF (No Fines Grade):**

1.2% by weight of cement  
 (do not exceed recommended dosage rate)

**NOTE:** Under certain conditions, the dosage rate for No Fines Grade may be as low as 0.8% depending on the quantity and type of total cementitious materials. The maximum use level is 2% by weight of cement for potable water applications.



Consult with Xypex's Technical Services Department for assistance in determining the appropriate dosage rate and for further information regarding enhanced chemical resistance, optimum concrete performance, or meeting the specific requirements and conditions of your project.

## Test Data

### PERMEABILITY

**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Aviles Engineering Corp., Houston, USA**

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**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Setsco Services, Pte Ltd., Singapore**

Six Xypex Admix-treated and six untreated concrete samples were tested for water permeability. Pressure was gradually increased over five days and then maintained at 7 bars (224 ft. water head) for 10 days. While the six reference samples showed water leakage beginning on the fifth day and increasing throughout the test period, the Xypex Admix samples showed no water leakage at any time during the test.

**DIN 1048, "Water Impermeability of Concrete", DICTU S.A., Dept. of Engineering and Construction Mgt., Santiago, Chile**

Concrete samples 120 mm thick containing Xypex Admix were tested with the same size reference samples for water impermeability. Samples were subjected to pressure for 28 days. Water totally permeated the untreated samples but no water penetration was detected in any of the Xypex Admix-treated samples.

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**ASTM C 39, "Compressive Strength of Cylindrical Concrete Specimens", Kleinfelder Laboratories, San Francisco, USA**

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### CHEMICAL RESISTANCE

**JIS, "Chemical Durability Test", Japanese Utility Company, In-house Test Report, Tokyo, Japan**

Concrete samples containing Xypex Admix were tested against five samples containing other admixtures and against a control sample, to determine resistance to corrosion and deterioration caused by contact with aggressive chemicals. All samples were soaked in a 5% sulfuric acid solution at 20°C for six months. Various evaluations and measurements were assessed every month during the test period, including: photographic comparisons, relative dynamic modulus of elasticity, percentage change in length, weight and flexural rigidity. Although the Xypex Admix sample was subjected to acid conditions well outside its published range, the results confirmed Xypex with the best performance among the seven samples tested.

**"Sulfuric Acid Resistance Test"**

**Aviles Engineering Corporation, Houston, USA**

Concrete samples containing Xypex Admix at different dosage rates (3%, 5% and 7%) were tested against untreated control samples for sulfuric acid resistance. After immersion in the sulfuric acid, each sample was tested for weight loss on a daily basis until a weight

loss of 50% or a definite response trend was obtained. The percentage weight loss of the samples containing Xypex Admix tested significantly lower than the control samples.

**“Sulphate Resistance Test”,  
Taywood Engineering Ltd., Perth, Australia**

Xypex Admix-treated concrete samples were immersed in an ammonium-sulphate solution and tested for “resistance in a harsh environment”. The performance of the Xypex crystalline technology was compared with five other concretes, including one containing a sulphate-resistant cement. Each of the test samples was cured for seven days and then placed in an ammonium-sulphate solution (132 g/litre) for 180 days. The rate of corrosion was determined by measuring weight loss, and length change was noted on a weekly basis. The Xypex crystalline technology substantially improved concrete performance as compared to the reference concrete and tested very similar to the sulphate-resistant concrete. The Xypex Admix-treated samples also provided the highest level of protection as measured by change in length.

**FREEZE/THAW DURABILITY**

**ASTM C 666, “Freeze/Thaw Durability”,  
Independent Laboratory, Cleveland, USA**

After 300 freeze/thaw cycles, the Xypex Admix-treated samples indicated 94% relative durability.

**POTABLE WATER EXPOSURE**

**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.

**Directions for Use**

Xypex Admix C-2000 must be added to the concrete at the time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment:

**1. READY MIX PLANT - DRY BATCH OPERATION**

Add Xypex Admix in powder form to the drum of the ready-mix truck. Drive the ready-mix truck under the batch plant and add the balance of the materials in accordance with standard concrete batching prac-

tices. Mix materials for a minimum of 5 minutes to ensure that the Xypex Admix has been thoroughly dispersed throughout the concrete.

**2. READY MIX PLANT - CENTRAL MIX OPERATION**

Mix Xypex Admix with water to form a very thin slurry (e.g. 15 - 20 lb./6.75 - 9 kg of powder mixed with 3 U.S. gallons/13.6 litres of water). Pour the required amount of material into the drum of the ready-mix truck. The aggregate, cement and water should be batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready-mix truck). Pour the Admix slurry into the truck and mix for at least 5 minutes to ensure even distribution of the Xypex Admix throughout the concrete.

**3. PRECAST BATCH PLANT**

Add Xypex Admix to the rock and sand, then mix thoroughly for 2 - 3 minutes before adding the cement and water. The total concrete mass should be blended using standard practices.

**NOTE:**

i. It is important to obtain a homogeneous mixture of Xypex Admix with the concrete. Therefore, do not add dry Admix powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.

ii. Concrete containing the Xypex Admix does not preclude the requirement for design of crack control, construction joint detailing and measures for repairing defects in concrete (i.e. honeycombing, tie holes, cracks beyond specified limits).

For further information regarding the proper use of Xypex Admix for a specific project, consult with a Xypex technical services representative.

**Setting Time and Strength**

The setting time of concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Xypex Admix C-2000 is designed for projects where extended retardation is required due to high ambient temperatures or long ready-mix delivery times. Concrete contain-

ing Xypex Admix C-2000 may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine the setting time and strength of the concrete dosed with Xypex Admix C-2000. Consult with a Xypex technical services representative for the most appropriate Xypex Admix for your project.

other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.

**Limitations**

When incorporating Xypex Admix, the temperature of the concrete mix should be above 40°F (4°C).

**Technical Services**

For more instructions, alternative installation methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

**Warranty**

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all



**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

- Non-toxic
- Less costly to apply than most other methods
- Permanent
- Increases flexibility in the construction schedule

**Packaging**

Xypex Concentrate DS-1 is available in 60 lb. (27.2 kg) pails.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Coverage**

Under normal conditions, the coverage rate for Xypex Concentrate DS-1 is 1.75 lb./sq. yd. (0.95 kg/m<sup>2</sup>).

**Test Data**

**PERMEABILITY**

**U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Pacific Testing Labs, Seattle, USA**

Two in. (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 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 Gewerbemuseum, Federal Higher Technical Education & Research Institute, Vienna, Austria**

Xypex-treated concrete samples were pressure tested to a maximum 7 bars (230 ft./70 m water

**Description**

Xypex Concentrate is a unique chemical treatment for the waterproofing and protection of concrete. XYPEX CONCENTRATE DS-1 is a special formulation designed specifically for a dry shake application on horizontal concrete surfaces. Packaged in the form of a dry powder compound, Concentrate DS-1 consists of Portland cement, various active proprietary chemicals, and an aggregate which has been crushed and graded to particle sizes suitable for concrete floors. DS-1 becomes an integral part of the concrete surface thereby eliminating problems normally associated with coatings (e.g. scaling, dusting, flaking and delamination). The active chemicals react with the moisture of the fresh concrete causing a catalytic reaction which generates a non-soluble crystalline formation within the pores and capillary tracts of the concrete.

**Recommended for:**

- Sewage and Water Treatment Plants
- Reservoirs
- Foundation Slabs
- Bridge Decks
- Below-grade Parking Structures

**NOTE:** For concrete surfaces that are subject to heavy traffic conditions or that require increased resistance to impact and abrasion, please consult with a Xypex technical services representative regarding the use of Xypex Concentrate DS-2.

**Advantages**

- Resists extreme hydrostatic pressure from either positive or negative surface of the concrete slab
- Becomes an integral part of the substrate
- Highly resistant to aggressive chemicals
- Can seal hairline cracks up to 0.4 mm
- Allows concrete to breathe

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 broken 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.

**CHEMICAL RESISTANCE**

**ASTM C 267-77, "Compressive 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", Tokyo, Japan**  
Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H<sub>2</sub>SO<sub>4</sub> solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

**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.

**Application Procedures**

1. Fresh concrete is placed, consolidated and levelled.
2. Wait until concrete can be walked on leaving an indentation of 1/4 - 3/8 in. (6.5 - 9.5 mm). Concrete should be free of bleed water and be able to support the weight of a power trowel. Then, float open the surface.
3. Immediately after floating open the surface, apply the dry shake material by hand or mechanical spreader. The dry shake material must be spread evenly.
4. As soon as the dry shake material has absorbed moisture from the base slab, it must be floated into the surface. The DS-1 powder must be thoroughly worked into the cement paste using a float (not a trowel). Failure to utilize a float for this process could result in damage to the hardened surface (i.e. flaking, blistering or peeling).
5. When concrete has hardened sufficiently, power trowel surface to the required finish.

**NOTE:**

i. Environmental conditions (e.g. hot or cold temperatures) may affect the application and installation of the dry shake powder. In hot, dry or windy conditions where evaporation of bleed water is occurring, the DS-1 powder should be applied immediately after

Step 1 above (i.e. screeding). Keep top of slab from premature drying to ensure homogeneous mixture of DS-1 powder into concrete paste. It is advisable to use an evaporation retardant on the fresh concrete.

ii. It is common that edges of a slab wall will set up earlier than the main body of concrete. Such edge areas can be dry shaken and finished with hand tools prior to proceeding with application to the main body of concrete.

iii. Consult with Xypex's Technical Services Department or your local Xypex representative regarding the optimum concrete performance under a variety of conditions during application of DS-1.

### Curing

Curing is important and should begin as soon as final set has occurred but before surface starts to dry. Conventional moist curing procedures such as water spray, wet burlap or plastic covers may be used. Curing should continue for at least 48 hours. In hot, dry, sunny conditions, consult manufacturer for specific instructions. In lieu of moist curing, concrete sealers and curing compounds meeting ASTM C 309 may be used.

### Note

1. For best results when applying dry shake materials, the air content of the concrete should not exceed 3% (a high air content can make it difficult to achieve a proper application). If a higher entrained air content is specified (e.g. for concrete that will be exposed to freezing and thawing), contact the Technical Services Department of Xypex Chemical Corporation for further application information.

2. Chronic moving cracks or joints will require a suitable flexible sealant.

3. For certain concrete mix designs, we recommend a test panel be produced and evaluated for finishing. For example, higher performance concrete with a low water/cement ratio, air entrainment, superplasticizers, or silica fume may reduce bleed water and make the concrete more difficult to finish.

4. For increased abrasion resistance, spray-apply Xypex Quickset following curing of the DS-1 application. The Xypex Quickset mix ratio is one part Quickset to one part water by volume. The recommended coverage rate is 150 ft.<sup>2</sup>/U.S. gallon (14 m<sup>2</sup>/litre).

### 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 Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07160**  
**Cementitious Crystalline**

**Description**

Xypex Concentrate is a unique chemical treatment for the waterproofing and protection of concrete. XYPEX CONCENTRATE DS-2 is a special formulation designed specifically for a dry shake application on horizontal concrete surfaces where greater resistance to impact and abrasion is required. Packaged in the form of a dry powder compound, Concentrate DS-2 consists of Portland cement, various active proprietary chemicals, and a synthetic aggregate hardener which has been crushed and graded to particle sizes suitable for concrete floors. DS-2 becomes an integral part of the concrete surface thereby eliminating problems normally associated with coatings (e.g. scaling, dusting, flaking and delamination). The active chemicals react with the moisture of the fresh concrete causing a catalytic reaction which generates a non-soluble crystalline formation within the pores and capillary tracts of the concrete.

**Recommended for:**

- Sewage and Water Treatment Plants
- Traffic Bearing Surfaces
- Warehouse Floors
- Foundation Slabs
- Below-grade Parking Structures

**Advantages**

- Resists extreme hydrostatic pressure from either positive or negative surface of the concrete slab
- Becomes an integral part of the substrate
- Highly resistant to aggressive chemicals
- Can seal hairline cracks up to 0.4 mm
- Allows concrete to breathe
- Non-toxic
- Less costly to apply than most other methods

- Permanent
- Increases flexibility in the construction schedule

**Packaging**

Xypex Concentrate DS-2 is available in 60 lb. (27.2 kg) pails and bags.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Coverage**

Under normal conditions, the coverage rate for Xypex Concentrate DS-2 is 6.75 - 7.5 lb./sq. yd. (3.6 - 4.0 kg/m<sup>2</sup>), depending on the degree of abrasion resistance required.

**NOTE:** Under heavy traffic conditions or where even greater abrasion resistance is required, consult with a Xypex technical services representative for a recommendation that meets your specific need.

**Test Data**

**PERMEABILITY**

***U.S. Army Corps of Engineers CRD C48-73, "Permeability of Concrete", Pacific Testing Labs, Seattle, USA***

Two in. (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.

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Xypex-treated concrete samples were pressure tested to a maximum 7 bars (230 ft./70 m 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 broken and showed water penetration to a depth of 15 mm on untreated samples but no measurable water penetration on the Xypex-treated samples.

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**CHEMICAL RESISTANCE**

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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.

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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.

**ABRASION RESISTANCE**

**ASTM C 501-84, "Taber Abrasion", AGRA Earth & Environment Ltd./James Neill & Associates, Vancouver, Canada**

Since 1978 various tests have been performed on concrete specimens containing the non-metallic/synthetic hardener utilized in Xypex DS-2. Testing included the evaluation of concrete specimens for abrasion resistance as measured by mass loss (Taber Abrasion). The concrete control samples used in the tests exhibited an average mass loss of 6.0 grams, while subsequent taber abrasion testing of concrete treated with Xypex DS-2 showed a mass loss of 3.3 grams. Xypex Quickset was then applied to samples treated with Xypex DS-2 and mass loss was further reduced to 2.2 grams. Test results indicate that use of Xypex DS-2 significantly improves the abrasion resistance of concrete.

**Application Procedures**

1. Fresh concrete is placed, consolidated and levelled.
2. Wait until concrete can be walked on leaving an indentation of 1/4 - 3/8 in. (6.5 - 9.5 mm). Concrete



should be free of bleed water and be able to support the weight of a power trowel. Then, float open the surface.

3. Immediately after floating open the surface, apply one-half of the dry shake material by hand or mechanical spreader. The dry shake material must be spread evenly.

4. As soon as the dry shake material has absorbed moisture from the base slab, it must be floated into the surface. The DS-2 powder must be thoroughly worked into the cement paste using a float (not a trowel). Failure to utilize a float for this process could result in damage to the hardened surface (i.e. flaking, blistering or peeling).

5. Immediately after power floating, apply remaining dry shake material at right angles to the first application.

6. Allow remaining dry shake material to absorb moisture from the base slab and then power float the material into the surface. Again, it is essential that the DS-2 powder is thoroughly worked into the cement paste using a float (not a trowel).

7. When concrete has hardened sufficiently, power trowel surface to the required finish.

**NOTE:**

i. Environmental conditions (e.g. hot or cold temperatures) may affect the application and installation of the dry shake powder. In hot, dry or windy conditions where evaporation of bleed water is occurring, the DS-2 powder should be applied immediately after Step 1 above (i.e. screeding). Keep top of slab from premature drying to ensure homogeneous mixture of DS-2 powder into concrete paste. It is advisable to use an evaporation retardant on the fresh concrete.

ii. It is common that edges of a slab wall will set up earlier than the main body of concrete. Such edge areas can be dry shaken and finished with hand tools prior to proceeding with application to the main body of concrete.

iii. Consult with Xypex's Technical Services Department or your local Xypex representative regarding the opti-

imum concrete performance under a variety of conditions during application of DS-2.

**Curing**

Curing is important and should begin as soon as final set has occurred but before surface starts to dry. Conventional moist curing procedures such as water spray, wet burlap or plastic covers may be used. Curing should continue for at least 48 hours. In hot, dry, sunny conditions, consult manufacturer for specific instructions. In lieu of moist curing, concrete sealers and curing compounds meeting ASTM C 309 may be used.

**Note**

1. For best results when applying dry shake materials, the air content of the concrete should not exceed 3% (a high air content can make it difficult to achieve a proper application). If a higher entrained air content is specified (e.g. for concrete that will be exposed to freezing and thawing), contact the Technical Services Department of Xypex Chemical Corporation for further application information.

2. Chronic moving cracks or joints will require a suitable flexible sealant.

3. For certain concrete mix designs, we recommend a test panel be produced and evaluated for finishing. For example, higher performance concrete with a low water/cement ratio, air entrainment, superplasticizers, or silica fume may reduce bleed water and make the concrete more difficult to finish.

4. To further enhance the surface, spray-apply Xypex Quickset following curing of the DS-2 application. The Xypex Quickset mix ratio is one part Quickset to one part water by volume. The recommended coverage rate is 150 ft.<sup>2</sup>/U.S. gallon (14 m<sup>2</sup>/litre).

**Technical Services**

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### Safe Handling Information

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**XYPEX PATCH'N PLUG**

DAT-PNP • REV-07-04



**Concrete Waterproofing**  
**03010**  
**Patching & Resurfacing**

**Description**

XYPEX PATCH'N PLUG is a specially designed, fast-setting, non-shrink, high-bond-strength, hydraulic cement compound for concrete patching and repair. Patch'n Plug stops flowing water in seconds and is used to seal cracks, tie holes, and other defects in concrete. The high performance characteristics of Patch'n Plug are enhanced by Xypex's unique crystalline waterproofing technology.

**Recommended for:**

- Stopping an active flow of water through cracks
- Repair of concrete substrates before the application of Xypex coating materials

**Advantages**

- Single component (simply add water)
- Fast setting: two to three minutes at 70°F (21°C)
- Excellent structural strength
- As durable as the masonry and concrete to which it is applied
- Non-metallic (won't rust or deteriorate)
- Non-toxic

**Packaging**

Xypex Patch'n Plug is available in 20 lb. (9.1 kg) pails and 60 lb. (27.2 kg) pails.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Coverage**

One 60 lb. (27.2 kg) pail of Xypex Patch'n Plug will produce 0.54 cubic feet (0.0154 cu. metres) of mortar.

**Test Data**

Physical Property	Test Method	Typical Result	
		psi	MPa
Compressive Strength	ASTM C109	psi	MPa
@ 24 hours		2100	14.3
@ 7 days		3100	21.3
@ 28 days		4500	31.0
Setting Time	ASTM C266	min.	sec.
Initial Set		3	50
Final Set		9	10
Tensile Bond Pull-Off	CSA A23.2-6B	psi	MPa
		120	0.8

**NOTE:** Samples prepared with 1 part water to 3.25 parts dry powder by volume (1 part water to 4 parts dry powder by mass). Setting time was determined using Gilmore needles.

**Plugging Instructions**

**1. PREPARATION** Rout out crack or hole by chiseling or chipping to a minimum depth of one inch (25 mm). Form a square or dovetail shaped space (do not use a "V" cut). Flush away all loose materials and dirt from the cavity with water and a stiff brush.

**2. MIXING** Add 1 part water to 3.5 parts Patch'n Plug by volume and mix to the consistency of a stiff putty. Do not mix more than can be used in 3 minutes. For best results, water temperature should be approximately 60 - 70°F (15 - 20°C).

**3. PLUGGING** Form plug with gloved hand. Place plug into cavity pressing firmly until plug is hard. When sealing cracks, begin at the highest point and work down.

**NOTE:** Where there is a high volume of water flow due to extreme hydrostatic pressure, a bleeder hose may be necessary to relieve the water pressure while sealing the repair area. (See procedures on reverse side.)

**Follow These Steps:**

- With a concrete chisel and hammer (or chipping gun), cut open a cavity at the point of greatest water flow.

## XYPEX PATCH'N PLUG

b. Place a stiff section of hose or pipe into the cavity and secure in place with Patch'n Plug to force water through the hose. This relieves the pressure so that the area can be patched. Allow a minimum of 24 hours for hardening.

c. Remove bleeder hose and plug remaining hole. If necessary, reduce water flow by inserting steel wool or wooden plug in the remaining hole before patching.

### Patching Instructions

**1. SURFACE PREPARATION** Rout out faulty concrete until sound substrate is reached. Remove all loose materials from area and saturate with clean water. Allow water to be absorbed into the concrete, then remove excess water.

**2. MIXING** For fast repairs to concrete or masonry, add water to Patch'n Plug powder (1.5 parts water to 4 parts powder by volume). Mix to a workable mortar consistency and trowel on as required. For large repairs, mix 1 part Patch'n Plug with 2 parts mason sand or small aggregate (3/8 in. or 10 mm minus crushed stone). Maximum ratio is 40 lb. (18.2 kg) stone to one 60 lb. pail (27.2 kg) of Patch'n Plug.

### Abnormal Temperatures

During above normal ambient temperatures, mixing water should not exceed 90°F (32°C) and Xypex Patch'n Plug material should not exceed 70°F (21°C). Below normal ambient temperatures will retard the setting time of Patch'n Plug. In this situation, Xypex materials should be stored at normal temperatures (see Storage) and mixing water should be heated to increase setting speed.

### 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 Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Rehabilitation**

**03930**

**Patching & Resurfacing**

**Description**

XYPEX MEGAMIX I is a thin parge coat for the waterproofing and resurfacing of vertical masonry or concrete surfaces, as a cap coat for Xypex Concentrate, or as an architectural rendering. Megamix I is a unique blend of Portland cement, treated silica sand, fibers and proprietary chemicals. It is mixed with Xycrylic Admix to produce enhanced bond. Megamix I is applied by brush or trowel up to a thickness of 3/8 in. (10 mm). The high performance characteristics of Megamix I are enhanced by Xypex's unique crystalline waterproofing and protection technology.

**NOTE:** For patching or resurfacing deteriorated concrete, requiring a thicker parge coat, (between 3/8 in. and 2 in. or 10 - 50 mm), refer to the product data sheet for Xypex Megamix II.

**Recommended for:**

- Waterproof coating for vertical concrete block surfaces and cast-in-place concrete walls
- A secondary or cap coat for Xypex Concentrate applications to porous masonry surfaces
- Lining for swimming pools, tunnels and tanks

**Advantages**

- Excellent adhesion and bond to concrete substrates
- Easy to apply
- Fiber reinforced
- Reduces surface absorption
- Provides good surface for painting or as a final finished surface
- NSF 61 certified

**Packaging**

Megamix I is available in 60 lb. (27.2 kg) pails.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year.

**Coverage**

Required coating thickness will vary depending on project requirements. At the recommended thickness of 1/8 in. (3.2 mm), one 60 lb. (27.2 kg) pail of Megamix I will cover 47.5 sq. ft. (4.4 m<sup>2</sup>). Megamix I may be applied as thin as 1/16 in. (1.6 mm) provided it is used as a cap coat over a coat of Xypex Concentrate (24 hours between coats is preferable). For application thickness exceeding 3/8 in. (10 mm), consult with the Technical Services Department of Xypex Chemical Corporation or your local Xypex representative.

**Physical Properties**

Mixing Liquid Required (2 water:1 part Xycrylic)		
1.4 U.S. gallon / 60 lb. pail 5.4 litre / 27.2 kg pail		
Compressive Strength (ASTM C 109)		
@ 7 days	2420 psi	16.7 MPa
@ 28 days	3610 psi	24.9 MPa
Direct Tensile Bond Strength (ACI 503R Appendix A)		
concrete block	220 psi	1.54 MPa
24 hr. Concentrate	180 psi	1.24 MPa
Water Permeability and Absorption CSN 73 2578 "Test for Water-Tightness of Surface Finishes of Building Materials"		
30 min. water absorption (% of untreated concrete block)	86.8% reduction	

**NOTE:** For bond and absorption tests, Megamix I was applied at 1/16 in. (1.6 mm) thick onto either pressure washed concrete block or 24 hr. old Xypex Concentrate.

**Application Procedures**

**1. SURFACE PREPARATION** The concrete surface to be treated with Megamix I must be clean and free from dirt, oil, paint, or other foreign substances that could hinder bond. Structural repairs (i.e. cracks, faulty construction joints, rock pockets, tie holes,

spalled concrete, etc.) should be performed prior to the application of the Megamix I coating. Pressure washing of surface may be required to ensure open capillary system to provide “tooth and suction” for the Megamix I coating.

**2. WETTING CONCRETE SURFACE** The concrete or masonry surface must be thoroughly saturated with clean water to control substrate suction and prevent premature drying out of the Megamix I coating.

**3. MIXING PROCEDURES** Prepare the mixing liquid by combining 1 part Xycrylic Admix with 2 parts clean water. Then, mix 1.4 U.S. gallons (5.4 litres) of the mixing liquid with one 60 lb. (27.2 kg) pail of Megamix I powder. Mix thoroughly to a creamy consistency that is suitable for either a brush or trowel application. Let mixture stand for 3 - 5 minutes, re-agitate and then apply.

**4. APPLYING MEGAMIX I** Ensure surface is “saturated, surface dry” (SSD) just prior to application. Brush or trowel apply Megamix I to the surface at the rate of 0.6 - 1.3 lb./sq. ft. (2.9 - 6.4 kg/m<sup>2</sup>). This coverage rate will produce a coating of between 1/16 in. and 1/8 in. (1.6 - 3.2 mm) thick depending on the porosity of the substrate. For spray application contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex representative for specific details.

For applications such as concrete block walls where Xypex Concentrate is to be used as the initial coat in a two-coat system, the Concentrate coating should be installed as per the manufacturer’s standard instructions. Megamix I should then be applied over the Concentrate coating while the Concentrate is still “green” (i.e. following initial set/approximately 2 - 4 hours). The Megamix I coating should not be applied later than 24 hours after the application of Xypex Concentrate.

**5. CURING** When used with Xycrylic Admix as specified above, Megamix I should not require any further curing. However, if weather conditions result in rapid evaporation (such as very hot or windy), then a

fine mist of water should be sprayed on the coating 2 - 3 times for one day.

**Technical Services**

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**Safe Handling Information**

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**Warranty**

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**Concrete Rehabilitation**

**03930**

Patching & Resurfacing

**Description**

XYPEX MEGAMIX II is a thick repair mortar for the patching and resurfacing of deteriorated concrete. Megamix II has been specifically formulated to produce superior bond, low shrinkage, chemical durability and high strength. It is a one component mortar and can be either sprayed or trowel applied at a thickness of 3/8 - 2 in. (10 - 50 mm). The high performance characteristics of Megamix II are enhanced by Xypex's unique crystalline waterproofing and protection technology.

**NOTE:** For rehabilitation applications, where a thin parge coating (less than 3/8 in. or 10 mm) or a cap coat for Xypex Concentrate is required, refer to the product data sheet for Megamix I.

**Recommended for the Rehabilitation of:**

- Water Tanks and Reservoirs
- Sewage Treatment Plants
- Concrete Water and Sewer Pipes
- Manholes and Vaults
- Marine Structures
- Bridge Structures
- Tunnels and Parking Garages

**Advantages**

- Excellent adhesion and bond to concrete substrates
- Low shrinkage, fiber reinforced
- Low chloride penetration
- Ready to use – just add water
- Vertical and overhead concrete repair; sprayable
- VOC compliant
- NSF 61 certified

**Packaging**

Megamix II is available in 55 lb. (25 kg) bags, 60 lb. (27.2 kg) pails, or in customized packaging to meet your specific requirements.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year.

**Coverage**

At 1/2 in. (12.5 mm) thickness, each 55 lb. (25 kg) bag of Megamix II will cover 11.3 sq. ft. (1.05 m<sup>2</sup>), or each 60 lb. (27.2 kg) pail will cover 12.3 sq. ft. (1.14 m<sup>2</sup>).

**Physical Properties**

Compressive Strength (ASTM C 109)		
@ 24 hrs	3080 psi	21.2 MPa
@ 3 days	5515 psi	38.0 MPa
@ 7 days	6845 psi	47.2 MPa
@ 28 days	8600 psi	59.3 MPa
Flexural Strength (ASTM C 78)		
@ 28 days	1190 psi	8.2 MPa
Splitting Tensile Strength (ASTM C 496)		
@ 28 days	603 psi	4.2 MPa
Direct Tensile Bond Strength to Concrete (ACI 503R Appendix A)		
@ 90 days	330 psi	2.3 MPa
Rapid Chloride Permeability (ASTM C 1202)		
@ 28 days	572 coulombs	
@ 90 days	420 coulombs	
Scaling Resistance (ASTM C 672)		
50 cycles	no scaling	
Chemical Resistance (ASTM C 267)		
mass loss (84 days)	negligible (retained 99.78% mass)	
Setting Time (ASTM C 266)		
initial	4:10 hrs:min	
final	7:10 hrs:min	
Note: Testing completed @ 14% water content of the mass of the dry ingredients.		

### Application Procedures

**1. SURFACE PREPARATION** Remove loose, delaminated or unsound concrete by high pressure water blast, chipping, or other means. Complete structural or reinforcing steel corrosion repairs as necessary. Saw cut perimeter of repair area to 3/8 in. (10 mm) depth. Remove dust, micro fractured particles and foreign material from the repair area by pressure washing or other suitable means necessary to clean surface and obtain desired bond.

**2. MIXING PROCEDURES** Best results are achieved using a mechanical mortar mixer and paddle with a capacity for low speed continuous blending. For small quantities of material a paddle mixer can be substituted. Mix requires 0.92 - 0.96 US gallons of water per 55 lb bag or 1.00 - 1.05 US gallons per 60 lb pail (3.5 - 3.7 litres per 25 kg bag or 3.8 - 4.0 litres per 27.2 kg pail). Use only clean water. Add approximately 90% of the required amount of water to a mixer and then add the Megamix II powder. Mix briefly and add additional water to achieve the required consistency (do not exceed maximum water without consulting Xypex Technical Representative). Mix 3 - 5 minutes to achieve a uniform consistency. Over mixing or delivery delays may result in product stiffening. Do not over water.

**3. APPLYING MEGAMIX II** Saturate the repair area with clean water and allow the surface to come to a "saturated, surface dry" (SSD) condition. Maintain concrete substrate in this condition during the application process. For improved bond, apply scrub coat of Megamix II onto prepared surface using a stiff bristle brush. Apply full coat of Megamix II while scrub coat is still wet (generally within 20 minutes). When applying Megamix II by low pressure spray equipment, use sufficient velocity to compact and build the thickness of the mortar. The spray nozzle should have a minimum 0.5 in. (12.5 mm) orifice to prevent clogging. Spray-apply Megamix II, at a right angle to surface, at a distance of 18 - 24 in. (450 - 600 mm). Complete finishing operations as quickly as possible. Megamix II can be finished to varying surface textures, including a rough finish directly

from spraying nozzle, to semi-smooth using a wood or rubber float or smooth using a steel trowel.

**NOTE:**

i. For a recommendation regarding the specific type of equipment required for the mixing and for the spray application of Megamix II, please contact the Technical Services Department of Xypex Chemical Corporation.

ii. An application of Xypex Concentrate may be specified by an engineer or design authority to provide enhanced waterproofing and chemical protection in extremely harsh conditions.

iii. Xypex Concentrate should be applied onto the Megamix II surface immediately following moist curing (i.e. 3 days). Ensure that the Megamix surface is rough or scored and saturated to provide "tooth and suction" for the Xypex coating.

iv. Megamix II can be extended with a maximum of 30 lbs. (13.6 kg) clean 3/8" (10mm) coarse aggregate per 55 lbs. (25 kg) container.

**4. APPLICATION THICKNESS** The thickness of the Megamix II application will depend on specific job site conditions and requirements. As a general guide, application thickness should be between 3/8 in. and 2 in. (10 mm and 50 mm). Single layer thickness for spray application will depend on equipment and applicator skill, but may be up to 2 in. (50 mm) vertical and 1.5 in. (40 mm) overhead. Roughen or score the surface before applying successive layers and apply immediately following initial set.

**NOTE:** For any application greater than 2 in. (50 mm) contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex representative.

**5. CURING** Curing is essential for optimum quality and durability of the repair mortar. Cure Megamix II using either ASTM C 309 compliant curing compounds or by moist curing methods. For moist curing, apply continuous source of moisture by spray, or wet burlap and polyethylene sheet or other suitable



means for a minimum of 3 days. Containment structures (i.e. reservoirs, tanks, etc.) can be filled with water following 3 days moist curing of the Megamix II coating.

**NOTE:**

- i. In hot, dry, windy weather, special curing procedures may be required prior to final set. This may involve use of fog spray, or suitable curing compounds following finishing.
- ii. Megamix II should not be mixed and placed at temperatures below 38°F (3°C) or above 86°F (30°C). Protect from rapid evaporation (hot and/or cold and windy conditions).

of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for the particular purpose and the warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.

**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 Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

**Warranty**

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement



**Concrete Restoration**

**03900**

**Patching & Resurfacing**

**Description**

XYPEX RESTORA-TOP 50 is one of three Xypex products specifically formulated for the repair and rehabilitation of horizontal concrete surfaces. Xypex Restora-Top 50 is used for the patching or resurfacing of deteriorated concrete up to 1/2 in. (12 mm) thick. It is used on surfaces where light traffic conditions exist. Xypex Restora-Top 50 consists of specially modified Portland cement, aggregates, admixtures and bonding agents combined in controlled proportions to provide excellent adhesion properties as well as reduced shrinkage.

**Recommended for:**

- Concrete Floors
- Driveways
- Decks
- Patios
- Steps
- Walkways
- Curbs
- Rain Damaged Slabs
- Levelling Course for Thin Set Mortars

**Advantages**

- Excellent adhesion to existing concrete surfaces
- Easy to use – just add water and mix
- Approximately 30 minutes working time
- Contains an integral bonding agent
- Moist curing is not normally required
- Ready for foot traffic in about 2.5 hours
- Suitable for indoor and outdoor use
- VOC compliant

**Limitations**

Restora-Top 50 should not be mixed and placed at temperatures below 50°F (10°C) or above 80°F (27°C). Protection from direct sunlight is desirable

under hot or windy conditions. Restora-Top 50 contains a polymer additive to enhance bond. To achieve maximum bond strength, the polymer must be allowed to dry out after the initial setting and curing period. Avoid immersion prior to full curing of Restora-Top 50.

**Packaging**

Xypex Restora-Top 50 is available in 55 lb. (25 kg) bags.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C).

**Coverage**

At 1/4 in. (6.4 mm) thickness, each 55 lb. (25 kg) bag of Restora-Top 50 will cover 24.8 sq. ft. (2.4 m<sup>2</sup>). For brush or broom applications, the yield will vary with the thickness and texture required. Each 55 lb. (25 kg) bag will cover an area of approximately 105 - 115 sq. ft. (10 - 11 m<sup>2</sup>) for a brush or broom application.

**Physical Properties**

Water Requirement		
0.936 U.S. gallons (3.6 litres) per 55 lb. (25 kg) bag		
Flow, ASTM C 230		
115% - 125%		
Working Time at 68°F (20°C)		
30 - 40 minutes		
Compressive Strength, CAN3 - A23.2 - 1B		
@ 1 day	2460 psi	17 MPa
@ 7 days	4930 psi	34 MPa
@ 28 days	5510 psi	38 MPa
Tensile Bond Strength to Concrete		
@ 7 days	116 psi	0.8 MPa
@ 28 days	200 psi	1.4 MPa

**NOTE:** Bond strength was determined by direct tensile loading of Restora-Top 50 which had been applied by trowel to a fully cured concrete slab at an average thickness of 1/2 in. (12 mm).

### Application Procedures

1. Remove all laitance, dirt, films, paint, coatings and other foreign matter.
2. Saturate concrete with clean water. Remove any excess surface water and allow surface to partially dry.
3. Place dry powder in a clean mixing container and add water to reach the desired consistency. For trowel application, add 0.936 U.S. gallons (3.6 litres) of water per each 55 lb. (25 kg) bag of powder. For brush or broom applications add extra water (approximately 1.5 pints/700 ml) per 55 lb. (25 kg) bag of powder. Do not mix more Restora-Top 50 than can be applied in 30 minutes.
4. When trowel applying (max. 1/2 in./12 mm thick), work a thin layer into the surface as a primer coat, then build up to the desired thickness and trowel to the desired finish. Avoid over-trowelling. If the thickness is greater than 1/2 in. (12 mm), apply in 1/2 in. (12 mm) layers allowing each layer to cure overnight.
5. When broom applying, first work Restora-Top 50 into the surface with a stiff bristle broom before lightly brooming to obtain an even surface texture.

### Curing

Because of the bonding and water retaining agents included in the mix, Restora-Top 50 does not normally require moist curing or protection. However, when applied in hot or windy conditions, Restora-Top 50 may require protection from rapid moisture loss by lightly spraying with water as necessary or by covering with a sheet of plastic.

### 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 Services Department of Xypex Chemical Corporation or your local Xypex representative.

### Safe Handling Information

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### Warranty

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**XYPEX RESTORA-TOP 100**

DAT-RES100 • REV-07-04



**Concrete Restoration**

**03900**

**Patching & Resurfacing**

**Description**

XYPEX RESTORA-TOP 100 is one of three Xypex products specifically formulated for the repair and rehabilitation of horizontal concrete surfaces. Xypex Restora-Top 100 is used for patches up to 1 in. (25 mm) thick where rapid setting and strength gain are required. Restora-Top 100 consists of specially modified Portland cement, aggregates, polypropylene fibers, and admixtures combined in controlled proportions. This compound provides excellent adhesion properties, rapid setting and strength gain as well as superior durability and reduced shrinkage.

**Recommended for:**

- Concrete Floors
- Parking Decks
- Walkways
- Warehouse Floors
- Bridge Decks
- Roads

**Advantages**

- Excellent adhesion to existing concrete surfaces
- Traffic-ready in two to four hours
- Easy to use – just add water and mix
- Rapid set and strength gain
- Suitable for indoor and outdoor use
- VOC compliant

**Limitations**

Restora-Top 100 should not be mixed and placed at temperatures below 37°F (3°C) or above 86°F (30°C). Protection from direct sunlight is desirable under hot or windy conditions. Use only as a patching or filling material.

**Packaging**

Xypex Restora-Top 100 is available in 55 lb. (25 kg) bags.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C).

**Coverage**

At 1 in. (25 mm) thickness, each 55 lb. (25 kg) bag of Restora-Top 100 will cover approximately 5.7 sq. ft. (0.52 m<sup>2</sup>).

**Physical Properties**

Setting Time, ASTM C 403		
Initial, at 68°F (20°C)	25 minutes	
Final, at 68°F (20°C)	45 minutes	
Working Time at 68°F (20°C)		
	20 minutes	
Air Content (% of Volume)		
	5%	
Compressive Strength		
@ 1 hr. after initial set	2150 psi	14.8 MPa
@ 3 hrs. after mixing	3000 psi	20.7 MPa
@ 6 hrs.	3450 psi	23.8 MPa
@ 24 hrs.	5000 psi	34.5 MPa
@ 28 days	7500 psi	51.7 MPa
Scaling Resistance in Presence of De-Icing Salt, ASTM C672 after 50 Cycles of Freezing and Thawing		
No Scaling (Rating O)		

**NOTE:** Compressive strength determined on 2 in. (50 mm) cube specimens, moist cured at 73° ± 3°F (23° ± 2°C) after 24 hours.

**Application Procedures**

1. Remove loose or unsound concrete by chipping, saw cutting, or other mechanical means. It is preferable to have a minimum repair thickness of 1/2 in. (12 mm) with square cut edges. Feather edging is not recommended.
2. Remove dust and foreign material from the repair area.
3. Saturate the repair area with water. Just as the concrete surface becomes dry, place the Restora-Top 100 material.

4. Add approximately 3/4 of the required water to the mixing container (0.39 U.S. gallons/1.5 litres of water is usually sufficient at this stage for each 55 lb./25 kg bag of product). While mixing, gradually add the Restora-Top 100 powder to the water. Add more water as required to obtain the desired consistency. Do not exceed 0.86 U.S. gallons (3.3 litres) of water per 55 lb. (25 kg) bag of Restora-Top 100.

5. Mix until thoroughly blended and until required consistency has been obtained. Normally a 2 minute mixing time is adequate. If the Restora-Top begins to harden or set, discard the mix. Do not add more water to the mixing container.

6. Place the mixed material as rapidly as possible and work the mix well into the prepared concrete surface to ensure freedom from voids and to obtain proper bonding.

7. Complete finishing operations as quickly as possible and be sure to clean the mixing container between batches. Partially set material in the mixer can accelerate the setting of subsequent batches.

**Curing**

1. After final set, moist curing of Restora-Top 100 for 24 hours is recommended.

2. In hot, dry or windy weather conditions, apply curing compound to the repaired area as soon as the Restora-Top material has set.

3. Protect from freezing for the first 24 hours, and protect from temperatures below 27°F (-3°C) for 72 hours.

**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 Services Department of Xypex Chemical Corporation or your local Xypex representative.

**Safe Handling Information**

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**Warranty**

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**Concrete Restoration**

**03900**

Patching & Resurfacing

**Description**

XYPEX RESTORA-TOP 200 is one of three Xypex products specifically formulated for the repair and rehabilitation of horizontal concrete surfaces. Xypex Restora-Top 200 is recommended for patching requirements that exceed 1 in. (25 mm) thickness and where high impact resistance is required. Restora-Top 200 consists of specially modified Portland cement, fine aggregate gradations, 1.2 in. (30 mm) long steel fibers, and admixtures combined in controlled proportions. This compound provides excellent adhesion properties, rapid setting and strength gain as well as superior durability and reduced shrinkage.

**Recommended for:**

- Concrete Floors
- Parking Decks
- Walkways
- Warehouse Floors
- Bridge Decks
- Roads

**Advantages**

- Excellent adhesion to existing concrete surfaces
- Traffic-ready in two to four hours
- Increased toughness and impact resistance
- Easy to use – just add water and mix
- Rapid set and strength gain
- Suitable for indoor and outdoor use
- VOC compliant

**Limitations**

Restora-Top 200 should not be mixed and placed at temperatures below 37°F (3°C) or above 86°F (30°C). Protection from direct sunlight is desirable under hot or windy conditions. Use only as a patching or filling material.

**Packaging**

Xypex Restora-Top 200 is available in 55 lb. (25 kg) bags.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C).

**Coverage**

At 1 in. (25 mm) thickness, each 55 lb. (25 kg) bag of Restora-Top 200 will cover approximately 5.7 sq. ft. (0.52 m<sup>2</sup>).

**Physical Properties**

Setting Time, ASTM C 403		
Initial, at 68°F (20°C)	25 minutes	
Final, at 68°F (20°C)	45 minutes	
Working Time at 68°F (20°C)		
	20 minutes	
Air Content (% of Volume)		
	5%	
Compressive Strength		
@ 1 hr. after initial set	2150 psi	14.8 MPa
@ 3 hrs. after mixing	3000 psi	20.7 MPa
@ 6 hrs.	3450 psi	23.8 MPa
@ 24 hrs.	5000 psi	34.5 MPa
@ 28 days	7500 psi	51.7 MPa
Scaling Resistance in Presence of De-Icing Salt, ASTM C672 after 50 Cycles of Freezing and Thawing		
No Scaling (Rating 0)		

**NOTE:** Compressive strength determined on 4 in. (100 mm) cube specimens, moist cured at 73° ± 3°F (23° ± 2°C) after 24 hours.

**Application Procedures**

1. Remove loose or unsound concrete by chipping, saw cutting, or other mechanical means. It is preferable to have a minimum repair thickness of 1/2 in. (12 mm) with square cut edges. Feather edging is not recommended.
2. Remove dust and foreign material from the repair area.

3. Saturate the repair area with water. Just as the concrete surface becomes dry, place the Restora-Top 200 material.

4. Add approximately 3/4 of the required water to the mixing container (0.39 U.S. gallons/1.5 litres of water is usually sufficient at this stage for each 55 lb./25 kg bag of product). While mixing, gradually add the Restora-Top 200 powder to the water. Add more water as required to obtain the desired consistency. Do not exceed 0.8 U.S. gallons (3 litres) of water per 55 lb. (25 kg) bag of Restora-Top 200.

5. Mix until thoroughly blended and until required consistency has been obtained. Normally a 2 minute mixing time is adequate. If the Restora-Top begins to harden or set, discard the mix. Do not add more water to the mixing container.

6. Place the mixed material as rapidly as possible and work the mix well into the prepared concrete surface to ensure freedom from voids and to obtain proper bonding.

7. Complete finishing operations as quickly as possible and be sure to clean the mixing container between batches. Partially set material in the mixer can accelerate the setting of subsequent batches.

### Curing

1. After final set, moist curing of Restora-Top 200 for 24 hours is recommended.

2. In hot, dry or windy weather conditions, apply curing compound to the repaired area as soon as the Restora-Top material has set.

3. Protect from freezing for the first 24 hours, and protect from temperatures below 27°F (-3°C) for 72 hours.

### 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 Services Department of Xypex Chemical Corporation 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 pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07100**

**Flexible  
Cementitious  
Membrane**

**Description**

Xypex FCM 80 is specifically designed for repairing cracks subject to movement, sealing construction joints, restoring deteriorated concrete, and waterproofing concrete structures. FCM 80 has exceptional adhesive and elongation characteristics and is often used in conjunction with the Xypex Crystalline Concrete Waterproofing and Protection System. FCM is a two component product consisting of specialized liquid polymer dispersion and a cementitious powder. These components are mixed just prior to application.

**Recommended for:**

- Moving Cracks
- Construction Joints
- Deteriorated Concrete Surfaces
- Concrete Block Walls
- Balconies, Terraces, and Planters
- Water-holding Structures
- Sewage and Water Treatment Tanks
- Marine Structures
- Thermal Contraction and Expansion

**Advantages**

- Flexible
- Superior elongation properties
- Excellent adhesive qualities
- Impermeable to water and chlorides
- Breathable, seamless
- Durable, retains properties in climatic extremes
- Non-toxic, solvent-free, odorless
- Effective when subjected to thermal contraction and expansion

**Packaging**

The Xypex FCM 80 is packaged in a carton as a unit (kit), which includes the liquid component (1.06

U.S. gallon/4 litre bottle) and the powder component (22 lb./10 kg pail). For larger projects, customized packaging is available; contact the manufacturer for details.

**Coverage**

When mixed, one unit will cover an estimated 28 sq. ft. (2.6 m<sup>2</sup>) at a two-coat application thickness of 1/8 in. (3 mm).

**Storage**

FCM materials must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is six months when stored under proper conditions.

**Properties**

<b>Solids Content (liquid component – EN ISO 3251)</b>	
Solids Content (%)	54
<b>Viscosity (liquid component – EN ISO 3219)</b>	
Dynamic Viscosity (MPa•s)	50 - 155
<b>Glass Transition Temperature (liquid component)</b>	
Tg	-49°C
<b>Liquid Water Permeability (EN 1062-1 Table 5)</b>	
Water Transmissibility	Class W <sub>3</sub> – Low ( <0.1 kg / (m <sup>2</sup> •hr <sup>0.5</sup> )
<b>Tensile Properties (ASTM D 412) – 28 day old; lab cured</b>	
Elongation @ break (%)	60 - 100%
Tensile Strength (MPa/psi)	1.0 / 145
<b>Bond Strength (EN 1542) – 28 day old; lab cured</b>	
Bond Strength (MPa/psi)	0.80 / 116
<b>Cold Bend Test (in house procedure)</b>	
Resistance to cracking (using 9.5 mm mandrel @ -16°C)	pass (no crack)

**Application Procedures**

**SURFACE PREPARATION**

Concrete surfaces must be free of all bond inhibiting materials such as loose concrete, dirt, dust, oil, grease, release agents, curing and cleaning compounds. Clean the surface thoroughly by sand-blasting, waterblasting or etching with muriatic (HCL)



acid. Prior to the FCM application, the preferred substrate moisture condition is dry, but may be “saturated surface dry”.

**MIXING**

Mix by weight: 1 part FCM 80 liquid with 2.5 parts FCM powder. Mix thoroughly for 3 - 4 minutes to obtain a homogeneous and lump-free compound. Do not mix more material than can be used in 30 minutes.

**REPAIR OF HAIRLINE CRACKS AND FAULTY CONSTRUCTION JOINTS – NEGATIVE SIDE APPLICATION**

**No Water Flow**

1. Clean and prepare the concrete surface as specified above.
2. Sawcut a 1 in. (25 mm) groove along crack length to a depth of approximately 1.5 in. (40 mm). Avoid contact with reinforcing steel.
3. Pressure wash cracks to remove loose material.
4. Mix 3 parts Xypex Concentrate and 1 part Patch'n Plug with 1 part water by volume to a stiff mortar consistency and pack tightly into groove. Air cure minimum of 40 minutes.
5. Trowel-apply first coat of FCM 80 to a width of 4 - 6 in. (10 - 15 cm) and a thickness of 1/16 in. (1.5 mm). Allow first coat to dry for six hours, then apply second coat of FCM 80 at the same rate to a total membrane thickness of 1/8 in. (3 mm). The second coat should be applied at right angles to the first coat.

**Against a Flow of Water**

1. Follow the same preparation procedures as above (i.e. cleaning, saw cutting, power washing).
2. Mix 3 parts Xypex Patch'n Plug and 1 part Concentrate with 1 part water by volume (note: this is the reverse of the ratio above) to a stiff mortar consistency and pack tightly into groove. Air cure minimum 40 minutes.
2. Trowel-apply first coat of FCM 80 to a width of 4 - 6 in. (10 - 15 cm) and a thickness of 1/16 in. (1.5 mm). Allow first coat to dry for six hours, then apply second coat of FCM 80 at the same rate to a total mem-

brane thickness of 1/8 in. (3 mm). The second coat should be applied at right angles to the first coat.

**COATING APPLICATION – POSITIVE SIDE**

1. Clean and prepare the concrete substrate as specified above.
2. Apply an initial coat of the FCM 80 mixture by trowel or spray to a thickness of approximately 1/16 in. (1.5 mm). Allow coating to dry for minimum of six hours and maximum of 24 hours.
3. Apply second coat at right angles to first coat to ensure even coverage. Second coat should bring total membrane thickness to 1/8 in. (3 mm).

**NOTE:**

- i. For optimum performance, the FCM coating should be applied to the positive side of a concrete surface subjected to hydrostatic pressure.
- ii. The ambient temperature for applying FCM should be between 50°F (10°C) and 86°F (30°C).
- iii. FCM can be applied directly over cracks up to 1/16 in. (1.5 mm) width and the FCM will withstand crack movement up to 1/16 in. (1.5 mm).
- iv. If significant crack movement is anticipated, a “bond-breaker” is recommended. Simply place 3/4 in. (19.1 mm) wide Scotch Linerless Rubber Splicing Tape 130C over the top of the crack or joint prior to applying the FCM membrane. This will allow for further elongation of the FCM material.

v. Overall waterproofing system details such as penetrations, perimeters, upturns, drainage, protection systems, etc. are the responsibility of the designer and / or users.

**Curing**

Xypex FCM 80 does not require any special curing procedures other than maintaining coating above 50°F (10°C) for a period of 24 hours after application. The FCM dries within 5 to 6 hours of application at 68°F (20°C). Protect the membrane surface from rain or water until dry. Air cure minimum 14 days prior to immersing the membrane in water.

### Technical Services

For more instructions, alternative application methods, or information concerning the compatibility of FCM 80 with other products or technologies, contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex representative. In view of the many factors that may affect the application of FCM 80, the information contained in this data sheet does not relieve the applicator or user from carrying out their own investigations or tests.

### Safe Handling Information

In liquid, powder or mixed form, FCM 80 may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex pails 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 workers and customers. Contact the Manufacturer or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**  
**07160**  
**Cementitious**  
**Crystalline – Curing**

**Description**

XYPEX GAMMA CURE is a curing agent designed specifically for Xypex crystalline waterproofing products. Gamma Cure may be used as an alternative to water curing for certain Xypex applications. It is also used to accelerate the Xypex crystallization process. Xypex Gamma Cure acts as an evaporation retardant by retaining the maximum amount of moisture in the Xypex coating. It also provides a catalyst for the reaction with the Xypex crystalline waterproofing treatment. It is a self-dissipating (2 - 3 days) non-film forming product.

**Recommended for:**

- Applications where water-curing is not possible
- Hot, dry, windy conditions
- Vertical surfaces

**Packaging**

Xypex Gamma Cure is available in 1 U.S. gallon (3.79 litre) bottles and 5 U.S. gallon (18.95 litre) pails.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Coverage**

One U.S. gallon (3.79 litres) of Gamma Cure when diluted with water will cover approximately 800 sq. ft. (75 m<sup>2</sup>).

**Application Procedures**

**1. CURING OF XYPEX COATING** Dilute one part Gamma Cure with 3 parts clean water. Apply by spraying onto the crystalline waterproofing coating after the coating has reached an initial set, but before it dries (approx. 1 - 2 hours).

**2. PREPARATION OF CONCRETE SUBSTRATE IN HOT, DRY OR WINDY CONDITIONS** Dilute one part Gamma Cure with 3 parts clean water and apply to concrete surface before application of the Xypex crystalline coating. Gamma Cure should be applied while the concrete is still damp from pre-watering.

**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 Services Department of Xypex Chemical Corporation or your local Xypex representative.

**Safe Handling Information**

Gamma Cure is an acidic solution. This product may be a mild to moderate skin and eye irritant. In addition, many of the components of the cementitious products that are used in conjunction with the Gamma Cure may also possess significant skin and eye irritation potential. Directions for treating these problems are clearly detailed on all Xypex pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

**Warranty**

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**Concrete Restoration**

**03900**

**Patching & Resurfacing**

**Description**

XYCRYLIC ADMIX is a water-based, high solids, polymer dispersion specifically designed for fortifying Portland cement compositions. This liquid is milky-white in color and improves curing qualities, enhances bond, imparts excellent water and weather resistance, and reduces shrinkage cracking. Xycrylic Admix is also used to fortify Xypex Patch'n Plug.

**Recommended for:**

- Patching and Concrete Repairs
- Resurfacing Floor Underlayments
- Terrazzo Flooring
- Spray and Fill Coats
- Highway and Bridge Deck Repair

**Advantages**

- Hardens and toughens cement mortars for improved durability
- Enhances adhesion capabilities to a wide variety of surfaces
- Increases resistance to many industrial chemicals
- Eliminates water curing

**Durability and Strength**

Cement mortars modified with Xycrylic Admix are hard, tough and durable. Compared with unmodified mortars, Xycrylic modified mortars have far superior flexural, adhesive and impact strengths as well as excellent abrasion resistance. They are especially useful where thin sections are desirable and where excessive vibration and heavy traffic is encountered.

**Adhesion**

Xycrylic Admix modified mortars have excellent adhesion to a variety of surfaces such as concrete, masonry, brick, wood, metals and others.

**Resistance Properties**

Cement mortars modified with Xycrylic Admix are resistant to many industrial chemicals as well as ultraviolet light and heat. Mortars containing Xycrylic Admix dry to a uniform color.

**Packaging**

Xycrylic Admix is available in 1 U.S. gallon (3.79 litre) bottles and 5 U.S. gallon (18.95 litre) pails.

**Storage**

Keep Xycrylic Admix from freezing.

**Mixing**

Xycrylic Admix may be used full strength or diluted with clean water depending on application requirements.

**Test Data**

Physical Strength of Cement Mortars					
ASTM Standard Test Method	Mixing Liquid				
	Full Strength	1:1 Water	1:2 Water	No Xycrylic	
C-190-85 Tensile Strength	610 4.2	440 3.0	375 2.6	235 1.6	psi MPa
C-109-88 Compressive Strength	5700 39.3	4530 31.2	3830 26.4	2390 16.5	psi MPa
C-348-86 Flexural Strength	1570 10.8	1130 7.8	960 6.6	610 4.2	psi MPa
Shear Bond Adhesion	640 4.4	360 2.5	260 1.8	45 0.31	psi MPa

**NOTE 1:** Strength properties are based on cement mortar prepared as 3 parts sand to 1 part cement by volume.

**NOTE 2:** Strengths are based on a 28 day air-cure. Wet cure strengths may be less.

**Application Procedures**

Xycrylic Admix may be used full strength or diluted with clean water depending on application requirements.

**For Use With Cement Mortar**

1. Thoroughly premix sand and cement (1 part cement to 2 parts sand).

2. Blend Xycrylic Admix with water according to strength, bonding and resistance requirements.
3. Add the Xycrylic mixing liquid (whether full strength or diluted with water) to the sand and cement.
4. Mix thoroughly until desired workable consistency is reached. Always withhold some Xycrylic mixing liquid so that the mortar will not be too fluid and so that mixing liquid can be carefully gauged near end of mixing cycle (2 - 4 minutes).

#### For Use With Patch'n Plug

1. Blend Xycrylic Admix with clean water (1 part Xycrylic to 1 part water by volume).
2. Add Xycrylic mixing liquid to the Patch'n Plug powder at a rate of 1 part liquid to 3.5 parts Patch'n Plug.
3. Mix to a stiff putty consistency. Do not mix more than can be used in three minutes.

### Curing

For optimum physical properties, cement mortars modified with Xycrylic Admix should be air-cured at ambient temperature and relative humidity.

### 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 Services Department of Xypex Chemical Corporation or your local Xypex representative.

### Safe Handling Information

Xycrylic Admix is alkaline and has a slight ammoniacal odor. This product may be a mild to moderate skin and eye irritant. In addition, many of the components of the cementitious products that are used in conjunction with the Xycrylic Admix may also possess significant skin and eye irritation potential. Directions for treating these problems are clearly detailed on all Xypex pails 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 workers and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

### Warranty

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



**Concrete Waterproofing**

**03010**

**Surface Hardener,  
Sealer & Dustproof**

**Description**

Xypex Quickset is a water-soluble liquid blend of silicates, neutralizers and penetrating agents specially compounded to harden, dustproof and seal the surfaces of fresh or newly cured concrete floors. Applied to the concrete surface, Xypex Quickset penetrates into the capillaries of the concrete substrate and chemically reacts with the free lime and calcium carbonate to form a hard, insoluble gel within the pores, thus closing off the small voids. Quickset provides superior hardening and a dustproof finish.

**Recommended for:**

- Concrete slabs where a hard, abrasion resistant (light to moderate traffic load), dustproof surface is required.
- Enhancing the abrasion resistance of a concrete surface where Concentrate DS-1 or DS-2 has been applied.

**Packaging**

Xypex Quickset is available in 1 U.S. gallon (3.79 litre) bottles and 5 U.S. gallon (18.95 litre) pails.

**Storage**

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

**Coverage**

Coverage rates will vary depending on surface conditions of the concrete, porosity, and project requirements. The following rates are approximate, assuming average concrete, finish, temperature and other factors:

**Rough or Broom Finish**      100 - 120 ft.<sup>2</sup>/U.S. gallon  
(2.5 - 3.0 m<sup>2</sup>/litre)

**Moderately Trowelled Floor**      120 - 150 ft.<sup>2</sup>/U.S. gallon  
(3.0 - 3.8 m<sup>2</sup>/litre)

**Heavily Trowelled Floor**      150 - 200 ft.<sup>2</sup>/U.S. gallon  
(3.8 - 5.0 m<sup>2</sup>/litre)

For the best results, increase coverage rate for each succeeding coat.

**Application**

1. Surface to be treated should be clean and free of all loose dirt, oil, curing compounds, efflorescence, free standing water and other foreign material. New concrete should have cured at least one month before treatment.

2. Dilute Quickset at a rate of one part liquid Quickset solution to one part clean water by volume. Mix thoroughly.

3. Apply Xypex Quickset by brush, soft-bristle broom, squeegee or spray. When applying by squeegee, the Quickset should be spread evenly over the surface to eliminate all puddles, or excess liquid. Brush out or mop up any puddles immediately.

4. If Xypex Quickset is to be spray applied, a garden-type sprayer can be used and the liquid should be applied in an even and uniform manner so that there are no puddles. It is recommended that the application be done in two even coats and each coat must be allowed to dry thoroughly before proceeding with next coat. Any surplus Quickset liquid should be immediately mopped up or brushed out.

**NOTE:**

1. Xypex Quickset should not be applied in temperatures less than 45°F (7°C) and must be kept from freezing before use.

2. Protect glass, stainless steel, aluminum, painted and ceramic surfaces from Xypex Quickset. If this should occur immediately wipe off with cloth soaked in water and wipe dry.

**Drying Time**

Xypex Quickset dries in approximately one-half to one hour per coat depending on temperature, humidity,

project conditions, etc. Each coat should be allowed to dry thoroughly before applying additional coats. Xypex Quickset should be completely dry before any traffic is permitted. It is recommended that 24 hours elapse before permitting any traffic on the treated area.

### 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 Services Department of Xypex Chemical Corporation or your local Xypex representative.

### Safe Handling Information

Xypex Quickset is a highly alkaline solution. This product may be a mild to moderate skin and eye irritant. In addition, many of the components of the cementitious products that are used in conjunction with the Xypex Quickset may also possess significant skin and eye irritation potential. Directions for treating these problems are clearly detailed on all Xypex pails and packaging. The Manufacturer 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 workers and customers. The Manufacturer recommends that you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

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### What makes Xypex unique?

Xypex becomes an integral part of the concrete mass itself. Traditional barrier products, on the other hand, rely solely on their performance at the surface of the concrete and are therefore subject to deterioration caused by exposure to the environment, hydrostatic pressure, puncturing, delamination, chemical erosion, and damage during backfilling. Xypex was developed to eliminate these very issues. The Xypex formula is based on the natural characteristics of concrete – the fact that concrete is both porous and chemical in nature. With moisture as the catalyst, Xypex's proprietary chemicals react with the products of cement hydration to form a non-soluble complex within the pores, voids and capillary tracts of the concrete mass. From this inside position, Xypex renders the concrete impenetrable by water and other liquids from any direction, eliminates the problems normally associated with traditional barriers and, in the process, enhances the quality and durability of the concrete structure.

### How long does Xypex last?

The Xypex treatment, unlike most other systems, becomes a permanent part of the concrete matrix. Its unique dendritic crystalline growth will not deteriorate under normal conditions, and the crystalline process will reactivate whenever water is present.

### What are some typical Xypex applications?

Typical Xypex applications include reservoirs, sewage and water treatment tanks, secondary containment structures, tunnels, underground vaults, manholes, concrete pipe, foundations, pools, parking structures and below grade construction.

### Can Xypex be used against extreme hydrostatic pressure?

Yes. Because Xypex is not dependent upon adhesion to the concrete surface and, instead, becomes an integral part of the concrete mass, it is capable of resisting extreme hydrostatic pressure from either side (positive or negative) of the concrete. Independent laboratory testing in accordance with U.S. Army Corps of Engineers CRD C-48-73 "Permeability of Concrete" showed that Xypex-treated concrete withstood up to 405 feet (123.4 m) of head pressure (175 psi/1.2 MPa), the limit of the testing apparatus.

### Does Xypex protect reinforcing steel?

Yes. By preventing the intrusion of water, salt water, sewage, and most chemicals, Xypex helps protect reinforcing steel against oxidation and deterioration.

### Does Xypex protect concrete against freeze/thaw damage?

Yes. By blocking the intrusion of water into concrete, Xypex helps protect the concrete from the damaging effect of repeated freeze/thaw cycles.

### Does Xypex have any adverse effect on concrete?

No. The Xypex crystalline formation becomes a part of the concrete matrix itself and has no deleterious effect on the concrete. In fact, independent laboratory testing has shown that under most conditions Xypex enhances the strength and durability of the concrete structure.

### Is Xypex toxic?

No. Xypex contains no volatile organic carriers (VOC) and can be applied safely in enclosed surroundings. Xypex is approved by numerous health and water authorities around the world for use on structures that contain potable water or foodstuffs. A few of these agencies are:

- NSF International
- Swiss Federal Department of Health
- Japan Food Research Laboratories
- United Kingdom (DWI) Drinking Water Inspectorate
- Australian Water Quality Centre
- Singapore Institute of Standards and Industrial Research
- France Research Centre for the Control of Water
- Czech Republic Health Institute & Centre for Drinking Water

### In what forms is the Xypex Crystalline Technology available?

The Xypex Crystalline Technology is available in three forms:

- As a Coating System (Xypex Concentrate & Modified) for new or existing structures
- As a Concrete Additive (Xypex Admix C-Series) to be added at time of concrete batching
- As a Dry Shake Material (Xypex Concentrate DS-1 & DS-2) for fresh horizontal surfaces

These three options will prove an asset to the value-engineering process and to the flexibility of the construction schedule.

### How is Xypex different from other products?

The Xypex crystalline system for concrete waterproofing and protection is substantially different from traditional barrier products (membranes, cementitious coatings, etc):

1. Xypex creates a crystalline structure deep within the pores and capillary tracts of the concrete mass to prevent the penetration of water and aggressive chemicals. In contrast, barrier type products function only at the surface of concrete.
2. Because Xypex is not dependent on surface adhesion to achieve its waterproofing effect, it is resistant to extreme hydrostatic pressure.
3. Xypex will seal hairline cracks up to 0.4 mm (1/64").
4. Xypex is not subject to the deterioration problems encountered by membranes.
5. Xypex is designed to be permanent and reactivates whenever water is present.

### Is Xypex used to waterproof cracks, faulty joints and other defects in concrete?

Yes. Xypex has a specific repair system that utilizes its unique crystalline waterproofing technology to stop water flow through cracks, faulty construction joints and other defects. In the case of expansion joints or chronic moving cracks, a flexible sealant is recommended.

### ***When Applied as a Coating:***

#### **Can the Xypex coating be applied to the negative side of a structure?**

Yes. Although applied as a coating, Xypex is not relying on its surface bonding capability to achieve its waterproofing effect. By means of diffusion, the reactive chemicals in the Xypex coating migrate through the capillary tracts within the concrete to become an integral part of the concrete mass. Therefore, the Xypex coating can be applied to either the positive (water side) or negative side even against strong hydrostatic pressure.

#### **Is there a preference when choosing between the positive or negative side?**

Generally, it is recommended that the Xypex coating be applied to the positive side (water side), if accessible, so as to ensure maximum benefit. Therefore, new construction specifications almost always call for the use of the Xypex coating on the positive side (water side). If, however, the positive side is not accessible e.g. tunneling projects or rehabilitation of existing structures, the Xypex coating will be specified for use on the negative side against the hydrostatic pressure.

#### **Can the Xypex coating be applied while the concrete is wet?**

Yes. In fact, the concrete must be wet or moist before applying the Xypex slurry coat. Xypex requires moisture to generate the crystalline growth in concrete. The presence of moisture is also necessary to ensure proper bonding of the slurry coat to the concrete substrate.

#### **Is the Xypex coating suitable for use on surfaces other than concrete?**

Xypex is totally compatible with the chemistry of concrete, whether poured-in-place, precast or shotcrete. It is not suitable for application to cut-limestone, clay brick, wood, metals, asphalt or other non-concrete building materials.

#### **How deep does the Xypex crystalline formation penetrate the concrete?**

The Xypex chemical reactions that initially take place at the concrete surface will continue deep into the concrete structure. Various factors affect the rate and depth of crystallization within the concrete. Some of these factors are: number of Xypex coats, mix design of the concrete, density, porosity, cement content, exposure to moisture and temperature. Independent testing measured the depth of Xypex crystalline penetration into a cast-in-place concrete block at 30 cm (approximately 12 inches). The test concrete sample was coated on the top surface with Xypex Concentrate and left outside the research laboratory in ambient temperatures for 12 months.

#### **How resistant is the Xypex coating to aggressive chemicals?**

Based on independent testing according to ASTM C 267-77 "Chemical Resistance of Mortars", the Xypex coating is not affected by a wide range of aggressive chemicals including mild acids, solvents, chlorides and caustic materials. Because Xypex is pH specific (not chemical specific) it will protect concrete from any chemical whose pH range is 3.0 to 11.0 constant contact, or 2.0 to 12.0 periodic contact.

### Is the Xypex coating affected by temperature, humidity, ultraviolet and oxygen levels?

When applied according to specifications, Xypex performs at 100% efficiency within -25°F to +265°F (-32°C to +130°C) constant temperatures or within -301°F to +2786°F (-185°C to +1530°C) periodic temperatures. Humidity, ultraviolet and the oxygen level (oxidation) have no effect on a Xypex coating.

### What is the appearance of a Xypex coating?

A Xypex coating normally produces a grey-colored, cementitious surface. However, Xypex “White” is also available.

### Can paint and other finishing materials be applied over a Xypex coating?

Yes. In most circumstances paint, epoxy coatings, cement parge coats, plaster and stucco can be applied over a Xypex coating. For further information concerning the interface of the Xypex coating with paint and other finishing materials, refer to pages 2.5-5 and 3.1-10 of this binder, and consult with a Xypex technical representative.

### How is the Xypex coating system different from other cementitious coatings?

Most cementitious coatings are simply surface treatments and are totally dependent on maintaining a proper bond to the concrete surface. Such coatings usually incorporate a latex modifier which makes the coating less permeable and acts as a bonding agent for better adhesion to the surface. They are surface treatments only, and have the added disadvantage of limiting breathability of the concrete. They do not form crystals within the concrete substrate (contrary to what is sometimes represented) and are not effective when applied against hydrostatic pressure.

### What are the installation advantages to using a Xypex coating system instead of membranes?

The crystalline nature of the Xypex waterproofing system provides many installation advantages over traditional barrier products:

1. Xypex does not require a dry surface; in fact, a wet surface is necessary.
2. Xypex does not require dry weather to be applied.
3. Xypex does not require costly surface priming or leveling prior to application.
4. Xypex cannot puncture, tear or come apart at the seams.
5. Xypex does not require protection during backfilling or during placement of steel, wire mesh or other materials.
6. Xypex can be applied on either side of a concrete surface – the negative or the positive side.
7. Xypex does not require sealing, lapping and finishing of seams at corners, edges or between membranes.
8. Xypex is less costly to apply than most other methods.

### ***When Applied as a Concrete Additive:***

#### **What is the difference between the various additives in Xypex's Admix C-Series?**

The Admix C-Series has been specially formulated to meet varying project and temperature conditions. Xypex Admix C-500 is specifically formulated to meet modern concrete practices that incorporate additives such as fly ash and slag. For most concrete mix designs adding the Admix C-500 will have minimal or no effect on setting time. Xypex Admix C-1000 is designed for typical Portland cement-rich concrete, where normal to a mildly extended set time is desired. Xypex Admix C-2000 is designed for projects where extended set time is required due to high ambient temperatures or long ready-mix delivery times.

#### **When is Xypex Admix introduced into the concrete mix?**

Xypex Admix is added to the concrete mix at time of batching. The sequence of procedures for addition of the Admix powder will vary depending on the type of batch plant operation and equipment e.g. ready-mix plant (dry batch operation), ready-mix plant (central mix operation), or precast batch plant.

#### **What is the recommended dosage rate for Xypex Admix?**

Xypex Admix is added to the concrete mix at a dosage rate within the range of 2 - 3% by weight of the Portland cement content. Where the "No Fines" (NF) grade is utilized, the equivalent dosage rate is 1 - 1.5%. For assistance in determining the appropriate dosage rate for a particular project, consult Xypex technical literature or contact a Xypex technical representative.

#### **Is Xypex Admix available in soluble bags?**

Yes. In North America, Australia, S.E. Asia, Europe, the Middle East and Africa, Xypex Admix is now available in soluble bags. The soluble bags provide a convenient, easy, dust-free method of installing the Admix to concrete mixes, and they are available in several sizes so as to accommodate the various dosage rates and mix design requirements.

#### **Can Xypex Admix be used in concrete containing other additives such as a water-reducer, plasticizer or air-entrainment agent?**

Yes. Xypex Admix has been used successfully in concrete mix designs containing a variety of other admixtures. However, it should be noted that the use of retarding admixtures at recommended dosage rates may cause further extension of set time when used with Xypex Admix. Consult with a Xypex technical representative for assistance in determining which version of Xypex Admix to use and the appropriate dosage rate.

#### **Can Xypex Admix be used in concrete containing fly ash, micro-silica or slag cement?**

Yes. Xypex Admix is very effective when used in modern mix designs that incorporate cementitious replacement materials i.e. fly ash, silica fume and blast furnace slag. The reactions that take place to form the crystalline structure are very complex. During the cement hydration process, Xypex's active chemicals not only react with calcium hydroxide and unhydrated cement particles but also with various metal oxides and mineral salts, regardless of the cement type used. Consult with a Xypex representative to determine dosage rates for such blended cement mix designs.



### **How are the setting time and compressive strength of concrete affected by the addition of Xypex Admix?**

The setting time of concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Extension of set time may occur when using Xypex Admix. The amount of extended set will depend upon the concrete mix design and the dosage rate of the Admix. Concrete containing Xypex Admix may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine setting time and strength of the concrete.

### **Are there any limitations that affect the performance of Xypex Admix?**

Use of Xypex Admix requires a minimum of 10% Portland cement content. Of course, optimum effectiveness will be dependent on a number of factors such as thickness of the concrete, Portland cement content, whether there is sufficient reinforcing steel for strength and crack control, quality of placing and finishing practices, sealing of construction joints etc. Typically, Xypex requires a minimum concrete thickness of 5 cm (2") and a minimum design strength of 20 MPa (3000 psi).

### ***When Applied as a Dry Shake:***

#### **When are Xypex dry shake products (Xypex Concentrate DS-1 or DS-2) normally used?**

The Xypex “dry shake” products are designed specifically for use on horizontal concrete slabs during the new construction phase. By incorporating the dry Xypex powder into the top surface of freshly poured concrete, the active chemicals in Xypex use the bleed water and moisture in the concrete as a migrating medium to generate the crystalline formation throughout the concrete substrate.

#### **What is the advantage of using the dry shake method?**

Because Xypex “dry shake” products become an integral part of the concrete surface, problems often associated with coatings (e.g. scaling, dusting, flaking, delamination) are eliminated. This can be very beneficial for slabs that require a hard surface due to traffic and abrasion. The dry shake method may also provide cost savings, especially on large projects, by reducing material and labor costs and by helping to speed up the construction schedule.

#### **How is Xypex DS-2 different from Xypex Concentrate DS-1?**

Xypex DS-2 has been specially designed for dry shake applications on horizontal concrete slabs where greater resistance to abrasion is required. Xypex DS-2 contains the same crystalline waterproofing properties as DS-1, however it also includes a synthetic aggregate hardener which has been crushed and graded to particle sizes suitable for concrete floors.



**Cracks & Faulty Construction Joints**

No Water Flow ..... 101  
 Against a Flow of Water ..... 102  
 Against High Pressure Water Flow..... 103

**Slab Interface Joints**

No Water Flow ..... 104  
 Against a Flow of Water ..... 105  
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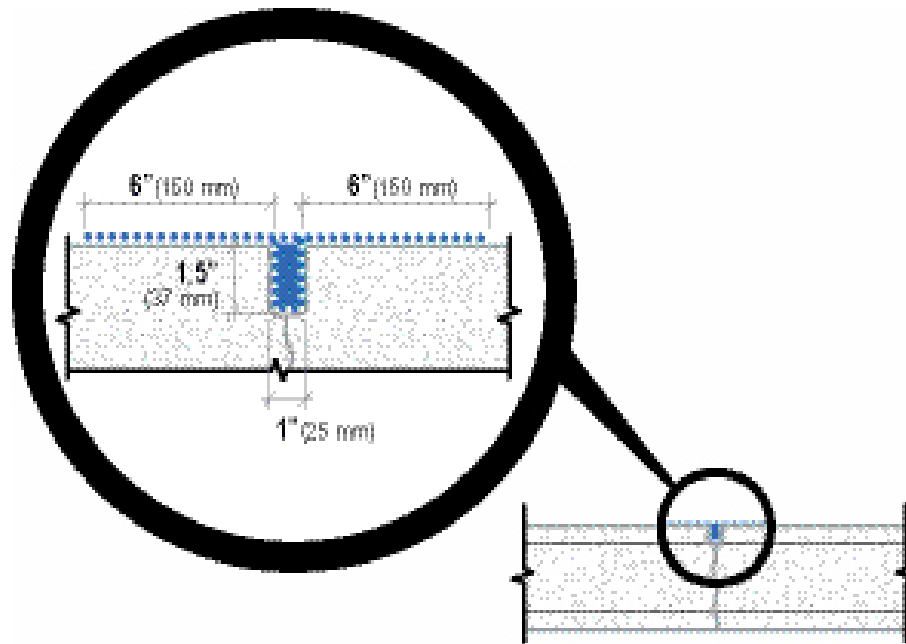
**Defective Concrete & Honeycomb**

No Water Flow ..... 108  
 Against a Flow of Water ..... 109



**REPAIR OF CRACKS & FAULTY CONSTRUCTION JOINTS**

**No Water Flow**



- CONCENTRATE SLURRY COAT
- CONCENTRATE DRY-PAC

**HYDROSTATIC PRESSURE - NO ACTIVE LEAKING WATER**

**Step 1**

Rout out crack/joint in a “U” shaped slot 1” (25 mm) wide and at least 1.5” (37 mm) deep. A “V” shaped slot is not acceptable.

**Step 2**

Remove all loose material and saturate with water. Allow water to soak into concrete and then remove all surface water.

**Step 3**

Apply one slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) to slot and to 6” (150 mm) strip on either side of slot. Application may be performed by brush or gloved hand.

**Step 4**

While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel

for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, then compress it tightly using a pneumatic packing device or a hammer and block.

**Step 5**

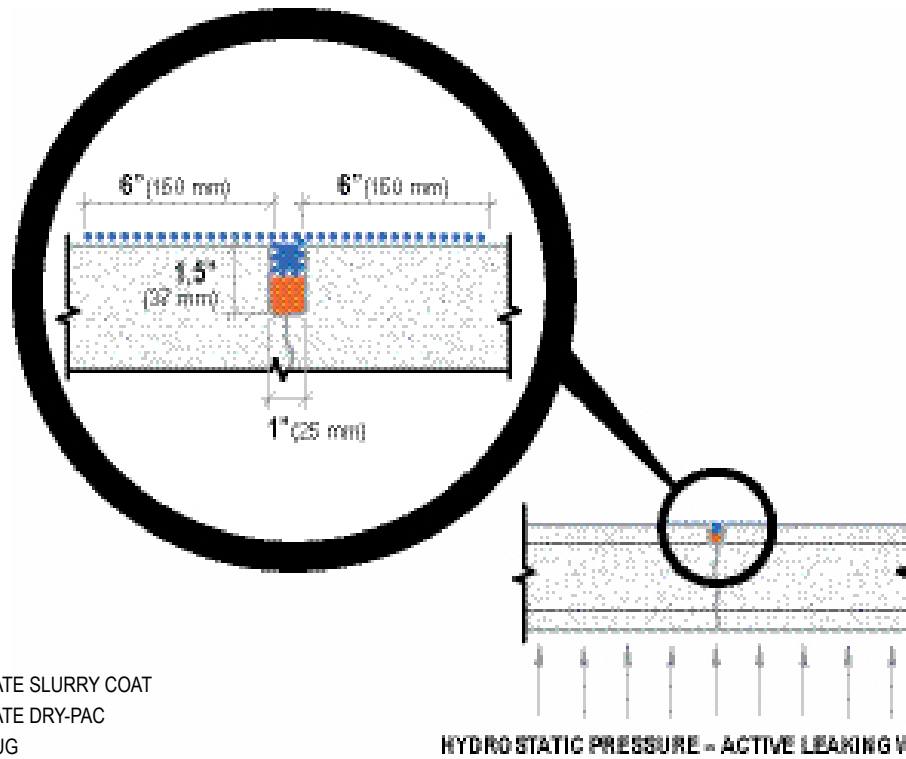
Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) over the repaired area and to 6” (150 mm) strip on either side of slot.

**Step 6**

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

**REPAIR OF CRACKS & FAULTY CONSTRUCTION JOINTS**

**Against a Flow of Water**



**Step 1**

Rout out crack/joint in a "U" shaped slot 1" (25 mm) wide and at least 1.5" (37 mm) deep. A "V" shaped joint is not acceptable. Areas with most water flow should be identified and chipped slightly deeper.

**Step 2**

Remove all loose material and saturate dry areas with water. Allow water to soak in and then remove all surface water.

**Step 3**

To stop active water flow apply Xypex Patch'n Plug to half the depth of slot immediately after removing surface water. Patch'n Plug is mixed by adding one part clean water to 3.5 parts Patch'n Plug powder by volume. Patch'n Plug should be applied to full length of crack/joint area.

**Step 4**

Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) in the slot over the Patch'n Plug and on the 6" (150 mm) strip of

concrete surface on either side of the slot. Application may be performed by brush or gloved hand.

**Step 5**

While slurry coat is still tacky, fill slot to surface level with Xypex Concentrate Dry-Pac. Dry-Pac is mixed by adding one part clean water to six parts Xypex Concentrate powder by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in mixture). Apply the Dry-Pac by gloved hand, then compress it tightly by using a pneumatic packing tool or a hammer and block.

**Step 6**

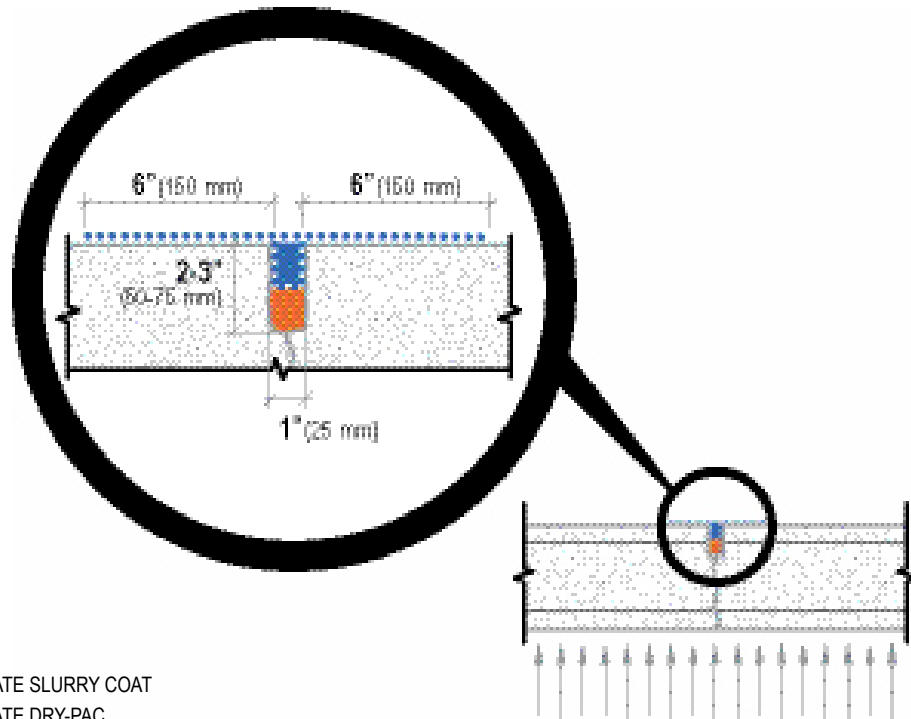
Wet the Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) over the repaired area and to 6" (150 mm) strip on either side of slot.

**Step 7**

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

**REPAIR OF CRACKS & FAULTY CONSTRUCTION JOINTS**

**Against High Pressure Water Flow**



- CONCENTRATE SLURRY COAT
- CONCENTRATE DRY-PAC
- PATCH'N PLUG

**HIGH HYDROSTATIC PRESSURE - ACTIVE LEAKING WATER**

**Step 1**

Rout out crack/joint in a “U” shaped slot 1” (25 mm) wide and 2 - 3” (50 - 75 mm) deep. A “V” shaped slot is not acceptable.

**Step 2**

In area of greatest water flow, drill hole or cavity 0.5” (13 mm) deeper into slot to accommodate a bleeder hose. A bleeder hose is a minimum 1.5 foot (0.5 m) length of smooth surfaced, fairly rigid tubing. Its purpose is to relieve the water pressure while crack/joint is being repaired.

**Step 3**

Remove all loose material and saturate dry areas with water. Allow water to soak in and then remove all surface water.

**Step 4**

Place one end of bleeder hose into the hole or cavity and, while holding hose steady, apply Xypex Patch’n Plug to the slot around the hose. Approximately two to four applications of Patch’n Plug may be necessary to secure the hose in place and embed the tubing completely up to surface level.

**Step 5**

To stop active water flow apply Xypex Patch’n Plug to half the depth of remaining slot area. Patch’n Plug is mixed by adding one part clean water to 3.5 parts Patch’n Plug powder by volume. If slot has dried

out before Patch’n Plug application, it should be re-wetted. Remove bleeder hose and pack hole with Xypex Patch’n Plug to stop all active water flow.

**Step 6**

Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) in the slot over the Patch’n Plug and on the 6” (150 mm) strip of concrete surface on either side of the slot. Application may be performed by gloved hand or by brush.

**Step 7**

While slurry coat is still tacky, fill slot to surface level with Xypex Concentrate in Dry-Pac consistency. Dry-Pac is mixed by adding one part clean water to six parts Xypex Concentrate powder by volume. Blend by trowel for 10 - 15 seconds only (lumps should be present in mixture). Apply the Dry-Pac by gloved hand, then compress it tightly by using a pneumatic packing tool or a hammer and block.

**Step 8**

Wet the Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) over the repaired area and to 6” (150 mm) strip on either side of slot.

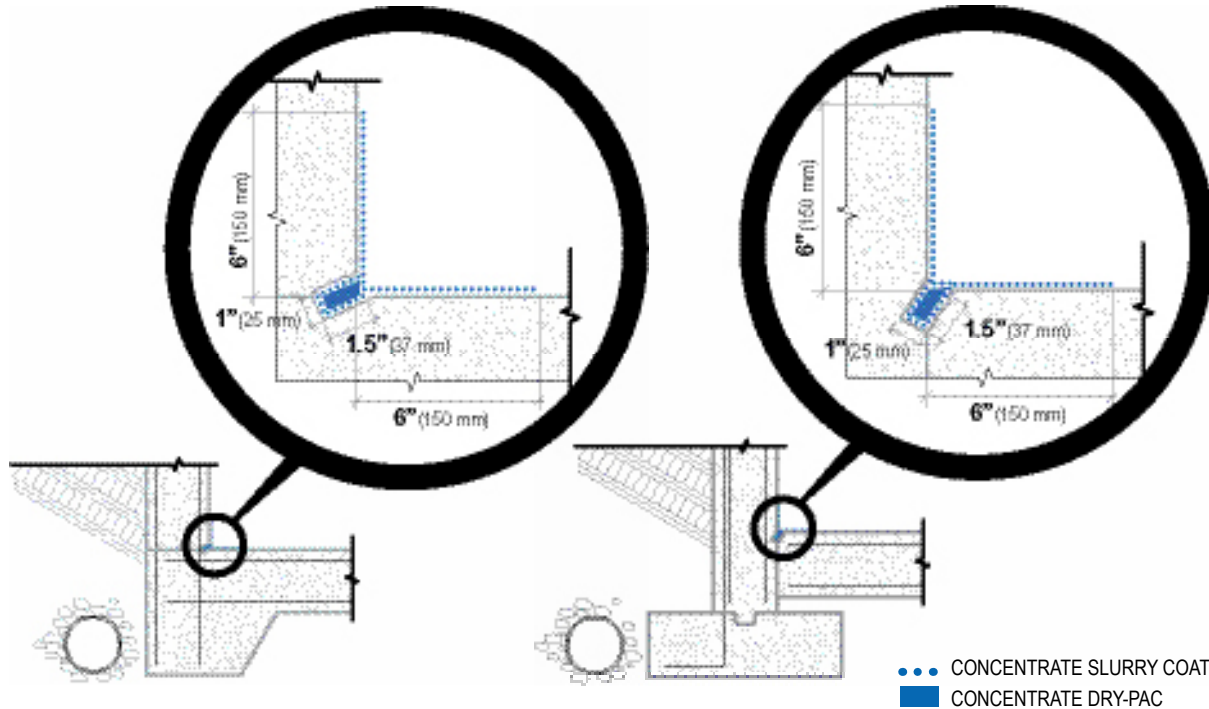
**Step 9**

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.



REPAIR OF SLAB INTERFACE JOINTS

No Water Flow



**Step 1**

Rout out a “U” shaped slot as per the drawings shown above and depending on the wall to slab interface configuration such that the bottom corner of the slot is centered over the cold joint. The slot is to be 1” (25 mm) wide by at least 1.5” (37 mm) deep. A “V” shaped slot is not acceptable.

**Step 2**

Remove all loose materials and saturate with water. Allow water to soak into concrete and then remove all surface water.

**Step 3**

Apply one slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) in the slot and to 6” (150 mm) up the wall and onto the slab away from the slot. Application may be performed by brush or gloved hand.

**Step 4**

While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

**Step 5**

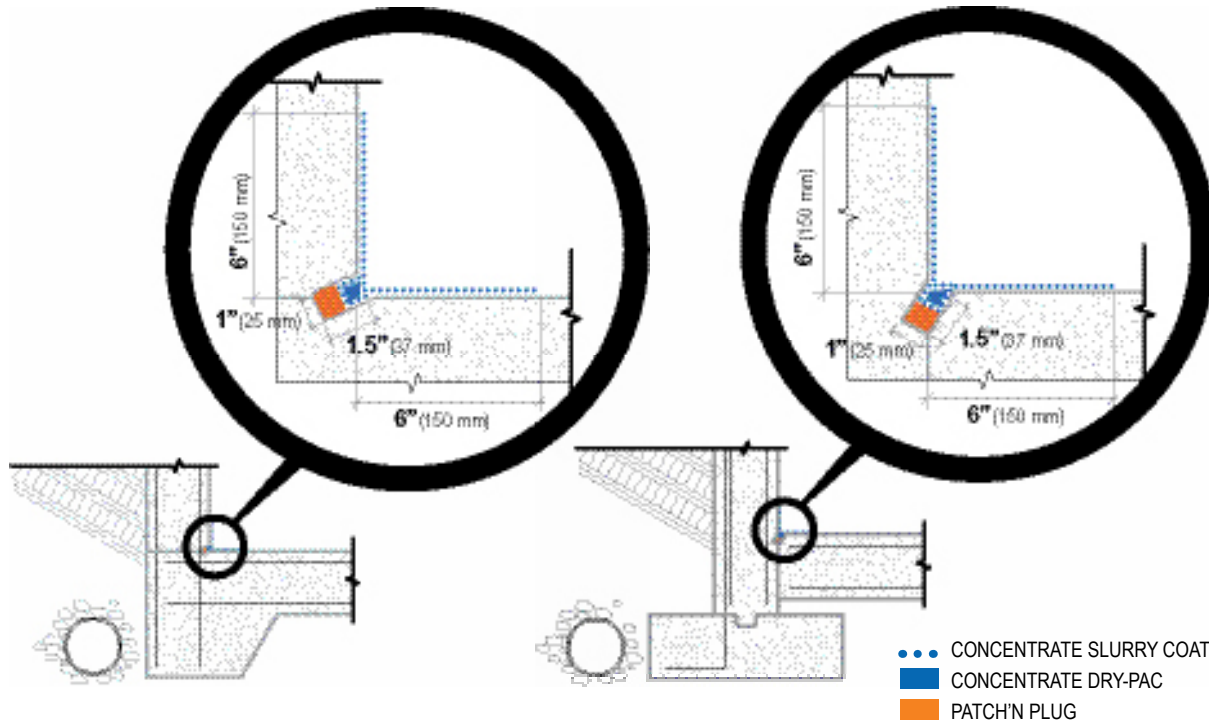
Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) over the repaired area and to 6” (150 mm) up the wall and onto the slab away from the slot.

**Step 6**

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

**REPAIR OF SLAB INTERFACE JOINTS**

**Against a Flow of Water**



**Step 1**

Rout out a “U” shaped slot as per the drawings shown above and depending on the wall to slab interface configuration such that the bottom corner of the slot is centered over the cold joint. The slot is to be 1” (25 mm) wide by at least 1.5” (37 mm) deep. A “V” shaped slot is not acceptable. Areas with most water flow should be identified and chipped deeper.

**Step 2**

Remove all loose materials and saturate with water. Allow water to soak into concrete and then remove all surface water.

**Step 3**

To stop active water flow apply Xypex Patch’n Plug to half the depth of slot immediately after removing surface water. Patch’n Plug is mixed by adding one part clean water to 3.5 parts Patch’n Plug powder by volume. Patch’n Plug should be applied to full length of crack/joint area.

**Step 4**

Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) in the slot, over

the Patch’n Plug, and to 6” (150 mm) up the wall and onto the slab away from the slot. Application may be performed by brush or gloved hand.

**Step 5**

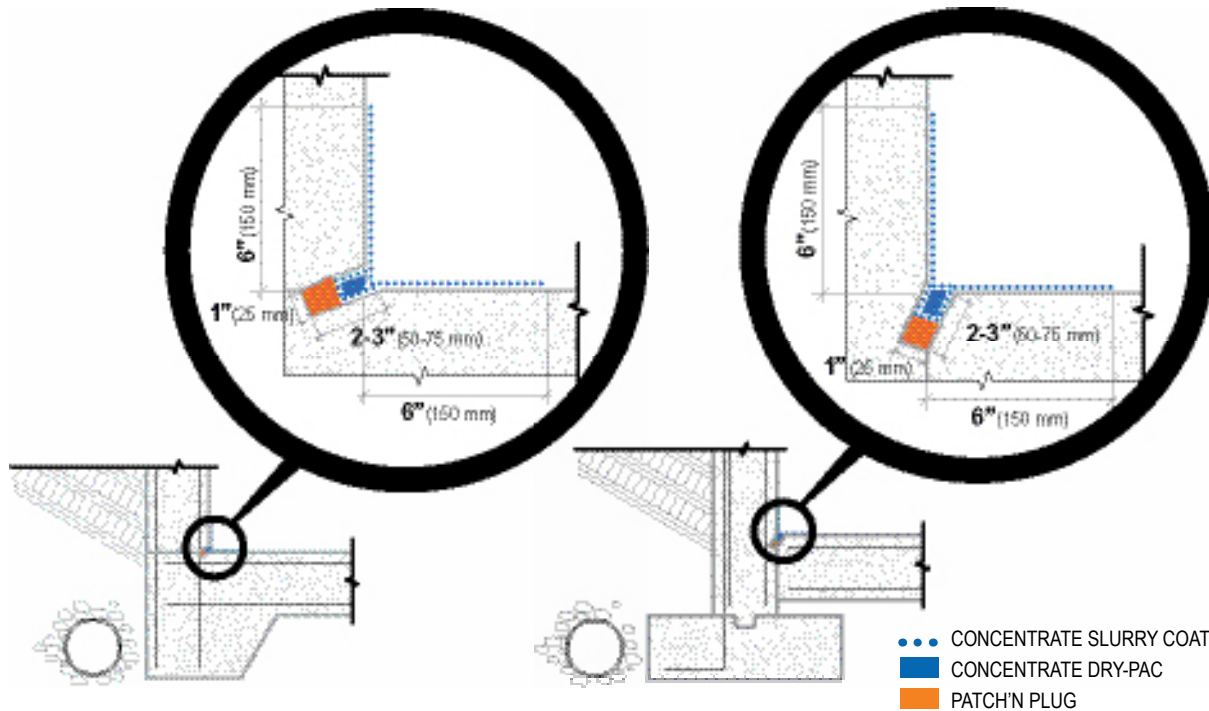
While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

**Step 6**

Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) over the repaired area and to 6” (150 mm) up the wall and onto the slab away from the slot.

**Step 7**

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

**REPAIR OF SLAB INTERFACE JOINTS**
**Against High Pressure Flow of Water**

**Step 1**

Rout out a "U" shaped slot as per the drawings shown above and depending on the wall to slab interface configuration such that the bottom corner of the slot is centered over the cold joint. The slot is to be 1" (25 mm) wide by at least 2 - 3" (50 - 75 mm) deep. A "V" shaped slot is not acceptable.

**Step 2**

In area of greatest water flow, drill hole or cavity 0.5" (13 mm) deeper into slot and over the joint to accommodate a bleeder hose. A bleeder hose is a minimum 1.5 foot (0.5 m) length of smooth surfaced, fairly rigid tubing. Its purpose is to relieve the water pressure while crack/joint is being repaired.

**Step 3**

Remove all loose materials and saturate dry areas with water. Allow water to soak into concrete and then remove all surface water.

**Step 4**

Place one end of bleeder hose into the hole or cavity and, while holding hose steady, apply Xypex Patch'n Plug to the slot around the hose. Approximately two to four applications of Patch'n Plug may be necessary to secure the hose in place and embed the tubing completely up to surface level.

**Step 5**

To stop active water flow apply Xypex Patch'n Plug to half the depth of remaining slot area. Patch'n Plug is mixed by adding one part clean water to 3.5 parts

Patch'n Plug powder by volume. If slot has dried out before Patch'n Plug application, it should be re-wetted. Remove bleeder hose and pack hole with Xypex Patch'n Plug to stop all active water flow.

**Step 6**

Apply a slurry coat of Xypex Concentrate at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) in the slot, over the Patch'n Plug, and to 6" (150 mm) up the wall and onto the slab away from the slot. Application may be performed by brush or gloved hand.

**Step 7**

While slurry coat is still tacky, fill slot to surface with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

**Step 8**

Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>) over the repaired area and to 6" (150 mm) up the wall and onto the slab away from the slot.

**Step 9**

Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.



**REPAIR OF DEFECTIVE CONCRETE & HONEYCOMB****No Water Flow**

---

- Step 1** Rout out faulty concrete to sound concrete.
- Step 2** Remove all loose materials and saturate area with water. Allow time for concrete to absorb water, then remove all free-standing water.
- Step 3** Apply a slurry coat of Xypex Concentrate to cavity area at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>).
- Step 4** While slurry coat is still tacky, fill cavity to surface with non-shrink grout. For large patches, the use of a bonding agent is recommended.
- Step 5** Allow patch to set, then apply a slurry coat of Xypex Concentrate over repaired area at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>).
- Step 6** Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.

**REPAIR OF DEFECTIVE CONCRETE & HONEYCOMB****Against a Flow of Water**

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- Step 1** Rout out faulty concrete to sound concrete.
- Step 2** Remove all loose materials and saturate the area with water. Allow time for concrete to absorb water, then remove any free-standing water.
- Step 3** To stop the flow of water, fill the cavity to surface with Xypex Patch'n Plug. For large cavities, first handrub a layer of Patch'n Plug into the cavity to help "key" the patch. Large patches may require the addition of aggregate to the Patch'n Plug. For the size and amount of aggregate, please refer to product data sheet. Where increased bonding is required, use suitable bonding agent.
- Step 4** After the patch has set, apply a slurry coat of Xypex Concentrate over repaired area at a coverage of 1.5 lb./sq. yd. (0.8 kg/m<sup>2</sup>).
- Step 5** Cure by fog spraying periodically with water for two days or apply Xypex Gamma Cure immediately after the slurry coat has set.



**XYPEX COATING APPLICATION INSTRUCTIONS**

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### Weather and Concrete Conditions

1. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 40°F (4°C).
2. Because Xypex requires moisture to initiate the crystalline waterproofing process, all concrete, whether fresh or old, must be saturated with water. (See Wetting Concrete below.)
3. The concrete surface must be a minimum of 20 hours old before application of the Xypex coating treatment.
4. For fresh concrete, the period between 24 hours and 72 hours is the optimum time within which to apply Xypex, as the new concrete is still “green” and requires very little pre-watering.

### Coverage

For normal surface conditions, the coverage rate for each Xypex coat is 1.25 to 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>).

### Surface Preparation

1. The concrete surface to be treated must be clean and free of laitance, dirt, film, paint, coatings or other foreign matter. The surface must also have an open capillary system to provide “tooth and suction” for the Xypex treatment.
2. If surface is too smooth (e.g. where steel forms are used) or if surface is covered with excess form oil or other foreign matter, the concrete should be lightly sand-blasted, water-blasted, or etched with muriatic (HCL) acid.
3. Horizontal surfaces should have a rough wood float or broom finish. Concrete laitance must be removed from surface by light sand-blasting, water-blasting or etching with muriatic (HCL) acid.
4. Surfaces to be etched with muriatic acid should be dampened with water before application of the acid. After acid etching flush concrete thoroughly with clean water.

### Structural Repair

1. Rout out cracks, faulty construction joints and other structural defects to a depth of 1.5 inches (37 mm) and a width of one inch (25 mm).
2. Apply a brush coat of Xypex Concentrate (as described below) in cavity and allow to dry for 10 minutes.
3. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block. (See below for Dry-Pac mixing instructions.)
4. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch'n Plug in lieu of Dry-Pac followed by a brush coat of Xypex Concentrate. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

Refer to Xypex Repair Procedures for more detailed instructions.

### Wetting Concrete

Xypex requires a saturated substrate and a damp surface. Concrete surfaces, therefore, 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.

**COATING APPLICATION PROCEDURES**

**Mixing**

1. Mix Xypex with clean water only (water that is free of salt and other deleterious materials).
2. Mix clean water into the Xypex powder with a paddle on a slow speed electric drill (250 RPM) or with other equipment that ensures adequate mixing. For small jobs, Xypex may be mixed by gloved hand or by trowel.
3. Be sure that the quantity mixed can be applied within 20 minutes. As the mixture thickens, stir frequently but do not add water.

**Mixing For Slurry Coat**

Mix Xypex powder with clean water to a creamy consistency in the following volume proportions:

**For Brush Application**

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>)  
 2.0 lb./sq. yd. (1.0 kg/m<sup>2</sup>)

5 parts powder to 2 parts water  
 3 parts powder to 1 part water

**For Spray Application**

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m<sup>2</sup>)

5 parts powder to 3 parts water  
 (ratio may vary with equipment type)

**Mixing Dry-Pac**

Using a trowel, mix one part clean water with six parts Xypex Concentrate powder by volume for 10 to 15 seconds. Lumps should be present in this mixture. Do not mix more than can be applied in 20 minutes.

**Applying Xypex**

1. Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces), or specialized spray equipment. Do not apply Xypex with a trowel, roller, paintbrush or paint sprayer. Contact your Xypex representative for further information.
2. The Xypex coating must be uniformly applied and should be just under 0.0625 inches (1.25 mm) thick. A thicker coating can cause curing difficulties, especially in warm weather.
3. 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.
4. For slab (horizontal) applications, care should be taken to spread the Xypex evenly, pulling a heavy broom over the fresh Xypex. This should be done in long strips and will serve to eliminate settlement of the Xypex in low spots on the slab and also to remove excess material which may have been applied.
5. In hot weather it is advisable to apply Xypex either early in the morning or late in the day. This will prevent the Xypex coating from drying out too quickly.

**NOTE:** Where a smooth, steel-trowelled finish is required for horizontal slab or where slab will be exposed to traffic (e.g. parking deck), apply Xypex Concentrate DS-1 or DS-2 by dry shake method. Consult Xypex Technical Data or your Xypex representative for further information.

## Curing

1. 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.
2. 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 to prevent premature drying of the coating.
3. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 36°F (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 treatment to allow the coating to breathe.
4. For concrete structures that hold liquids (e.g. swimming pools, reservoirs, wet wells, tanks, etc.), Xypex should be cured for three days and then allowed to set for 12 days before filling the structure with liquid.
5. For structures holding particularly hot and/or corrosive liquids, Xypex should be cured for three days and allowed to set for 18 days before filling.
6. In situations where there is poor air circulation (e.g. small, enclosed reservoirs or wet wells), fans or blown air may be necessary to aid the curing of Xypex.
7. Xypex Gamma Cure may be used in lieu of water curing for certain applications (consult with Xypex Chemical Corporation or your nearest Xypex distributor). Gamma Cure should be applied using a garden type sprayer and must be diluted as per directions before use. Do not apply more Gamma Cure than is specified.
8. For Xypex coated slabs that will be a wearing surface, water curing is recommended.

## Backfilling

Backfilling can take place 36 hours after the Xypex application. If backfilling takes place within seven days after the application, the backfilling material should be moist so as not to draw moisture from the Xypex coating.

## Application of Paints, Epoxies or Similar Coatings

Xypex requires 21 days of curing and crystal generation before the application of any paint or epoxy. Washing the Xypex surface with a 3 - 5% muriatic acid solution is recommended before applying the coating. Be sure to flush all acid off the surface.

## Application of Grout, Cement Parge Coat, Plaster or Stucco

It is important that any other cementitious system be applied over the Xypex coating before the Xypex crystals have had time to plug the pores of the concrete. Therefore, grouts, cement parge coats etc. should be applied after the Xypex has completely set but while it is still "green" (8 to 48 hours). Use of a bonding agent is recommended.

**NOTE:** Xypex Chemical Corporation makes no representations or warranties regarding the compatibility of Xypex products with plasters, stuccos, tiles and other surface-applied materials. It is the responsibility of the installer of these surface-applied materials to take whatever measures are necessary, including testing, to ensure acceptance by or adhesion to the Xypex treated surface.

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 Chemical Corporation.

### Caution

Xypex is highly alkaline.

1. Avoid contact with skin or eyes.
2. Protect hands with rubber gloves when handling dry powder or wet mixture.
3. If skin comes into contact with Xypex material, wash immediately and thoroughly with water for 15 minutes. If discomfort continues, seek prompt medical attention.
4. Wear eye protection. If dry powder or wet mixture gets into eyes, flush immediately and thoroughly with water and seek medical aid.
5. Wear a suitable mask where there is potential for generating dust. If Xypex is ingested, do not induce vomiting; have affected person drink two glasses of water and obtain immediate medical attention.
6. For material safety data sheets, please contact Xypex Chemical Corporation at 604.273.5265 or toll free 800.961.4477.

Measure	Xypex Concentrate	Xypex Modified	Xypex Patch'n Plug
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**Single Slurry Coat**

lb. per sq. yd.	1.50	1.50	n/a
kg per sq. m	0.80	0.80	n/a

**One of Two Slurry Coats**

lb. per sq. yd.	1.25 - 1.50	1.25 - 1.50	n/a
kg per sq. m	0.65 - 0.80	0.65 - 0.80	n/a

**Filling a 0.75" (19 mm) deep x 1" (25 mm) Wide Slot**

lb. per lineal ft.	0.45	n/a	0.50
kg per meter	0.65	n/a	0.75

**Filling a 1" deep (25 mm) x 1" (25 mm) Wide Slot**

lb. per lineal ft.	0.55	n/a	0.60
kg per meter	0.85	n/a	0.90

**Filling a 1.5" deep (37 mm) x 1" (25 mm) Wide Slot**

lb. per lineal ft.	0.85	n/a	0.95
kg per meter	1.25	n/a	1.40

The above is a guide only. Actual usage may vary according to the project.

Using the proper tools and equipment and wearing protective clothing while working with Xypex products encourages a safer and more effective result.

### Protective Clothing and Equipment

- Hard Hat
- Ear Protectors
- Eye Goggles
- Safety Glasses
- Face Shield
- Dust and Mist Mask
- Coveralls
- Knee Protectors
- Work Boots
- Leather Gloves
- Rubber Gloves
- Rain Gear
- Sandblasting Protection Gear

### Surface Preparation Equipment

- Sandblaster (Pot and Hose)
- Chipping Hammer and Chisels
- Waterblaster
- Scabblers/Scarifiers
- Crack Chaser
- Compressor

### Mixing Equipment

- Mixing Pail
- Electric Drill & Mixing Paddle

### Application Equipment

- Semi-Stiff Concrete Brush
- Pattern Pistol (Gun & Hopper)
- Hy-Flex Spray Pump
- Quickspray Carrousel Pump
- Water Sprayer
- Packing Gun with Packer Head
- Mechanical Spreader

### Miscellaneous Equipment

- Extension Cords
- Flood Lights
- Industrial Vacuum (Wet/Dry Capability)
- Ladders and Scaffolding
- Maintenance Tools and Equipment
- Power Trowel
- Water Hoses and Spray Nozzles
- Ropes
- Space Heating Units
- Tarpaulins
- Ventilation Fans

For more detailed information, please contact Xypex Chemical Corporation at 604.273.5265, toll free 800.961.4477 or your local Xypex representative.

