



ADMIX C-1000 NF

07160 CEMENTITIOUS CRYSTALLINE

Concrete Waterproofing

Description

Xypex is a unique chemical treatment for the waterproofing, protection and improvement of concrete. XYPEX ADMIX C-1000 NF is added to the concrete mix at the time of batching. Xypex Admix C-1000 NF consists of Portland cement 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. This reaction generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete that permanently seals the concrete and prevents the penetration of water and other liquids from any direction.

NOTE: The Xypex Admix C-Series has been specially formulated to meet varying project and temperature conditions. Xypex Admix C-1000 NF is designed for concrete, where normal to a mild retarded set is desired. See Setting Time and Strength for more details. Consult with a Xypex Technical Representative for the most appropriate Xypex Admix for your project.

Compliance

Xypex Admix C-1000 NF complies with the requirements of AS 1478.1, as a type SN Special Purpose Admixture.

Recommended for:

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

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
- Permanent

- Less costly to apply than most other methods
- 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 NF is available in 3.5 kg and 20 kg buckets, and 15 kg buckets containing 5 x 3 kg soluble bags. For large projects, customised packaging is available.

Storage

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

Dosage Rates

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

0.8% - 1.0% by weight of cementitious content

Consult with Xypex Australia's Technical Department or your local Xypex representative 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

ACCI Water Permeability Test, "Water Permeability of Concrete", Australia Centre of Construction and Innovation, University of New South Wales, Sydney, Australia

Concrete samples containing Xypex Admix at various dose rates (0.8% and 1.2%) were tested for water permeability against control samples. All the samples were subjected to a pressure of 10 bars (100 metres waterhead) for 2 weeks. Water permeability coefficients were calculated and the Xypex Admix modified concrete showed significant reduction in water permeability by up to 93% at dosage rate of 1.2%.

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. waterhead). 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", Setesco 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. waterhead) 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

AS 1012.9, "Compressive Strength of Cylindrical Concrete Specimens", Australia Centre of Construction and Innovation, University of New South Wales, Sydney, Australia

Type-GB blend cements containing Xypex Admix at various dose rates (0.8% and 1.2%) recorded significant strength increase at early age (3 - 28 days) by up to 31% compared to control samples.

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).

DRYING SHRINKAGE

AS 1012.13, "Determination of Drying Shrinkage of Concrete", Australia Centre of Construction and Innovation, University of New South Wales, Sydney, Australia

Xypex Admix modified concrete mixes were found to have significant lower drying shrinkage by up to 25% compared to the control mixes using Type-GB cement.

CHEMICAL RESISTANCE

AS2350.14, "Length Change in Sulphate Solution", Australia Centre of Construction and Innovation, University of New South Wales, Sydney, Australia

Potential expansion of concrete in sulphate environments was assessed in accordance with AS2350.14 by immersing samples in a sulphate solution over 16 weeks. Concrete samples containing Xypex Admix at different dosage rates (0.8% and 1.2%) were tested against untreated control samples for sulphate resistance. The test data showed the use of Xypex Admix demonstrated significant improvements in sulphate resistance (low expansion). Higher dose rate of 1.2% of Xypex Admix resulted in lower expansion in the sulphate solution.

"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/l) 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.

NT BUILD 443, ACCI Modified Test, "Chloride Diffusion by NordTest with 3% NaCl solution", Australia Centre of Construction and Innovation, University of New South Wales, Sydney, Australia

Xypex Admix modified concretes were immersed in a 3.0% sodium chloride solution for at least 35 days. The chloride diffusion coefficients were calculated according to Fick's Second Law based on the chloride content profile in the concrete samples after immersion. Significant reductions in the chloride diffusion coefficients were found with all the Xypex Admix modified concretes by up to 45% compared to control concretes. The concretes

modified with high dosage rate of Xypex Admix showed highest level of protection in the chloride diffusion test.

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.

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

AS/NZS 4020 "Products for Use in Contact With Drinking Water", Australian Water Quality Centre, Adelaide, South Australia

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

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

Directions for Use

Xypex Admix C-1000 NF 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 Prior to concrete being batched, add Xypex Admix in powder form to the drum of the ready-mix truck. After batching,

mix the materials for 2 - 3 minutes to ensure the Admix is distributed evenly throughout the batch. A minimum of 10 minutes must elapse before discharge of the concrete. A further 1 minute of mixing at high speed immediately prior to discharge is recommended.

2. READY MIX PLANT - CENTRAL MIX OPERATION Mix Xypex Admix with water to form a very thin slurry (e.g. 7.0 kg of powder mixed with 13.0 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 concrete 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. Xypex soluble bags are best suited for use in the Dry Batch operation.

For further information regarding the proper use of Xypex Admix for a specific project, consult with a Xypex Technical 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. Extension of set time may occur when using Xypex Admix C-1000 NF. 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.

Limitations

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

Technical Services

For more instructions, alternative application methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact

the Technical Department of Xypex Australia or your local Xypex representative.

Safe Handling Information

Xypex is alkaline. As a cementitious powder or mixture, Xypex may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex buckets and packaging. The Manufacturer also maintains comprehensive and up-to-date Material Safety Data Sheets on all its products. Each sheet contains health and safety information for the protection of your employees and customers. Contact Xypex Australia or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

Warranty

Concrete Waterproofing Manufacturing Pty Ltd (trading as Xypex Australia) (the Manufacturer[™]) warrants that the products manufactured by it shall be free from material defects and of a consistent quality. Should any of the products be proven defective, the liability of the Manufacturer shall be limited to replacement of the product ex-factory. The Manufacturer gives no warranty as to fitness of the products for any particular purpose. The user shall: determine the suitability of the product for its intended use; comply with the directions for use and safe handling information available from Xypex; where necessary, engage an experienced Xypex applicator; and assume all risks and liabilities in connection with the use of this product.

Sustainability

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



ecospecifier global GREEN TAG CERTIFIED  GOLD PLUS		See website for more information and disclaimers. Sustainability Assessment Category – AVERAGE SCORES												
		<table border="1"> <tr><td>Building Synergy</td><td>0</td></tr> <tr><td>Health & Ecotoxicity</td><td>0.25</td></tr> <tr><td>Biodiversity</td><td>0.02</td></tr> <tr><td>LCA Score</td><td>0.05</td></tr> <tr><td>GHG = 0.55kgCO₂e/m²</td><td>0.25</td></tr> <tr><td>Social Responsibility</td><td>0.65</td></tr> </table>	Building Synergy	0	Health & Ecotoxicity	0.25	Biodiversity	0.02	LCA Score	0.05	GHG = 0.55kgCO ₂ e/m ²	0.25	Social Responsibility	0.65
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		ecospecifier global GREEN TAG www.ecospecifier.com.au												
Green Tag EcoPOINT		0.21												
GREENRATE LEVEL (GBCA Approved Scheme ID = A18)		A												
		Comments: GHG figure based on cradle to gate LCA, calculated in accordance with ISO14064. The LCA study was conducted in accordance with the ISO 14040/44 standard.												



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 T/A XYPEX AUSTRALIA ABN 96-093-161-963 76 Merkel Street, Thurgoona NSW, 2640 Australia
 P.O. Box 255, Lavington NSW, 2641 Australia Tel: +61 2 6040 2444 Fax: +61 2 6040 2411
 Email: xypenq@xypex.com.au Website: www.xypex.com.au
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