



# MEGAMIX II

WITH BIO-SAN®

Concrete Rehabilitation and Protection Against Microbial Induced Corrosion and Chemical Attack

## Description

Xypex Megamix II with Bio-San is a resurfacing mortar specifically designed for the restoration of deteriorated concrete surfaces caused by microbial induced corrosion, abrasion/erosion and chemical attack. It is formulated for ease of application, superior bond, low shrinkage, high strength and resistance to microbial, acid and sulphate attack. Xypex Megamix II with Bio-San is a one component mortar and can be spray or trowel applied at a thickness of 10 - 50 mm per layer. The high performance characteristics of Megamix II are enhanced by Xypex's unique crystalline waterproofing and protection technology. In most applications, such as manhole resurfacing, Megamix II with Bio-San can be used to replace epoxy linings and calcium aluminate repair mortars.

Megamix II with Bio-San contains bioactive mineral solids which fix permanently within the repair mortar matrix impairing bio-film formation, thus limiting microbial induced corrosion of the repaired surface in sewer environments. It significantly extends the life of sewer and waste water infrastructure by inhibiting the growth of acid causing sewer bacteria such as Thiobacillus that cause MIC (microbial induced corrosion).

## Recommended for the Rehabilitation of:

- Manholes / Sewer Pipes
- Pump and Lift Stations
- Head Works
- Septic Tanks
- Digesters
- Clarifiers
- Industrial Structures

## Advantages

- Excellent adhesion and bond to concrete substrates
- Inhibits microbial induced corrosion
- Low shrinkage, fiber reinforced
- Resistant to acid attack
- Very resistant to severe sulphate exposure
- Highly resistant to chloride diffusion
- Ready to use – just add water
- Vertical and overhead concrete repair; sprayable
- Does not contain any VOCs

## Packaging

Megamix II with Bio-San is available in 20 kg buckets or in customised packaging to meet your specific requirements.

## Storage

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

## Coverage

At 12.5 mm thickness, each 20 kg bucket of Megamix II with Bio-San will cover 0.84 m<sup>2</sup>.

## Laboratory Test Data

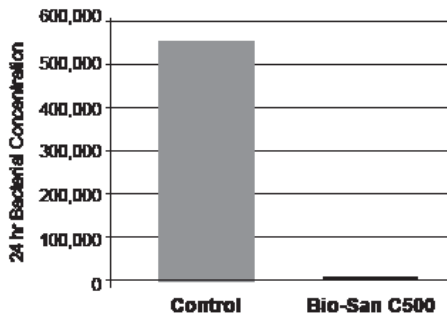
Compressive Strength (ASTM C 109) <sup>1</sup>	
@ 24 hrs	18 MPa
@ 3 days	32 MPa
@ 7 days	42 MPa
@ 28 days	53 MPa
Flexural Strength (ASTM C 78)	
@ 28 days	8.2 MPa
Splitting Tensile Strength (ASTM C 496)	
@ 28 days	4.2 MPa
Direct Tensile Bond Strength to Concrete (ASTM C 1583)	
@ 90 days	2.3 MPa
Elastic Modulus (EN 13412)	
28 days	20.4 GPa
Rapid Chloride Permeability (ASTM C 1202)	
@ 28 days	< 572 coulombs
@ 90 days	< 420 coulombs
Carbonation Depth (EN 13295)	
@ age 49 days for 56 days in 1% CO <sub>2</sub>	No measurable carbonation depth
Scaling Resistance (ASTM C 672)	
50 cycles	No scaling
Sulphate Resistance - (Product Tested to ASTM C 1012)	
6 mo expansion	0.027%
12 mo expansion	0.029%
Acid Resistance (ASTM C 267)	
Mass loss (84 days)	Negligible (retained 99.8% mass)
Setting Time (ASTM C 266)	
Initial	3:25 hrs:min
Final	5:00 hrs:min
<b>Note:</b> Testing completed @ 14% water content of the mass of the dry ingredients @ 6% air content.	
<sup>1</sup> Results may differ based on statistical variability and site conditions. Recommended minimum specified strength for field conditions are: Compressive Strength: > 45 MPa and Bond Strength: > 0.9 MPa.	

## Test Data

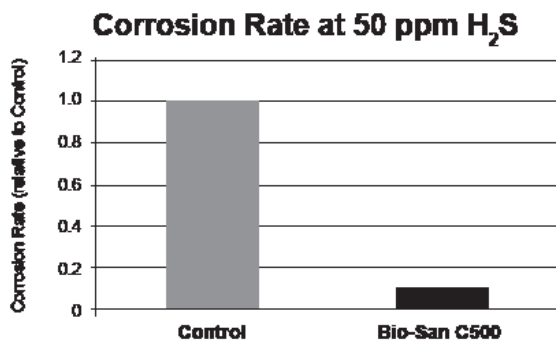
### ANTIMICROBIAL EFFECT & CORROSION RATE

**ISO 22196 (Modified) Evaluation of Antimicrobial Effect of Xypex Bio-San C500 and Corrosion Rate”, McGrath Engineering Ltd, North Vancouver, B.C., Canada**

Xypex Bio-San C500 was added at 1% dosage rate to Portland cement mortar and compared to untreated control samples for antimicrobial performance. A substantial reduction in the sewer bacteria *Thiobacillus novellus* / *Starkeya novella* was found indicating a definite antimicrobial effect.



Concrete was cast in 100 x 200 mm cylinders with both control and treated mixes. A wastewater facility was chosen that had elevated H<sub>2</sub>S levels and substantial existing MIC corrosion damage. Test samples were suspended in the air space of the tank for 10 years. Exposure trials showed that treated concrete had nine times less concrete mass loss compared to control samples.



After exposure of 10 years, the bacterial concentration on the treated samples was minimal, indicating continued antimicrobial action and efficacy.

## 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 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 to obtain desired bond. A roughened surface texture such as ICRI CSP 5 or greater is typically re-

quired to achieve adequate bond. Maintain surface in saturated surface dry (SSD) condition for application of Megamix II mortar.

**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 typically requires 2.7 to 2.8 litres of water per 20 kg bucket. Use only sufficient clean water to create a medium to stiff mortar consistency. 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 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 with Bio-SAN** 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 12.5 mm orifice to prevent clogging. Spray-apply Megamix II, at a right angle to surface, at a distance of 450 - 600 mm. When applying Megamix II with a trowel ensure that the Megamix II is fully consolidated and worked well into the scrub coat and substrate. 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, contact the Xypex Technical Department.

ii. For enhanced chemical protection and crack healing of the substrate Xypex Concentrate may be applied to broom finished surface of the Xypex Megamix II as soon as the surface will accept the Xypex Concentrate without being disturbed. The Xypex Concentrate must then be mist cured for as long as required to ensure a 3 day wet cure of the Megamix II below it. Gamma Cure alone is not sufficient for curing a Concentrate on Megamix II installation.

iii. Megamix II can be extended with clean 10 mm coarse aggregate in specific applications. Consult Xypex Representative.

**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 10 mm and 50 mm. Single layer thickness for spray application will depend on equipment and applicator skill, but may be up to 50 mm vertical and 40 mm overhead. Roughen or score the surface before applying successive layers and apply immediately following initial set.

**NOTE:**

i. For any application greater than 50 mm thickness contact the Technical Department of Xypex Australia or your local Xypex Representative.

**5. CURING** Curing is essential for optimum quality and durability of the repair mortar. Cure Megamix II using moist curing methods. For moist curing, apply continuous source of moisture by spray, or utilize 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 maybe required prior to final set. This may involve the use of fog spray, or suitable curing compounds following finishing.

ii. Megamix II should not be mixed and placed at temperatures below 3°C or above 30°C. Protect from rapid evaporation (hot and/or cold and windy conditions).

## Technical Services

For more instructions, alternative application / curing 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 pails and packaging. The Manufacturer also maintains comprehensive and up-to-date Safety Data Sheets on all its products. Each sheet contains health and safety information for the protection of workers and customers. Xypex Bio-San C500 is EPA registered (No. 92393-2). The Manufacturer recommends you contact Xypex Australia or your local Xypex Representative to obtain copies of Safety Data Sheets prior to product stor-

age 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 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.

