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 3/8 to 2 in. (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
- CE certified meeting EN 1504-3

Packaging

Megamix II with Bio-San is available in 55 lb. (25 kg) bags or in customized packaging to meet your specific requirements.

Storage

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

Coverage

At 1/2 in. (12.5 mm) thickness, each 55 lb. (25 kg) bag of Megamix II with Bio-San will cover 11.3 sq. ft. (1.05 m^2).

Laboratory Test Data

Compressive Strength (ASTM C 109)[1]		
@ 24 hrs @ 3 days @ 7 days @ 28 days	2600 psi 4600 psi 6100 psi 7700 psi	18 MPa 32 MPa 42 MPa 53 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 (ASTM C 1583)		
@ 90 days	330 psi	2.3 MPa
Elastic Modulus (EN 13412)		
28 days	20.4 GPa	
Rapid Chloride Permeability (ASTM C 1202)		
@ 28 days @ 90 days	< 572 coulombs < 420 coulombs	
Carbonation Depth (EN 13295)		
@ age 49 days for 56 days in 1% CO_2	No measurable carbonation depth	
Scaling Resistance (ASTM C 672)		
50 cycles	No scaling	
Sulphate Resistance - (Product Tested to ASTM C 1012)		
6 mo expansion 12 mo expansion	0.027% 0.029%	
Acid Resistance (ASTM C 267)		
Mass loss (84 days)	Negligible (retained 99.8% mass)	

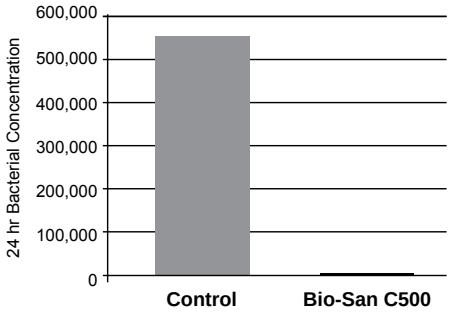
Setting Time (ASTM C 266)	
Initial Final	3:25 hrs:min 5:00 hrs:min
Note: Testing completed @ 14% water content of the mass of the dry ingredients @ 6% air content.	
[1]Results may differ based on statistical variability and site conditions. Recommended minimum specified strength for field conditions are: Compressive Strength: > 6,500 psi (45 MPa) and Bond Strength: > 130 psi (0.9 MPa).	

Test Data

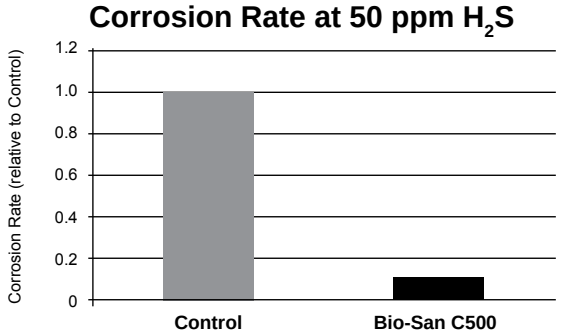
ANTIMICROBIAL EFFECT & CORROSION RATE

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_2S 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 a minimum depth of 3/8" (10 mm) – 3/4" (19 mm) preferred. 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 required 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 0.91 to 0.94 U.S. gallons of water per 55 lb bag or (3.45 to 3.55 litres per 25 kg bag). 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 Technical Services 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 Spray 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). 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 Technical Services Department of Xypex Chemical Corporation.

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. Xypex Xycrylic Admix at 2 parts water to 1 part Xycrylic dilution may be used as mix liquid in place of water for Megamix II.

iv. Megamix II can be extended with clean 3/8" (10 mm) coarse aggregate in specific applications. Consult Xypex Technical Services 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 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:

i. For any application greater than 2 in. (50 mm) thickness contact the Technical Services Department of Xypex Chemical Corporation or your local Xypex Technical Services Representative.

ii. Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

5. CURING Curing is essential to achieve 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. When using a 2:1 water to Xycrylic Admix blend as the mix liquid, wet curing should not be done except in extremely hot and dry conditions. In these conditions consult Xypex Technical Services.

NOTE:

i. In most cases early curing procedures will be required prior to final set. This typically involves use of fog spray, or suitable evaporation retarding compounds following finishing.

ii. Megamix II should not be mixed and placed at temperatures below 39ºF (3ºC) or above 86ºF (30ºC). 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 Services Department of Xypex Chemical Corporation or your local Xypex Technical Services Representative.

Certification

Xypex Megamix II satisfies the requirements of EN 1504-3; Initial Type Testing (ITT) according to EN 1504-3 was certified by BSI as the Notifying Body.

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. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex Technical Services Representative to obtain copies of 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 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.

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