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Australian Water Quality Centre

Xypex Australia
Attn: Greg Baker
PO Box 255
Lavington
NSW 2641
AUSTRALIA

22/06/2012

Dear Greg,

Please find the attached report to AS/NZS 4020:2005 for Xypex Patch'n Plug submitted for testing.

Should you have any enquiries about the report or any other matters pertaining to the Standard please contact the laboratory on 61 8 7424 1512

Yours sincerely,

Michael Glasson
Product Testing Team Leader

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FINAL REPORT

Report ID : 104790

Report Information

Submitting Organisation :	00109093 : Xypex Australia
Account :	130086 : Xypex Australia
AWQC Reference :	130086-2011-CSR-4 : Prod Test: XYPEX PATCH N' PLUG
Project Reference :	PT-1792
Product Designation :	Xypex Patch'n Plug
Composition of Product :	Portland Cement and Alkaline Earth Compounds (see attached Product Data Sheet and MSDS).
Product Manufacturer :	Concrete Waterproofing Manufacturing Pty. Ltd., Union Rd, Lavington, NSW.
Use of Product :	In-Line/Patching and Repair Mortar for Concrete Repairs.
Sample Selection:	As provided by the submitting organisation.
Testing Requested :	**AS/NZS 4020:2005 TESTING OF PRODUCTS FOR USE IN CONTACT WITH DRINKING WATER**
Product Type :	Composite
Samples :	Samples were prepared and controlled as described in Appendix A of AS/NZS 4020:2005
Extracts :	Extracts were prepared as described in Appendix C, D, E, F, G, H.
Project Completion Date :	21-Jun-2012
Project Comment :	The results presented herein demonstrate compliance of Xypex Patch'n Plug to AS/NZS 4020:2005 when exposed at area to volume ratios up to 15000 mm2/L at 20°C ± 2°C.

THE RESULTS STATED IN THIS REPORT RELATE TO THE SAMPLE OF THE PRODUCT SUBMITTED FOR TESTING. ANY CHANGES IN THE MATERIAL FORMULATION, PROCESS OF MANUFACTURE, THE METHOD OF APPLICATION, OR THE SURFACE AREA-TO-VOLUME RATIO IN THE END USE, COULD AFFECT THE SUITABILITY OF THE PRODUCT FOR USE IN CONTACT WITH DRINKING WATER

Michael Glasson
APPROVED SIGNATORY

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Summary of Results

APPENDIX	RESULTS
C – Taste of Water Extract	Passed at an exposure of 15000 mm2 per Litre.
D – Appearance of Water Extract	Passed at an exposure of 15000 mm2 per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 15000 mm2 per Litre.
F – Cytotoxic Activity of Water Extract	Passed at an exposure of 15000 mm2 per Litre.
G – Mutagenic Activity of Water Extract	Passed at an exposure of 15000 mm2 per Litre.
H – Extraction of Metals	Passed at an exposure of 15000 mm2 per Litre.

Summary Comment : Twenty three soakings were performed to obtain a pH < 9.0. In accordance with section A8 (Cementitious Products). Sample was mixed and prepared using 1.5 parts water to 4 parts powder.

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CLAUSE 6.2 Taste of Water Extract

Sample Description	The sample consisted of two glass slides (single side coated on each) measuring 75 mm x 100 mm providing an approximate surface area of 15000 mm2 per Litre. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).
Extraction Temperature	20°C ± 2°C.
Test Method	Taste of Water Extract (Appendix C)
Test Information	
Scaling Factor	Not applied.
Results	Not detected.
Evaluation	The product passed the requirements of clause 6.2 when tested at an exposure of 15000 mm2 per Litre.
Number of Samples	2.
Test Comment	Not applicable.

Peter Christopoulos
APPROVED SIGNATORY

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CLAUSE 6.3 Appearance of Water Extract

Sample Description The sample consisted of two glass slides (single side coated on each) measuring 75 mm x 100 mm providing an approximate surface area of 15000 mm2 per Litre. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Appearance of Water Extract (Appendix D)

Scaling Factor Not applied.

Results

	Test (- Blank)	Maximum Allowed	Units
Colour	<1	5	HU
Turbidity	0.2	0.5	NTU

Evaluation The product passed the requirements of clause 6.3 when tested at an exposure of 15000 mm2 per Litre.

Number of Samples 1.

Test Comment Not applicable.

Joanne Clark
APPROVED SIGNATORY

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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description The sample consisted of two glass slides (single side coated on each) measuring 75 mm x 100 mm providing an approximate surface area of 15000 mm2 per Litre. Extracts were prepared using 1000 mL volumes of test water.

Test Method Growth of Aquatic Micro-organisms (Appendix E)

Inoculum The volume of the inoculum was 100 mL

Scaling Factor Not applied.

Results

Mean Dissolved Oxygen	Control	7.2	mg/L
Mean Dissolved Oxygen Difference	Positive Reference	5.4	mg/L
	Negative Reference	0.1	mg/L
	Test	0.10	mg/L

Evaluation The product passed the requirements of clause 6.4 when tested at an exposure of 15000 mm2 per Litre.

Number of Samples 1.

Test Comment Not applicable.

Stephanie Semczuk
APPROVED SIGNATORY

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CLAUSE 6.5 Cytotoxic Activity of Water Extract

Sample Description	The sample consisted of two glass slides (single side coated on each) measuring 75 mm x 100 mm providing an approximate surface area of 15000 mm2 per Litre. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).
Extraction Temperature	20°C ± 2°C.
Test Method	Cytotoxic Activity of Water Extract (Appendix F)
Scaling Factor	Not applied.
Results	Non cytotoxic.
Evaluation	The product passed the requirements of clause 6.5 when tested at an exposure of 15000 mm2 per Litre.
Number of Samples	1.
Test Comment	The test extracts and blank extracts were used to prepare nutrient growth medium and subsequently used to grow a cell line (ATCC Number CCL 81) in the analysis. In addition zinc sulphate (0.4 mmol) was used for the positive control in the analysis.

Brendon King
APPROVED SIGNATORY

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CLAUSE 6.6 Mutagenic Activity of Water Extract

Sample Description The sample consisted of two glass slides (single side coated on each) measuring 75 mm x 100 mm providing an approximate surface area of 15000 mm2 per Litre. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Mutagenic Activity of Water Extract (Appendix G)

Scaling Factor Not applied.

Results

Bacteria Strain	S9	Blank	Sample Extract	Positive Controls	
		Number of Revertants per Plate			
Salmonella typhimurium TA98	-	33, 48, 33	24, 43, 43	2961, 2898, 2747	NPD (20µg)
Mean ± Standard deviation		38.0 ± 8.7	36.7 ± 11.0	2868.7 ± 110.0	
	+	39, 37, 35	42, 38, 49	2914, 2628, 2774	2-AF (20µg)
Mean ± Standard deviation		37.0 ± 2.0	43.0 ± 5.6	2772.0 ± 143.0	
Salmonella typhimurium TA100	-	258, 287, 347	313, 374, 370	1086, 971, 988	Azide (1.0µg)
Mean ± Standard deviation		297.3 ± 45.4	352.3 ± 34.1	1015.0 ± 62.1	
	+	311, 274, 279	302, 271, 204	1807, 2661, 2193	2-AF (20µg)
Mean ± Standard deviation		288.0 ± 20.1	259.0 ± 50.1	2220.3 ± 427.7	
Salmonella typhimurium TA102	-	327, 304, 367	385, 420, 426	1684, 2094, 2465	Mitomycin C(10µg)
Mean ± Standard deviation		332.7 ± 31.9	410.3 ± 22.1	2081.0 ± 390.7	
	+	300, 365, 393	324, 387, 344		
Mean ± Standard deviation		352.7 ± 47.7	351.7 ± 32.2		

Comments S9 was used as a metabolic activator. NPD (4-nitro-o-phenylenediamine), Azide, and Mitomycin C are specific positive controls for strains TA98, TA100 and TA102 respectively while 2 - AF (2-aminofluorene) when used in conjunction with S9 is a positive control for both TA98 and TA100

Evaluation The product passed the requirements of clause 6.6 when tested at an exposure of 15000 mm2 per Litre.

Number of Samples 1.

Test Comment Not applicable.

Peter Christopoulos
APPROVED SIGNATORY

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CLAUSE 6.7 Extraction of Metals

Sample Description The sample consisted of two glass slides (single side coated on each) measuring 75 mm x 100 mm providing an approximate surface area of 15000 mm2 per Litre. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Extraction of Metals (Appendix H)

Scaling Factor Not applied.

Method of Analysis All methods used to determine concentrations of metals are based on those described in the 21st edition of Standard Methods for the Examination of Water and Wastewater published by the APHA, AWWA and WEF (2005). The methods have been adapted for the instrumentation in use at the Australian Water Quality Centre.
Concentration of the metals described in Table 2 of the AS/NZS 4020:2005 are determined as follows:
Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium and Silver by Inductively Coupled Plasma Mass Spectrometry.

Results	Limit of Reporting mg/L	Blank mg/L	Test 1 mg/L	Test 2 mg/L	Max Allowed mg/L
Final Extract					
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	0.0004	0.0003	<0.0003	0.007
Barium	0.0005	0.0356	0.0275	0.0280	0.7
Cadmium	0.0005	0.0001	0.0001	0.0002	0.002
Chromium	0.0001	0.0002	0.0011	0.0011	0.05
Copper	0.0001	0.3530	0.2043	0.2081	2.0
Lead	0.0001	0.0022	0.0014	0.0014	0.01
Mercury	0.00003	0.00006	0.00018	0.00012	0.001
Molybdenum	0.0001	<0.0001	<0.0001	<0.0001	0.05
Nickel	0.0001	0.0020	0.0013	0.0012	0.02
Selenium	0.0001	<0.0001	<0.0001	<0.0001	0.01
Silver	0.00003	<0.00003	<0.00003	<0.00003	0.1

Evaluation The product passed the requirements of clause 6.7 when tested at an exposure of 15000 mm2 per Litre.

Number of Samples 1.

Test Comment Not applicable.

Dzung Bui
APPROVED SIGNATORY

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