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FINAL REPORT

Report ID : 308493

Report Information

Submitting Organisation : 00109358 : Parchem Construction Supplies Pty Ltd
Account : 130335 : Parchem Construction Supplies Pty Ltd
AWQC Reference : 130335-2020-CSR-15 : Prod Test: Vandex Cemelast
Project Reference : PT-4553
Product Designation : Vandex Cemelast
Composition of Product : Acrylic Modified Cement (see attachments).
Product Manufacturer : Vandex, GERMANY.
Use of Product : In-Line/Waterproofing Barrier for Positive and Negative Water Pressure.
Sample Selection: As provided by the submitting organisation.
Testing Requested : **AS/NZS 4020 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 4020:2018
Extracts : Extracts were prepared as described in Appendix/Clause C, D, E, F, G, H, 6.8.
Project Completion Date : 04-May-2021
Project Comment : The results presented herein demonstrate compliance of Vandex Cemelast to AS/NZS 4020 when exposed at area to volume ratios up to 15,000 mm²/L at 20°C ± 2°C.

PLEASE NOTE THAT THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL

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/CLAUSE	RESULTS
C – Taste	Passed at an exposure of 15000 mm ² per Litre.
D – Appearance	Passed at an exposure of 15000 mm ² per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 15000 mm ² per Litre.
F – Cytotoxic Activity	Passed at an exposure of 15000 mm ² per Litre.
G – Mutagenic Activity	Passed at an exposure of 15000 mm ² per Litre.
H – Metals	Passed at an exposure of 15000 mm ² per Litre.
6.8 – Organic Compounds	Passed at an exposure of 15000 mm ² per Litre.

Test Methods

Test(s) in Appendix	AWQC Test Method	Reference Method
C	T0320-01	AS/NZS 4020:2018
D	TO029-01 & TO018-01	APHA 2120c & APHA 2130b
E	TO014-03	APHA 4500 O G
F	TM-001	AS/NZS 4020:2018
G	TM-002	AS/NZS 4020:2018
H	TIC-006	EPA 200.8

Organic Test Methods

Test(s) in Clause	Test Method	Reference Method
Clause 6.8	TMZ-M36	USEPA524.2
	EP239	USEPA521
	EP132-LL	USEPA_SW846-8270D
	EP075C	USEPA_SW846-8270D
	EP075ASIM	USEPA_SW846-8270D

Summary Comment :

The compound was applied (to glass slides) and cured for 7 days at 20°C prior to testing (ratio of 500g BB75-Z to 180g Cemelast). Thirty one sequential soakings were performed to obtain a pH < 9.0. In accordance with section A8 (Cementitious Products).



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CLAUSE 6.2 Taste

Sample Description	The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm ² /L. Extracts were prepared using 1000 mL volumes of pre-conditioning water(AI 12.6).
Extraction Temperature	20°C ± 2°C.
Test Method	Taste (Appendix C)
Test Information	
Scaling Factor	Not applicable.
Results	Not detected (sample and controls).
Evaluation	The product passed the requirements of clause 6.2 when tested at an exposure of 15000 mm ² per Litre.
Number of Samples	2.
Test Comment	Not applicable.

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CLAUSE 6.3 Appearance

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditioning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Appearance (Appendix D)

Scaling Factor Not applicable.

Results

	<u>Test (- Blank)</u>	<u>Maximum Allowed</u>	<u>Units</u>
Colour	<1	5	HU
Turbidity	<0.1	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.

Andrew Paul Ford

Andrew Ford
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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. 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 applicable.

Results			
Mean Dissolved Oxygen	Control		7.2 mg/L
Mean Dissolved Oxygen Difference	Positive Reference		4.5 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.

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CLAUSE 6.5 Cytotoxic Activity

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditioning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Cytotoxic Activity (Appendix F)

Scaling Factor Not applicable.

Results Non-Cytotoxic (sample and controls).

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.

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CLAUSE 6.6 Mutagenic Activity

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditioning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Mutagenic Activity (Appendix G)

Scaling Factor Not applicable.

Results

	<u>Bacteria Strain</u>	<u>Number of Revertants per Plate</u>				
		S9	Blank	Sample Extract	Positive Controls	
<i>Salmonella typhimurium</i> TA98	-	18, 20, 24	26, 21, 23	3773, 4169, 3956	<u>NPD</u> (20µg)	
	Mean ± Standard deviation	20.7 ± 3.1	23.3 ± 2.5	3966.0 ± 198.2		
	+	21, 30, 22	21, 27, 23	3397, 3472, 3489	<u>2-AF</u> (20µg)	
	Mean ± Standard deviation	24.3 ± 4.9	23.7 ± 3.1	3452.7 ± 49.0		
<i>Salmonella typhimurium</i> TA102	-	401, 444, 413	382, 394, 446	4424, 3678, 3316	<u>Mitomycin C</u> (10µg)	
	Mean ± Standard deviation	419.3 ± 22.2	407.3 ± 34.0	3806.0 ± 565.0		
	+	536, 528, 411	505, 504, 466	2436, 2670, 2582		
	Mean ± Standard deviation	491.7 ± 70.0	491.7 ± 22.2	2562.7 ± 118.2		

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

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.

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CLAUSE 6.7

Metals

Sample Description

The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditioning water(AI 12.6).

Extraction Temperature

20°C ± 2°C.

Test Method

Metals (Appendix H)

Scaling Factor

Not applicable.

Method of Analysis

All methods used to determine concentrations of metals are based on those described in the US EPA method 200.8 Determination of Trace elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry. 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 4020:2018 are determined as follows:

Aluminium, Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, 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					
Aluminium	0.001	0.034	0.034	0.034	0.2
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	<0.0003	<0.0003	<0.0003	0.01
Barium	0.0005	0.0244	0.0259	0.0259	0.7
Boron	0.020	0.091	0.091	0.050	1.4
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	0.002
Chromium	0.0001	0.0002	0.0002	0.0002	0.05
Copper	0.0001	0.0696	0.0845	0.0836	2.0
Iron	0.0005	0.0081	0.0061	0.0071	0.3
Lead	0.0001	0.0004	0.0004	0.0004	0.01
Manganese	0.0001	0.0025	0.0018	0.0022	0.1
Mercury	0.00003	<0.00003	<0.00003	<0.00003	0.001
Molybdenum	0.0001	0.0002	0.0002	0.0002	0.05
Nickel	0.0001	0.0007	0.0005	0.0007	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 42000 mm² per Litre.

Number of Samples

1.

Test Comment

Not applicable.

Dzung Bui

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CLAUSE 6.8 Organic Compounds

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditioning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Organic Compounds (Clause 6.8). Max Allowed values are taken from the Australian Drinking Water Guidelines and Drinking-water Standards for New Zealand. Please note, some reported compounds have no guideline value.

Scaling Factor Not applicable.

Results

Organic Compound

Nitrosamines	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
1-Nitrosopiperidine (NPip)	<0.003	<0.003	
1-Nitrosopyrrolidine (NPyr)	<0.01	<0.01	
Nitrosomorpholine (NMor)	<0.003	<0.003	
N-Nitrosodiethylamine (NDEA)	<0.01	<0.01	
N-Nitrosodimethylamine (NDMA)	<0.003	<0.003	0.1 µg/L
N-Nitrosodi-n-propylamine (NDPA)	<0.003	<0.003	
N-Nitrosomethylethylamine (NMEA)	<0.003	<0.003	

Organic Compound

Phenols	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
2 4 5-trichlorophenol	<1.0	<1.0	
2 4 6-trichlorophenol	<1.0	<1.0	20 µg/L
2 4-dichlorophenol	<1.0	<1.0	200 µg/L
2 4-dimethylphenol	<1.0	<1.0	
2 6-dichlorophenol	<1.0	<1.0	
2-chlorophenol	<1.0	<1.0	300 µg/L
2-nitrophenol	<1.0	<1.0	
4-chloro-3-methylphenol	<1.0	<1.0	
m+p cresol	<2.0	<2.0	
o-cresol	<1.0	<1.0	
pentachlorophenol	<2.0	<2.0	9 µg/L
phenol	<1.0	<1.0	



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Organic Compound

Phthalate Esters

	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
Bis(2-ethylhexyl) phthalate	<10	<10	10 µg/L
Butyl benzyl phthalate	<2	<2	
Di(2-ethylhexyl) adipate	<2	<2	
Diethyl phthalate	<2	<2	
Dimethyl phthalate	<2	<2	
Di-n-butyl phthalate	<2	<2	
Di-n-octyl phthalate	<2	<2	

Organic Compound

Polycyclic Aromatic Hydrocarbons

	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
Acenaphthene	<0.02	<0.02	
Acenaphthylene	<0.02	<0.02	
Anthracene	<0.02	<0.02	
Benzo(a)anthracene	<0.02	<0.02	
Benzo(a)pyrene	<0.005	<0.005	0.01 µg/L
Benzo(a)pyrene TEQ	<0.005	<0.005	
Benzo(b+j)fluoranthene	<0.02	<0.02	
Benzo(ghi)perylene	<0.02	<0.02	
Benzo(k)fluoranthene	<0.02	<0.02	
Chrysene	<0.02	<0.02	
Dibenzo(a-h)anthracene	<0.02	<0.02	
Fluoranthene	<0.02	<0.02	
Fluorene	<0.02	<0.02	
Indeno(123-cd)pyrene	<0.02	<0.02	
Naphthalene	<0.02	<0.02	
PAH - Total	<0.005	<0.005	
Phenanthrene	<0.02	<0.02	
Pyrene	<0.02	<0.02	



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Organic Compound

Volatile Organic Compounds GCMS

	Blank µg/L	Test µg/L	Max Allowed
1 1 1 2-Tetrachloroethane	<1	<1	
1 1 1-Trichloroethane	<1	<1	
1 1 2 2-Tetrachloroethane	<1	<1	
1 1 2-Trichloroethane	<1	<1	
1 1-Dichloropropene	<1	<1	
1 2 3-Trichlorobenzene	<1	<1	
1 2 3-Trichloropropane	<1	<1	
1 2 4-Trichlorobenzene	<1	<1	
1 2 4-Trimethylbenzene	<1	<1	
1 2-Dibromo-3-chloropropane	<1	<1	1 µg/L
1 2-Dibromoethane	<1	<1	1 µg/L
1 2-Dichlorobenzene	<1	<1	1500 µg/L
1 2-Dichloroethane	<1	<1	3 µg/L
1 2-Dichloropropane	<1	<1	
1 3 5-Trimethylbenzene	<1	<1	
1 3-Dichlorobenzene	<1	<1	
1 3-Dichloropropane	<1	<1	
1 4-Dichlorobenzene	<1	<1	40 µg/L
1,1-Dichloroethane	<1	<1	
1,1-Dichloroethene	<1	<1	30 µg/L
2,2-Dichloropropane	<1	<1	
2-Chlorotoluene	<1	<1	
4-Chlorotoluene	<1	<1	
4-Isopropyltoluene	<1	<1	
Benzene	<1	<1	1 µg/L
Bromobenzene	<1	<1	
Bromochloromethane	<1	<1	
Bromodichloromethane	26	24	60 µg/L
Bromoform	10	9	100 µg/L
Bromomethane	<4	<4	
Carbon tetrachloride	<1	<1	3 µg/L
Chlorobenzene	<1	<1	300 µg/L
Chloroethane	<4	<4	
Chloroform	17	17	400 µg/L
Chloromethane	<4	<4	
cis-1 3-Dichloropropene	<1	<1	
cis-1,2-Dichloroethene	<1	<1	
Dibromochloromethane	33	30	150 µg/L
Dibromomethane	<1	<1	
Dichlorodifluoromethane	<1	<1	
Dichloromethane	<4	<4	4 µg/L
Ethylbenzene	<1	<1	300 µg/L
Hexachlorobutadiene	<0.7	<0.7	0.7 µg/L
Isopropylbenzene	<1	<1	
m+p-Xylenes - Total	<2	<2	



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Volatile Organic Compounds GCMS

	Blank µg/L	Test µg/L	Max Allowed
Naphthalene	<1	<1	
n-Butylbenzene	<1	<1	
n-Propylbenzene	<1	<1	
o-Xylene	<1	<1	
sec-Butylbenzene	<1	<1	
Styrene	<1	<1	30 µg/L
tert-Butylbenzene	<1	<1	
Tetrachloroethene	<1	<1	50 µg/L
Toluene	<1	<1	800 µg/L
Total 1,2-dichloroethene	<2	<2	60 µg/L
Total 1,3-dichloropropene	<2	<2	20 µg/L
Total Trichlorobenzene	<2	<2	30 µg/L
Total Xylene	<3	<3	600 µg/L
trans-1,3-Dichloropropene	<1	<1	
trans-1,2-Dichloroethene	<1	<1	
Trichloroethene	<1	<1	
Trichlorofluoromethane	<1	<1	
Trihalomethanes - Total	86	80	250 µg/L
Vinyl chloride	<0.3	<0.3	0.3 µg/L

Evaluation The product passed the requirements of clause 6.8 when tested at an exposure of 15000 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.

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