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FINAL REPORT

Report ID : 323761

Report Information

Submitting Organisation : 00109358 : Parchem Construction Supplies Pty Ltd
Account : 130335 : Parchem Construction Supplies Pty Ltd
AWQC Reference : 130335-2020-CSR-10 : Prod Test: Leakmaster
Project Reference : PT-4518
Product Designation : Leakmaster
Composition of Product : Polyurethane - Water Swelling and Water Stop Paste Sealant (Grey).
Product Manufacturer : C.I. Kasei Co., LTD, Tokyo, JAPAN.
Use of Product : In-Line/Sealing Compound.
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 : 02-Nov-2021
Project Comment : Samples received on week beginning the 4-Jan-2021 and testing commenced on the 18-Jan-2021.

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
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Summary of Results

APPENDIX/CLAUSE	RESULTS
C – Taste	Passed at an exposure of 1000 mm ² per Litre.
D – Appearance	Passed at an exposure of 5000 mm ² per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 5000 mm ² per Litre.
F – Cytotoxic Activity	Passed at an exposure of 5000 mm ² per Litre.
G – Mutagenic Activity	Passed at an exposure of 5000 mm ² per Litre.
H – Metals	Passed at an exposure of 5000 mm ² per Litre.
6.8 – Organic Compounds	Passed at an exposure of 5000 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 sealant was applied (to glass slides) and cured for 7 days at 20°C prior to testing.



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CLAUSE 6.2 Taste

Sample Description The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 1000 mm² per Litre. Extracts were prepared using 2500 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20°C ± 2°C.

Test Method Taste (Appendix C)

Test Information

Scaling Factor Not applied.

Results Not detected (sample and controls).

Evaluation The product passed the requirements of clause 6.2 when tested at an exposure of 1000 mm² per Litre.

Number of Samples 2.

Test Comment Panellists detected plastic and rubber tastes in the final (7th) extracts when tested at 5000m m²/L at 20°C. Test repeated at 1000mm²/L where no discernible tastes detected in the final extracts, met the requirements of clause 6.2.

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CLAUSE 6.3 Appearance

Sample Description The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 5000 mm² per Litre. Extracts were prepared using 500 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20°C ± 2°C.

Test Method Appearance (Appendix D)

Scaling Factor Not applied.

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 5000 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.

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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 5000 mm² per Litre. Extracts were prepared using 500 mL volumes of test water.

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

Inoculum The volume of the inoculum was 50 mL

Scaling Factor Not applied.

Results

Mean Dissolved Oxygen	Control	7.5 mg/L
Mean Dissolved Oxygen Difference	Positive Reference	5.2 mg/L
	Negative Reference	<0.1 mg/L
	Test	0.70 mg/L

Evaluation The product passed the requirements of clause 6.4 when tested at an exposure of 5000 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.



Thuy Diep
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CLAUSE 6.5 Cytotoxic Activity

Sample Description The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 5000 mm² per Litre. Extracts were prepared using 500 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20°C ± 2°C.

Test Method Cytotoxic Activity (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 5000 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.

Stella Fanok
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CLAUSE 6.6 Mutagenic Activity

Sample Description The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 5000 mm² per Litre. Extracts were prepared using 500 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20°C ± 2°C.

Test Method Mutagenic Activity (Appendix G)

Scaling Factor Not applied.

Results

	<u>Bacteria Strain</u>		<u>Number of Revertants per Plate</u>			
	S9	Blank	Sample Extract	Positive Controls		
<i>Salmonella typhimurium</i> TA98	-	26, 18, 20	24, 16, 17	4377, 4314, 4545		<u>NPD</u> (20µg)
Mean ± Standard deviation		21.3 ± 4.2	19.0 ± 4.4	4412.0 ± 119.4		
	+	18, 17, 26	21, 25, 19	3691, 3871, 4463		<u>2-AF</u> (20µg)
Mean ± Standard deviation		20.3 ± 4.9	21.7 ± 3.1	4008.3 ± 403.9		
<i>Salmonella typhimurium</i> TA102	-	391, 430, 431	339, 422, 407	4499, 5086, 3560		<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		417.3 ± 22.8	389.3 ± 44.2	4381.7 ± 769.7		
	+	447, 454, 507	463, 427, 456	2300, 2917, 3118		
Mean ± Standard deviation		469.3 ± 32.8	448.7 ± 19.1	2778.3 ± 426.3		

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 5000 mm² per Litre.

Number of Samples 1.

Test Comment The differences in the mean number of revertants between the blank and test extracts do not exceed two standard deviations; accordingly there is no evidence of a mutagenic response.

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CLAUSE 6.7

Metals

Sample Description

The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 5000 mm² per Litre. Extracts were prepared using 500 mL volumes of 50 mg/L hardness water.

Extraction Temperature

20°C ± 2°C.

Test Method

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 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	0.006	0.009	0.009	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	0.0007	<0.0005	<0.0005	0.7
Boron	0.020	<0.020	<0.020	<0.020	1.4
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	0.002
Chromium	0.0001	<0.0001	<0.0001	<0.0001	0.05
Copper	0.0001	<0.0001	<0.0001	<0.0001	2.0
Iron	0.0005	<0.0005	<0.0005	<0.0005	0.3
Lead	0.0001	<0.0001	<0.0001	<0.0001	0.01
Manganese	0.0001	<0.0001	<0.0001	<0.0001	0.1
Mercury	0.00003	<0.00003	<0.00003	<0.00003	0.001
Molybdenum	0.0001	<0.0001	<0.0001	<0.0001	0.05
Nickel	0.0001	0.0001	0.0001	<0.0001	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 5000 mm² per Litre.

Number of Samples

1.

Test Comment

Not applicable.



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CLAUSE 6.8 Organic Compounds

Sample Description The sealant was applied onto a single sided glass substrate (50mm x 50mm) providing a total surface area of approximately 5000 mm² per Litre. Extracts were prepared using 500 mL volumes of 50 mg/L hardness water.

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 applied.

Results

Organic Compound

Nitrosamines	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2102931	ES2102931	
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.	ES2102931	ES2102931	
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.	ES2102931	ES2102931	
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.	ES2102931	ES2102931	
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

Organic Compound	Blank µg/L	Test µg/L	Max Allowed
Volatile Organic Compounds GCMS			
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	<1	<1	60 µg/L
Bromoform	<1	<1	100 µg/L
Bromomethane	<4	<4	
Carbon tetrachloride	<1	<1	3 µg/L
Chlorobenzene	<1	<1	300 µg/L
Chloroethane	<4	<4	
Chloroform	<1	<1	400 µg/L
Chloromethane	<4	<4	
cis-1 3-Dichloropropene	<1	<1	
cis-1,2-Dichloroethene	<1	<1	
Dibromochloromethane	<1	<1	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	<4	<4	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 5000 mm² per Litre.

Number of Samples 1.

Test Comment Subcontracted testing conducted by ALS, Environmental Division, NATA accreditation no. 825 site no. 10911 and ALS Scoresby, NATA accreditation no. 992, site no. 989

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