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Our Reference :PT-68
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Date :9th June 2006

Mr Steve Santo
Caps Beta Pty Ltd
P.O. Box 461
Haberfield NSW 2045

Dear Mr Santo,

Attached is a report to AS/NZS 4020:2005 for the Flexigum submitted for testing. The product passed the requirements of the Standard at an exposure of 5455 mm² per Litre.

Should you have any enquiries about the report or any other matters pertaining to the Standard please contact Sam Loveder or myself on (08) 8259 0332.

Yours sincerely,

M. Glasson
SENIOR TECHNICAL OFFICER



AS/NZS 4020:2005
WATER QUALITY
MANAGEMENT SYSTEMS

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FINAL REPORT

Report Information

Report ID : 7515
Submitting Organisation : 00120011 : Caps Beta Pty Ltd
Account : 140089 : Caps Beta Pty Ltd
AWQC Reference : 140089-2005-CSR-1 :
Project Reference : PT-68
Product Designation : Flexigum.
Composition of Product : Refer to Material Safety Data Sheet.
Product Manufacturer : Bitum Limited, Israel.
Use of Product : Heavy Duty Tanking Membrane.
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 : 08-Jun-2006

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	RESULTS
C — Taste of Water Extract	Passed at an exposure of 5455 mm ² per Litre.
D — Appearance of Water Extract	Passed at an exposure of 15000 mm ² per Litre.
E — Growth of Aquatic Micro-organisms	Passed at an exposure of 5455 mm ² per Litre.
F — Cytotoxic Activity of Water Extract	Passed at an exposure of 15000 mm ² per Litre.
G — Mutagenic Activity of Water Extract	Passed at an exposure of 15000 mm ² per Litre.
H — Extraction of Metals	Passed at an exposure of 15000 mm ² per Litre.



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CLAUSE 6.2 Taste of Water Extract

Sample Description	The sample was applied to the surface of a single glass slide with dimensions 75 mm x 100 mm providing a surface area of approximately 5455 mm ² per Litre. Extracts were prepared using 1375 mL volumes of 50 mg/L hardness water.
Extraction Temperature	20 ± 2 C.
Test Method	Taste of Water Extract (Appendix C)
Scaling Factor	Not applied.
Results	Not detected.
Evaluation	The product passed the requirements of clause 6.2 when tested at an exposure of 5455 mm ² per Litre.
Number of Samples	2.

Sam Loveder
APPROVED SIGNATORY



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CLAUSE 6.3 Appearance of Water Extract

Sample Description The sample was applied to the surface of two glass slides with dimensions 75 mm x 100 mm providing a surface area of approximately 15000 mm² per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20 ± 2 C.

Test Method Appearance of Water Extract (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 15000 mm² per Litre.

Number of Samples 1.

Stephanie Sernczuk
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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description The sample was applied to the surface of two glass slides with dimensions 75 mm x 100 mm providing a surface area of approximately 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 A scaling factor of 0.3636 was applied.

Results

Mean Dissolved Oxygen	Control	7.0 mg/L
Mean Dissolved Oxygen Difference	Positive Reference	5.0 mg/L
	Negative Reference	<0.1 mg/L
	Test	4.4 mg/L

Evaluation A final MDOD value of 1.6 was achieved when a scaling factor of 0.3636 was applied to the test result. The product passed the requirements of clause 6.4 when tested at an exposure of 5455 mm² per Litre.

Number of Samples 1.

Phil Thomas
APPROVED SIGNATORY



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CLAUSE 6.5 Cytotoxic Activity of Water Extract

Sample Description	The sample was applied to the surface of two glass slides with dimensions 75 mm x 100 mm providing a surface area of approximately 15000 mm ² per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperature	20 ± 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 mm ² per Litre.
Number of Samples	1.

Stella Fanok
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CLAUSE 6.6 Mutagenic Activity of Water Extract

Sample Description The sample was applied to the surface of two glass slides with dimensions 75 mm x 100 mm providing a surface area of approximately 15000 mm² per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20 ± 2 C.

Test Method Mutagenic Activity of Water Extract (Appendix G)

Scaling Factor Not applied.

Results

<u>Bacteria Strain</u>		<u>Number of Revertants per Plate</u>			
<i>Salmonella typhimurium</i> TA98	S9 -	Blank 29, 32, 27	Sample Extract 25, 22, 22	Positive Controls 3122, 2851, 2705	<u>NPD</u> (20µg)
	Mean ± Standard deviation	29.3 ± 2.5	23.0 ± 1.7	2892.7 ± 211.6	
	+	36, 32, 31	20, 22, 26	2552, 2553, 2413	<u>2-AF</u> (20µg)
	Mean ± Standard deviation	33.0 ± 2.6	22.7 ± 3.1	2506.0 ± 80.5	
<i>Salmonella typhimurium</i> TA100	-	121, 135, 135	150, 145, 148	577, 554, 513	<u>Azide</u> (1.0µg)
	Mean ± Standard deviation	130.3 ± 8.1	147.7 ± 2.5	548.0 ± 32.4	
	+	147, 163, 133	144, 164, 156	1554, 1084, 1640	<u>2-AF</u> (20µg)
	Mean ± Standard deviation	147.7 ± 15.0	154.7 ± 10.1	1426.0 ± 299.3	
<i>Salmonella typhimurium</i> TA102	-	419, 420, 378	377, 331, 334	821, 787, 744	<u>Mitomycin C</u> (2µg)
	Mean ± Standard deviation	405.7 ± 24.0	347.3 ± 25.7	784.0 ± 38.6	
	+	445, 458, 398	357, 314, 394		
	Mean ± Standard deviation	433.7 ± 31.6	355.0 ± 40.0		

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.



Sam Loveder
APPROVED SIGNATORY



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CLAUSE 6.7 Extraction of Metals

Sample Description The sample was applied to the surface of two glass slides with dimensions 75 mm x 100 mm providing a surface area of approximately 15000 mm² per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperature 20 ± 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 and Selenium by inductively coupled plasma mass spectrometry.
Silver by graphite furnace absorption spectrophotometry (Varian).

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	0.001	<0.001	<0.001	<0.001	0.007
Barium	0.0005	<0.0005	0.0017	0.0013	0.7
Cadmium	0.0005	<0.0005	<0.0005	<0.0005	0.002
Chromium	0.003	<0.003	<0.003	<0.003	0.05
Copper	0.0010	<0.0010	<0.0010	<0.0010	2.0
Lead	0.0005	<0.0005	<0.0005	<0.0005	0.01
Mercury	0.0003	<0.0003	<0.0003	<0.0003	0.001
Molybdenum	0.0005	<0.0005	<0.0005	<0.0005	0.05
Nickel	0.0005	<0.0005	0.0005	0.0005	0.02
Selenium	0.003	<0.003	<0.003	<0.003	0.01
Silver	0.002	<0.002	<0.002	<0.002	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.

Greg O'Neil
APPROVED SIGNATORY



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