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LiquiMix Pty Ltd  
Attn: Ben Bahrami  
24 Rosa Place  
Richlands  
QLD 4077  
AUSTRALIA

5/06/2019

Dear Ben,

Please find the attached report to AS/NZS 4020:2005 for Civilox 18(Light Grey)/Elaston W80 (White) Primer/Topcoat system 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,

A handwritten signature in black ink, appearing to read "M Glasson", is written over a light grey rectangular background.

Michael Glasson  
Supervisor Product Testing



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Chemical and Biological Testing  
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## FINAL REPORT

Report ID : 252876

### Report Information

**Submitting Organisation** : 00120664 : LiquiMix Pty Ltd  
**Account** : 141294 : LiquiMix Pty Ltd  
**AWQC Reference** : 141294-2018-CSR-1 :  
**Project Reference** : PT-3719  
**Product Designation** : Civilox 18(Light Grey)/Elaston W80 (White) Primer/Topcoat system  
**Composition of Product** : Phenalkamine/Polyurea  
**Product Manufacturer** : Liquimix, Richlands, Queensland.  
**Use of Product** : In-line/Potable Water lining  
**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** : 04-Jun-2019  
**Project Comment** : The results presented herein demonstrate compliance of Civilox 18(Light Grey)/Elaston W80 (White) Primer/Topcoat system to AS/NZS 4020 when exposed at area to volume ratios up to 1000mm<sup>2</sup>/L and 5,000 mm<sup>2</sup>/L respectively 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



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### Summary of Results

APPENDIX	RESULTS
C – Taste of Water Extract	Passed at an exposure of of 5,000 mm <sup>2</sup> per Litre ( topcoat) and 1,000 mm <sup>2</sup> per Litre (primer).
D – Appearance of Water Extract	Passed at an exposure of of 15,000 mm <sup>2</sup> per Litre ( topcoat) and 5,000 mm <sup>2</sup> per Litre (primer).
E – Growth of Aquatic Micro-organisms	Passed at an exposure of of 15,000 mm <sup>2</sup> per Litre ( topcoat) and 5,000 mm <sup>2</sup> per Litre (primer).
F – Cytotoxic Activity of Water Extract	Passed at an exposure of of 15,000 mm <sup>2</sup> per Litre ( topcoat) and 5,000 mm <sup>2</sup> per Litre (primer).
G – Mutagenic Activity of Water Extract	Passed at an exposure of of 15,000 mm <sup>2</sup> per Litre ( topcoat) and 5,000 mm <sup>2</sup> per Litre (primer).
H – Extraction of Metals	Passed at an exposure of of 15,000 mm <sup>2</sup> per Litre ( topcoat) and 5,000 mm <sup>2</sup> per Litre (primer).

### Test Methods

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

### Summary Comment :

The coated samples were applied and cured by the submitting organisation prior to submission.

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### CLAUSE 6.2 Taste of Water Extract

<b>Sample Description</b>	The sample consisted of a primer/topcoat system consisting of panels to provide an exposure of 5,000 mm <sup>2</sup> per Litre (topcoat) and 1,000 mm <sup>2</sup> per Litre (primer). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
<b>Extraction Temperatur</b>	20°C ± 2°C
<b>Test Method</b>	Taste of Water Extract (Appendix C)
<b>Test Information</b>	
<b>Scaling Factor</b>	Not applicable.
<b>Results</b>	Not detected (sample and controls).
<b>Evaluation</b>	The product passed the requirements of clause 6.2 when tested at an exposure of 5,000 mm <sup>2</sup> per Litre (topcoat) and 1,000 mm <sup>2</sup> per Litre (primer).
<b>Number of Samples</b>	2.
<b>Test Comment</b>	Iodine, Metallic and Rubber tastes were detected when tested at 15000 & 5000 mm <sup>2</sup> per Litre. The test was repeated at a lower exposure, 5000 & 1000 mm <sup>2</sup> per Litre and no tastes were detected.



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### CLAUSE 6.3 Appearance of Water Extract

**Sample Description** The sample consisted of a primer/topcoat system consisting of panels to provide an exposure of 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**Extraction Temperatur** 20°C ± 2°C

**Test Method** Appearance of Water Extract (Appendix D)

**Scaling Factor** Not applicable.

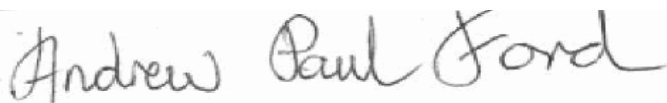
#### Results

	<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 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer).

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.4 Growth of Aquatic Micro-organisms

**Sample Description** The sample consisted of a primer/topcoat system consisting of panels to provide an exposure of 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer). 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	7.3 mg/L
Mean Dissolved Oxygen Differenc	Positive Reference	5.1 mg/L
	Negative Reference	<0.1 mg/L
	Test	1.10 mg/L

**Evaluation** The product passed the requirements of clause 6.4 when tested at an exposure of 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer).

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.5 Cytotoxic Activity of Water Extract

<b>Sample Description</b>	The sample consisted of a primer/topcoat system consisting of panels to provide an exposure of 15,000 mm <sup>2</sup> per Litre (topcoat) and 5,000 mm <sup>2</sup> per Litre (primer). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
<b>Extraction Temperatur</b>	20°C ± 2°C
<b>Test Method</b>	Cytotoxic Activity of Water Extract (Appendix F)
<b>Scaling Factor</b>	Not applicable.
<b>Results</b>	Non-cytotoxic.
<b>Evaluation</b>	The product passed the requirements of clause 6.5 when tested at an exposure of 15,000 mm <sup>2</sup> per Litre (topcoat) and 5,000 mm <sup>2</sup> per Litre (primer).
<b>Number of Samples</b>	1.
<b>Test Comment</b>	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 of Water Extract

**Sample Description** The sample consisted of a primer/topcoat system consisting of panels to provide an exposure of 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**Extraction Temperature** 20°C ± 2°C

**Test Method** Mutagenic Activity of Water Extract (Appendix G)

**Scaling Factor** Not applicable.

#### Results

Bacteria Strain	Number of Revertants per Plate				
	S9	Blank	Sample Extract	Positive Controls	
<i>Salmonella typhimurium</i> TA98	-	27, 25, 30	37, 29, 23	3999, 4357, 3912	<u>NPD</u> (20µg)
Mean ± Standard deviation		27.3 ± 2.5	29.7 ± 7.0	4089.3 ± 235.9	
	+	36, 42, 41	28, 31, 28	3768, 4000, 3854	<u>2-AF</u> (20µg)
Mean ± Standard deviation		39.7 ± 3.2	29.0 ± 1.7	3874.0 ± 117.3	
<i>Salmonella typhimurium</i> TA100	-	193, 173, 168	195, 170, 186	997, 917, 1028	<u>Azide</u> (1.0µg)
Mean ± Standard deviation		178.0 ± 13.2	183.7 ± 12.7	980.7 ± 57.3	
	+	204, 216, 245	246, 191, 177	2584, 2595, 2567	<u>2-AF</u> (20µg)
Mean ± Standard deviation		221.7 ± 21.1	204.7 ± 36.5	2582.0 ± 14.1	
<i>Salmonella typhimurium</i> TA102	-	424, 408, 415	409, 430, 469	3409, 2299, 3531	<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		415.7 ± 8.0	436.0 ± 30.4	3079.7 ± 678.8	
	+	441, 498, 510	452, 502, 510	2744, 2951, 2937	
Mean ± Standard deviation		483.0 ± 36.9	488.0 ± 31.4	2877.3 ± 115.7	

**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 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer).

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.7 Extraction of Metals

**Sample Description** The sample consisted of a primer/topcoat system consisting of panels to provide an exposure of 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**Extraction Temperature** 20°C ± 2°C

**Test Method** Extraction of 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 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

Results	Limit of Reporting mg/L	Blank mg/L	Test 1 mg/L	Test 2 mg/L	Max Allowed mg/L
<b>Final Extract</b>					
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	<0.0003	<0.0003	<0.0003	0.007
Barium	0.0005	<0.0005	<0.0005	<0.0005	0.7
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
Lead	0.0001	<0.0001	<0.0001	<0.0001	0.01
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 15,000 mm<sup>2</sup> per Litre (topcoat) and 5,000 mm<sup>2</sup> per Litre (primer).

**Number of Samples** 1.

**Test Comment** Not applicable.



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