



Earth Water & Infrastructure Pty Ltd  
Attn: Paulus des Anges  
1 Stoney Way  
Derrimut  
VIC 3026  
AUSTRALIA

15/11/2019

Dear Paulus,

Please find the attached report to AS/NZS 4020:2018 for Hexa-Cover Floating Cover R114 (228mm) Representative Model 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,

Heather Menzies  
Technical Officer Life Science



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## FINAL REPORT

Report ID : 263626

### Report Information

**Submitting Organisation :** 00100464 : Earth Water & Infrastructure Pty Ltd  
**Account :** 143812 : Earth Water & Infrastructure Pty Ltd  
**AWQC Reference :** 143812-2019-CSR-1 : Prod Test: Modular Water Cover  
**Project Reference :** PT-4023  
**Product Designation :** Hexa-Cover Floating Cover R114 (228mm) Representative Model  
**Composition of Product :** Polypropylene.  
**Product Manufacturer :** Hexa-Cover A/S, DENMARK.  
**Use of Product :** In-Lilne/Modular Floating Cover for Water Storages.  
**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, H, 6.8.  
**Project Completion Date :** 15-Nov-2019  
**Project Comment :** The results presented herein demonstrate compliance of Hexa-Cover Floating Cover R114 (228mm) Representative Model to AS/NZS 4020 when exposed at area to volume ratios up to 15,000mm<sup>2</sup>/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

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**Summary of Results**

APPENDIX/CLAUSE	RESULTS
C – Taste	Passed at an exposure of 15,000 mm <sup>2</sup> per Litre.
D – Appearance	Passed at an exposure of 15,000 mm <sup>2</sup> per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 15,000 mm <sup>2</sup> per Litre.
F – Cytotoxic Activity	Passed at an exposure of 15,000 mm <sup>2</sup> per Litre.
H – Metals	Passed at an exposure of 15,000 mm <sup>2</sup> per Litre.
6.8 – Organic Compounds	Passed at an exposure of 15,000 mm <sup>2</sup> 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
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 :** Product range to include R114 (228mm) and R90 (180mm) Floating Covers.



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**CLAUSE 6.2 Taste**

<b>Sample Description</b>	The sample consisted of two panels sectioned from floating cover piece to give a total surface area of approximately 15,000 mm <sup>2</sup> /L. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
<b>Extraction Temperature</b>	20°C ± 2°C.
<b>Test Method</b>	Taste (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 15,000 mm <sup>2</sup> per Litre.
<b>Number of Samples</b>	2.
<b>Test Comment</b>	Not applicable.

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**CLAUSE 6.3 Appearance**

**Sample Description** The sample consisted of two panels sectioned from floating cover piece to give a total surface area of approximately 15,000 mm<sup>2</sup>/L. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**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 15,000 mm<sup>2</sup> per Litre.

**Number of Samples** 1.

**Test Comment** Not applicable.

Andrew Ford  
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### CLAUSE 6.4 Growth of Aquatic Micro-organisms

**Sample Description** The sample consisted of two panels sectioned from floating cover piece to give a total surface area of approximately 15,000 mm<sup>2</sup>/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 87 mL

**Scaling Factor** Not applicable.

#### Results

Mean Dissolved Oxygen	Control	7.7 mg/L
Mean Dissolved Oxygen Difference	Positive Reference	5.6 mg/L
	Negative Reference	<0.1 mg/L
	Test	0.20 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.

**Number of Samples** 1.

**Test Comment** Not applicable.

Kerrie Jooste  
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### CLAUSE 6.5 Cytotoxic Activity

<b>Sample Description</b>	The sample consisted of two panels sectioned from floating cover piece to give a total surface area of approximately 15,000 mm <sup>2</sup> /L. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
<b>Extraction Temperature</b>	20°C ± 2°C.
<b>Test Method</b>	Cytotoxic Activity (Appendix F)
<b>Scaling Factor</b>	Not applicable.
<b>Results</b>	Non-cytotoxic (sample and controls).
<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.
<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.

Stella Fanok  
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**CLAUSE 6.7**

**Metals**

**Sample Description**

The sample consisted of two panels sectioned from floating cover piece to give a total surface area of approximately 15,000 mm<sup>2</sup>/L. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**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
<b>Final Extract</b>					
Aluminium	0.001	0.004	0.007	0.011	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	<0.0005	<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	0.0004	2.0
Iron	0.0005	<0.0005	<0.0005	0.0006	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	0.0003	0.0004	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.

**Number of Samples**

1.

**Test Comment**

Not applicable.



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**CLAUSE 6.8 Organic Compounds**

**Sample Description** The sample consisted of two panels sectioned from floating cover piece to give a total surface area of approximately 15,000 mm<sup>2</sup>/L. Extracts were prepared using 1000 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 applicable.

**Results**

**Organic Compound**

<b>Nitrosamines</b>	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES1930546	ES1930546	
1-Nitrosopiperidine (NPip)	<0.003	<0.003	
1-Nitrosopyrrolidine (NPyr)	<0.01	<0.01	
Nitrosomorpholine (NMorA)	<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**

<b>Phenols</b>	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES1930546	ES1930546	
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.	ES1930546	ES1930546	
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.	ES1930546	ES1930546	
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	<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 15,000 mm<sup>2</sup> per Litre.

**Number of Samples** 1.

**Test Comment** Not applicable.

Qiong Huang

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