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Australian Water Quality Centre

Bermad Water Technologies
Attn: Colin Kirkland
PO Box 506
Thomastown
VIC 3074
AUSTRALIA

3/04/2019

Dear Colin,

Please find the attached report to AS/NZS 4020:2005 for Air Valve - 50mm Bermad C10 (Representative Sample) 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,

Michael Glasson
Supervisor Product Testing

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Australian Water Quality Centre

FINAL REPORT

Report ID : 248643

Report Information

Submitting Organisation	00121202 : Bermad Water Technologies
Account :	142174 : Bermad Water Technologies
AWQC Reference :	142174-2018-CSR-2 : Prod Test: 50mm Air Valve
Project Reference :	PT-3747
Product Designation :	Air Valve - 50mm Bermad C10 (Representative Sample)
Composition of Product :	GRN and PP.
Product Manufacturer :	Bermad, ISRAEL.
Use of Product :	In-Line/Air Valve.
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	03-Apr-2019
Project Comment :	The results presented herein demonstrate compliance of Air Valve - 50mm Bermad C10 (Representative Sample) to AS/NZS 4020 when tested at the 'In-the-Product' exposure with a 0.05 scaling factor at 20°C ± 2°C. Product range to include 50mm to 80mm.

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 the in-the-product exposure with a scaling factor of 0.05 applied.
D – Appearance of Water Extract	Passed at the in-the-product exposure with a scaling factor of 0.05 applied.
E – Growth of Aquatic Micro-organisms	Passed at the in-use exposure.
F – Cytotoxic Activity of Water Extract	Passed at the in-the-product exposure with a scaling factor of 0.05 applied.
G – Mutagenic Activity of Water Extract	Passed at the in-the-product exposure with a scaling factor of 0.05 applied.
H – Extraction of Metals	Passed at the in-the-product exposure with a scaling factor of 0.05 applied.

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 : Not applicable.

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CLAUSE 6.2 Taste of Water Extract

Sample Description	The valve was tested at the in-the-product exposure. Each valve held approximately 150 mL of water. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperatur	20°C ± 2°C.
Test Method	Taste of Water Extract (Appendix C)
Test Information	
Scaling Factor	A scaling factor of 0.05 was applied.
Results	Not detected (sample and controls).
Evaluation	The product passed the requirements of clause 6.2 when tested at the in-the-product exposure with a scaling factor of 0.05 applied.
Number of Samples	2.
Test Comment	Not applicable.

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CLAUSE 6.3 Appearance of Water Extract

Sample Description The valve was tested at the in-the-product exposure. Each valve held approximately 150 mL of water. 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 A scaling factor of 0.05 was applied.

Results

	Test (- Blank)	Maximum Allowed	Units
Colour	<1	5	HU
Turbidity	<0.1	0.5	NTU

Evaluation The product passed the requirements of clause 6.3 when tested at the in-the-product exposure with a scaling factor of 0.05 applied.

Number of Samples 1.

Test Comment Not applicable.

Andrew Paul Ford

Andrew Ford
APPROVED SIGNATORY

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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description The non-metallic components were immersed at the in-use exposure. The surface area was in the range 1000 mm² per Litre and 15,000 mm² per Litre. Extracts were prepared using 2500 mL volumes of test water.

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

Inoculum The volume of the inoculum was 250 mL

Scaling Factor Not applied.

Results

Mean Dissolved Oxygen	Control	7.3	mg/L
Mean Dissolved Oxygen Differenc	Positive Reference	5.4	mg/L
	Negative Reference	<0.1	mg/L
	Test	1.20	mg/L

Evaluation The product passed the requirements of clause 6.4 when tested at the in-the-product exposure.

Number of Samples 1.

Test Comment Not applicable.

Thuy Diep
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CLAUSE 6.5 Cytotoxic Activity of Water Extract

Sample Description	The valve was tested at the in-the-product exposure. Each valve held approximately 150 mL of water. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperatur	20°C ± 2°C.
Test Method	Cytotoxic Activity of Water Extract (Appendix F)
Scaling Factor	A scaling factor of 0.05 was applied.
Results	Non-cytotoxic (sample and controls).
Evaluation	The product passed the requirements of clause 6.5 when tested at the in-the-product exposure with a scaling factor of 0.05 applied.
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.

Brendon King
APPROVED SIGNATORY

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CLAUSE 6.6 Mutagenic Activity of Water Extract

Sample Description The valve was tested at the in-the-product exposure. Each valve held approximately 150 mL of water. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperatur 20°C ± 2°C.

Test Method Mutagenic Activity of Water Extract (Appendix G)

Scaling Factor A scaling factor of 0.05 was applied.

Results

Bacteria Strain	S9	Blank	Sample Extract	Positive Controls	
Salmonella typhimurium TA98	-	27, 25, 30	29, 28, 25	3999, 4357, 3912	NPD (20µg)
Mean ± Standard deviation		27.3 ± 2.5	27.3 ± 2.1	4089.3 ± 235.9	
	+	36, 42, 41	28, 27, 47	3768, 4000, 3854	2-AF (20µg)
Mean ± Standard deviation		39.7 ± 3.2	34.0 ± 11.3	3874.0 ± 117.3	
Salmonella typhimurium TA100	-	193, 173, 168	174, 163, 160	997, 917, 1028	Azide (1.0µg)
Mean ± Standard deviation		178.0 ± 13.2	165.7 ± 7.4	980.7 ± 57.3	
	+	204, 216, 245	195, 232, 202	2584, 2595, 2567	2-AF (20µg)
Mean ± Standard deviation		221.7 ± 21.1	209.7 ± 19.7	2582.0 ± 14.1	
Salmonella typhimurium TA102	-	424, 408, 415	342, 432, 411	3409, 2299, 3531	Mitomycin C(10µg)
Mean ± Standard deviation		415.7 ± 8.0	395.0 ± 47.1	3079.7 ± 678.8	
	+	441, 498, 510	425, 470, 501	2744, 2951, 2937	
Mean ± Standard deviation		483.0 ± 36.9	465.3 ± 38.2	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 the in-the-product exposure with a scaling factor of 0.05 applied.

Number of Samples 1.

Test Comment Not applicable.

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CLAUSE 6.7 Extraction of Metals

Sample Description The valve was tested at the in-the-product exposure. Each valve held approximately 150 mL of water. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperatur 20°C ± 2°C.

Test Method Extraction of Metals (Appendix H)

Scaling Factor A scaling factor of 0.05 was 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, 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
Final Extract					
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	0.0018	0.0012	0.0009	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	0.0009	0.0006	0.0005	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	0.0003	0.0003	0.0003	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 the in-the-product exposure with a scaling factor of 0.05 applied.

Number of Samples 1.

Test Comment Not applicable.

Dzung Bui
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