

FINAL REPORT


Report ID : 250565

Report Information

Submitting Organisation : 00121312 : Arad Ltd
Account : 142320 : Arad Ltd
AWQC Reference : 142320-2018-CSR-9 : Prod Test: Octave Plastic Body 1.5" - 2" Water Meter
Project Reference : PT-3834
Product Designation : Octave Plastic Body Water Meter (1 1/2" representative model)
Composition of Product : Polyamide Polymer Body (see attachment 1 for additional information).
Product Manufacturer : Arad Ltd., Kibbutz Dalia, ISRAEL.
Use of Product : In-Line/Plastic Body Water Meter.
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 : 02-May-2019
Project Comment : The results presented herein demonstrate compliance of Octave Plastic Body Water Meter (1 1/2" representative model) to AS/NZS 4020 when tested at the 'in-the-product' exposure with a 0.1 scaling factor 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



Michael Glasson
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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 0.1 applied.
D – Appearance of Water Extract	Passed at the in-the-product exposure with a scaling factor of 0.1 applied.
E – Growth of Aquatic Micro-organisms	Passed when tested at the in-use exposure.
F – Cytotoxic Activity of Water Extract	Passed at the in-the-product exposure with a scaling factor of 0.1 applied.
G – Mutagenic Activity of Water Extract	Passed at the in-the-product exposure with a scaling factor of 0.1 applied.
H – Extraction of Metals	Passed at the in-the-product exposure with a scaling factor of 0.1 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 : Product range to include 1 1/2" to 2" models.

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CLAUSE 6.2 Taste of Water Extract

Sample Description	The meter was tested at the in-the-product exposure. Each meter held approximately 150 mL of water. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperature	20°C ± 2°C.
Test Method	Taste of Water Extract (Appendix C)
Test Information	
Scaling Factor	A scaling factor of 0.1 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 0.1 applied.
Number of Samples	2.
Test Comment	Not applicable.



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CLAUSE 6.3 Appearance of Water Extract

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

Extraction Temperature 20°C ± 2°C.

Test Method Appearance of Water Extract (Appendix D)

Scaling Factor A scaling factor of 0.1 was 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 the in-the-product exposure with a scaling factor of 0.1 applied.

Number of Samples 1.

Test Comment Not applicable.



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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 1000 mL volumes of test water.

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

Inoculum The volume of the inoculum was 125 mL

Scaling Factor Not applicable.

Results			
Mean Dissolved Oxygen	Control		7.4 mg/L
Mean Dissolved Oxygen Differenc	Positive Reference		3.9 mg/L
	Negative Reference		<0.1 mg/L
	Test		<0.10 mg/L

Evaluation The product passed the requirements of clause 6.4 when tested at the in-use 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 meter was tested at the in-the-product exposure. Each meter held approximately 150 mL of water. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperature	20°C ± 2°C.
Test Method	Cytotoxic Activity of Water Extract (Appendix F)
Scaling Factor	A scaling factor of 0.1 was applied.
Results	Non-cytotoxic.
Evaluation	The product passed the requirements of clause 6.5 when tested at the in-the-product exposure with a scaling factor of 0.1 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.



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CLAUSE 6.6 Mutagenic Activity of Water Extract

Sample Description The meter was tested at the in-the-product exposure. Each meter held approximately 150 mL of water. 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 A scaling factor of 0.1 was applied.

Results

	<u>Bacteria Strain</u>		<u>Number of Revertants per Plate</u>			
	S9	Blank	Sample Extract	Positive Controls		
<i>Salmonella typhimurium</i> TA98	-	21, 32, 22	17, 29, 17	4131, 4026, 4234		<u>NPD</u> (20µg)
Mean ± Standard deviation		25.0 ± 6.1	21.0 ± 6.9	4130.3 ± 104.0		
	+	18, 16, 19	13, 19, 16	3784, 4022, 3846		<u>2-AF</u> (20µg)
Mean ± Standard deviation		17.7 ± 1.5	16.0 ± 3.0	3884.0 ± 123.5		
<i>Salmonella typhimurium</i> TA100	-	147, 115, 119	107, 99, 135	900, 917, 912		<u>Azide</u> (1.0µg)
Mean ± Standard deviation		127.0 ± 17.4	113.7 ± 18.9	909.7 ± 8.7		
	+	126, 116, 140	128, 159, 158	2408, 2344, 2187		<u>2-AF</u> (20µg)
Mean ± Standard deviation		127.3 ± 12.1	148.3 ± 17.6	2313.0 ± 113.7		
<i>Salmonella typhimurium</i> TA102	-	407, 448, 525	428, 419, 467	3408, 3692, 3046		<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		460.0 ± 59.9	438.0 ± 25.5	3382.0 ± 323.8		
	+	445, 518, 466	462, 473, 453	2204, 2471, 2285		
Mean ± Standard deviation		476.3 ± 37.6	462.7 ± 10.0	2320.0 ± 136.9		

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 0.1 applied.

Number of Samples 1.

Test Comment Not applicable.



Peter Christopoulos
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CLAUSE 6.7 Extraction of Metals

Sample Description The meter was tested at the in-the-product exposure. Each meter held approximately 150 mL of water. 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 A scaling factor of 0.1 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	<0.0003	<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	0.0003	0.0004	0.0003	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	0.0010	<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 the in-the-product exposure with a scaling factor of 0.1 applied.

Number of Samples 1.

Test Comment Not applicable.



Dzung Bui
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AS/NZS 4020:2005

Attachment 1

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SAMPLE REFERENCE PT-3834

DATE 23/04/2019

PRODUCT DESCRIPTION Octave Plastic Body Water Meter (1 1/2" representative model)

A. MATERIAL of each product submitted		B. COMPONENTS which are manufactured from each wetted material		C. FITTINGS/ASSEMBLED PRODUCT in which components will be used	
Name & Code	Manufacturer/ Supplier	Name & Code	Manufacturer/ Supplier	Name & Code	Manufacturer/ Supplier
VICTREX PEEK 450G BEIGE	VICTREX	96210209 D-FLOW SENSOR WIRE L=260mm	D-FLOW	Octave 1 1/2"-2"	ARAD Ltd.
29100013EM PPA+40%GF (GRIVORY XE 4101 BLACK 9225)	EMS CHEMIE AG	31535009 (exist only in 1 1/2" w/m) BODY OCTAVE 1 1/2" PLASTIC THREADED	ARAD Ltd.		
29100013EM PPA+40%GF (GRIVORY XE 4101 BLACK 9225)	EMS CHEMIE AG	31540009(exist only in 2" w/m) BODY OCTAVE 2" PLASTIC THREADED	ARAD Ltd.		

