

FINAL REPORT

Report ID : 98109

Report Information

Submitting Organisation : 00109049 : VIPAC Engineers & Scientists Ltd
Account : 130044 : Vipac Engineers & Scientists Limited - AS/NZS 4020 Testing
AWQC Reference : 130044-2012-CSR-3 : Prod Test: 200 L Vertical Tank HWS
Project Reference : PT-1784
Product Designation : Megasun Forced Circulation System 200/BL2 Vertical Storage Tank with Heat Exchange
Composition of Product : Steel Plate USD 37.2 quality, Glass Enameling Internal and Coil Heat Exchanger - Heavy Duty Steel Tube (33 mm).
Product Manufacturer : Solamet S.A Athens-Lamia National Road, Ypato Thivon, GREECE.
Use of Product : In-Use/Hot Water Storage Tank.
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 : Appendix K
Samples : Samples were prepared and controlled as described in Appendix A of AS/NZS 4020:2005
Extracts : Extracts were prepared as described in Appendix D, F, G, H.
Project Completion Date : 27-Feb-2012
Project Comment : The results presented herein demonstrate compliance of the Megasun Forced Circulation System 200/BL2 Vertical Storage Tank with Heat Exchanger to AS/NZS 4020 when exposed at the In-use exposure.

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
D – Appearance of Water Extract	Passed when tested at the In-use exposure.
F – Cytotoxic Activity of Water Extract	Passed when tested at the In-use exposure.
G – Mutagenic Activity of Water Extract	Passed when tested at the In-use exposure.
H – Extraction of Metals	Passed when tested at the In-use exposure.

Summary Comment : Product range to include 200 L to 1000 L storage tank capacities.



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CLAUSE 6.3 Appearance of Water Extract

Sample Description The tank was tested at the In-use exposure. Each system in contact with approximately 200 L of water. Extracts were prepared using 1000 mL volumes of water.

Extraction Temperature Max Op. Temp.

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 the In-use exposure.

Number of Samples 1.

Test Comment Not applicable.



Joanne Clark
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CLAUSE 6.5 Cytotoxic Activity of Water Extract

Sample Description The tank was tested at the in-use exposure. Each system in contact with approximately 200 L of water. Extracts were prepared using 1000 mL volumes of water.

Extraction Temperature Max Op. Temp.

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 the in-use exposure.

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
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CLAUSE 6.6 Mutagenic Activity of Water Extract

Sample Description The tank was tested at the In-use exposure. Each system in contact with approximately 200 L of water. Extracts were prepared using 1000 mL volumes of water.

Extraction Temperature Max Op. Temp.

Test Method Mutagenic Activity of Water Extract (Appendix G)

Scaling Factor Not applied.

Results

Bacteria Strain	Number of Revertants per Plate				
	S9	Blank	Sample Extract	Positive Controls	
Salmonella typhimurium TA98	-	46, 31, 28	33, 34, 34	2200, 2230, 1949	<u>NPD</u> (20µg)
Mean ± Standard deviation		35.0 ± 9.6	33.7 ± 0.6	2126.3 ± 154.3	
	+	28, 46, 39	36, 44, 32	2129, 1961, 2209	<u>2-AF</u> (20µg)
Mean ± Standard deviation		37.7 ± 9.1	37.3 ± 6.1	2099.7 ± 126.6	
Salmonella typhimurium TA100	-	145, 176, 251	150, 149, 152	754, 575, 642	<u>Azide</u> (1.0µg)
Mean ± Standard deviation		190.7 ± 54.5	150.3 ± 1.5	657.0 ± 90.4	
	+	75, 211, 219	264, 223, 240	1507, 1699, 2231	<u>2-AF</u> (20µg)
Mean ± Standard deviation		168.3 ± 80.9	242.3 ± 20.6	1812.3 ± 375.1	
Salmonella typhimurium TA102	-	566, 592, 603	594, 575, 645	1735, 1776, 1804	<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		587.0 ± 19.0	604.7 ± 36.2	1771.7 ± 34.7	
	+	563, 273, 439	542, 499, 452		
Mean ± Standard deviation		425.0 ± 145.5	497.7 ± 45.0		

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 the In-use exposure.

Number of Samples 1.

Test Comment Not applicable.



Peter Christopoulos
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CLAUSE 6.7 Extraction of Metals

Sample Description The tank was tested at the in-use exposure. Each system in contact with approximately 200 L of water. Extracts were prepared using 1000 mL volumes of water.

Extraction Temperature Max Op. Temp.

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, 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
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	0.0326	0.2170	0.2177	0.7
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	0.002
Chromium	0.0001	0.0003	0.0009	0.0008	0.05
Copper	0.0001	0.0596	0.0212	0.0208	2.0
Lead	0.0001	0.0008	0.0006	0.0006	0.01
Mercury	0.00003	<0.00003	<0.00003	<0.00003	0.001
Molybdenum	0.0001	0.0002	0.0003	0.0003	0.05
Nickel	0.0001	0.0022	0.0006	0.0005	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-use exposure.

Number of Samples 1.

Test Comment Not applicable.



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