FINAL REPORT

Report ID: 5R105

Report Information

Submitting Organisation: 01109049: VIPAC Engineers & Scientists Ltd
Account: 110041: Vpac Engineers & Scientists Limited - AS/NZS 4020 Testing
AWQC Reference: 110041-2012-CSR-3: Prod Test: 200 L Vertical Tank HVS
Project Reference: PT-1784
Product Designation: Megason Forced Circulation System 200L Vertical Storage Tank with Heat Exchanger
Composition of Product: Stainless Steel SUS 316 quality, Glass Enameling Internal and Coll Heat Exchanger - Heavy Duty Steel Tube (33 mm).
Product Manufacturer: Solaris 5A Athens-Lamia National Road, Ypato Thirion, 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 Megason Forced Circulation System 200L Vertical Storage Tank with Heat Exchanger to AS/NZS 4020 when exposed to 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 EXCISE, COULD AFFECT THE SUITABILITY OF THE PRODUCT FOR USE IN CONTACT WITH DRINKING WATER.

[Signature]
M. Guiseon
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### Summary of Results

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>D — Appearance of Water Extract</td>
<td>Passed when tested at the in-use exposure.</td>
</tr>
<tr>
<td>F — Cytotoxic Activity of Water Extract</td>
<td>Passed when tested at the in-use exposure.</td>
</tr>
<tr>
<td>G — Mutagenic Activity of Water Extract</td>
<td>Passed when tested at the in-use exposure.</td>
</tr>
<tr>
<td>H — Extraction of Metals</td>
<td>Passed when tested at the in-use exposure.</td>
</tr>
</tbody>
</table>

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


Test Method: Appearance of Water Extract (Appendix D)

Scaling Factor: Not applied.

Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Limit</th>
<th>Maximum Allowed</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>1</td>
<td>5</td>
<td>HU</td>
</tr>
<tr>
<td>Turbidity</td>
<td>-0.1</td>
<td>0.5</td>
<td>NTU</td>
</tr>
</tbody>
</table>

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.
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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.


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 61) in the analysis. In addition, zino sulphate (5.4 mM) was used for the positive control in the analysis.

Dreidon 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. Tanks were prepared using 1000 mL volumes of water.

### Extraction Temperature

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

### Scaling Factor
Not applied.

### Results

<table>
<thead>
<tr>
<th>Bacteria Strain</th>
<th>Number of Revertants per Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blank</td>
</tr>
<tr>
<td>Salmonella typhimurium TA98</td>
<td>46, 31, 23</td>
</tr>
<tr>
<td>Mean ± Standard deviation</td>
<td>35.0 ± 6.6</td>
</tr>
<tr>
<td>+</td>
<td>20, 45, 39</td>
</tr>
<tr>
<td>Mean ± Standard deviation</td>
<td>37.7 ± 9.1</td>
</tr>
<tr>
<td>Salmonella typhimurium TA100</td>
<td>145, 178, 251</td>
</tr>
<tr>
<td>Mean ± Standard deviation</td>
<td>190.7 ± 54.5</td>
</tr>
<tr>
<td>+</td>
<td>75, 211, 110</td>
</tr>
<tr>
<td>Mean ± Standard deviation</td>
<td>168.3 ± 60.9</td>
</tr>
<tr>
<td>Salmonella typhimurium TA102</td>
<td>646, 692, 603</td>
</tr>
<tr>
<td>Mean ± Standard deviation</td>
<td>587.0 ± 19.0</td>
</tr>
<tr>
<td>+</td>
<td>503, 273, 428</td>
</tr>
<tr>
<td>Mean ± Standard deviation</td>
<td>426.0 ± 145.5</td>
</tr>
</tbody>
</table>

### Comments
S9 was used as a metabolic activator. NPO (3-nitro-o-phenylendiamine), Azida, 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.

_Signed by Peter Christopoulos, APPROVED SIGNATORY_

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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 100 mL volumes of water.


**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, AIWPA 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 4020:2000 are determined as follows: Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium and Silver by Inductively Coupled Plasma Mass Spectrometry.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Limit of Reporting</th>
<th>Blank</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Max Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
</tr>
<tr>
<td>Antimony</td>
<td>0.0005</td>
<td>-0.0002</td>
<td>-0.0005</td>
<td>-0.0005</td>
<td>0.003</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.0005</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>0.007</td>
</tr>
<tr>
<td>Barium</td>
<td>0.0000</td>
<td>0.0002</td>
<td>0.275</td>
<td>0.277</td>
<td>0.7</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.0004</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>0.003</td>
</tr>
<tr>
<td>Chromium</td>
<td>0.0001</td>
<td>0.0003</td>
<td>0.0005</td>
<td>0.0008</td>
<td>0.05</td>
</tr>
<tr>
<td>Copper</td>
<td>0.0001</td>
<td>0.0096</td>
<td>0.0112</td>
<td>0.0128</td>
<td>0.01</td>
</tr>
<tr>
<td>Lead</td>
<td>0.0001</td>
<td>0.0005</td>
<td>0.0005</td>
<td>0.0006</td>
<td>0.01</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.00003</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>0.001</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>0.0001</td>
<td>0.0002</td>
<td>0.0003</td>
<td>0.0003</td>
<td>0.05</td>
</tr>
<tr>
<td>Nickel</td>
<td>0.0001</td>
<td>0.0002</td>
<td>0.0005</td>
<td>0.0002</td>
<td>0.02</td>
</tr>
<tr>
<td>Selenium</td>
<td>0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>0.01</td>
</tr>
<tr>
<td>Silver</td>
<td>0.00003</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>0.1</td>
</tr>
</tbody>
</table>

**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.

*Zhang Bu*  
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