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Equus Armac  
Attn: Dean Barr  
PO Box 3424  
Mornington  
VIC 3424  
AUSTRALIA

28/06/2016

Dear Dean,

Please find the attached report to AS/NZS 4020:2005 for VELOSIT WP 101, VELOSIT RM 205 and VELOSIT WP 120 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,

A handwritten signature in black ink, appearing to read "M Glasson", is written over a light blue horizontal line.

Michael Glasson  
Supervisor Product Testing



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Chemical and Biological Testing  
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## FINAL REPORT

Report ID : 184925

### Report Information

**Submitting Organisation** : 00121017 : Equus Armac  
**Account** : 141815 : Equus Armac  
**AWQC Reference** : 141815-2016-CSR-1 : Prod Test: Velosit - WP101/RM205/WP120  
**Project Reference** : PT-2804  
**Product Designation** : VELOSIT WP 101, VELOSIT RM 205 and VELOSIT WP 120  
**Composition of Product** : Cementitious - 2mm VELOSIT WP 101 (surface), 10mm VELOSIT RM 205 (core) and 2mm VELOSIT WP 120.  
**Product Manufacturer** : VELOSIT GmbH & Co. KG, Horn-Bad Meinberg, GERMANY.  
**Use of Product** : In-Line/Cementitious Repair and Waterproofing System.  
**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** : 28-Jun-2016  
**Project Comment** : The results presented herein demonstrate compliance to AS/NZS 4020 for VELOSIT WP 101, VELOSIT RM 205 and VELOSIT WP 120 at 20°C ± 2°C, exposed at an area to volume ratio up to 15,000 mm<sup>2</sup>/L.

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                                | RESULTS   |
|---|---|
| C – Taste of Water Extract              | Passed at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core). |
| D – Appearance of Water Extract         | Passed at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core). |
| E – Growth of Aquatic Micro-organisms   | Passed at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core). |
| F – Cytotoxic Activity of Water Extract | Passed at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core). |
| G – Mutagenic Activity of Water Extract | Passed at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core). |
| H – Extraction of Metals                | Passed at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core). |

### Test Methods

| Test(s) in Appendix | AWQC Test Method    | Reference Method |
|---------------------|---------------------|------------------|
| C                   | T0320-01            | AS/NZS 4020:2005 |
| D                   | TO029-01 & TO018-01 | APHA 2130b       |
| E                   | TO014-03            | APHA 4500 O C    |
| F                   | TM-001              | AS/NZS 4020:2005 |
| G                   | TM-002              | AS/NZS 4020:2005 |
| H                   | TIC-006             | EPA 200.8        |

### Summary Comment :

Thirty five sequential soakings were performed to obtain a pH < 9.0. In accordance with section A8 (Cementitious Products).

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### CLAUSE 6.2 Taste of Water Extract

|                              |   |
|------------------------------|---|
| <b>Sample Description</b>    | The sample consisted of a cementitious panel containing three layers (2 outer surfaces at 15,000mm <sup>2</sup> /L and 1 central core layer at 4300mm <sup>2</sup> /L). Extracts were prepared using 500 mL volumes of pre-conditioning water(AI 12.6). |
| <b>Extraction Temperatur</b> | 20°C ± 2°C.   |
| <b>Test Method</b>           | Taste of Water Extract (Appendix C)   |
| <b>Test Information</b>      |   |
| <b>Scaling Factor</b>        | Not applicable.   |
| <b>Results</b>               | Not detected.   |
| <b>Evaluation</b>            | The product passed the requirements of clause 6.2 when tested at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core).  |
| <b>Number of Samples</b>     | 2.  |
| <b>Test Comment</b>          | Not applicable.   |



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### CLAUSE 6.3 Appearance of Water Extract

#### Sample Description

The sample consisted of a cementitious panel containing three layers (2 outer surfaces at 15,000mm<sup>2</sup>/L and 1 central core layer at 4300mm<sup>2</sup>/L). Extracts were prepared using 500 mL volumes of pre-conditioning water(AI 12.6).

#### Extraction Temperatur

20°C ± 2°C.

#### Test Method

Appearance of Water Extract (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

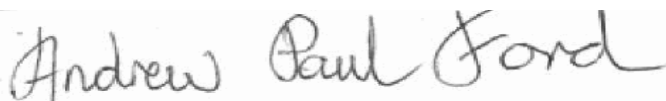
The product passed the requirements of clause 6.3 when tested at an exposure of 15000 mm<sup>2</sup>/L (outer side) and 4300mm<sup>2</sup>/L (core).

#### Number of Samples

1.

#### Test Comment

Not applicable.



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### CLAUSE 6.4 Growth of Aquatic Micro-organisms

#### Sample Description

The sample consisted of a cementitious panel containing three layers (2 outer surfaces at 15,000mm<sup>2</sup>/L and 1 central core layer at 4300mm<sup>2</sup>/L). Extracts were prepared using 500 mL volumes of test water.

#### Test Method

Growth of Aquatic Micro-organisms (Appendix E)

#### Inoculum

The volume of the inoculum was 100 mL

#### Scaling Factor

Not applicable.

#### Results

|                                 |                    |           |
|---------------------------------|--------------------|-----------|
| Mean Dissolved Oxygen           | Control            | 7.2 mg/L  |
| Mean Dissolved Oxygen Differenc | Positive Reference | 5.4 mg/L  |
|                                 | Negative Reference | <0.1 mg/L |
|                                 | Test               | 0.80 mg/L |

#### Evaluation

The product passed the requirements of clause 6.4 when tested at an exposure of 15000 mm<sup>2</sup>/L (outer side) and 4300mm<sup>2</sup>/L (core).

#### Number of Samples

1.

#### Test Comment

Not applicable.



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### CLAUSE 6.5 Cytotoxic Activity of Water Extract

|                              |  |
|------------------------------|--|
| <b>Sample Description</b>    | The sample consisted of a cementitious panel containing three layers (2 outer surfaces at 15,000mm <sup>2</sup> /L and 1 central core layer at 4300mm <sup>2</sup> /L). Extracts were prepared using 500 mL volumes of pre-conditioning water(AI 12.6).  |
| <b>Extraction Temperatur</b> | 20°C ± 2°C.  |
| <b>Test Method</b>           | Cytotoxic Activity of Water Extract (Appendix F)   |
| <b>Scaling Factor</b>        | Not applicable.  |
| <b>Results</b>               | Non-Cytotoxic.   |
| <b>Evaluation</b>            | The product passed the requirements of clause 6.5 when tested at an exposure of 15000 mm <sup>2</sup> /L (outer side) and 4300mm <sup>2</sup> /L (core).   |
| <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. |



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### CLAUSE 6.6 Mutagenic Activity of Water Extract

**Sample Description** The sample consisted of a cementitious panel containing three layers (2 outer surfaces at 15,000mm<sup>2</sup>/L and 1 central core layer at 4300mm<sup>2</sup>/L). Extracts were prepared using 500 mL volumes of pre-conditioning water(AI 12.6).

**Extraction Temperatur** 20°C ± 2°C.

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

**Scaling Factor** Not applicable.

#### Results

| Bacteria Strain                     | Number of Revertants per Plate |               |                |                   |                           |
|-------------------------------------|--------------------------------|---------------|----------------|-------------------|---------------------------|
|                                     | S9                             | Blank         | Sample Extract | Positive Controls |                           |
| <i>Salmonella typhimurium</i> TA98  | -                              | 36, 30, 24    | 35, 31, 20     | 2125, 2343, 2180  | <u>NPD</u> (20µg)         |
| Mean ± Standard deviation           |                                | 30.0 ± 6.0    | 28.7 ± 7.8     | 2216.0 ± 113.4    |                           |
|                                     | +                              | 36, 38, 38    | 34, 32, 33     | 1577, 1658, 1399  | <u>2-AF</u> (20µg)        |
| Mean ± Standard deviation           |                                | 37.3 ± 1.2    | 33.0 ± 1.0     | 1544.7 ± 132.5    |                           |
| <i>Salmonella typhimurium</i> TA100 | -                              | 761, 731, 854 | 670, 673, 715  | 1563, 1710, 1624  | <u>Azide</u> (1.0µg)      |
| Mean ± Standard deviation           |                                | 782.0 ± 64.1  | 686.0 ± 25.2   | 1632.3 ± 73.9     |                           |
|                                     | +                              | 250, 262, 282 | 243, 211, 269  | 1234, 928, 686    | <u>2-AF</u> (20µg)        |
| Mean ± Standard deviation           |                                | 264.7 ± 16.2  | 241.0 ± 29.1   | 949.3 ± 274.6     |                           |
| <i>Salmonella typhimurium</i> TA102 | -                              | 473, 610, 459 | 481, 495, 518  | 2754, 2617, 2754  | <u>Mitomycin C</u> (10µg) |
| Mean ± Standard deviation           |                                | 514.0 ± 83.4  | 498.0 ± 18.7   | 2708.3 ± 79.1     |                           |
|                                     | +                              | 452, 460, 534 | 524, 476, 470  | 2272, 1795, 1822  |                           |
| Mean ± Standard deviation           |                                | 482.0 ± 45.2  | 490.0 ± 29.6   | 1963.0 ± 267.9    |                           |

**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 an exposure of 15000 mm<sup>2</sup>/L (outer side) and 4300mm<sup>2</sup>/L (core).

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.7 Extraction of Metals

**Sample Description** The sample consisted of a cementitious panel containing three layers (2 outer surfaces at 15,000mm<sup>2</sup>/L and 1 central core layer at 4300mm<sup>2</sup>/L). Extracts were prepared using 500 mL volumes of pre-conditioning water(AI 12.6).

**Extraction Temperature** 20°C ± 2°C.

**Test Method** Extraction of 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 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<br>mg/L | Blank<br>mg/L | Test 1<br>mg/L | Test 2<br>mg/L | Max Allowed<br>mg/L |
|----------------------|----------------------------|---------------|----------------|----------------|---------------------|
| <b>Final Extract</b> |                            |               |                |                |                     |
| 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                     | 0.0264        | 0.0274         | 0.0269         | 0.7                 |
| Cadmium              | 0.0001                     | <0.0001       | <0.0001        | <0.0001        | 0.002               |
| Chromium             | 0.0001                     | 0.0002        | 0.0003         | 0.0002         | 0.05                |
| Copper               | 0.0001                     | 0.1803        | 0.1868         | 0.1859         | 2.0                 |
| Lead                 | 0.0001                     | 0.0007        | 0.0009         | 0.0009         | 0.01                |
| Mercury              | 0.00003                    | <0.00003      | <0.00003       | 0.00020        | 0.001               |
| Molybdenum           | 0.0001                     | 0.0002        | 0.0002         | 0.0002         | 0.05                |
| Nickel               | 0.0001                     | 0.0026        | 0.0029         | 0.0029         | 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 15000 mm<sup>2</sup>/L (outer side) and 4300mm<sup>2</sup>/L (core).

**Number of Samples** 1.

**Test Comment** Not applicable.



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