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Zintec Corrosion Solutions
Attn: Grant Weatherburn
61 Derwent Park Road
Moonah
TAS 7009
AUSTRALIA

23/08/2012

Dear Grant,

Please find the attached report to AS/NZS 4020:2005 for Zinga 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".

Michael Glasson
Product Testing Team Leader



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FINAL REPORT


Report ID : 107478

Report Information

Submitting Organisation : 00121120 : Zintec Corrosion Solutions
Account : 142045 : Zintec Corrosion Solutions
AWQC Reference : 142045-2012-CSR-1 : Prod Test: Zinga LGF
Project Reference : PT-1857
Product Designation : Zinga
Composition of Product : 96% Zinc in Dry Film (see MSDS and Technical Data Sheet for additional information).
Product Manufacturer : Zingametall, BELGIUM.
Use of Product : In-Line/Protective Coating of Steel Assets.
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 : 23-Aug-2012
Project Comment : The results presented herein demonstrate compliance to AS/NZS 4020 for Zinga, exposed at an area to volume ratio up to 1000 mm²/L 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
APPROVED SIGNATORY



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Summary of Results

APPENDIX	RESULTS
C – Taste of Water Extract	Passed at an exposure of 1000 mm ² /L.
D – Appearance of Water Extract	Passed at an exposure of 15000 mm ² /L.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 6300 mm ² /L with scaling factor of 0.42 applied.
F – Cytotoxic Activity of Water Extract	Passed at an exposure of 15000 mm ² /L.
G – Mutagenic Activity of Water Extract	Passed at an exposure of 15000 mm ² /L.
H – Extraction of Metals	Passed at an exposure of 15000 mm ² /L.

Summary Comment : The sample was applied and cured by the submitting organisation.

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CLAUSE 6.2 Taste of Water Extract

Sample Description	The sample consisted of a panel with dimensions 25 mm x 40 mm providing a surface area of 1000 mm ² per Litre. 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	Not applied.
Results	Not detected.
Evaluation	The product passed the requirements of clause 6.2 when tested at an exposure of 1000 mm ² per Litre.
Number of Samples	2.
Test Comment	Panellists detected stale tastes in the first dilution of the final (seventh) chlorinated extracts when tested at an exposure of 6300 mm ² /L. Test was repeated at 1000 mm ² /L and no tastes were detected.



Peter Christopoulos
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CLAUSE 6.3 Appearance of Water Extract

Sample Description The sample consisted of two glass slides each with a single side coated measuring 75 mm x 100 mm giving an approximate surface area of 15000 mm² per Litre. 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 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 an exposure of 15000 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.



Joanne Clark
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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description The sample consisted of two glass slides each with a single side coated measuring 75 mm x 100 mm giving an approximate surface area of 15000 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 100 mL

Scaling Factor A scaling factor of 0.42 was applied.

Results

Mean Dissolved Oxygen	Control	7.4 mg/L
Mean Dissolved Oxygen Difference	Positive Reference	5.4 mg/L
	Negative Reference	<0.1 mg/L
	Test	1.60 mg/L

Evaluation The product passed the requirements of clause 6.4 when tested at an exposure of 6300 mm² per Litre with a scaling factor of 0.42 applied.

Number of Samples 1.

Test Comment The Mean Dissolved Oxygen Difference in the extracts exceeded the maximum allowable concentration. A scaling factor of 0.42 was applied.



Stephanie Semczuk
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CLAUSE 6.5 Cytotoxic Activity of Water Extract

Sample Description The sample consisted of two glass slides each with a single side coated measuring 75 mm x 100 mm giving an approximate surface area of 15000 mm² per Litre. 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 Not applied.

Results Non cytotoxic.

Evaluation The product passed the requirements of clause 6.5 when tested at an exposure of 15000 mm² per Litre.

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 sample consisted of two glass slides each with a single side coated measuring 75 mm x 100 mm giving an approximate surface area of 15000 mm² per Litre. 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 Not applied.

Results

<u>Bacteria Strain</u>	<u>Number of Revertants per Plate</u>				
	S9	Blank	Sample Extract	Positive Controls	
<i>Salmonella typhimurium</i> TA98	-	34, 51, 47	45, 49, 44	1987, 2246, 1712	<u>NPD</u> (20µg)
Mean ± Standard deviation		44.0 ± 8.9	46.0 ± 2.6	1981.7 ± 267.0	
	+	45, 47, 38	33, 40, 46	1849, 2017, 1992	<u>2-AF</u> (20µg)
Mean ± Standard deviation		43.3 ± 4.7	39.7 ± 6.5	1952.7 ± 90.6	
<i>Salmonella typhimurium</i> TA100	-	336, 327, 318	314, 329, 282	869, 849, 872	<u>Azide</u> (1.0µg)
Mean ± Standard deviation		327.0 ± 9.0	308.3 ± 24.0	863.3 ± 12.5	
	+	294, 296, 333	302, 307, 290	1503, 1601, 2462	<u>2-AF</u> (20µg)
Mean ± Standard deviation		307.7 ± 22.0	299.7 ± 8.7	1855.3 ± 527.7	
<i>Salmonella typhimurium</i> TA102	-	729, 698, 833	709, 737, 721	1876, 2000, 2004	<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		753.3 ± 70.7	722.3 ± 14.0	1960.0 ± 72.8	
	+	712, 753, 1015	828, 724, 1048		
Mean ± Standard deviation		826.7 ± 164.4	866.7 ± 165.4		

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 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.



Peter Christopoulos
APPROVED SIGNATORY

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CLAUSE 6.7 Extraction of Metals

Sample Description The sample consisted of two glass slides each with a single side coated measuring 75 mm x 100 mm giving an approximate surface area of 15000 mm² per Litre. 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 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	<0.0005	<0.0005	<0.0005	0.7
Cadmium	0.0005	<0.0001	<0.0001	<0.0001	0.002
Chromium	0.0001	<0.0001	<0.0001	<0.0001	0.05
Copper	0.0001	<0.0001	<0.0001	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	<0.0001	<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 an exposure of 15000 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.



Dzung Bui
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