

FINAL REPORT


Report ID : 113165

Report Information

Submitting Organisation : 00121168 : Cable Distribution Services
Account : 142123 : Cable Distribution Services
AWQC Reference : 142123-2012-CSR-1 : Prod Test: Xtrem H07RN-F DN-F Cable Material
Project Reference : PT-1981
Product Designation : Xtrem H07RN-F DN-F Cable Material
Composition of Product : Rubber Insulated and Sheathed Cores.
Product Manufacturer : Topcable, SPAIN.
Use of Product : In-Line/ Submersible Pump Cable.
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 : 24-Dec-2012
Project Comment : The results presented herein demonstrate compliance of Xtrem H07RN-F DN-F Cable Material to AS/NZS 4020:2005 when exposed at area to volume ratios up to 2500 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
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Summary of Results

APPENDIX	RESULTS
C – Taste of Water Extract	Passed at an exposure of 2500 mm2 per Litre.
D – Appearance of Water Extract	Passed at an exposure of 2500 mm2 per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 2500 mm2 per Litre.
F – Cytotoxic Activity of Water Extract	Passed at an exposure of 2500 mm2 per Litre.
G – Mutagenic Activity of Water Extract	Passed at an exposure of 2500 mm2 per Litre.
H – Extraction of Metals	Passed at an exposure of 2500 mm2 per Litre.

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 : Not applicable.



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CLAUSE 6.2 Taste of Water Extract

Sample Description	The sample consisted of a section of the sheath with dimensions 25 mm x 50 mm providing a surface area of approximately 2500 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 2500 mm ² per Litre.
Number of Samples	2.
Test Comment	Not applicable.



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Peter Christopoulos
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CLAUSE 6.3 Appearance of Water Extract

Sample Description The sample consisted of a section of the sheath with dimensions 25 mm x 50 mm providing a surface area of approximately 2500 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

	Test (- Blank)	Maximum Allowed	Units
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 2500 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 a section of the sheath with dimensions 25 mm x 50 mm providing a surface area of approximately 2500 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 Not applied.


Results

Mean Dissolved Oxygen	Control	7.3 mg/L
Mean Dissolved Oxygen Difference	Positive Reference	5.1 mg/L
	Negative Reference	<0.1 mg/L
	Test	0.60 mg/L

Evaluation The product passed the requirements of clause 6.4 when tested at an exposure of 2500 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.



Stephanie Semczuk
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CLAUSE 6.5 Cytotoxic Activity of Water Extract

Sample Description	The sample consisted of a section of the sheath with dimensions 25 mm x 50 mm providing a surface area of approximately 2500 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	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 2500 mm ² 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 a section of the sheath with dimensions 25 mm x 50 mm providing a surface area of approximately 2500 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	-	28, 23, 18	21, 26, 28	2488, 2497, 2448	<u>NPD</u> (20µg)
Mean ± Standard deviation		23.0 ± 5.0	25.0 ± 3.6	2477.7 ± 26.1	
	+	28, 34, 19	16, 28, 30	2212, 2531, 2814	<u>2-AF</u> (20µg)
Mean ± Standard deviation		27.0 ± 7.5	24.7 ± 7.6	2519.0 ± 301.2	
<i>Salmonella typhimurium</i> TA100	-	224, 184, 203	182, 164, 194	941, 1038, 1119	<u>Azide</u> (1.0µg)
Mean ± Standard deviation		203.7 ± 20.0	180.0 ± 15.1	1032.7 ± 89.1	
	+	193, 204, 243	189, 196, 250	1842, 2001, 1494	<u>2-AF</u> (20µg)
Mean ± Standard deviation		213.3 ± 26.3	211.7 ± 33.4	1779.0 ± 259.3	
<i>Salmonella typhimurium</i> TA102	-	644, 697, 683	560, 599, 678	2394, 2486, 2485	<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		674.7 ± 27.5	612.3 ± 60.1	2454.7 ± 52.5	
	+	456, 482, 594	480, 528, 540		
Mean ± Standard deviation		510.7 ± 73.3	514.3 ± 30.9		

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 2500 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.

Peter Christopoulos
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CLAUSE 6.7 Extraction of Metals

Sample Description The sample consisted of a section of the sheath with dimensions 25 mm x 50 mm providing a surface area of approximately 2500 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	<0.0001	2.0
Lead	0.0001	<0.0001	<0.0001	<0.0001	0.01
Mercury	0.00003	<0.00003	0.00005	<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 2500 mm² per Litre.

Number of Samples 1.

Test Comment Not applicable.



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