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Australian Water Quality Centre

FINAL REPORT

Report ID : 123421

Report Information

Submitting Organisation :	00121209 : Industrial Gaskets
Account :	142182 : Industrial Gaskets
AWQC Reference :	142182-2013-CSR-1 : Prod Test: BA-U Gasket Material
Project Reference :	PT-2053
Product Designation :	BA-U Gasket Material
Composition of Product :	Aramide Fibres and NBR.
Product Manufacturer :	DONIT TESNIT, d.o.o.Cesta komandanta Staneta , SLOVENIA
Use of Product :	In-Line/Compressed Gasket Material.
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, F, G, H.
Project Completion Date :	02-Aug-2013
Project Comment :	The results presented herein demonstrate compliance of BA-U Gasket Material to AS/NZS 4020:2005 when exposed at area to volume ratios up to 1000 mm2/L at 20°C ± 2°C. Product range to include 0.5 mm, 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm and 3.0 mm thicknesses.

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 1000 mm2 per Litre.
D – Appearance of Water Extract	Passed at an exposure of 1000 mm2 per Litre.
F – Cytotoxic Activity of Water Extract	Passed at an exposure of 1000 mm2 per Litre.
G – Mutagenic Activity of Water Extract	Passed at an exposure of 1000 mm2 per Litre.
H – Extraction of Metals	Passed at an exposure of 1000 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
F	TM-001	AS/NZS 4020:2005
G	TM-002	AS/NZS 4020:2005
H	TIC-006	EPA 200.8

Summary Comment : Refer to WRAS Certificate No. M 104731/A for test information (Appendix E).

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CLAUSE 6.2 Taste of Water Extract

Sample Description	The sample consisted of two gasket panels with dimensions 75 mm x 100 mm providing a total surface area of approximately 1000 mm2 per Litre (gasket edges exposed only). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperature	85°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 mm2 per Litre.
Number of Samples	4.
Test Comment	Panellists detected earthy/medicinal/musty tastes in the first dilution of the final (seventh) chlorinated extracts when tested at 95°C. The test was repeated with freshly submitted sample from a new batch at 20°C were no tastes were detected.

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CLAUSE 6.3 Appearance of Water Extract

Sample Description The sample consisted of two gasket panels with dimensions 75 mm x 100 mm providing a total surface area of approximately 1000 mm2 per Litre (gasket edges exposed only). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperature 85°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	0.4	0.5	NTU

Evaluation The product passed the requirements of clause 6.3 when tested at an exposure of 1000 mm2 per Litre.

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 sample consisted of two gasket panels with dimensions 75 mm x 100 mm providing a total surface area of approximately 1000 mm2 per Litre (gasket edges exposed only). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
Extraction Temperature	85°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 1000 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 gasket panels with dimensions 75 mm x 100 mm providing a total surface area of approximately 1000 mm2 per Litre (gasket edges exposed only). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperature 85°C ± 2°C.

Test Method Mutagenic Activity of Water Extract (Appendix G)

Scaling Factor Not applied.

Results

Bacteria Strain	S9	Blank	Sample Extract	Positive Controls	
		Number of Revertants per Plate			
Salmonella typhimurium TA98	-	15, 23, 19	13, 22, 14	1590, 2029, 2281	NPD (20µg)
Mean ± Standard deviation		19.0 ± 4.0	16.3 ± 4.9	1966.7 ± 349.7	
	+	19, 25, 17	15, 17, 23	1874, 2069, 2057	2-AF (20µg)
Mean ± Standard deviation		20.3 ± 4.2	18.3 ± 4.2	2000.0 ± 109.3	
Salmonella typhimurium TA100	-	402, 396, 408	313, 339, 292	978, 1018, 911	Azide (1.0µg)
Mean ± Standard deviation		402.0 ± 6.0	314.7 ± 23.5	969.0 ± 54.1	
	+	212, 206, 239	221, 184, 197	2141, 1958, 2646	2-AF (20µg)
Mean ± Standard deviation		219.0 ± 17.6	200.7 ± 18.8	2248.3 ± 356.3	
Salmonella typhimurium TA102	-	823, 742, 813	880, 783, 831	2811, 2622, 2547	Mitomycin C(10µg)
Mean ± Standard deviation		792.7 ± 44.2	831.3 ± 48.5	2660.0 ± 136.0	
	+	690, 605, 797	683, 618, 780		
Mean ± Standard deviation		697.3 ± 96.2	693.7 ± 81.5		

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 1000 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 two gasket panels with dimensions 75 mm x 100 mm providing a total surface area of approximately 1000 mm2 per Litre (gasket edges exposed only). Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

Extraction Temperature 85°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	0.0006	0.0005	<0.0005	0.003
Arsenic	0.0003	<0.0003	<0.0003	<0.0003	0.007
Barium	0.0005	0.0978	0.0165	0.0164	0.7
Cadmium	0.0001	<0.0001	0.0002	<0.0001	0.002
Chromium	0.0001	0.0001	0.0002	0.0002	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	0.00006	0.00009	0.001
Molybdenum	0.0001	<0.0001	0.0002	0.0002	0.05
Nickel	0.0001	<0.0001	0.0002	0.0002	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 1000 mm2 per Litre.

Number of Samples 1.

Test Comment Not applicable.

Dzung Bui
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