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FINAL REPORT

This report supersedes the following issued reports: 319641.

Report ID : 319732

Report Information

Submitting Organisation : 00100847 : Macsim Australia|New Zealand Pty Ltd
Account : 144432 : Macsim Australia|New Zealand Pty Ltd
AWQC Reference : 144432-2021-CSR-2 : Prod Test: 53TRGT (Translucent) MF50 Trans - Roof & Gutter
Project Reference : PT-4643
Product Designation : MF50 Roof and Gutter
Composition of Product : Silicone (Translucent).
Product Manufacturer : Hangzhou, CHINA.
Use of Product : In-Line/Silicone for Tanks, Guttering and Roofing.
Sample Selection: As provided by the submitting organisation.
Testing Requested : **AS/NZS 4020 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 4020:2018
Extracts : Extracts were prepared as described in Appendix/Clause C, D, E, F, G, H, 6.8.
Project Completion Date : 10-Sep-2021
Project Comment : Product sample was received on the 11-May-2021 and testing commenced 08-Jun-2021.

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/CLAUSE | RESULTS |
|---------------------------------------|--|
| C – Taste | Passed at an exposure of 2500 mm ² per Litre. |
| D – Appearance | Passed at an exposure of 2500 mm ² per Litre. |
| E – Growth of Aquatic Micro-organisms | Passed at an exposure of 2500 mm ² per Litre. |
| F – Cytotoxic Activity | Passed at an exposure of 2500 mm ² per Litre. |
| G – Mutagenic Activity | Passed at an exposure of 2500 mm ² per Litre. |
| H – Metals | Passed at an exposure of 2500 mm ² per Litre. |
| 6.8 – Organic Compounds | Passed at an exposure of 2500 mm ² per Litre. |

Test Methods

| Test(s) in Appendix | AWQC Test Method | Reference Method |
|---------------------|---------------------|-------------------------|
| C | T0320-01 | AS/NZS 4020:2018 |
| D | TO029-01 & TO018-01 | APHA 2120c & APHA 2130b |
| E | TO014-03 | APHA 4500 O G |
| F | TM-001 | AS/NZS 4020:2018 |
| G | TM-002 | AS/NZS 4020:2018 |
| H | TIC-006 | EPA 200.8 |

Organic Test Methods

| Test(s) in Clause | Test Method | Reference Method |
|-------------------|-------------|-------------------|
| Clause 6.8 | TMZ-M36 | USEPA524.2 |
| | EP239 | USEPA521 |
| | EP132-LL | USEPA_SW846-8270D |
| | EP075C | USEPA_SW846-8270D |
| | EP075ASIM | USEPA_SW846-8270D |

Summary Comment :

The sealant was applied and cured for seven days at 20°C prior to testing.



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CLAUSE 6.2

Taste

Sample Description

The sample consisted of one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total 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

Taste (Appendix C)

Test Information

Scaling Factor

Not applied.

Results

Not detected (sample and controls).

Evaluation


The product passed the requirements of clause 6.2 when tested at an exposure of 2500 mm² per Litre.

Number of Samples

2.

Test Comment

The 24 hour extracts were not analysed in this test.


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CLAUSE 6.3 Appearance

Sample Description The sample consisted of one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total 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 (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 2500 mm² per Litre.

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 one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total surface area of approximately 2500 mm ² 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 | 7.6 mg/L |
| | Mean Dissolved Oxygen Difference | Positive Reference | 5.3 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 2500 mm ² per Litre. | | |
| Number of Samples | 1. | | |
| Test Comment | Not applicable. | | |

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CLAUSE 6.5 Cytotoxic Activity

| | |
|-------------------------------|--|
| Sample Description | The sample consisted of one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total 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 (Appendix F) |
| Scaling Factor | Not applied. |
| Results | Non-cytotoxic (sample and controls). |
| 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. |

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CLAUSE 6.6 Mutagenic Activity

Sample Description The sample consisted of one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total 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 (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 | - | 24, 30, 22 | 31, 31, 31 | 3658, 3576, 3345 | <u>NPD</u> (20µg) |
| Mean ± Standard deviation | | 25.3 ± 4.2 | 31.0 ± 0.0 | 3526.3 ± 162.3 | |
| | + | 37, 27, 33 | 27, 33, 33 | 3616, 3615, 3620 | <u>2-AF</u> (20µg) |
| Mean ± Standard deviation | | 32.3 ± 5.0 | 31.0 ± 3.5 | 3617.0 ± 2.6 | |
| <i>Salmonella typhimurium</i> TA102 | - | 425, 466, 469 | 427, 420, 409 | 2232, 2247, 2173 | <u>Mitomycin C</u> (10µg) |
| Mean ± Standard deviation | | 453.3 ± 24.6 | 418.7 ± 9.1 | 2217.3 ± 39.1 | |
| | + | 545, 504, 456 | 462, 428, 491 | 1896, 2215, 2479 | |
| Mean ± Standard deviation | | 501.7 ± 44.5 | 460.3 ± 31.5 | 2196.7 ± 291.9 | |

Comments S9 was used as the metabolic activator. NPD (4-nitro-o-phenylenediamine) and Mitomycin C are specific positive controls for strains TA98 - and TA102 (- and +) respectively, while 2-AF (2-aminofluorene) when used in conjunction with S9 is a positive control for TA98+.

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 The differences in the mean number of revertants between the blank and test extracts do not exceed two standard deviations; accordingly there is no evidence of a mutagenic response.

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CLAUSE 6.7

Metals

Sample Description

The sample consisted of one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total 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

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 US EPA method 200.8 Determination of Trace elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry. 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 4020:2018 are determined as follows:

Aluminium, Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, 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 | | | | | |
| Aluminium | 0.001 | <0.001 | 0.006 | 0.006 | 0.2 |
| Antimony | 0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.003 |
| Arsenic | 0.0003 | <0.0003 | <0.0003 | <0.0003 | 0.01 |
| Barium | 0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.7 |
| Boron | 0.020 | <0.020 | 0.038 | 0.028 | 1.4 |
| Cadmium | 0.0001 | <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 |
| Iron | 0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.3 |
| Lead | 0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.01 |
| Manganese | 0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.1 |
| 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 2500 mm² per Litre.

Number of Samples

1.

Test Comment

Not applicable.



Dzung Bui

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CLAUSE 6.8 Organic Compounds

Sample Description The sample consisted of one panel (coated on a single side) with dimensions 25 mm x 100 mm providing a total 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 Organic Compounds (Clause 6.8). Max Allowed values are taken from the Australian Drinking Water Guidelines and Drinking-water Standards for New Zealand. Please note, some reported compounds have no guideline value.

Scaling Factor Not applied.

Results

Organic Compound

| Nitrosamines | Blank µg/L | Test µg/L | Max Allowed |
|----------------------------------|---------------|--------------|-------------|
| !External Lab Report No. | ES2122722 | ES2122722 | |
| 1-Nitrosopiperidine (NPip) | <0.003 | <0.003 | |
| 1-Nitrosopyrrolidine (NPyr) | <0.01 | <0.01 | |
| Nitrosomorpholine (NMor) | <0.003 | <0.003 | |
| N-Nitrosodiethylamine (NDEA) | <0.01 | <0.01 | |
| N-Nitrosodimethylamine (NDMA) | <0.003 | <0.003 | 0.1 µg/L |
| N-Nitrosodi-n-propylamine (NDPA) | <0.003 | <0.003 | |
| N-Nitrosomethylethylamine (NMEA) | <0.003 | <0.003 | |

Organic Compound

| Phenols | Blank µg/L | Test µg/L | Max Allowed |
|--------------------------|---------------|--------------|-------------|
| !External Lab Report No. | ES2122722 | ES2122722 | |
| 2 4 5-trichlorophenol | <1.0 | <1.0 | |
| 2 4 6-trichlorophenol | <1.0 | <1.0 | 20 µg/L |
| 2 4-dichlorophenol | <1.0 | <1.0 | 200 µg/L |
| 2 4-dimethylphenol | <1.0 | <1.0 | |
| 2 6-dichlorophenol | <1.0 | <1.0 | |
| 2-chlorophenol | <1.0 | <1.0 | 300 µg/L |
| 2-nitrophenol | <1.0 | <1.0 | |
| 4-chloro-3-methylphenol | <1.0 | <1.0 | |
| m+p cresol | <2.0 | <2.0 | |
| o-cresol | <1.0 | <1.0 | |
| pentachlorophenol | <2.0 | <2.0 | 9 µg/L |
| phenol | <1.0 | <1.0 | |



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Organic Compound

Phthalate Esters

| | Blank µg/L | Test µg/L | Max Allowed |
|-----------------------------|---------------|--------------|-------------|
| !External Lab Report No. | ES2122722 | ES2122722 | |
| Bis(2-ethylhexyl) phthalate | <10 | <10 | 10 µg/L |
| Butyl benzyl phthalate | <2 | <2 | |
| Di(2-ethylhexyl) adipate | <2 | <2 | |
| Diethyl phthalate | <2 | <2 | |
| Dimethyl phthalate | <2 | <2 | |
| Di-n-butyl phthalate | <2 | <2 | |
| Di-n-octyl phthalate | <2 | <2 | |

Organic Compound

Polycyclic Aromatic Hydrocarbons

| | Blank µg/L | Test µg/L | Max Allowed |
|--------------------------|---------------|--------------|-------------|
| !External Lab Report No. | ES2122722 | ES2122722 | |
| Acenaphthene | <0.02 | <0.02 | |
| Acenaphthylene | <0.02 | <0.02 | |
| Anthracene | <0.02 | <0.02 | |
| Benzo(a)anthracene | <0.02 | <0.02 | |
| Benzo(a)pyrene | <0.005 | <0.005 | 0.01 µg/L |
| Benzo(a)pyrene TEQ | <0.005 | <0.005 | |
| Benzo(b+j)fluoranthene | <0.02 | <0.02 | |
| Benzo(ghi)perylene | <0.02 | <0.02 | |
| Benzo(k)fluoranthene | <0.02 | <0.02 | |
| Chrysene | <0.02 | <0.02 | |
| Dibenzo(a-h)anthracene | <0.02 | <0.02 | |
| Fluoranthene | <0.02 | <0.02 | |
| Fluorene | <0.02 | <0.02 | |
| Indeno(123-cd)pyrene | <0.02 | <0.02 | |
| Naphthalene | <0.02 | <0.02 | |
| PAH - Total | <0.005 | <0.005 | |
| Phenanthrene | <0.02 | <0.02 | |
| Pyrene | <0.02 | <0.02 | |



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| Volatile Organic Compounds GCMS | Blank µg/L | Test µg/L | Max Allowed |
|---------------------------------|---------------|--------------|-------------|
| 1 1 1 2-Tetrachloroethane | <1 | <1 | |
| 1 1 1-Trichloroethane | <1 | <1 | |
| 1 1 2 2-Tetrachloroethane | <1 | <1 | |
| 1 1 2-Trichloroethane | <1 | <1 | |
| 1 1-Dichloropropene | <1 | <1 | |
| 1 2 3-Trichlorobenzene | <1 | <1 | |
| 1 2 3-Trichloropropane | <1 | <1 | |
| 1 2 4-Trichlorobenzene | <1 | <1 | |
| 1 2 4-Trimethylbenzene | <1 | <1 | |
| 1 2-Dibromo-3-chloropropane | <1 | <1 | 1 µg/L |
| 1 2-Dibromoethane | <1 | <1 | 1 µg/L |
| 1 2-Dichlorobenzene | <1 | <1 | 1500 µg/L |
| 1 2-Dichloroethane | <1 | <1 | 3 µg/L |
| 1 2-Dichloropropane | <1 | <1 | |
| 1 3 5-Trimethylbenzene | <1 | <1 | |
| 1 3-Dichlorobenzene | <1 | <1 | |
| 1 3-Dichloropropane | <1 | <1 | |
| 1 4-Dichlorobenzene | <1 | <1 | 40 µg/L |
| 1,1-Dichloroethane | <1 | <1 | |
| 1,1-Dichloroethene | <1 | <1 | 30 µg/L |
| 2,2-Dichloropropane | <1 | <1 | |
| 2-Chlorotoluene | <1 | <1 | |
| 4-Chlorotoluene | <1 | <1 | |
| 4-Isopropyltoluene | <1 | <1 | |
| Benzene | <1 | <1 | 1 µg/L |
| Bromobenzene | <1 | <1 | |
| Bromochloromethane | <1 | <1 | |
| Bromodichloromethane | <1 | <1 | 60 µg/L |
| Bromoform | <1 | <1 | 100 µg/L |
| Bromomethane | <4 | <4 | |
| Carbon tetrachloride | <1 | <1 | 3 µg/L |
| Chlorobenzene | <1 | <1 | 300 µg/L |
| Chloroethane | <4 | <4 | |
| Chloroform | <1 | <1 | 400 µg/L |
| Chloromethane | <4 | <4 | |
| cis-1 3-Dichloropropene | <1 | <1 | |
| cis-1,2-Dichloroethene | <1 | <1 | |
| Dibromochloromethane | <1 | <1 | 150 µg/L |
| Dibromomethane | <1 | <1 | |
| Dichlorodifluoromethane | <1 | <1 | |
| Dichloromethane | <4 | <4 | 4 µg/L |
| Ethylbenzene | <1 | <1 | 300 µg/L |
| Hexachlorobutadiene | <0.7 | <0.7 | 0.7 µg/L |
| Isopropylbenzene | <1 | <1 | |
| m+p-Xylenes - Total | <2 | <2 | |



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| Volatile Organic Compounds GCMS | Blank µg/L | Test µg/L | Max Allowed |
|---------------------------------|---------------|--------------|-------------|
| Naphthalene | <1 | <1 | |
| n-Butylbenzene | <1 | <1 | |
| n-Propylbenzene | <1 | <1 | |
| o-Xylene | <1 | <1 | |
| sec-Butylbenzene | <1 | <1 | |
| Styrene | <1 | <1 | 30 µg/L |
| tert-Butylbenzene | <1 | <1 | |
| Tetrachloroethene | <1 | <1 | 50 µg/L |
| Toluene | <1 | <1 | 800 µg/L |
| Total 1,2-dichloroethene | <2 | <2 | 60 µg/L |
| Total 1,3-dichloropropene | <2 | <2 | 20 µg/L |
| Total Trichlorobenzene | <2 | <2 | 30 µg/L |
| Total Xylene | <3 | <3 | 600 µg/L |
| trans-1,3-Dichloropropene | <1 | <1 | |
| trans-1,2-Dichloroethene | <1 | <1 | |
| Trichloroethene | <1 | <1 | |
| Trichlorofluoromethane | <1 | <1 | |
| Trihalomethanes - Total | <4 | <4 | 250 µg/L |
| Vinyl chloride | <0.3 | <0.3 | 0.3 µg/L |

Evaluation The product passed the requirements of clause 6.8 when tested at an exposure of 2500 mm² per Litre.

Number of Samples 1.

Test Comment Subcontracted testing conducted by ALS, Environmental Division, NATA accreditation no. 825 site no. 10911 and ALS Scoresby, NATA accreditation no. 992, site no. 989

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