Analytical Report: ABG61717
Eurofins Sample Number: NJ23AA8729-1
Version: 1

Accreditation No: 15773
Accredited for compliance with
ISO/IEC 17025 - Testing

Allco Waterproofing Solutions Limited
3 Te Kea Place
Albany, Auckland
NZ

Client Account Number: A01519378N9Y
Eurofins Quote Number: NSF6PH23004901

Eurofins Sample Number NJ23AA8729-1

Original Received Date:	03-Aug-2023
Description:	ALLCO JM TPO: JM TPO White Colour and JM TPO Gray Colour; TPO membrane for roofing waterproofing applications. Thickness 1.5mm (60 mil)
Lot Number:	2353636
Containers Submitted:	30 Unit(s)

Analysis

AS/NZS 4020:2018 Compliance Testing

Refer to Attachment # 1

Subcontracted Testing (if performed) is not covered under NATA Accreditation 15773.

NATA accreditation is associated with the testing methods to
which the GLP report relates.

Method: AS/NZS 4020, Appendix A and in-house method TMP 191100 & TMP 191101
Analysis Date: 22-Aug-2023

Sample Compliance Assessment

NJ23AA8729-1 meets the requirement(s) for all listed test(s) where specifications were applied.

Supplemental Information

Samples were tested as received. Specifications (if) reported are as provided by the client.

Accredited for compliance with ISO/IEC 17025:2017- Testing. NATA Accreditation Number 15773.

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Eurofins Sample Number: NJ23AA8729-1

Version: 1

Accreditation No: 15773

Accredited for compliance with ISO/IEC 17025 - Testing

Contracted Company: Eurofins ams Laboratories (Sydney)

179 Magowar Road, Girraween, NSW 2145 Australia
SampleReceiptAMS@eurofins.com

TGA Licence No: MI-2021-LI-08995-1 APVMA Licence No: 6241

Questions about this report should be directed to your project manager or the general email listed above.

Reviewed and electronically signed for Data Reviewer Approval by
Sandhya Singh, Department Manager -Chemistry & Toxicology
for Eurofins ams Laboratories Pty Ltd, on 09-Nov-2023 07:39:40 UTC+11:00

1. SAMPLE INFORMATION:

Methodology: AS/NZS 4020, *Appendix A* and in-house method TMP-191100 & TMP-191101

Cross Reference No.:	Not Applicable
Interim Reporting:	Not Applicable
Batch No./ Manufacturing Date:	2353636 / 22/10/2021
Product Manufacturer:	Johns Manville PO BOX 5108, Denver CO, 80217-5108
Sampling Organisation:	Allco Waterproofing Solutions Limited
General Composition:	Refer to Section 9
Product Use:	In-Line (Roof Membrane Waterproofing)
Temperature Range:	-40 to +116^{o}C
Previous Testing:	Not Applicable
Sample selection for tests:	As provided by the Submitting Organisation

Sample storage conditions:	Prepared and controlled as per AS/NZS 4020, *Appendix A*
Extracts:	Prepared as per AS/NZS 4020, *Appendices C, D, E, F, G & H*
Testing procedure:	ALLCO JM TPO White Colour and ALLCO JM TPO Gray Colour were supplied as test sheets, each sheet with dimensions of 100mm x 75mm and exposure of ~7,500mm^2. For testing, 4 x test panels of each Colour were immersed in 1L of water to give a total testing exposure of ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L test water. Initial testing is based on the recommended 'total immersion' exposure of ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L test water at (20 ± 2)^{o}C to cover a cold water application up to <40^{o}C. Due to Organic Compounds, *Appendix D*, passing at an evaluated exposure of ~17,241mm^2 / 1L, Taste testing only is based on a "total immersion" exposure of 3 x test sheets / 1.31L test water (≡~17,176mm^2 ALLCO JM TPO White Colour + ~17,176mm^2 ALLCO JM TPO Gray Colour / 1L test water) at (20 ± 2)^{o}C to cover a cold water application up to <40^{o}C. Refer to Section 9 for product details.
Volume retention:	NA

2. SUMMARY OF RESULTS:

Appendix	RESULTS
C - TASTE (CLAUSE 6.2)	PASSED at 'total immersion' exposure of ~17,176mm^2 ALLCO JM TPO White Colour + ~17,176mm^2 ALLCO JM TPO Gray Colour / 1L
D – APPEARANCE (Colour and Turbidity) (CLAUSE 6.3)	PASSED at 'total immersion' exposure of ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L
D – APPEARANCE (Organic Compounds) (CLAUSE 6.8)	PASSED at an evaluated 'total immersion' exposure of ~17,241mm^2 ALLCO JM TPO White Colour + ~17,241mm^2 ALLCO JM TPO Gray Colour / 1L*
E - GROWTH OF AQUATIC MICRO-ORGANISMS (CLAUSE 6.4)	PASSED at 'total immersion' exposure of ~15,000mm^2 ALLCO JM TPO White Colour + ~15,000mm^2 ALLCO JM TPO Gray Colour / 1L
F - CYTOTOXIC ACTIVITY (CLAUSE 6.5)	PASSED at 'total immersion' exposure of ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L
G - MUTAGENIC ACTIVITY (CLAUSE 6.6)	PASSED at 'total immersion' exposure of ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L
H - METALS (CLAUSE 6.7)	PASSED at 'total immersion' exposure of ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L

*** NOTE: Quantitative evaluation based on sample result, testing exposure and AS/NZS 4020 test specification.**

Based on completion and evaluation of all tests on 08/11/2023, the product, ALLCO JM TPO: JM TPO White Colour and JM TPO Gray Colour; TPO membrane for roofing waterproofing applications. Thickness 1.5mm (60 mil); fully complied with the test requirements of AS/NZS 4020:2018 to cover a cold water application up to <40°C, at the recommended 'total immersion' exposure of ~17,176mm^2 ALLCO JM TPO White Colour + ~17,176mm^2 ALLCO JM TPO Gray Colour / 1L test water at (20 ± 2)°C.

Testing although determined by the relevant product Standard, is generally recognised for up to 5 years by the certifying body, providing the testing procedures remain the same, and the background information on all wetted parts and the product are adequately documented. Also, the results stated in the report relate to the samples of the product submitted for testing. Any changes in the material formulation and supplier/manufacturer of all wetted items, the 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, and re-testing may be required before this actual time frame, governed by the completion and evaluation date.

3. TASTE:

Methodology: AS/NZS 4020, *Appendix C* and in-house method TMP-191130.

Exposure: 'total immersion'; ~22,500mm^2 ALLCO JM TPO White Colour + ~22,500mm^2 ALLCO JM TPO Gray Colour / 1.31L test water
(≡~17,176mm^2 ALLCO JM TPO White Colour + ~17,176mm^2 ALLCO JM TPO Gray Colour / 1L test water)

Extraction temperature: (20 ± 2)^{o}C **Scaling factor:** NA **Number of Panellists:** 5

No. of samples for Chlorine-free extract: 3 of each

No. of samples for Chlorinated extract: 3 of each

Description	Extract	Test Water	Taste (+ / –)	Taste Description (No. of tasters)	Test Dilution *(Taste intensity)
Test Blank	First 24h	Chlorine-free	NA	NA	NA
	Final 9-day	Chlorine-free	–	–	–
Sample	First 24h	Chlorine-free	NA	NA	NA
	Final 9-day	Chlorine-free	–	–	–
Test Blank	First 24h	Chlorinated	NA	NA	NA
	Final 9-day	Chlorinated	–	–	–
Sample	First 24h	Chlorinated	NA	NA	NA
	Final 9-day	Chlorinated	–	–	–

+ Taste detected **–** No taste detected NA Not applicable

AS/NZS 4020 test requirement: Minimum of 4 tasters with no discernible taste at the first 1/2 dilution.
Figure in brackets is the number of panellists detecting a taste at this dilution.

Note:
1. Tasters are given a 14-point scale to describe its intensity, with minimum of 1 as extremely weak, and maximum of >14 as extremely strong. An average of all tasters represents taste intensity.
2. First extract becomes final extract.

EVALUATION:

On the basis of these results the samples of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Taste; *Appendix C*.

4.A. APPEARANCE: COLOUR AND TURBIDITY

Methodology: AS/NZS 4020, *Appendix D* and in-house methods TMP-191140 and TMP-191106.

Exposure: 'total immersion'; ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L test water

Extraction temperature: (20 ± 2)°C **Scaling factor:** NA

No. of samples tested: 4 of each

	a) **TRUE COLOUR:** Hazen Units **(HU)**		b) **TURBIDITY:** Nephelometric Turbidity Units **(NTU)**	
	First 24h	Final 9-day	First 24h	Final 9-day
Sample Extract pH (9-day) = 6.12	NA	<2	NA	0.07
Test Blank pH (9-day) = 6.13	NA	<2	NA	0.19
FINAL RESULT	NA	<2	NA	<0.01
AS/NZS 4020 Test sample requirements	**≤5**		**≤0.5**	

< = less than ≤ = less than or equal to NA = Not applicable
First extract becomes final extract

For test a), test extractions were performed by Eurofins ams Laboratories Pty. Ltd. The test extracts were subsequently subcontracted to Eurofins │Environment Testing for assessment (NATA Accreditation No. 1261), Report No. 1022610-W. In-house Method based on APHA 2120 B.

EVALUATION:

On the basis of these results the samples of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Appearance (Colour & Turbidity); *Appendix D*.

4.B. APPEARANCE: ORGANIC COMPOUNDS

Methodology: AS/NZS 4020, *Appendix D* and in-house methods TMP-191140 and TMP-191106.

Refer to Section 4.A for testing conditions (Exposure, Extraction temperature, Scaling factor & No. of Samples tested) **Test Extract:** 9-day

No.	Organic Compound	Drinking Water Guideline Maximum Allowable Concentration mg/L (ppm)	Limit of Reporting mg/L (ppm)	Test Blank mg/L (ppm)	Sample Extract I mg/L (ppm)	FINAL RESULT I mg/L (ppm
Volatiles						
1	[1] Benzene	0.001*	0.001	<0.001	<0.001	<0.001
2	[1] Carbon tetrachloride	0.003*	0.001	<0.001	<0.001	<0.001
3	[1] Chlorobenzene	0.3*	0.00001	<0.00001	<0.00001	<0.00001
4	[1] 1,2-dichloroethane	0.003*	0.00001	<0.00001	<0.00001	<0.00001
5	[1] 1,1-dichloroethene	0.03*	0.001	<0.001	<0.001	<0.001
6	[1] Cis 1,2-dichloroethene	0.06*	0.00001	<0.00001	<0.00001	<0.00001
7	[1] Trans 1,2-dichloroethene	0.06*	0.001	<0.001	<0.001	<0.001
8	[1] Dichloromethane (methylene chloride)	0.004*	0.00002	<0.00002	<0.00002	<0.00002
9	[1] Ethylbenzene	0.3*	0.001	<0.001	<0.001	<0.001
10	[1] Styrene (Vinylbenzene)	0.03*	0.001	<0.001	<0.001	<0.001
11	[1] Tetrachloroethene	0.05*	0.00002	<0.00002	<0.00002	<0.00002
12	[1] Toluene	0.8*	0.001	<0.001	<0.001	<0.001
13	[1] Trichlorobenzenes	0.03*	0.0005	<0.0005	<0.0005	<0.0005
14	[1] Trichloroethene	0.02**	0.00001	<0.00001	<0.00001	<0.00001
15	[1] Vinyl chloride	0.0003*	0.00005	<0.00005	<0.00005	<0.00005
16	[1] Xylene	0.6*	0.003	<0.003	<0.003	<0.003
Volatiles (Trihalomethanes)						
17	[1] Bromodichloromethane***	0.06**	0.001	<0.001	<0.001	<0.001
18	[1] Bromoform***	0.1*	0.001	<0.001	<0.001	<0.001
19	[1] Chloroform***	0.25*	0.005	<0.005	<0.005	<0.005
20	[1] Dibromochloromethane***	0.15**	0.001	<0.001	<0.001	<0.001
Chlorinated Hydrocarbons						
21	[1] Hexachlorobutadiene	0.0007*	0.0005	<0.0005	<0.0005	<0.0005
22	[1] Plasticisers di(2-ethylhexyl) (Phthalate)	0.009**	0.0005	<0.0005	<0.0005	<0.0005
23	[1] 2-chlorophenol	0.3*	0.00001	<0.00001	<0.00001	<0.00001
24	[1] 2, 4-dichlorophenol	0.2*	0.00001	<0.00001	<0.00001	<0.00001
25	[1] 2, 4, 6-trichlorophenol	0.02*	0.00002	<0.00002	<0.00002	<0.00002
26	[1] 1,2-dichlorobenzene	1.5*	0.0005	<0.0005	<0.0005	<0.0005
27	[1] 1,4-dichlorobenzene	0.04*	0.0005	<0.0005	<0.0005	<0.0005
28	[1] Benzo-(a)-pyrene (PAHs)	0.00001*	0.00001	<0.00001	<0.00001	<0.00001
Epichlorohydrin by EPA 524.2 Modified						
29	[2] Epichlorohydrin	0.0005 *	0.0004	<0.0004	<0.0004	<0.0004
Nitrosamines						
30	[3] N-Nitrosodimethylamine (NDMA)	0.0001*	0.00001	0.000896	0.001070	0.00017

*Australian Drinking Water Guideline **NZ Drinking Water Guideline

4.B. APPEARANCE: ORGANIC COMPOUNDS CONT.

NOTE:

[1] Test extractions were performed by Eurofins ams Laboratories Pty. Ltd. The test extracts were subsequently subcontracted to Eurofins | Environment Testing, NATA Accreditation No. 1261, Report No. 1023814-W. In-house Method based on USEPA 522, 8260D & 8270E.

[2] (Epichlorohydrin) Test extractions were performed by Eurofins ams Laboratories Pty. Ltd. The test extracts were subsequently subcontracted to Eurofins | Eaton, Report No. 380-62268-1. In-house Method based on USEPA 524.2 Modified.

[3] Test extractions were performed by Eurofins ams Laboratories Pty. Ltd. The test extracts were subsequently subcontracted to Sydney Water, NATA Accreditation No. 63, Report No. 291110 In-house Method based on USEPA 521.

Evaluated Exposure	**= (Testing exposure x AS/NZS 4020 Specification) / Sample result.**
based on NDMA	= (~30,000mm^2 x 100) / 174
	= ~17,241mm^2 / 1L

EVALUATION:

The results have not complied at the testing exposure but on final calculation of evaluated exposure, the samples of this product referred to in this report have complied with the test requirements of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Appearance (Organic Compounds); Appendix D, at an evaluated 'total immersion' exposure of ~17,241mm^2 ALLCO JM TPO White Colour + ~17,241mm^2 ALLCO JM TPO Gray Colour / 1L test water.

5. GROWTH OF AQUATIC MICRO-ORGANISMS:

Methodology: AS/NZS 4020, *Appendix E* and in-house method TMP-191150.

Incubation temperature: (30 ± 1)°C

Exposure: 'total immersion'

No. of samples tested: 4 of each

Component Name	**Testing Exposure**	**Inoculum (mL)**	*** MEAN DISSOLVED OXYGEN DIFFERENCE (MDOD) in mg/L**
ALLCO JM TPO: JM TPO White Colour and JM TPO Gray Colour	~15,000mm^2 / 1L	100	0.95
Negative Reference Control (glass plate)	~15,000mm^2 / 1L	100	<0.01
Positive Reference Control (paraffin waxed glass plate)	~15,000mm^2 / 1L	100	6.39
Test Blank	Blank / 1L	100	6.13 in mg/L as mean dissolved oxygen

NA Not applicable

***** Difference from test blank and represents mean of five readings (weeks 5, 5 ½, 6, 6 ½ & 7)

AS/NZS 4020 test sample requirements: Less than or equal to 2.4 for MDOD

In-house Method based on APHA 4500 OG.

EVALUATION:

On the basis of these results the samples of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Growth of Aquatic Micro-organisms; *Appendix E*.

6. CYTOTOXIC ACTIVITY:

Methodology: AS/NZS 4020, *Appendix F* and in-house method TMP-191160.

Exposure: 'total immersion'; ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L test water

Extraction temperature: (20 ± 2)°C **Scaling factor:** NA

Extracts: 24h, 48h & 72h **No. of samples tested:** 4 of each

The test sample extracts from the product, as well as the test blank (test water) were used to prepare a nutrient growth medium, subsequently utilised to grow a monkey kidney cell line (VERO ATCC CCL 81).

Microscopic Examination	**Test Sample Extract** (24h, 48h and 72h)	**Test Blank** (24h, 48h and 72h)
Cell Morphology:	Satisfactory	Satisfactory
Monolayer: Confluence/Healthy Growth as ~%	100%	100%

NA = Not applicable

Cytotoxicity was detected with Zinc Sulphate, used as a positive control and analysed at 0.4mM of Zinc. Water for Irrigation was included with the test blank as negative control.

AS/NZS 4020 test sample requirements: 1) Non-cytotoxic response- confluent monolayer similar to test blank.
2) Cytotoxic response- irregularly shaped cells & cell death similar to positive control 0.4mM Zinc Sulphate.

EVALUATION:

On the basis of these results the samples of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Cytotoxic Activity; *Appendix F*.

7. MUTAGENIC ACTIVITY:

Methodology: AS/NZS 4020, *Appendix G* and in-house method TMP-191170.
Exposure: 'total immersion'; ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L test water
Extraction temperature: (20 ± 2)°C **Scaling factor:** NA
Extract: 24h **No. of samples tested:** 4 of each

-S9	*Salmonella typhimurium* TA98	Mean	Std Deviation	+ S9	*Salmonella typhimurium* TA98	Mean	Std Deviation
-ve c	27 26 23	25	2	-ve c	38 26 38	34	7
2,4-DNPH	232 208 256	232	24	2-AA	324 288 180	264	75
T.BLK	19 22 22	21	2	T.BLK	37 38 31	35	4
Sample	30 23 22	25	4	Sample	20 28 27	25	4

-S9	*Salmonella typhimurium* TA102	Mean	Std Deviation	+ S9	*Salmonella typhimurium* TA102	Mean	Std Deviation
-ve c	440 520 408	456	58	-ve c	592 640 664	632	37
2,4-DNPH	1048 1424 984	1152	238	Benzo(a)pyrene	1040 752 620	804	215
T.BLK	472 512 408	464	52	T.BLK	648 640 656	648	8
Sample	456 464 456	459	5	Sample	616 720 528	621	96

+ S9 = ***** Metabolic Activator NA = Not applicable > = greater than
2,4-DNPH = 2, 4-dinitrophenylhydrazine 2-AA = 2-aminoanthracene -ve c = Negative Control
TA98 & TA102: Base-pair substitution type
AS/NZS 4020 test sample requirements: (The differences in the mean number of revertants between either of the negative controls and test sample extracts should not exceed two standard deviations (for triplicate analysis)).
Positive response: If mean revertants for sample extract outside the range of spontaneous revertants for test strain.

EVALUATION:
On the basis of these results the samples of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Mutagenic Activity; *Appendix G*.

8. METALS:

Methodology: AS/NZS 4020, *Appendix H* and in-house methods TMP-191180 and TMP-191230.
Exposure: 'total immersion'; ~30,000mm^2 ALLCO JM TPO White Colour + ~30,000mm^2 ALLCO JM TPO Gray Colour / 1L test water
Extraction temperature: (20 ± 2)°C **Scaling factor:** NA **Extracts:** 9-day
No. of samples for I: 4 of each **No. of samples for II:** 4 of each

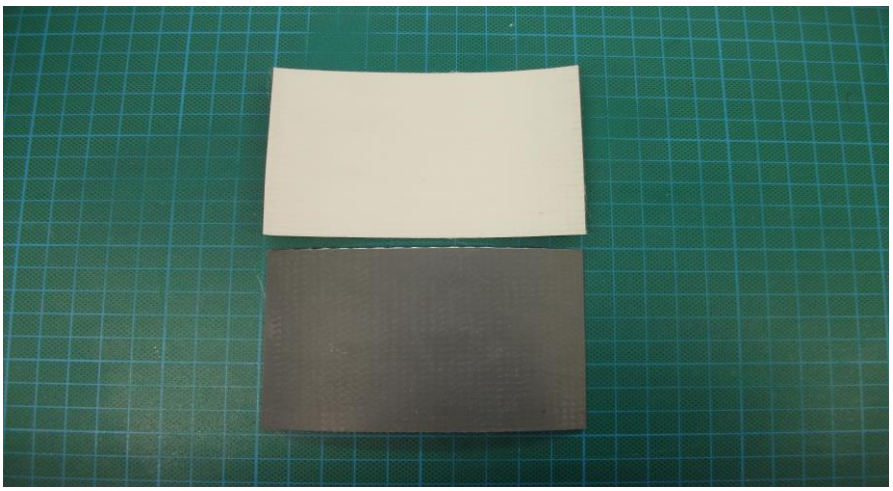
Element	AS/NZS 4020: Maximum Allowable Concentration mg/L (ppm)	Limit of Reporting mg/L (ppm)	Test Blank mg/L (ppm)	Sample Extract I mg/L (ppm)	Sample Extract II mg/L (ppm)	FINAL RESULT I mg/L (ppm)	FINAL RESULT II mg/L (ppm)
Aluminium[1] (Al)	0.2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Antimony[1] (Sb)	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic[1] (As)	0.01	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium[1] (Ba)	0.7	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron[1] (B)	1.4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium[1] (Cd)	0.002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chromium[1] (Cr)	0.05	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper[1] (Cu)	2	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron[1] (Fe)	0.3	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead[1] (Pb)	0.01	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese[1] (Mn)	0.1	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Mercury[1] (Hg)	0.001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum[1] (Mo)	0.05	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel[1] (Ni)	0.02	0.001	0.002	<0.001	<0.001	<0.001	<0.001
Selenium[1] (Se)	0.01	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver[1] (Ag)	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

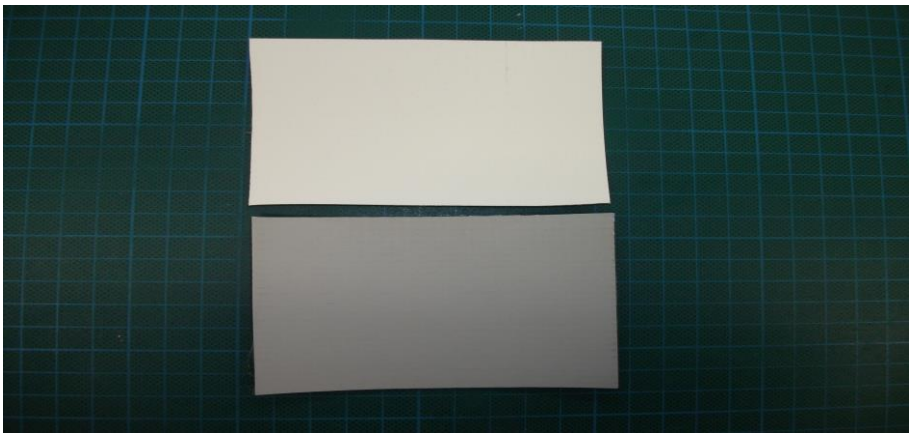
< = less than mg/L = milligram per litre [1] = ICPMS – In-house Method Code: LTM-MET 3040
First extract becomes final extract. NA = Not applicable
Test extractions were performed by Eurofins ams Laboratories Pty. Ltd. The test extracts were subsequently subcontracted to Eurofins │Environment Testing for assessment (NATA Accreditation No. 1261), Report No. 1022610-W. In-house Method based on US EPA Method 3010A & US EPA Method 6020B.

EVALUATION:

On the basis of these results the samples of this product referred to in this report have complied with the test requirements of AS/NZS 4020:2018, Metals; *Appendix H*.

9.I. PHOTO OF TEST SAMPLE:





9.II. BILL OF MATERIAL (BOM):

Part #	Description of Component	Description of Sub-components (assemblies)	Material Composition	Total Surface Area (mm^2)	Wetted Surface Area (mm^2)	Raw Material Manufacturer	Component Manufacturer
1 x 15 pcs	Grey TPO	Thermoplastic Polyolefin membrane	Polyolefin	7,500 mm^2 per pc		Johns Manville	N.A.
1 x 15 pcs	White TPO	Thermoplastic Polyolefin membrane	Polyolefin	7,500 mm^2 per pc		Johns Manville	N.A.

9.III. PRODUCT DATA SHEET (PDS):

Johns Manville

JM TPO – 60 mil

Thermoplastic Polyolefin Membrane

Meets or exceeds the requirements of ASTM D 6878

Features and Components

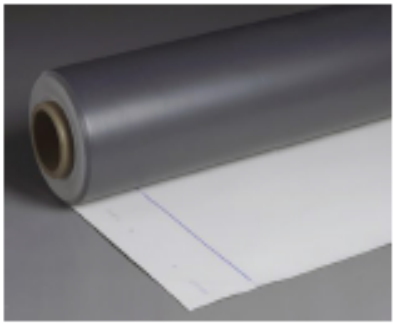
Thickness Over Scrim: Optimized and tested on a continual basis with a state-of-the-art thickness gauge to verify that the thickness valued by our customers is incorporated into the sheet.

One of the Widest Melt Windows: Promotes better welds over a wider variety of speeds and temperatures, and leads to a softer, more flexible and workable sheet.

Reinforced fabric scrim layer and top-ply thickness: Lends to durable physical properties including:

- Long-term weathering, UV resistance and heat-aging properties
- High breaking and tearing strength

Optimized TPO formulation: delivers high-performance ozone resistance, cool roof reflectivity and overall weather resistance.



Component: M (Membrane) – Single Ply

Colors

Gray*	White	Tan*

**Gray and Tan lead times are subject to availability and may require an upcharge for smaller projects.*

System Compatibility

This product may be used as a component in the following systems. Please reference product application for specific installation methods and information.

Multi-Ply	BUR		APP			SBS		
	HA	CA	HW	HA	CA	HW	SA	MF
	Do not use with multi-ply systems							

Single Ply	TPO				PVC			EPDM		
	MF	AD	SA	IW	MF	AD	IW	MF	AD	BA
	Compatible with the selected single ply systems above									

Key: **HA** – Hot Applied **CA** – Cold Applied **HW** – Heat Weldable **SA** – Self Adhered **MF** – Mechanically Fastened **IW** – Induction Weld **BA** – Ballasted **AD** – Adhered

Energy and the Environment

Standard			Reflectivity	Emissivity
CRRC*	White	Initial	0.77	0.87
		3 Yr. Aged	0.70	0.86
	Tan	Initial	0.67	0.87
		3 Yr. Aged	0.62	0.90
	Gray	Initial	0.35	0.87
		3 Yr. Aged	0.34	0.90
CA Title 24	White	Pass	0.77	0.87
	Tan	Pass 3 Yr. Aged	SRI=75	
LEED® (SRI)	White	Initial	95	
		3 Yr. Aged	85	
	Tan	Initial	81	
		3 Yr. Aged	75	
	Gray	Initial	39	
		3 Yr. Aged	32	
Recycled Content	Post-consumer		0%	
	Post-industrial		5%	

The LEED® Solar Reflectance Index (SRI) is calculated per ASTM E1980.

Peak Advantage® Guarantee Information

Product	Guarantee Term
JM TPO 60 mil	5, 10, 15, or 20 years

Codes and Approvals

Installation/Application

Refer to JM TPO application guides and detail drawings for instructions.

Packaging and Dimensions

Roll Widths	5' (1.52 m)	6' (1.83 m)	8' (2.44 m)	10' (3.05 m)	12' (3.66 m)
Roll Lengths	100' (30.48 m)				
Roll Coverage	500 ft² (46.45 m²)	600 ft² (55.74 m²)	800 ft² (74.32 m²)	1000 ft² (92.90 m²)	1200 ft² (111.5 m²)
Rolls per Pallet	8				
Pallet Weight	1424 lb (645.9 kg)	1729 lb (783.8 kg)	2329 lb (1052.3 kg)	2866 lb (1296.5 kg)	3440 lb (1560.4 kg)
Pallets per Truck*	28-32	22-26	18-20	12-16	12-14
Producing Location	Scottsboro, AL				

**Assumes 48' flatbed truck and does not reflect pallets of accessories or impact of mixed sizes.*

9.III. PRODUCT DATA SHEET (PDS) CONT.:

Johns Manville

JM TPO – 60 mil

Thermoplastic Polyolefin Membrane

Meets or exceeds the requirements of ASTM D 6878

Tested Physical Properties

Physical Properties		ASTM Test Method	Standard for ASTM D 6878 (Min.)	JM TPO – 60 mil	
				MD*	XMD**
Strength	Breaking Strength, min, lbf (N)	D 751	220 (976)	411 (1,828)	388 (1,726)
	Elongation at Break, min %	D 751	15	27	27
	Tearing Strength, min, lbf (N)	D 751	45 (200)	92 (409)	178 (792)
	Factory Seam Strength, min, lbf (N)	D 751	66 (290)	112 (498)	
Longevity	Thickness, min, in.	D 751	+/- 10% from Nominal	0.060 (Nominal)	
	Thickness Over Scrim, min, in. (mm)	D 7635	0.015	0.027 (0.686)	
	Water Absorption, max, %	D 471	3.0	0.11	
	Brittleness Point, max, -40°F	D 2137	No Cracks	Pass	
	Ozone Resistance	D1149	No Cracks	Pass	
Heat Aged Performance	Properties after Heat Aging @ 240°F	D 573	Pass/Fail	Pass	
	Breaking Strength, % (after aging)	D 751	90	>90	>90
	Elongation, % (after aging)	D 751	90	>90	>90
	Tearing Strength, % (after aging)	D 751	60	>60	>60
	Weight Change, max, % (after aging)	D 751	±1.0	0.19	
	Linear Dimensional Change, max, % (after 6 hrs @ 158°F)	D 1204	±1.0	<0.1	
Weather Performance	Accelerated Weathering, min	G 151 & G 155	10,080 kj/m²•nm @ 340 nm (4,000 hrs @ 0.70 W)	>20,160 kj/m² (>8,000 hrs)	
	Cracking (@ 7x magnification)	G 155	No Cracks	Pass	

*MD = Machine Direction **XMD = Cross-Machine Direction Note: All data represents tested values.

Supplemental Testing

Physical Properties	ASTM Test Method	Standard for ASTM D 6878 (Min.)	JM TPO – 60 mil Result
Dynamic Puncture	D 5635	N/A	Pass @ 25 Joules
Static Puncture	D 5602	N/A	Pass @ 44 lb (20 kg)
Impact Resistance of Bituminous Roofing Systems	D 3746	N/A	Pass - minor indentations
Reflectance	C 1549	N/A	78%
	E 903	N/A	80%
Emittance	C 1371	N/A	0.87
	E 408	N/A	0.96
SRI	E 1980	N/A	95
Resistance of Synthetic Polymer Material to Fungi	G 21	N/A	0 rating
Puncture Resistance (FTMS 101C, Method 2031)	N/A	N/A	371 lb (168 kg)
Moisture Vapor Transmission	E 96	N/A	0 g/m² per 24 hours
Hydrostatic Resistance, Mullen	D 751	N/A	474 PSI (3268 kPa)
Standard Test Method for Air Permeance of Building Materials	E 2178	N/A	Pass @ <0.0005 L/(s-m²) (Pass @ <0.0001 CFM/ft²)

Technical specifications as shown in this literature are intended to be used as general guidelines only. Please refer to the Safety Data Sheet and product label prior to using this product. The Safety Data Sheet is available by calling (800) 922-5922 or on the web at www.jm.com/roofing. The physical and chemical properties of the product listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Check with the regional sales representative nearest you for current information.

All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, which includes a Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions or for information on other Johns Manville roofing products and systems, visit www.jm.com/terms-conditions.

RS-8633 8-21 (Replaces 4-21)

9.IV. SAFETY DATA SHEET (SDS):

WATERPROOFING SOLUTIONS LTD

Allco JM TPO
Safety Data Sheet

1. Identification of Substance & Company

Product

Product name	Allco JM TPO
Other names	Allco JM TPO FB 115, Allco JM TPO – 60 mil
HSNO approval	NA – non hazardous
Approval description	Non hazardous
UN number	NA
Proper Shipping Name	NA
DG class	NA
Packaging group	NA
Hazchem code	NA
Uses	single ply polyester fabric reinfrced, thermoplastic polyolefin (TPO) fully bonded water proofing sheet membrane for roofs and decks.

Company Details

Company	**Allco Waterproofing Solutions**	
Address	5 Te Kea Place	PO Box 101-903
	Albany	North Shore City
	Auckland	0745
	New Zealand	New Zealand
Telephone	+64 9 448 1185	
Website	www.allco.co.nz	

3. Composition / Information on Ingredients

Component	CAS/ Identification	Conc (%)
trade secret – non hazardous	proprietary	100%

This is a commercial product whose exact ratio of components may vary. Trace quantities of impurities are also likely.

(Note: Sections 1 & 3 in the SDS {Section 1: Identification & Section 3: Composition/information on ingredients} only are included for sample traceability).