



19 December 2019

Our Ref: EN13/2499

TEST REPORT No. 8310.2

Requested by: Wet-seal Management Pty Ltd
6 Forge Drive
Coffs Harbour
NSW 2450

On (date): 21 September 2017
Product Descriptions: Enviro-coat Waterproofing Membrane External DS 420
Manufacturer: UREKA

Sampling Details
Date: 21 September 2017
How (methods): Delivered to Clayton

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The results reported herein relate only to the item(s) tested.

This test report consists of 13 pages.

SUMMARY OF ASSESSMENTS REPORTED

AS 4654.1:2012	Appendix A – Table A4	Pass
AS 4654.1:2012	Appendix B – Resistance of Waterproofing Membranes to Cyclic Movement	Pass
ASTM E96	Moisture Vapour Transmission	Pass
AS 4654.1:2012	Temperature Resistance	Pass
AS 4347.9:2002	Thickness (Mean of sample provided for assessment)	1.03mm
ASTM C794	Bond Strength - Cement Sheet	86.50N
	- Timber	94.56N
	- Ceramic Tile	99.75N

TERM OF VALIDITY

Enviro-coat Waterproofing Membrane External DS 420 is deemed to meet the requirements of:
AS 4654.1:2012 Waterproofing membrane systems for external above-ground use, Non-exposed

This CSIRO wet area membrane report will lapse three years after the initial date of issue and assessment unless revalidation has been requested and granted.

The validity date for report 8310.2 is 12 July 2021



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SUMMARY OF RESULTS

AS 4654.1:2012 Waterproofing membrane systems for external above-ground use, Non-exposed: Appendix A: Assessment of Durability of waterproof membranes

Test Report No.	7980	8097	
Year of test	2017	2018	
Control	77%		Class II
Water Immersion	69%		PASS
Detergent Immersion	83%		PASS
Heat Ageing @ 80 °C	73%		PASS
Temperature Resistance		51%	PASS

Wet-seal Management Pty Ltd test sample, Enviro-coat Waterproofing Membrane External DS 420 achieves the performance requirements of AS 4654.1:2012 Waterproofing membrane systems for exterior above-ground use, **Non-exposed**.

Appendix B: Assessment of resistance of waterproofing membranes to cyclic movement Class II type membrane: 2mm gauge length for a 0.39mm extension, repeated 50 cycles.

Result: No fatigue cracking exhibited. PASS

ASTM E96: Water Vapour Transmission of Materials 1.55g/m²/24

AS 4347.9:2002 Thickness 1.03mm

AS 4654.1:2012 Tensile strength 5.50MPa

ASTM C794 Bond Strength - Cement Sheet 86.65N
- Timber 94.56N
- Ceramic Tile 99.75N



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TEST CARRIED OUT IN ACCORDANCE WITH
AS4654.1:2012 Wet Area Membranes
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 26 September 2017

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 50%RH
Sample Number: 7980 - 1 (Numbered 1 to 5)
Samples: Average of 5 samples
Load rate: 50mm/min

Elongation at Break

CONTROL SET

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
7980 - 1 1 to 5	1.02	33.64	25.46	5.50	77

Requirement for Class II: The specimens have an average percentage strain of $\geq 60\%$ & $\leq 299\%$

Classification: Class II (Medium extensibility)



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TEST CARRIED OUT IN ACCORDANCE WITH AS4654.1:2012 Wet Area Membranes
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 24 November 2017

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 50%RH
Sample Number: 7980 - 3 (Numbered 1 to 9)
Samples: Average of 3 samples
Load rate: 50mm/min
Solution: 1L of deionised water

Elongation at Break

WATER IMMERSION

Period & Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
7 Days 7980 – 3 1 to 3	0.83	23.06	28.52	4.63	86
28 Days 7980 – 3 4 to 6	0.86	25.52	27.17	4.95	82
56 Days 7980 – 3 7 to 9	0.87	24.63	22.78	4.72	69

Requirement: The sample requires an elongation at break strain greater than 39% at 56 days without additional bond relief. Between 39% and 20% additional bond strength is required. Less than 20% - fail.

Result: 69% **PASS**



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TEST CARRIED OUT IN ACCORDANCE WITH AS4654.1:2012 Wet Area Membranes
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 24 November 2017

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 50%RH
Sample Number: 7980 - 4 (Numbered 1 to 9)
Samples: Average of 3 samples
Load rate: 50mm/min
Solution: 1L of 2% solution N8 detergent

Elongation at Break

DETERGENT IMMERSION

Period & Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
7 Days 7980 - 4 1 to 3	0.94	22.18	27.85	3.93	84
28 Days 7980 - 4 4 to 6	0.96	34.23	24.82	9.42	75
56 Days 7980 - 4 7 to 9	0.98	27.86	27.51	4.74	83

Requirement: The sample requires an elongation at break strain greater than 39% at 56 days without additional bond relief. Between 39% and 20% additional bond strength is required. Less than 20% - fail.

Result: 83% PASS



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TEST CARRIED OUT IN ACCORDANCE WITH AS4654.1:2012 Wet Area Membranes Appendix B: Assessment of Resistance of Waterproofing Membranes to Cyclic Movement Test Date: 27 October 2017

RESULTS: Location: Laboratory
Test Rig: Applied Test Systems
Series 904 Vertical Sealant Tester
Number of Cycles: 50
Type of Cycle: Full cycle
Cycle Time: 2 hours to complete full cycle
Cycle expansion: 50% of Control elongation at break
Sample Size: 65mm x 25mm
Sample Span: 4mm between header plates
Sample Thickness: 1.03mm

The test sample achieved a control Elongation of Break of 77% as per AS4654.1 Appendix B. For a Class II membrane, the maximum strain used for the cycling shall be 50% the elongation at break.

Number of Cycles completed 50
Surface Crazeing Nil
Surface Tears Nil
Membrane Rupture Nil

Result: PASS



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TEST CARRIED OUT IN ACCORDANCE WITH
ASTM E96: Moisture Vapour Transmission Rate

Test Date: 24 November 2017

RESULTS: Location: Ceramic Tile Laboratory
Open mouth dish: Diameter 100mm
Test Period: 456 hours
Conditions: 23°C / RH 50%
Desiccant: Silica gel

Desiccant Method (Procedure A)

Sample	Thickness (mm)	Water Vapour Tx g/m ² /24hr	Permeance Perms (in. lbs)
Specimen 1	0.97	1.55	29.77
Specimen 2	1.05	2.04	39.21
Specimen 3	1.14	1.05	20.18
Mean	1.05	1.55	29.72

Requirement: Record result according to Table A3 Basic properties of membranes. Results shall determine if material is a moisture suppressant coating.

Permeance: 29.72 Perms (in. lbs)

Water Vapour Tx: 1.55g/m²/24 hours

Result: PASS



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Test Date: 15 June 2018

TEST CARRIED OUT IN ACCORDANCE WITH AS 4654.1:2012
Appendix A: Durability of waterproof membranes

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 65%RH
Samples: Average of 4 samples
Load rate: 150mm/min

Elongation at Break

HEAT AGEING @ 80 °C

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
8097 1 to 4	0.94	58.69	24.02	10.41	73

Requirement: The sample requires an elongation at break strain greater than 86% at 7 days. Less than 86% - fail.

Result: 73% PASS



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Test Date: 15 June 2018

TEST CARRIED OUT IN ACCORDANCE WITH AS 4654.1:2012
Temperature resistance

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 65%RH
Temperature: -15°C to +85°C
Samples: Average of 4 samples
Load rate: 150mm/min

Elongation at Break

TEMPERATURE RESISTANCE

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
8097 1 to 4	0.87	67.44	16.73	12.92	51

Requirement: Samples exhibited no cracking, fractures, or surface defects.

Result: **PASS**



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Test Date: 05 July 2018

TEST CARRIED OUT IN ACCORDANCE WITH ASTM C794
Adhesion-In-Peel of elastomeric joint sealants

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 65%RH
Samples: Average of 4 samples
Load rate: 50mm/min

BOND STRENGTH

Sample	Substrates					
	Cement Sheet		Timber		Ceramic Tile	
	Peel strength (N)	Adhesion Loss %	Peel strength (N)	Adhesion Loss %	Peel strength (N)	Adhesion Loss %
1	77.81	0	89.48	0	91.38	0
2	93.00	0	122.47	0	125.55	0
3	94.28	0	101.61	0	91.05	0
4	80.92	0	64.66	0	91.04	0
Mean	86.50	0	94.56	0	99.75	0



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Test Date: 26 September 2017

TEST CARRIED OUT IN ACCORDANCE WITH AS 4654.1:2012
Appendix A: Durability of waterproof membranes

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 65%RH
Samples: Average of 5 samples
Load rate: 150mm/min

TENSILE STRENGTH

Sample Number	Sample Thickness (mm)	Maximum Load (N)	Maximum Stress (MPa)
7980 – 1 1 to 5	1.02	33.64	5.50

Result: 5.50MPa



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TEST CARRIED OUT IN ACCORDANCE WITH AS/NZ 4347.9
Thickness

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 50%RH
Samples: 3 samples

SAMPLE THICKNESS

Point	Measurement (mm)
1	1.02
2	1.02
3	1.11
4	1.06
5	1.01
6	0.93
7	1.03
8	0.98
9	1.09
Mean	1.03

Result: 1.00mm



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Prepared on behalf of CSIRO by:

Name: Khanh Ho
Position: Research Project Officer
Date: 19 December 2019

Signature:

A handwritten signature in black ink, appearing to read 'Khanh Ho', with a horizontal line underneath.