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TEST REPORT

DC2635/4

TESTING OF VULKEM 346 UV GREY MEMBRANE TO THE REQUIREMENTS OF AS4654.1 2012

CLIENT
Tremco Pty Ltd
PO Box 7124
Silverwater
Rydalmere
NSW 2128
Australia

TEST SUMMARY

Objective

Testing was completed of the Vulkem 346 UV (grey) to the requirements of AS4654.1 2012 *Waterproofing membranes for external above-ground use Part 1: Materials.*

Summary

Passing results were obtained for the Vulkem 346 UV (grey) where requirements are stated in the AS4654.1 2012 Standard. The Vulkem 346 UV (grey) met the requirements to be classified as Class II (medium extensibility).

Test sponsor

Tremco Pty Ltd
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Description of test specimen

The client supplied sheet membrane samples to be tested.

Date of test

20 June 2016

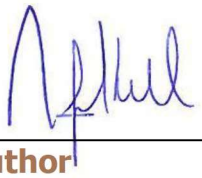
LIMITATION

The results reported here relate only to the items tested.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

SIGNATORIES



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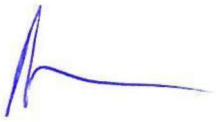

Reviewer

Nick Marston
Materials Team Leader

DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	DESCRIPTION
1	20 June 2016	Initial Issue
2	28 November 2017	Revised formatting
3	3 December 2019	Product name changed

1. SUMMARY

AS4654.1 Table 2.1 Requirements – Fully Bonded Membranes - Vulkem 346 UV Grey

PROPERTY REQUIRED	METHOD	RESULTS	
Abrasion resistance	AS1580.403.2	Non - trafficable	
Bond strength	ASTM C794	Concrete masonry 42 N Plywood 146 N	
Cyclic movement	Moving Joint Test		Pass
Dimensional stability	ASTM D6207	N/A – liquid membrane	
Elongation at break	AS4654.1 Appendix A	21.95 MPa 210 % Elongation	Class II
Field seam strength	N/A	N/A – liquid membrane	
Heat ageing	AS/NZS4858	20.80 MPa 201 % Elongation	Pass
Temperature resistance	AS4654.1 Clause 2.6		Pass
Ultraviolet resistance	AS4654.1 Table A4	18.99 MPa 207 % Elongation	Pass
Tensile strength	AS4654.1 Table A4	21.95 MPa 210 % Elongation	
Thickness	Various methods	0.51 mm (mean of sample supplied) See Note 1	
Durability	AS4654.1 Table A4	See Note 2	Pass
Water vapour transmission rate	ASTM E96	26.0 g/m^2/24 hours	

Notes:

1. Thickness measurement – the product is a liquid applied waterproofing membrane. The thickness of the membrane will be determined by application.

2. Durability of membranes is a combined group of assessments as detailed in AS4654.1 Appendix A, Table A4.

Control	21.95 MPa	210 % Elongation	
Water immersion	11.55 MPa	181 % Elongation	Pass
Detergent immersion	16.09 MPa	215 % Elongation	Pass
Heat ageing	20.80 MPa	201 % Elongation	Pass
Ultra violet	18.99 MPa	207 % Elongation	Pass
Bioresistance	Manufacturing guidelines for bioresistance to be followed		

2. ABRASION RESISTANCE

2.1 Testing

Test carried out in accordance with AS 1580.403.2.

Sample diameter:	100 mm
Number of samples:	3
Number of test points:	6
Abrader wheels:	CS10
Number of revolutions:	500

2.2 Results

Test Point	Sample 1 Thickness (mm)		Sample 2 Thickness (mm)		Sample 3 Thickness (mm)	
	Pre	Post	Pre	Post	Pre	Post
1	0.61	0.60	0.59	0.59	0.18	0.17
2	0.60	0.60	0.59	0.58	0.18	0.17
3	0.62	0.61	0.60	0.59	0.14	0.13
4	0.62	0.61	0.60	0.58	0.11	0.11
5	0.61	0.60	0.61	0.60	0.11	0.1
6	0.62	0.61	0.60	0.59	0.14	0.13
Mean	**0.61**	**0.61**	**0.60**	**0.59**	**0.14**	**0.14**

Mean loss: 0.01 mm

Classification: Non - trafficable

3. BOND STRENGTH

3.1 Testing

Testing carried out on Vulkem 350 SL base in accordance with ASTM C794.

3.2 Results

Results are an average of 4 samples.

Substrate	Average peel strength (N)
Concrete masonry	42
Plywood	146

4. CYCLIC MOVEMENT

4.1 Testing

Testing carried out in accordance with AS4654.1 Appendix B Assessment of resistance of waterproofing membranes to cyclic movement.

4.2 Results

Number of cycles:	50
Cycle Time:	2 hours
Cycle expansion:	50% of control elongation at break
Sample size:	65 mm x 25 mm
Sample span:	2 mm between plates
Sample thickness:	0.51mm

The test sample achieved a control elongation at break of 210% as per AS4654 Appendix A. For a Class II membrane the extension movement used for cycling is 50% of the control elongation at break.

Number of cycles completed:	50
Surface crazing:	Nil
Surface tears:	Nil
Membrane rupture:	Nil

Result: Meets the requirement for the Moving Joint Test

5. ELONGATION AT BREAK

5.1 Testing

Test carried out in accordance with AS4654.1 Appendix A.

5.2 Results

Results are an average of 5 samples.

Mean sample thickness (mm)	Tensile strength (MPa)	Elongation at break (%)
0.51	21.95	210

Requirement for Class II: The specimens have an elongation at break of 60 – 299 %.

Classification: Class II (medium extensibility)

6. HEAT AGEING

6.1 Testing

Testing carried out in accordance with AS4654.1 Appendix A.

6.2 Results

Results are an average of 6 samples.

Mean sample thickness (mm)	Tensile strength (MPa)	Elongation at break (%)
0.51	20.80	201

Requirement: The specimens require an elongation at break greater than 50% of the control sample, 201%. An elongation of less than 101% is a fail.

Result : Pass

7. TEMPERATURE RESISTANCE

7.1 Testing

Testing carried out in accordance with AS4654.1 Appendix A. Samples were exposed for 2 days at 85°C and samples were exposed for 2 days at -15°C.

7.2 Results

Results are an average of 6 samples.

High temperature, 85°C

Mean sample thickness (mm)	Tensile strength (MPa)	Elongation at break (%)
0.51	20.65	187

Low temperature, -15°C

Mean sample thickness (mm)	Tensile strength (MPa)	Elongation at break (%)
0.51	19.89	178

Requirement: The membrane shall remain waterproof when subjected to temperatures likely to be encountered in use: for Australia these would be within the range -15°C to 85°C.

Samples shall exhibit no cracking, fractures or surface defects after exposure.

Result : Pass

8. ULTRAVIOLET RESISTANCE

8.1 Testing

Testing carried out in accordance with AS4654.1 Appendix A.

8.2 Results

Results are an average of 6 samples.

Mean sample thickness (mm)	Tensile strength (MPa)	Elongation at break (%)
0.51	18.99	207

Requirement: The specimens require an elongation at break greater than 40% of the control sample, 201%. An elongation of less than 80% is a fail.

Result : Pass

9. TENSILE STRENGTH

9.1 Testing

Testing carried out in accordance with AS4654.1 Appendix A.

9.2 Results

Results are an average of 6 samples.

Mean sample thickness (mm)	Tensile strength (MPa)	Elongation at break (%)
0.51	21.95	210

10. DURABILITY

10.1 Testing

Testing carried out in accordance with AS4654.1 Appendix A

10.2 Results

	Tensile Strength	Elongation at break	Pass / Fail
Control	21.95 MPa	210 % Elongation	N/A
Water immersion	11.55 MPa	181 % Elongation	Pass
Detergent immersion	16.09 MPa	215 % Elongation	Pass
Heat ageing	20.80 MPa	201 % Elongation	Pass
Ultra violet	18.99 MPa	207 % Elongation	Pass
Bioresistance	Manufacturing guidelines for bioresistance to be followed		

11. WATER VAPOUR TRANSMISSION RATE

11.1 Testing

Testing carried out in accordance with ASTM E96 desiccant method.

11.2 Results

Thickness (mm)	WVTR (g/m^2/24 hours)	Coefficient of variation (%)	Minimum result (g/m^2/24 hours)	Maximum result (g/m^2/24 hours)
0.51	26.0	18.4	21.6	31.4