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Industrial Research Services

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ABN 41 687 119 230

14 August 2009

Our Ref: EN13 / XXX 03/0211

TEST REPORT No. 4912

Requested by: Waterproofing Technologies P/L
Client:
on (date):
Product Descriptions: Enviro 700 PUR Waterproofing Membrane
Manufacturer: Waterproofing Technologies P/L

Sampling Details

Date:
How (methods): Delivered to Highett

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This test report consists of 11 pages.

SUMMARY OF ASSESSMENTS REPORTED

AS/NZS 4858:2004	Appendix A, Durability of waterproof membranes
AS/NZS 4858:2004	Appendix B, Resistance of Waterproofing Membranes to Cyclic Movement
AS 3558.-1999	Water Absorption
ASTM E96	Moisture Vapour Transmission

TERM OF VALIDITY

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 4912 is 14 August 2012



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ISSUE DATE: 14 August 2009
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PRODUCT DESC: Enviro 700 PUR Waterproofing Membrane

SUMMARY OF RESULTS

AS4858:2004 Wet Area Membranes

Appendix A: Assessment of Durability of waterproof membranes

The sample requires an elongation at break strain percentage greater than 710% at 56 days.
Note: (710% equates to 50% of control elongation at break strain percentage).

Durability of membranes: Elongation to break	Strain %	
Control	1419%	Class III
Water Immersion	1600%	PASS
Detergent Immersion	1620%	PASS
Bleach Immersion	1629%	PASS
Heat Ageing	1391%	PASS

Waterproofing Technologies P/L test sample, Enviro 700 PUR Waterproofing Membrane achieves the performance requirements of AS/NZS 4858: 2004 Durability of Membranes for Class III membrane installation.

Appendix B: Assessment of resistance of waterproofing membranes to cyclic movement

Class III type membrane: 2mm gauge length for a 4 mm extension, repeated 50 cycles.

Requirement: No Fatigue cracking exhibited.
Result: **PASS**

The Water Vapour Transmission (WVT) in accordance to ASTM E96: 7.33 g/m²/24h

Appendix C: Suitability of waterproofing membranes when used over particle board

Appendix C will not be required as the Enviro 700 PUR Waterproofing Membrane has a water vapour transmission below 8g/m²/24h.

AS 3558.1 Methods of testing plastics & composite materials sanitary plumbing fixtures:

Method 1: Determination of water absorption characteristics

Water absorption:	Sample 1	0.5%	
	Sample 2	1.3%	
	Sample 3	1.2%	Maximum 1.3%

Conclusion: Enviro 700 PUR Waterproofing Membrane does not require a 'Suitability over particleboard' to pass the requirements of AS/NZS 4858 Wet area membranes.



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TEST CARRIED OUT IN ACCORDANCE WITH
AS4858:2004 Wet Area Membranes
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 17 June 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 4912 - 1 (Numbered 1 to 5)
Samples: Average of 5 samples
Load rate: 150mm/min

Elongation at Break

CONTROL SET

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
4912 – 1 1 to 5	1.0	36.31	468.40	4.03	1419

Requirement for Class III: The specimens have an average percentage strain of $\geq 300\%$.

Classification: Class III (High Extensibility)

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AS4858:2004 Wet Area Membranes
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 7 August 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 4912 - 3 (Numbered 1 to 9)
Samples: Average of 3 samples
Load rate: 150mm/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 4912 – 3 1 to 3	1.0	30.70	493.35	5.12	1495
28 Days 4912 – 3 4 to 6	1.0	28.82	539.02	4.80	1633
56 Days 4912 – 3 7 to 9	1.0	22.66	527.93	3.78	1600

Requirement: The sample requires an elongation at break strain greater than 710% at 56 days without additional bond relief. Between 710% and 355% additional bond strength is required. Less than 355% - fail.

Result: **1600%** **PASS**



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Appendix A: Assessment of Durability of waterproof membranes

Test Date: 7 August 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 4912 - 5 (Numbered 1 to 9)
Samples: Average of 3 samples
Load rate: 150mm/min
Solution: 1L of 10.5 g/L sodium hypochlorite & 2.25 g/L of sodium hydroxide

Elongation at Break

BLEACH IMMERSION

Period & Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
7 Days 4912 – 5 1 to 3	1.0	31.49	522.47	5.25	1585
28 Days 4912– 5 4 to 6	1.0	27.00	532.56	4.50	1614
56 Days 4912 – 5 7 to 9	1.0	22.24	537.61	3.71	1629

Requirement: The sample requires an elongation at break strain greater than 710% at 56 days without additional bond relief. Between 710% and 355% additional bond strength is required. Less than 355% - fail.

Result: 1629% **PASS**



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Appendix A: Assessment of Durability of waterproof membranes

Test Date: 7 August 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 4912 - 4 (Numbered 1 to 9)
Samples: Average of 3 samples
Load rate: 150mm/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 4912 – 4 1 to 3	1.0	28.42	533.43	4.74	1616
28 Days 4912 – 4 4 to 6	1.0	22.05	497.09	3.67	1506
56 Days 4912 – 4 7 to 9	1.0	26.76	534.53	4.46	1620

Requirement: The sample requires an elongation at break strain greater than 710% at 56 days without additional bond relief. Between 710% and 355% additional bond strength is required. Less than 355% - fail.

Result: 1620% **PASS**



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Appendix A: Assessment of Durability of waterproof membranes

Test Date: 17 June 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 55%RH
Sample Number: 4912 - 2 (Numbered 1 to 4)
Samples: Average of 3 samples
Load rate: 150mm/min

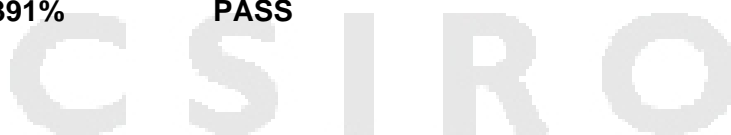
Elongation at Break

HEAT AGEING

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
4912 - 2 1 to 4	1.0	36.63	459.04	6.11	1391

Requirement: The sample requires an elongation at break strain greater than 710% at 7 days. Less than 710% - fail.

Result: 1391% **PASS**





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TEST CARRIED OUT IN ACCORDANCE WITH AS4858:2004 Wet Area Membranes
Appendix B: Assessment of Resistance of Waterproofing Membranes to Cyclic Movement

Test Date: 6 July 2009

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: 2mm between header plates
Sample Thickness: 1.20 mm

The test sample achieved a control Elongation of Break of 1419% as per AS4858 Appendix A. For a Class III membrane type the extension movement used for cycling is 4 mm extension.

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

Result: Meets the requirement for Moving Joint Test

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

Test Date: 17 June 2009

RESULTS: Location: Ceramic Tile Laboratory
Open mouth dish: Diameter 100mm
Test Period: 528 hours
Conditions: 23°C / RH 50%
Membrane to dish sealant: wax
Desiccant: Silica gel

Desiccant Method (Procedure A)

Sample	Thickness mm	Water VapourTx g/m ² /24hr	Permeance µg/N.s
Specimen 1	1.2	6.12	0.0503
Specimen 2	1.2	8.99	0.0740
Specimen 3	1.2	6.88	0.0567
Mean		7.33	0.0603

Requirement: If > 8g/m²/24 hours, additional testing referred to in (e) of Table A1 will be required to establish suitability for use over particleboard.

Result:

Water vapour transmission 7.33 g/m²/24 hours **PASS**

Permeance 0.0603 µg/N.s

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TEST CARRIED OUT IN ACCORDANCE WITH
AS 3558.-1999: Water Absorption

Test Date: 17 June 2009

RESULTS: Location: Ceramic Tile Laboratory
Test Period: 24 hours
Conditions: 23°C / RH 50%

Sample	Thickness (mm)	Water Absorption		
		Mass (m1)	Mass (m2)	% Mass Difference
Specimen 1	1.5	22.04	22.14	0.5
Specimen 2	1.5	24.56	24.88	1.3
Specimen 3	1.5	22.82	23.10	1.2
Maximum				

Requirement: Determine maximum water absorption as mean difference %

Result: 1.3 %

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Date and Place 14 August 2009 Highett, Vic

Name, Title and Signature:



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