



Industrial Research Services

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CSIRO

28 February 2012

Our Ref: EN13 / 1969 03/0211

TEST REPORT No. 6095.2

Requested by: Mapei Australia Pty Ltd
on (date): 24 November 2011
Product Descriptions: Mapelastec Aquadefence IT Waterproof Membrane

Manufacturer: Mapei Australia Pty Ltd

Sampling Details

Date: 24 November 2011
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	Pass
AS/NZS 4858:2004	Appendix B, Resistance of Waterproofing Membranes to Cyclic Movement	Pass
AS 3558.-1999	Water Absorption	2.22%
ASTM E96	Moisture Vapour Transmission	Pass

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 6095.2 is 28 February 2015



REPORT NO: 6095.2
ISSUE DATE: 28 February 2012
MANUFACTURER: MAPEI AUSTRALIA PTY LTD
PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 2 of 11

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 185% at 56 days.
Note: (185% equates to 50% of control elongation at break strain percentage).

Durability of membranes: Elongation to break	Strain %	
Control	370%	Class III
Water Immersion	654%	PASS
Detergent Immersion	504%	PASS
Bleach Immersion	781%	PASS
Heat Ageing - 50 °C	298%	PASS

MAPEI AUSTRALIA PTY LTD test sample, Mapelastic Aquadefence IT Waterproof 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 4mm extension, repeated 50 cycles.

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

The Water Vapour Transmission (WVT) in accordance to ASTM E96: 0.65g/m²/24h

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

Appendix C will not be required as the Mapelastic Aquadefence IT Waterproof 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	2.22%	
	Sample 2	1.69%	
	Sample 3	1.31%	Maximum 2.22%

Conclusion: Mapelastic Aquadefence IT Waterproof Membrane does not require a 'Suitability over particleboard' to pass the requirements of AS/NZS 4858 Wet area membranes.



REPORT NO: 6095.2
ISSUE DATE: 28 February 2012
MANUFACTURER: MAPEI AUSTRALIA PTY LTD
PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 3 of 11

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

Test Date: 12 December 2011

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 6095.2 - 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 %
6095.2 - 1 1 to 5	1.15	13.45	122.11	0.58	370

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

Classification: Class III (High extensibility)



REPORT NO: 6095.2
ISSUE DATE: 28 February 2012
MANUFACTURER: MAPEI AUSTRALIA PTY LTD
PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 4 of 11

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

Test Date: 1 February 2012

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 6095.2 - 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 6095.2 – 3 1 to 3	0.82	8.03	180.67	0.49	547
28 Days 6095.2 – 3 4 to 6	0.84	7.56	245.21	0.45	743
56 Days 6095.2 – 3 7 to 9	0.86	5.95	215.81	0.35	654

Requirement: The sample requires an elongation at break strain greater than 185% at 56 days without additional bond relief. Between 185% and 93% additional bond strength is required. Less than 93% - fail.

Result: **654%** **PASS**



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Appendix A: Assessment of Durability of waterproof membranes

Test Date: 1 February 2012

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 6095.2 - 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 6095.2 – 5 1 to 3	0.93	6.72	213.32	0.36	646
28 Days 6095.2– 5 4 to 6	0.98	5.12	281.66	0.26	854
56 Days 6095.2 – 5 7 to 9	1.01	4.74	257.77	0.23	781

Requirement: The sample requires an elongation at break strain greater than 185% at 56 days without additional bond relief. Between 185% and 93% additional bond strength is required. Less than 93% - fail.

Result: 781% **PASS**



REPORT NO: 6095.2
ISSUE DATE: 28 February 2012
MANUFACTURER: MAPEI AUSTRALIA PTY LTD
PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 6 of 11

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

Test Date: 1 February 2012

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 6095.2 - 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 6095.2 – 4 1 to 3	1.05	8.84	235.66	0.42	714
28 Days 6095.2 – 4 4 to 6	1.07	6.65	216.73	0.31	657
56 Days 6095.2 – 4 7 to 9	1.08	4.72	166.36	0.22	504

Requirement: The sample requires an elongation at break strain greater than 185% at 56 days without additional bond relief. Between 185% and 93% additional bond strength is required. Less than 93% - fail.

Result: **504%** **PASS**



REPORT NO: 6095.2
ISSUE DATE: 28 February 2012
MANUFACTURER: MAPEI AUSTRALIA PTY LTD
PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 7 of 11

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

Test Date: 14 December 2011

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 55%RH
Sample Number: 6095.2 - 2 (Numbered 1 to 4)
Samples: Average of 4 samples
Load rate: 150mm/min

Elongation at Break

HEAT AGEING - 50 °C

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
6095.2- 2 1 to 4	1.27	20.52	98.21	0.72	298

Requirement: The sample requires an elongation at break strain greater than 185% at 7 days. Less than 185% - fail.

Result - 50 °C **298%** **PASS**



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Page 8 of 11

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

Test Date: 16 December 2011

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: 0.77mm

The test sample achieved a control Elongation of Break of 370% as per AS4858 Appendix A. For a Class III membrane type the extension movement used for cycling is 4mm extension.

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

Result: PASS

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REPORT NO: 6095.2
ISSUE DATE: 28 February 2012
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PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 9 of 11

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

Test Date: 10 February 2012

RESULTS: Location: Ceramic Tile Laboratory
Open mouth dish: Diameter 100mm
Test Period: 864 hours
Conditions: 23°C / RH 50%
Membrane to dish sealant: wax
Desiccant: Silica gel

Desiccant Method (Procedure A)

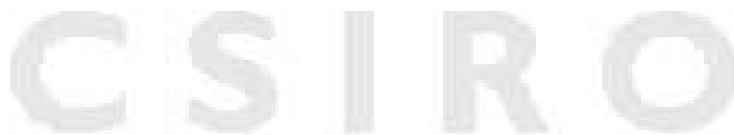
Sample	Thickness mm	Water Vapour Tx g/m ² /24hr	Permeance µg/N.s
Specimen 1	0.83	0.55	0.000554
Specimen 2	0.84	0.56	0.000558
Specimen 3	0.86	0.83	0.000824
Mean	0.84	0.65	0.000645

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 0.65g/m²/24 hours **PASS**

Permeance 0.0006µg/N.s





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PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 10 of 11

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

Test Date: 9 February 2012

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	0.83	9.46	9.67	2.22
Specimen 2	0.84	10.04	10.21	1.69
Specimen 3	0.86	10.64	10.78	1.31
Mean	0.84	10.05	10.22	1.74

Requirement: Determine maximum water absorption as mean difference %

Result: **2.22%**

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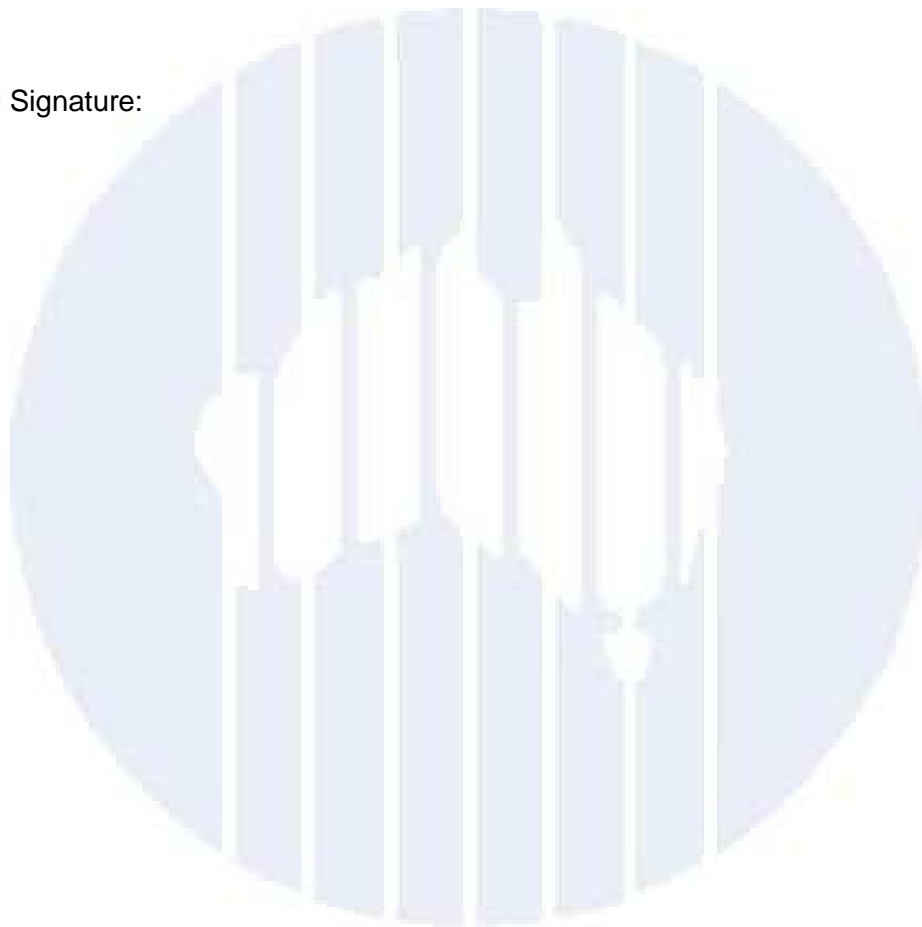
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PRODUCT DESC: Mapelastic Aquadefence IT Waterproof Membrane

Page 11 of 11

Date and Place 28 February 2012 Highett, Vic

Name, Title and Signature:



ANDY GIANG
TECHNICAL OFFICER

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