



CSIRO INDUSTRIAL RESEARCH SERVICES

REPORT 5141 External

COMPLIANCE ASSESSMENT

Waterproofing Technologies Pty Ltd
enviro HP 1200 Waterproofing Membrane
to
AS 4654.1:2009

CSIRO, CMSE, Industrial Research Services, Slips Surfaces and Finishes

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Industrial Research Services

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CSIRO – Approval System

15 October, 2010

Our Ref. EN13/ 1744

TEST REPORT No: 5141 External

Requested by: Waterproofing Technologies Pty Ltd
Phil Serio
Suite 3, Level 1, 295 Princes Highway
St. Peters, NSW 2044

on (date): November 2009

Product Desc: HP 1200 Waterproofing Membrane

Sampling details: Waterproofing Technologies Pty Ltd

Where: n/a

Date: November 2009

By Whom: Peter Westgate

How (methods): n/a

The results reported relate only to the sample(s) tested and the information received.

No responsibility is taken for the accuracy of the sampling unless it is done under our own supervision. CSIRO cannot accept responsibility for deviations in the manufactured quality and performance of the product.

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SUMMARY OF ASSESSMENT REPORTED

AS/NZS 46654.1-2009 Waterproofing membrane systems for exterior use:
Above ground level
Fully bonded liquid membranes



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 CLIENT: Waterproofing Technologies Pty Ltd
 PRODUCT DESC: HP 1200 Waterproofing Membrane

SUMMARY OF ASSESSMENTS

FULLY BONDED LIQUID MEMBRANE

Requirements - (Table 2.1)

Property required	Test method	Outcomes
Abrasion resistance	CSIRO Abrasion	Mean Loss 0.019mm Clause 2.3.2 Trafficable – (b)
Bond Strength	ASTM C794	Not assessed
Cyclic Movement	CSIRO Moving Joint test	Pass
Elongation at break	AS/NZS 4858 Appendix A	7.19 MPa 378% Elongation
Field seam strength	AS 4654.1 Clause 2.5	n/a
Heat Ageing	AS/NZS 4858	7.18 MPa 381% Elongation
Temperature resistance	AS 4654.1 Clause 2.6	Pass
Ultraviolet resistance	AS 4654.1 Table A4	Client assessment
Tensile strength	AS 4654.1 Table A4	7.19 MPa 378% Elongation
Thickness	Various methods	1.8mm (mean of sample supplied) Note 2
Durability	AS 4654.1 Table A4	Refer Note 1
Water vapour transmission	ASTM E96	1.95 g/m ² /24 hours

Notes:

- Durability of membranes is a combined group of assessments in Appendix A, Table A4.

Control:	7.19 MPa	378% Elongation
Water immersion	5.31 MPa	362% Elongation
Detergent immersion	5.32 MPa	382% Elongation
Heat ageing	7.18 MPa	381% Elongation
Ultra Violet (UV)	An assessment has been made for the client for UV exposure.	
Bioresistance	The client's bioresistance self assessment program has yet to be finalised.	
- Thickness measurement – the Enviro HP 1200 membrane is a 2 component spray applied polyurethane waterproof membrane. The thickness of the membrane will be determined by application.



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PRODUCT DESC: HP 1200 Waterproofing Membrane

TEST CARRIED OUT IN ACCORDANCE WITH AS4654.1:2009 Waterproofing membrane systems for exterior use
CSIRO Abrasion Assessment [Replacement method for ASTM D1242] Test Date: 09 June 2010

RESULTS: Location: Ceramic Tile Laboratory
Sample: 100 mm diameter
No of samples: 3
No of test points: 8
Abrader: Taber 5155
Abrader wheels: H22
No of revolutions: 1000

Results:

Test Point	Sample 1 Thickness (mm)		Sample 2 Thickness (mm)		Sample 3 Thickness (mm)	
	Pre Taber	Post Taber	Pre Taber	Post Taber	Pre Taber	Post Taber
1	1.84	1.79	1.85	1.78	1.81	1.76
2	1.64	1.58	1.65	1.59	1.76	1.71
3	1.80	1.75	1.82	1.77	1.65	1.58
4	1.76	1.71	1.77	1.71	1.89	1.82
5	1.64	1.57	1.65	1.58	1.77	1.70
6	1.88	1.82	1.89	1.82	1.64	1.58
Mean	1.76	1.70	1.77	1.71	1.75	1.69

Mean Loss: 0.06mm

Clause 2.3.2 Trafficable

Pedestrian traffic only – abrasion depth less than 0.2mm
Occasional service vehicle traffic – abrasion depth less than 0.1mm
Regular vehicle traffic – abrasion depth less than 0.05mm

Classification:

Occasional service vehicle traffic.



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TEST CARRIED OUT IN ACCORDANCE WITH
AS4858:2004 Wet Area Membranes

Test Date: 18 January 2010

Appendix B: Assessment of Resistance of Waterproofing Membranes to Cyclic Movement

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: 2.00 mm

The test sample achieved a control Elongation of Break of 378% 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 Crazing	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
AS4858:2004 Wet Area Membranes
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 15 December 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 5141 - 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 %
5141 - 1 1 to 5	1.8	36.83	124.77	7.19	378

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

Classification: Class III (High Extensibility)

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AS4654.1:2009 Waterproofing membrane systems for exterior use
Appendix A: Assessment of Durability of waterproof membranes

Test Date: 21 January 2010

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 55%RH
Sample Number: 5141 (Numbered 1 to 3)
Heat temperature: 65 ±2°C
Time in temperature: 7 days
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 %
5141 1 to 3	1.8	86.18	125.69	7.18	381

Requirement: The sample requires an elongation at break strain greater than 50% of the control sample, 378%. An elongation of less than 191% is a failure.

Result: 381% **PASS**

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Appendix A: Assessment of Durability of waterproof membranes

Test Date: 16 April 2010

RESULTS: Location: Ceramic Tile Laboratory
Conditioning: 23°C 55%RH
Sample Number: 5141 -6 (Numbered 1 to 8)
Temperatures: 85 ±2°C & -15 ±2°C
Time in temperature: 2 days
Samples: Average of 4 samples
Load rate: 150mm/min

Elongation at Break

TEMPERATURE RESISTANCE

High temperature

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
5141-6 1 to 4	1.8	107.08	121.05	7.14	367

Low temperature

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
5141-6 5 to 8	1.8	101.76	121.67	6.64	369

Requirement:

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

Samples held at +85°C exhibited no cracking, fractures, or surface defects.

Samples held at -15°C exhibited no cracking, fractures, or surface defects.



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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: 15 December 2009

RESULTS: Location: Ceramic Tile Laboratory
Conditions: 7 days at 23°C 55%RH
Sample Number: 5141 - 1 (Numbered 1 to 5)
Samples: Average of 5 samples
Load rate: 150mm/min

Tensile strength at Break

CONTROL SET

Sample Number	Sample Thickness Mean (mm)	Maximum Load (N)	Maximum Extension (mm)	Maximum Stress MPa	Maximum Strain %
5141 – 1 1 to 5	1.8	36.83	124.77	7.19	378

Tensile strength values for assessment requirements of Table A4, Durability of Membranes are noted on page 9 of this report.

Tensile strength values for membrane sample assessed for elongation after being subjected to extreme temperatures are note on page 7 of this report.

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TEST CARRIED OUT IN ACCORDANCE WITH
AS4858:2004 Wet Area Membranes

Test Date: 01 February 2010

DURABILITY

Assessment of Durability of waterproof membranes

Durability of membranes:	Elongation to break	Strain %	Pass/Fail	Tensile Strength
Control		381%	n/a	7.19 MPa
Water Immersion		362%	Pass	5.31 MPa
Detergent Immersion		382%	Pass	5.23 MPa
Heat Ageing		381%	Pass	7.18 MPa
Ultra Violet (UV)	(Initial)	260%		
	(Post UV)	255%		

Refer Era Polymers Pty Ltd Report #WR33096 in Appendix A

Bioresistance

The client's bioresistance self assessment program has yet to be finalised

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

Test Date: 7 January 2010

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	2.0	1.967	0.0162
Specimen 2	2.0	2.167	0.0178
Specimen 3	2.0	1.711	0.0141
Mean	2.0	1.948	0.0160

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 1.95 g/m²/24 hours **PASS**

Permeance 0.016 µg/N.s

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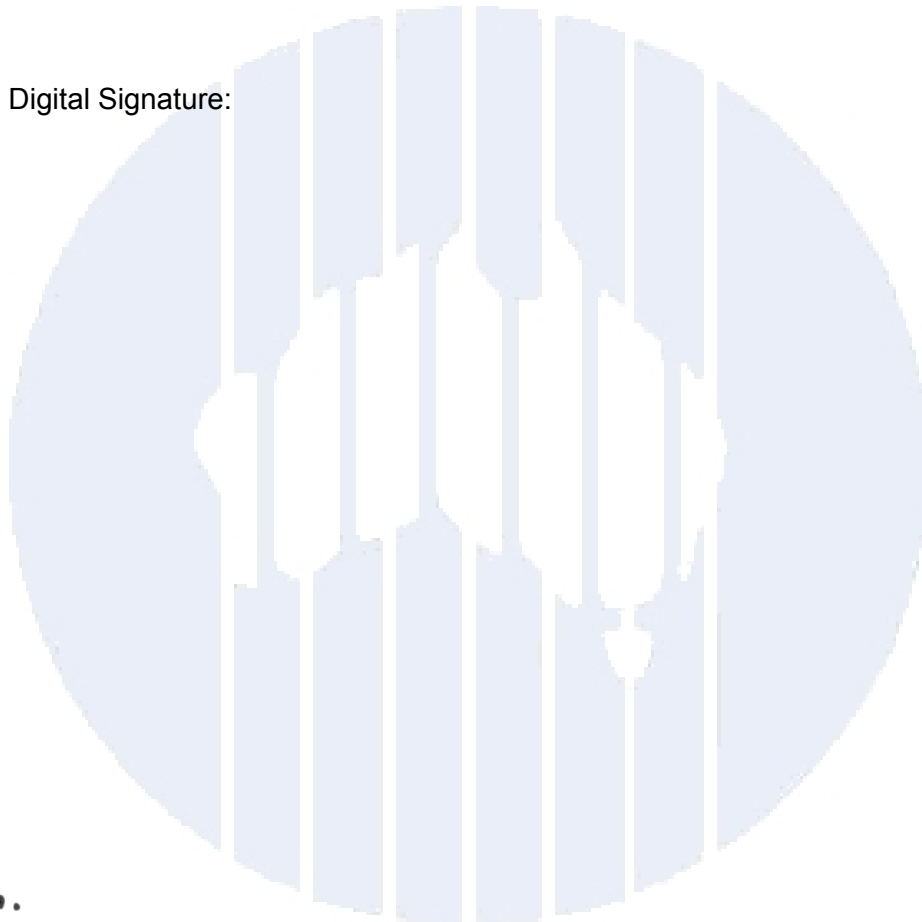
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Date and Place 15 October 2010 Highett, Vic

Name, Title and Digital Signature:



**DAVID WEEKS
SENIOR TECHNICAL OFFICER**

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