TEST REPORT

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TEST SUMMARY

Objective

Assessment of supplied sample to AS/NZS 4858:2004

Project

Evaluation of Emer-Proof Advanced to AS/NZS 4858:2004

Report Number

397-29 AS/NZS 4858:2004

Customer

NAME	**Fosroc**
ADDRESS	**1956 Dandenong Rd, Clayton**
	VIC 3168
CONTACT PERSON	**Phil Jones**
TELEPHONE	**+64 21 833216**

Name of test material

Emer-Proof Advanced

Description of test material

Single component water based grey membrane

Date of receipt of test material

14/11/2024

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Testing Facility and Location

NAME	XTec Gen Pty Ltd
ADDRESS	30-32 Park Avenue Woodville North 5012
ABN	22634729294

LIMITATION

The test results reported here relate only to the items tested.

CUSTOMER SUPPLIED INFORMATION & DATA

2 x coats @ 750um
Expected DFT: 750um
Dried film supplied

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the *XTecGen Test Request and Sample Submission Form*.

SIGNATORIES

Author

Michael Bakanyozo

Head Laboratory Technician

Reviewer

Eric Scardigno

Laboratory Manager

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SUMMARY OF TESTS

AS4858 Requirements:

PROPERTY	METHOD	RESULT	ASSESSMENT CRITERIA	ASSESSMENT
Acceptance of Cyclic movement	*AS4858 Appendix B*	**No failures observed**	*AS 4858 Appendix B Paragraph B4*	**PASS**
Durability[1]: Control Elongation at break	*AS1145.3*	***353%***	*AS 4858 Table 5.1*	**Class III**
Durability[1]: Control Tensile Strength		***0.87MPa***		
Durability[1]: Water Immersion Elongation at break	*N/A*	***609%***	*AS 4858 Table A1*	**PASS**
Durability[1]: Water immersion Tensile Strength		***0.26 MPa***		
Durability[1]: Bleach Immersion Elongation at break		***288%***		**PASS**
Durability[1]: Bleach Immersion Tensile Strength		***0.27 MPa***		
Durability[1]: Detergent Immersion Elongation at break		***542%***		**PASS**
Durability[1]: Detergent Immersion Tensile Strength		***0.17 MPa***		
Durability[1]: Heat aging Elongation at break	*N/A*	**320%**	*AS 4858 Table A1*	**PASS**

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Durability[1]: Heat aging Tensile Strength		***1.14 MPa***		[redacted]
Water Absorption	*AS 3558.1 (with sample size modified to be 50mm x 50mm by the thickness used in practice).*	***4.11%***	*AS 4858 Table 8.1*	
Moisture vapour transmission rate	*ASTM E96 Desiccant method*	**4.34g/m^2/24 hours**	*AS 4858 Table 8.1*	**Additional testing as per AS4858.1 Table 8.1 (e) is not required to establish suitability for use over particleboard**.

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CYCLIC MOVEMENT

Date of test: 2/12 - 6/12/2024

Testing:

Testing carried out in accordance with AS 4654.1 Appendix B "Assessment of resistance of waterproofing membranes to cyclic movement"

Additions, deviations and/or exclusions from AS 4654.1 Appendix B:

Nil

Test Parameters:

PARAMETER	VALUE
Membrane class	III
Number of cycles	50
Cycle time	2 Hours
Cycle expansion	4 mm
Sample Size	65 mm x 25 mm
Sample span	2 mm between plates
Sample thickness	0.792 mm

Test Results:

TEST RESULT	VALUE
Number of cycles completed	50
Surface crazing	Nil
Surface tears	Nil
Membrane rupture	Nil

Test Observations:

DAY	DATE	NUMBER OF CYCLES	Failure Observed		
			RUPTURE/HOLING		OTHER
1	2/12/2024	0	☐Yes	☒No	
2	3/12/2024	13	☐Yes	☒No	
3	4/12/2024	23	☐Yes	☒No	
4	5/12/2024	37	☐Yes	☒No	
5	6/12/2024	50	☐Yes	☒No	

Passing requirement: *"Any rupture holing the specimen or extending through the thickness for more than 1mm in from the edge of the specimen shall be taken as a failure and the number of cycles to failure shall be reported. If failure does not occur after 50 cycles it shall be reported together with the*

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types of any surface defects that have been induced and the number of cycles at which onset of the defect occurred"

Result: Pass. Meets the requirement for CSIRO moving joint test as per AS 4858 Appendix B.

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DURABILITY OF MEMBRANE

CONTROL SET

Date of test: 25/11/2024

Testing: Test carried out in accordance with AS 1145.3.

Additions, deviations and/or exclusions from AS 1145.3: Nil

Test Parameters:

PARAMETER	VALUE
Ambient temperature (conditioning)	23.4-24.9°C
Ambient humidity (conditioning)	38.0-48.9%RH
Ambient temperature (testing)	23.9°C
Ambient humidity (testing)	56.9%RH
Accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Video Extensometer
Method of preparation of specimens	Dry film supplied
Orientation of specimens to direction of cast	Parallel to direction of casting blade
Clamping device:	Pneumatic jaws
Testing speed:	50mm/min

Test Results:

Replicate	Sample thickness (mm)	Maximum Extension (mm)	Maximum Stress (MPa)	Maximum Strain (%)
1	0.75	93.9	0.75	358
2	0.79	99.1	0.92	396
3	0.79	91.1	0.93	364
4	0.79	75.5	0.81	302
5	0.79	86.7	0.96	347
Mean	0.78	89.3	0.87	353
Std Deviation	0.02	8.9	0.09	34

Requirement for Class III (high extensibility): ≥300% elongation at break

Requirement for Class II (medium extensibility) 60-299% elongation at break

Requirement for Class I (low extensibility) <60% elongation at break.

Classification: Class III

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DURABILITY OF MEMBRANE

WATER IMMERSION

Date of test: 17/12/2024 – 4/02/2025

Testing:

Test carried out in accordance with AS 4858 Table A1.

Additions, deviations and/or exclusions from AS 4858 Table A1:

Nil

Test Parameters:

PARAMETER	VALUE
Ambient temperature (conditioning)	23.4-24.9°C
Ambient humidity (conditioning)	38.0-48.9%RH
Ambient temperature (testing)	23.3-24.5°C
Ambient humidity (testing)	39.9-59.1%RH
Minimum accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Video Extensometer
Method of preparation of specimens	Dry film supplied
Orientation of specimens to direction of cast	Parallel to direction of casting blade
Clamping device:	Pneumatic jaws
Testing speed:	50mm/min

Test Results:

Sample Number	Sample thickness (mm)	Maximum Extension (mm)	Tensile strength (MPa)	Elongation at break (%)
1	0.92	176.3	0.23	705
2	0.91	159.4	0.23	637
3	0.93	152.9	0.23	612
7 Day Means	0.92	162.8	0.23	651
7 Day Std Devs	0.01	12.1	0.00	48
4	1.04	141.1	0.22	564
5	1.00	153.6	0.23	615
6	1.04	154.0	0.23	615
28 Day Means	1.03	149.6	0.23	598
28 Day Std Devs	0.02	7.4	0.01	29
7	0.98	141.8	0.28	567

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8	0.98	169.5	0.22	678
9	1.00	145.2	0.29	581
56 Day Means	0.99	152.2	0.26	609
56 Day Std Devs	0.01	15.1	0.04	60

Passing Requirement*: "Elongation at break shall not be less than 50% of that of the controls for the bond breakers given in Table 6.1 [AS4848]. For an elongation between 50% and 25% of the controls the membrane requires additional bond relief above that given in [AS4858] Table 6.1. A failure is for less than 25% retention of elongation at break of the controls".*

To pass this condition an elongation at break value of 89% or greater is required.

Result: 609% PASS

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DURABILITY OF MEMBRANE

BLEACH IMMERSION

Date of test: 17/12/2024 - 4/02/2025

Testing:

Test carried out in accordance with AS 4858 Table A1.

Additions, deviations and/or exclusions from AS 4858 Table A1:

Nil

Test Parameters:

PARAMETER	VALUE
Ambient temperature (conditioning)	23.4-24.9°C
Ambient humidity (conditioning)	38.0-48.9%RH
Ambient temperature (testing)	23.3-24.5°C
Ambient humidity (testing)	39.9-59.1%RH
Minimum accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Video Extensometer
Method of preparation of specimens	Dry film supplied
Orientation of specimens to direction of cast	Parallel to direction of casting blade
Clamping device:	Pneumatic jaws
Testing speed:	50mm/min

Test Results:

Sample Number	Sample thickness (mm)	Maximum Extension (mm)	Tensile strength (MPa)	Elongation at break (%)
1	0.85	102.4	0.39	409
2	0.89	103.5	0.39	414
3	0.91	97.9	0.39	392
7 Day Means	0.88	101.3	0.39	405
7 Day Std Devs	0.03	3.0	0.00	12
4	0.98	93.3	0.36	373
5	0.95	80.5	0.34	322
6	0.91	79.9	0.31	320
28 Day Means	0.95	84.6	0.34	338
28 Day Std Devs	0.03	7.5	0.02	30
7	0.90	63.1	0.26	253

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8	0.87	83.1	0.28	332
9	0.91	69.8	0.26	279
56 Day Means	0.89	72.0	0.27	288
56 Day Std Devs	0.02	10.1	0.01	41

Passing Requirement: *"Elongation at break shall not be less than 50% of that of the controls for the bond breakers given in Table 6.1 [AS4848]. For an elongation between 50% and 25% of the controls the membrane requires additional bond relief above that given in [AS4858] Table 6.1. A failure is for less than 25% retention of elongation at break of the controls*".

To pass this condition an elongation at break value of 89% or greater is required.

Result: 288% PASS

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DURABILITY OF MEMBRANE

DETERGENT IMMERSION

Date of test: 17/12/2024 - 4/02/2025

Testing:

Test carried out in accordance with AS 4858 Table A1.

Additions, deviations and/or exclusions from AS 4858 Table A1:

Nil

Test Parameters:

PARAMETER	VALUE
Ambient temperature (conditioning)	23.4-24.9°C
Ambient humidity (conditioning)	38.0-48.9%RH
Ambient temperature (testing)	23.3-24.5°C
Ambient humidity (testing)	39.9-59.1%RH
Minimum accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Video Extensometer
Method of preparation of specimens	Dry film supplied
Orientation of specimens to direction of cast	Parallel to direction of casting blade
Clamping device:	Pneumatic jaws
Testing speed:	50mm/min

Test Results: Detergent Immersion

Sample Number	Sample thickness (mm)	Maximum Extension (mm)	Tensile strength (MPa)	Elongation at break (%)
1	0.94	166.8	0.24	667
2	0.91	138.1	0.22	552
3	0.90	161.6	0.23	646
7 Day Means	0.92	155.5	0.23	622
7 Day Std Devs	0.02	15.3	0.01	61
4	0.99	131.8	0.17	527
5	1.03	136.8	0.17	547
6	1.01	132.6	0.19	530
28 Day Means	1.01	133.7	0.18	535
28 Day Std Devs	0.02	2.7	0.01	11
7	0.94	138.2	0.16	553

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8	0.93	138.6	0.20	554
9	0.98	129.3	0.16	519
56 Day Means	0.95	135.4	0.17	542
56 Day Std Devs	0.03	5.2	0.02	20

Passing Requirement: *"Elongation at break shall not be less than 50% of that of the controls for the bond breakers given in Table 6.1 [AS4848]. For an elongation between 50% and 25% of the controls the membrane requires additional bond relief above that given in [AS4858] Table 6.1. A failure is for less than 25% retention of elongation at break of the controls".*

To pass this condition an elongation at break value of 89% or greater is required.

Result: 542% PASS

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DURABILITY OF MEMBRANE

HEAT AGING

Date of test: 13/12/2024

Testing:

Test carried out in accordance with AS 4858 Table A1.

Additions, deviations and/or exclusions from AS 4858 Table A1:

Nil

Test Parameters:

PARAMETER	VALUE
Ambient temperature (conditioning)	23.4-24.9°C
Ambient humidity (conditioning)	38.0-48.9%RH
Ambient temperature (testing)	24.3°C
Ambient humidity (testing)	52.6% RH
Accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Video Extensometer
Method of preparation of specimens	Dry film supplied
Orientation of specimens to direction of cast	Parallel to direction of casting blade
Clamping device:	Pneumatic jaws
Testing speed:	50mm/min

Test Results:

Number of replicates	Sample thickness (mm)	Maximum Extension (mm)	Tensile strength (MPa)	Elongation at break (%)
1	0.75	93.5	1.07	374
2	0.74	70.2	1.18	281
3	0.74	76.0	1.17	304
Mean	0.75	79.9	1.14	320
Std Deviation	0.01	12.1	0.06	49

Passing Requirement*: "Elongation at break shall not be less than 50% of the result recorded for the control"*

To pass this condition an elongation at break value of 177% or greater is required.

Result: 320% PASS

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WATER ABSORPTION

Date of test: 26/11-27/11/2024

Testing:

Test carried out in accordance with AS 3558.1.

Additions, deviations and/or exclusions from AS 3558.1:

Per AS 4858, sample dimensions modified to be 50mm*50mm.

Test Results:

SAMPLE	THICKNESS (mm)	WATER ABSORPTION		
		MASS (m1) (g)	MASS (m2) (g)	MASS DIFFERENCE (%)
1	0.82	2.9001	3.0209	4.17
2	0.84	2.8962	3.0086	3.88
3	0.79	2.795	2.9147	4.28
Mean	0.82	2.86	2.98	4.11
Std Deviation	0.02	0.06	0.06	0.21

Result: 4.11%

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WATER VAPOUR TRANSMISSION RATE

Date of test: 26/11-10/12/2025

Testing:

Test carried out in accordance with ASTM E96 Desiccant Method.

Additions, deviations and/or exclusions from ASTM E96 Desiccant Method:

Nil

Test Parameters:

PARAMETER	VALUE
Test temperature:	23.5-24,3°C
Test humidity:	48.1-59.6% RH
Cup design:	Round, anodised aluminium cup
Sealant:	Paraffin Wax
Desiccant:	Anhydrous Calcium Chloride

Test Results

SAMPLE	THICKNESS (mm)	SIDE OF SPECIMEN HIGHER VAPOUR PRESSURE WAS APPLIED TO	REGRESSION		WATER VAPOUR TRANSMISSION RATE (g/m^2/24 hours)
			EQUATION	r^2 VALUE	
1	0.78	Side A, top of cast film	$Mass_{(g)}=0.0006(Time_{hr})+170.95$	0.9996	4.34
2	0.78	Side A, top of cast film	$Mass_{(g)}=0.0006(Time_{hr})+170.99$	0.9997	4.34
3	0.77	Side B, bottom of cast film	$Mass_{(g)}=0.0006(Time_{hr})+170.18$	0.9997	4.34
4	0.76	Side B, bottom of cast film	$Mass_{(g)}=0.0006(Time_{hr})+171.07$	0.9996	4.34
Mean	0.77				4.34
Std Deviation	0.01				0.00

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Passing requirement: If>8g/m^2/24 hours, additional testing referred to in [AS 4858.1 Table 8.1] (e) will be required to establish suitability for use over particleboard.

Result: 4.34g/m^2/24 hours Additional testing as per AS4858 Table 8.1 (e) is not required to establish suitability for use over particleboard.

END OF REPORT

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