TEST REPORT

Accredited for compliance with ISO/IEC 17025 – Testing
20678

TEST SUMMARY

Objective

Assessment of ACTFLEX 929 HV to AS/NZS 4858:2004

Project

Assessment of ACTFLEX 929 HV to AS/NZS 4858:2004

Report Number

0242-5 AS/NZS 4858:2004

Customer

NAME	FORSPEC Protective Coatings
ADDRESS	22/872 Canterbury Road Roselands, Sydney 2196
CONTACT PERSON	James Gilto
EMAIL	james@forspec.com.au
TELEPHONE	02 8021 3517
MOBILE	02 8021 3517

Name of test material

ACTFLEX 929 HV

Description of test material

Moisture Cured Polyurethane

Date of receipt of test material

30/05/2023

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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 coats @ 0.7mm. expected dry film 1.2mm

Dry 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

Ruby Scardigno

Laboratory Technician

Reviewer

Eric Scardigno

Laboratory Manager

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*	*547 %*	*AS 4858 Table 5.1*	Class III
Durability[1]: Control Tensile Strength		*4.15 MPa*		
Durability[1]: Water Immersion Elongation at break	*N/A*	*474 %*	*AS 4858 Table A1*	PASS
Durability[1]: Water immersion Tensile Strength		*3.88 MPa*		
Durability[1]: Bleach Immersion Elongation at break		*435 %*		PASS
Durability[1]: Bleach Immersion Tensile Strength		*3.21MPa*		
Durability[1]: Detergent Immersion Elongation at break		*601 %*		PASS
Durability[1]: Detergent Immersion Tensile Strength		*3.84MPa*		
Durability[1]: Heat aging Elongation at break	*N/A*	*341 %*	*AS 4858 Table A1*	PASS

Durability[1]: Heat aging Tensile Strength		*4.41MPa*		[redacted]
Water Absorption	*AS 3558.1 (with sample size modified to be 50mm x 50mm by the thickness used in practice).*	0.79%	*AS 4858 Table 8.1*	
Moisture vapour transmission rate	*ASTM E96 Desiccant method*	7.76g/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.
†Suitability for use over particleboard	*AS4858 Appendix C*	Test not performed	*AS 4858 Appendix C Paragraph C5*	Test not performed

[1]Durability of membranes is a combined group of assessments as detailed in AS4858 Appendix A, Table A4.

†This symbol indicates tests for which XTecGen Laboratory was not NATA accredited for at time of testing.

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CYCLIC MOVEMENT

Date of test: 12/06-16/06/2023

Testing:

Testing carried out in accordance with AS 4858 Appendix B "Assessment of resistance of waterproofing membranes to cyclic movement"

Additions, deviations and/or exclusions from AS 4858 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	1.351mm

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	12/06/2023	0	☐Yes	☒No	
2	13/06/2023	9	☐Yes	☒No	
3	14/06/2023	21	☐Yes	☒No	
4	15/06/2023	33	☐Yes	☒No	
5	16/06/2023	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*

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 4858.1 Appendix B.

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DURABILITY OF MEMBRANE

CONTROL SET

Date of test: 7/06/2023

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)	23.0-23.8°C
Ambient humidity (conditioning)	52.8-54.8%
Ambient temperature (testing)	22.8°C
Ambient humidity (testing)	51.6% RH
Accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Electronic internal measurement
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	1.253	258.634	4.304	539.287
2	1.27	215.969	4.083	414.754
3	1.322	222.76	4.047	459.78
4	1.289	249.237	4.215	648.1
5	1.236	210.583	4.107	672.43
Mean	1.27	231.4	4.15	547
Std Deviation	0.03	21.2	0.11	113

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: 13/07-31/08/2023

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)	23.0-23.8°C
Ambient humidity (conditioning)	52.8-54.8%
Ambient temperature (testing)	22.0-26.4°C
Ambient humidity (testing)	29.2-48.8% RH
Minimum accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Electronic internal measurement
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	1.15	228.1	4.58	649
2	1.09	235.5	4.67	684
3	1.07	196.7	4.21	481
7 Day Means	1.10	220.1	4.49	605
7 Day Std Devs	0.04	20.6	0.24	109
4	1.14	241.7	4.08	519
5	1.21	252.0	4.02	504
6	1.21	176.2	3.70	344
28 Day Means	1.19	223.3	3.93	456
28 Day Std Devs	0.04	41.1	0.20	97
7	1.10	235.3	3.93	491

8	1.14	239.8	3.90	526
9	1.06	182.2	3.82	405
56 Day Means	1.10	219.1	3.88	474
56 Day Std Devs	0.04	32.0	0.06	62

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 137% or greater is required.

Result: 474% PASS

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DURABILITY OF MEMBRANE

BLEACH IMMERSION

Date of test: 13/07-31/08/2023

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)	23.0-23.8°C
Ambient humidity (conditioning)	52.8-54.8%
Ambient temperature (testing)	22.0-26.4°C
Ambient humidity (testing)	29.2-48.8% RH
Minimum accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Electronic internal measurement
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	1.41	223.8	4.02	487
2	1.19	187.3	4.21	477
3	1.21	197.1	4.26	519
7 Day Means	1.27	202.7	4.16	494
7 Day Std Devs	0.12	18.9	0.12	22
4	1.21	151.9	3.22	317
5	1.10	202.6	3.73	385
6	1.12	226.4	3.75	469
28 Day Means	1.14	193.6	3.57	390
28 Day Std Devs	0.06	38.1	0.30	76
7	1.09	204.0	3.19	426

8	1.08	191.6	3.27	417
9	1.12	200.8	3.16	461
56 Day Means	1.10	198.8	3.21	435
56 Day Std Devs	0.02	6.5	0.06	24

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 137% or greater is required.

Result: 435% PASS

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DURABILITY OF MEMBRANE

DETERGENT IMMERSION

Date of test: 13/07-31/08/2023

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)	23.0-23.8°C
Ambient humidity (conditioning)	52.8-54.8%
Ambient temperature (testing)	22.0-26.4°C
Ambient humidity (testing)	29.2-48.8% RH
Minimum accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Electronic internal measurement
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	1.33	233.1	4.18	521
2	1.29	251.9	4.35	605
3	1.18	269.0	4.66	640
7 Day Means	1.26	251.3	4.40	588
7 Day Std Devs	0.08	18.0	0.24	61
4	1.37	271.0	3.91	491
5	1.38	258.2	3.84	530
6	1.22	293.7	4.08	563
28 Day Means	1.32	274.3	3.94	528
28 Day Std Devs	0.09	18.0	0.13	36
7	1.18	279.6	3.78	568

8	1.16	314.2	3.94	628
9	1.27	304.6	3.81	607
56 Day Means	1.21	299.5	3.84	601
56 Day Std Devs	0.06	17.9	0.09	30

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 137% or greater is required.

Result: 601% PASS

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DURABILITY OF MEMBRANE

HEAT AGING

Date of test: 28/06/2023

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)	23.1-24.8°C
Ambient humidity (conditioning)	50.2-54.2% RH
Ambient temperature (testing)	22.8°C
Ambient humidity (testing)	51.6% RH
Accuracy grading of test machine	A
Specimen type	Type 5
Elongation measurement type:	Electronic internal measurement
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	1.40	216.566	4.27	346
2	1.20	165.608	4.31	289
3	1.22	232.888	4.63	387
Mean	1.27	205.0	4.41	341
Std Deviation	0.11	35.1	0.20	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 274% or greater is required.

Result: 341% PASS

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WATER ABSORPTION

Date of test: 15/06-16/06/2023

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	1.199	4.6387	4.676	0.80
2	1.216	4.7262	4.7597	0.71
3	1.164	4.2748	4.3115	0.86
Mean	1.19	4.55	4.58	0.79
Std Deviation	0.03	0.24	0.24	0.08

Result: 0.79%

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WATER VAPOUR TRANSMISSION RATE

Date of test: 12/07-26/07/2023

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:	23.8-25.7°C
Test humidity:	47.2-53.3% RH
Cup design:	Round cup with sealing flange
Sealant:	Paraffin Wax
Desiccant:	Anhydrous Calcium Chloride

Test Results

SAMPLE	THICKNESS (mm)	SIDE OF SPECIMEN HIGHER VAPOUR PRESSURE WAS APPLIED TO	REGRESSION		WATER VAPOUR TRANSMISSON RATE (g/m^2/24 hours)
			EQUATION	r^2 VALUE	
1	1.10	Side A, top of cast film	$Mass_{(g)}=0.0011x(Time_{hr})+190.4$	0.9999	7.95
2	1.13	Side A, bottom of cast film	$Mass_{(g)}=0.001x(Time_{hr})+163.16$	0.9999	7.20
3	1.10	Side B, top of cast film	$Mass_{(g)}=0.0011x(Time_{hr})+190.84$	0.9999	7.95
4	1.16	Side B, bottom of cast film	$Mass_{(g)}=0.0011x(Time_{hr})+163.75$	0.9999	7.93
Mean	1.12				7.76
Std Deviation	0.03				0.37

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: 7.76 g/m^2/24 hours Additional testing as per AS4858.1 Table 8.1 (e) is not required to establish suitability for use over particleboard.

END OF REPORT