

Test Report No. 7191352624-MEC25-ES_AD1
dated 27 Dec 2024



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SUBJECT:

Testing of sealant submitted by RLA Polymers Pty Ltd

TESTED FOR:

The Fire Stop Centre
Unit J - 657 Great South Road Penrose
Auckland
New Zealand 1642

Attn: Mr Sunny Rajak

SAMPLE DESCRIPTION:

1. No physical test sample was submitted for testing 'FSC Ultra Sealant FIRESTOPULTRA' which is the subject of this additional test report.
2. This additional test report is not applicable for certification scheme application with any certification bodies and cannot be used to support an 'Application Of Product Certification'.
3. The test results stated in this additional test report are based exclusively on the test results of a past submitted and tested sample reported in test report no. 7191339983-MEC24-ES dated 27 Dec 2024.
4. This additional test report is issued on the basis of the declaration by the customer that 'FSC Ultra Sealant FIRESTOPULTRA' which is the subject of this additional test report is exactly the same as the original sample provided for test report no. 7191339983-MEC24-ES dated 27 Dec 2024 in terms of technical specification and performance.
5. The details of the product, including name, brand, article number and any technical specification are solely provided by the client and no verification has been done by TUV SUD PSB Pte Ltd to whether such details are true and correct.
6. The detailed declaration by the client as follows:
 - company name: RLA Polymers Pty Ltd
 - address: 215 Colchester Rd, Kilsyth VIC Australia
 - name of authorised person: Mr Craig Hildebrand
 - company telephone number: 1800 242 931
 - email address: childebrand@rlapolymers.com.au



LA-2007-0380-A LA-2007-0386-C
LA-2007-0381-F LA-2010-0464-D
LA-2007-0382-B LA-2018-0702-B
LA-2007-0383-G LA-2018-0703-G
LA-2007-0384-G LA-2020-0747-L
LA-2007-0385-E

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

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TEST METHODS:

ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants

Staining And Colour Change, UV Exposure

1. ASTM C510 : 2016 Standard Test Method For Staining And Colour Change Of Single Or Multi-Component Joint Sealants

Test equipment : QUV Weatherometer
Lamp designation : Fluorescent UVA 340 mm
Test cycle : 8 hours UV exposure at $60 \pm 3^\circ\text{C}$ and 4 hours condensation at $50 \pm 3^\circ\text{C}$, irradiance $0.89 \text{ W/m}^2 \cdot \text{nm}$ (ASTM G154)
Exposure duration : 100 hours
No. of determinations : 4 samples: 2 samples with sealant and 2 samples without sealant (For UV Exposure)
2 control samples: 1 sample with sealant and 1 sample without sealant (Standard Conditions)

Staining And Colour Change, Standard Conditions In Distilled Water

Test apparatus : Container with distilled water
Test condition : Distilled water immersion for 1 minute, once a day, (5 days per week)
Test duration : 14 days
No. of determinations : 2 samples: 1 sample with sealant and 1 sample without sealant (For distilled water immersion)
2 control samples: 1 sample with sealant and 1 sample without sealant (Standard Conditions)

Extrudability

2. ASTM C1183/C1183M : 2013 (2018) Standard Test Method For Extrusion Rate Of Elastomeric Sealants

Test method : Procedure A
Test pressure : $40 \pm 1 \text{ psi}$
No. of determination : 1

Flow Properties

3. ASTM C639 : 2015 Standard Test Method For Rheological (Flow) Properties Of Elastomeric Sealants

Method : Test method for 'Type II' sealant
Test conditions : a) $4.4 \pm 2^\circ\text{C}$ in environmental chamber for 4 hours
b) $50 \pm 2^\circ\text{C}$ in oven for 4 hours
No. of determinations : 2 for vertical and horizontal displacements



Hardness

4. ASTM C661 : 2015 Standard Test Method For Indentation Hardness Of Elastomeric-Type Sealants By Means Of A Durometer

Test Conditions:

- a) $23\pm 2^{\circ}\text{C}$ and $50\pm 5\%$ relative humidity for 7 days
b) $38\pm 2^{\circ}\text{C}$ and 95% relative humidity for 7 days
c) $23\pm 2^{\circ}\text{C}$ and $50\pm 5\%$ relative humidity for 7 days
No. of determinations : 2, 3 points per test piece

Tack-Free Time

5. ASTM C679 : 2015 Standard Test Method For Tack-Free Time Of Elastomeric Sealants

Test apparatus : 30 g weight
No. of determinations : 2

Cyclic Adhesion & Cohesion

6. ASTM C719 : 2014 (2019) Standard Test Method For Adhesion And Cohesion Of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

Test Conditions:

- a) $23\pm 2^{\circ}\text{C}$ and $50\pm 5\%$ relative humidity for 7 days
b) $37.8\pm 2^{\circ}\text{C}$ and 95% relative humidity for 7 days
c) $23\pm 2^{\circ}\text{C}$ and $50\pm 5\%$ relative humidity for 7 days
d) Immersion in distilled water at 23°C for 7 days
e) Drying in oven at 70°C for 7 days followed by joint movement at standard temperature $23\pm 2^{\circ}\text{C}$
f) Drying in oven at 70°C for 16-20 hours followed by class extension at cold temperature $-26.1\pm 1.7^{\circ}\text{C}$
Substrate : Mortar
Class : 20
No. of cycles : 10
Crosshead speed : 3.2 mm/hr
No. of determinations : 3

Effects Of Heat Ageing

7. ASTM C1246 : 2017 Standard Test Method For Effects Of Heat Ageing On Weight Loss, Cracking, And Chalking Of Elastomeric Sealants After Cure

Test Conditions:

- a) $23\pm 2^{\circ}\text{C}$ and $50\pm 5\%$ relative humidity for 28 days
b) $70\pm 2^{\circ}\text{C}$ for 21 days
No. of determinations : 3, 1 as control

Effects Of Accelerated Weathering

8. ASTM C793 : 2005 (2017) Standard Test Method For Effects Of Accelerated Weathering On Elastomeric Joint Sealants



Test Conditions:

23±2°C and 50±5% relative humidity for 21 days

Test equipment	:	QUV Weatherometer
Test cycle	:	8 hours UV exposure at 60±3°C and 4 hours condensation at 50±3°C, irradiance 0.89 W/m ² .nm (ASTM G154)
Lamp designation	:	Fluorescent UVA 340 nm
Exposure duration	:	250 hours
No. of determinations	:	3 (1 as control)
Bend test		
Test equipment	:	Environmental chamber
Apparatus	:	Steel mandrel
Test condition	:	-26±2°C for 24 hours
No. of determinations	:	3

Adhesion-In-Peel, Standard Conditions And UV Exposure Through Glass

9. ASTM C794 : 2018 Standard Test Method For Adhesion-In-Peel Of Elastomeric Joint Sealants

Test Conditions:

a. 23±2°C and 50±5% relative humidity for 21 days

b. 23±2°C and 50±5% relative humidity for 21 days followed by

i. UV exposure

ii. Immersion in water at 23°C for 7 days

Substrate	:	Mortar
Crosshead speed	:	50 mm/min
No. of determinations	:	4 for test condition a
Substrate	:	Glass
Test cycle	:	8 hours UV exposure at 60±3°C and 4 hours condensation at 50±3°C, irradiance 0.89 W/m ² .nm (ASTM G154)
Lamp designation	:	Fluorescent UVA 340 nm
Exposure duration	:	200 hours
Crosshead speed	:	50 mm/min
No. of determinations	:	4 for test condition b

Cyclic Adhesion & Cohesion After Continuous Water Immersion

10. *ASTM C1247 : 2014 Standard Test Method For Durability Of Sealants Exposed To Continuous Immersion In Liquids
Cross-reference Adopted ASTM C719 : 2014 (2019) Standard Test Method For Adhesion And Cohesion Of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

Test Conditions:

a) 23±2°C and 50±5% relative humidity for 7 days

b) 37.8±2°C and 95±5% relative humidity for 7 days

c) 23±2°C and 50±5% relative humidity for 7 days

d) Water Immersion at 50°C for 6 weeks followed by test

e) Continuous water immersion at 50°C for 4 weeks followed by test

Substrate	:	Mortar
Total immersion duration	:	10 weeks
Test temperature	:	Room temperature
Class	:	20
No. of cycles	:	3
Crosshead speed	:	3.2 mm/hr
No. of determinations	:	3



CONDITIONING:

Unless otherwise specified, all test specimens were tested at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity.
Standard Conditions parameters: $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity.

TEST RESULTS:

Test	'FSC Ultra Sealant FIRESTOPULTRA'	ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants
1. Staining And Colour Change	No staining No colour change	The sealant shall not cause any visible stain on the top surface of a white cement mortar base
2. Extrudability	265.4 ml/min	Type S (single component), grade NS (non-sag or gunnable sealant) shall have an extrusion rate of not less than 10 ml/min
3. Rheological (Flow) Properties	Vertical displacement: 0 mm sag Horizontal displacement: No deformation	Grade NS (non-sag) or gunnable sealant shall have flow characteristics such that it does not sag more than 4.8 mm ($\frac{3}{16}$ in.) in vertical displacement. Also the sealant shall show no deformation in horizontal displacement (refer to Types II and IV in the tests)
4. Indentation Hardness	test piece 1, average : 18.4 test piece 2, average : 18.2 average of 2 test pieces : 18.3	Use T1 (traffic) sealant shall have a hardness reading, after being properly cured, of not less than 25 Use T2 (traffic) sealant shall have a hardness reading, after being properly cured, of less than 25 Use NT (non-traffic) sealant shall have a hardness reading, after being properly cured, of less than 60
5. Tack-Free Time	No transfer of test specimens to the polyethylene film	There shall be no transfer of the sealant to the polyethylene film when tested at 72 hours
6. Adhesion & Cohesion Under Cyclic Movement, Class 20 Mortar	No loss in bond	The total loss in bond and cohesion areas among the three specimens tested for each surface shall be no more than 9 cm^2 ($1\frac{1}{2} \text{ in.}^2$) with standard mortar, glass, and aluminium or any other specified substrates
7. Effects Of Heat Ageing On Weight Loss, Cracking And Chalking, average	3.7% No cracking and chalking	The sealant shall not lose more than >7% of its original weight or show any cracking and chalking

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TEST RESULTS:

Test	'FSC Ultra Sealant FIRESTOPULTRA'	ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants
8. Effects Of Accelerated Weathering	No cracks after UV exposure and bend test	The sealant shall show no cracks greater than those shown in example #2 of Figure 1 in ASTM C793 after the specified UV exposure and shall show no cracks greater than those shown in example #2 of Figure 2 in ASTM C793 after exposure at cold temperature and the bend test (refer to Photo 2)
9. a. Adhesion-In-Peel, average Mortar	43.9 N (9.9 lbf) cohesive failure within the sealant and no adhesive bond loss between sealant and substrate for each test piece	The peel strength for each individual test shall not be less than 22.2 N (5 lbf) when tested with standard mortar, glass, and aluminium or any other specified substrate. In addition, the sealant shall show no more than 25% adhesive bond loss for each individual test
b. Adhesion-In-Peel After UV Exposure, average Glass	45.5 N (10.3 lbf) cohesive failure within the sealant and no adhesive bond loss between sealant and substrate for each test piece	Adhesion-In-Peel For Use G Exposed To UV Exposure Through Glass The peel strength for each individual test shall not be less than 22.2 N (5 lbf) and the compound shall be no more than 25% adhesive bond loss for each individual test to include 200 hours in accelerated weathering device followed by 7 days immersion in distilled water
10. *Adhesion & Cohesion Under Cyclic Movement After Continuous Water Immersion At 50°C, i. 1 st : 6 weeks, Class 20 Mortar ii. 2 nd : 4 weeks, total 10 weeks Class 20 Mortar	No loss in bond No loss in bond	After 6 weeks exposure, the total loss in bond and cohesion areas among the specimens tested for each substrate shall be no greater than 9.5 cm ² (1 1/2 in ²) with standard glass, aluminium, or any other substrate specified. After 10 weeks exposure, the total loss in bond and cohesion areas among the specimens tested for each substrate shall be no greater than 9.5 cm ² (1 1/2 in ²) with standard glass, aluminium, or any other substrate specified.


REMARKS:

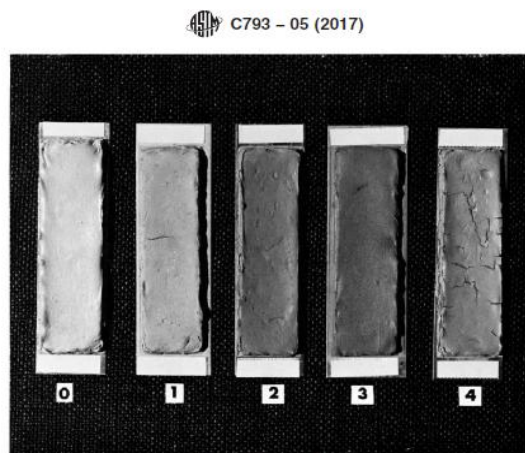
- The tests and ASTM C920 specifications are requested by the client.
- The test conditions for staining and colour change test, effects of accelerated weathering test and adhesion-in-peel uv exposure through glass test were based on ASTM G154 : 2016 Standard Practice For Operating Fluorescent Light Apparatus For UV Exposure Of Non-Metallic Materials.


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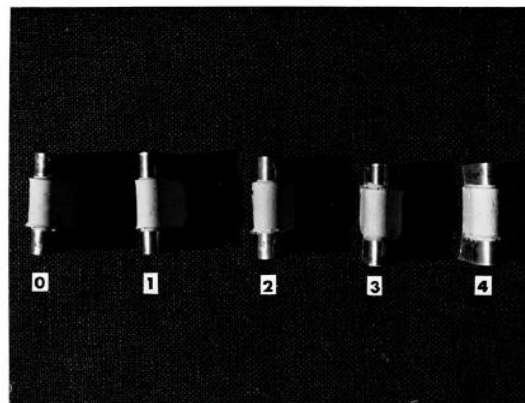
3. The specific gravity value required for extrudability test was provided by the client.
4. For effects of accelerated weathering test, in ASTM C793, Photo 2 consists of Figure 1 which indicate the presence of cracks after UV exposure and Figure 2 which indicate the presence of cracks after bend test.
5. The class and types of substrates are specified by the client for ASTM C719 joint movement, ASTM C794 peel strength and ASTM C1247 continuous water immersion joint movement tests.
6. The substrates did not require primer before application of the sealant as specified by the client.
7. *ASTM C1247 - Not SAC-SINGLAS accredited.


Li Yangyang
Testing Officer


Eddie Suwand
Senior Associate Engineer
Real Estate & Infrastructure
Mechanical Centre



Note: 1—Number 0 represents no cracks.
FIG. 1 Examples of Cracking Obtainable After the Weathering Test



Note: 1—Number 0 represents no cracks.
FIG. 2 Examples of Cracking Obtainable After the Bend Test

Photo 2: Figures 1 and 2 showing presence of cracks after UV exposure and after bend test respectively
(taken from ASTM C793 as a guide and are not client's samples)



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Effective 27 March 2024