

Test Report No. 7191234604-MEC20/04A-ED
dated 3 Sep 2020



PSB Singapore

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SUBJECT:

Testing of sealant submitted by Guangzhou Baiyun Chemical Industry Co., Ltd.

TESTED FOR:

Guangzhou Baiyun Chemical Industry Co., Ltd.
No.1 Yunan Road, Guangzhou Civilian Science & Technology Park, Taihe, Guangzhou,
China P.S.:510540

Attn: Mr Jimmy Zheng

SAMPLE DESCRIPTION:



The following items were received on 28 Feb 2020 as shown:

Sample	Size	Quantity
'DJ-A3-SS607E Firestop Silicone Sealant' (refer to Photo 1)	300 ml/cartridge	10 cartridges



Photo 1: 'DJ-A3-SS607E Firestop Silicone Sealant'



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



TEST METHODS:

Adopted ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants

Staining And Colour Change, UV Exposure

1. Adopted 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 55°C and 4 hours condensation at 45°C (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. Adopted ASTM C1183/C1183M : 2013 (2018) Standard Test Method For Extrusion Rate Of Elastomeric Sealants

Test pressure : 40 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°C in environmental chamber for 4 hours
b) 50°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°C and 50% relative humidity for 7 days
b) 38°C and 95% relative humidity for 7 days
c) 23°C and 50% 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

No. of determinations : 2

Cyclic Adhesion & Cohesion

6. 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°C and 50% relative humidity for 7 days
b) 38°C and 95% relative humidity for 7 days
c) 23°C and 50% 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
Substrate : Mortar, aluminium, glass
Test temperature : Room temperature
No. of determinations : 3 for class 25 per substrate

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°C and 50% relative humidity for 28 days
b) 70°C for 21 days
No. of determinations : 3, 1 as control

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Effects Of Accelerated Weathering

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

Test Conditions:

23°C and 50% relative humidity for 21 days

Test equipment : QUV Weatherometer
 Test cycle : 8 hours UV exposure at 55°C and 4 hours condensation at 45°C (ASTM G154)
 Lamp designation : Fluorescent UVA 340 mm
 Exposure duration : 250 hours
 No. of determinations : 3 (1 as control)
 Bend test
 Apparatus : Steel mandrel
 Test condition : -26°C for 24 hours
 No. of determinations : 3

Adhesion-In-Peel

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

Test Conditions:

23°C and 50% relative humidity for 21 days

Substrate : Mortar, aluminium, glass
 Crosshead speed : 50 mm/min
 No. of determinations : 4 per substrate

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	'DJ-A3-SS607E Firestop Silicone Sealant'	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	405.0 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





TEST RESULTS:

Test	'DJ-A3-SS607E Firestop Silicone Sealant'	ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants
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 (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 : 21.7 test piece 2, average : 23.0 average of 2 test pieces : 22.4	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 25 a. mortar b. aluminium c. glass	No loss in bond No loss in bond 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 ¹ / ₂ 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	1.0% No cracking and chalking	The sealant shall not lose more than >7% of its original weight or show any cracking and chalking
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. Adhesion-In-Peel, average a. mortar b. aluminium c. glass	104.4 N (23.5 lbf) 110.2 N (24.8 lbf) 92.9 N (20.9 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

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REMARKS:

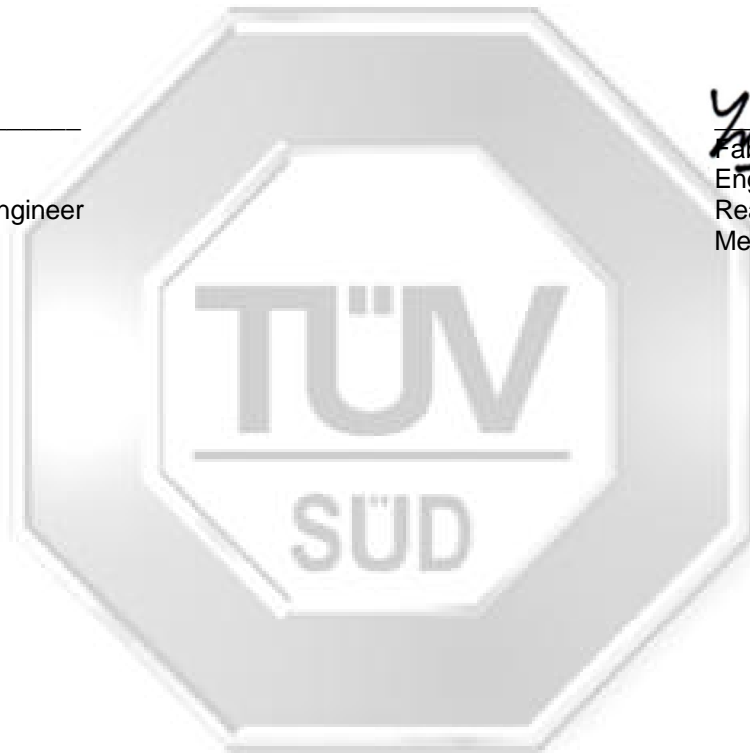
1. The test conditions for staining and colour change tests and effects of accelerated weathering test were adopted from ASTM G154 : 2016 Standard Practice For Operating Fluorescent Light Apparatus For UV Exposure Of Non-Metallic Materials.
2. For effects of accelerated weathering test, in ASTM C793, 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.
3. The substrates did not require priming before application of the sealant as specified by the client.
4. The class and type of substrate are specified by the client for ASTM C719 joint movement and ASTM C794 peel strength tests.
5. One cartridge was sent to other section for material identification/verification FTIR test.

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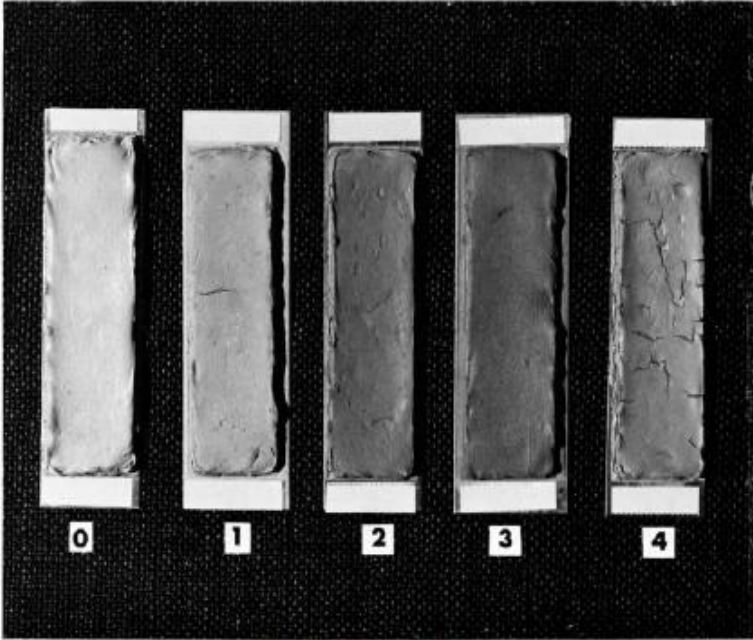
Eddie Suwand
Testing Officer
Senior Associate Engineer

A handwritten signature in black ink, appearing to read 'Fabien Tan'.

Fabien Tan
Engineer
Real Estate & Infrastructure
Mechanical Centre

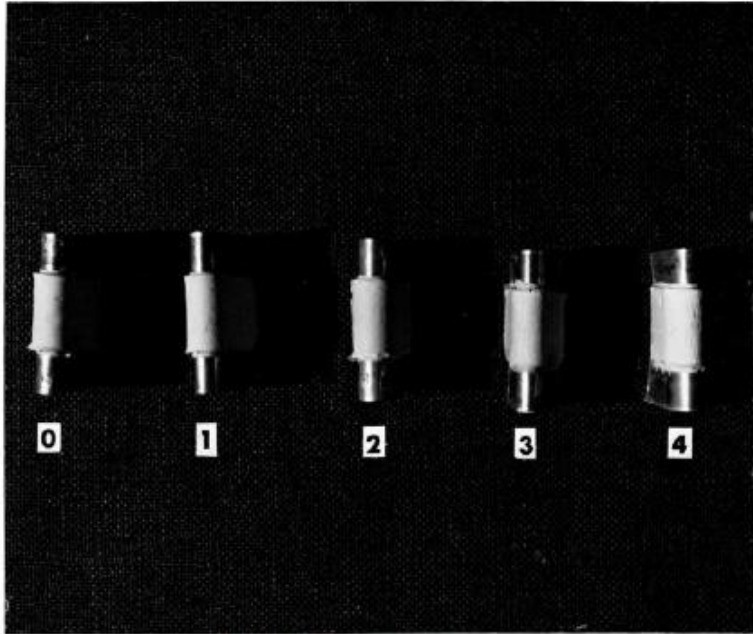


ASTM C793 - 05 (2017)



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 01 September 2020

