

Test Report No. 7191238129-MEC20/01A_AD1-ED
dated 31 Aug 2020



PSB Singapore

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SUBJECT:

Testing of sealant submitted by Hangzhou Zhijiang Silicone Chemicals Co., Ltd

TESTED FOR:

Finotech Switzerland AG
Talacherring 6a
8103 Unterengstringen
Switzerland

Attn: Mr Joerg Szybalski

SAMPLE DESCRIPTION:

1. No physical test sample was submitted for testing 'Finotech® SQ-490' 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.
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. 7191238129-MEC20/01A-ED dated 31 Aug 2020.
4. This additional test report is issued on the basis of the declaration by the customer that 'Finotech® SQ-490' which is the subject of this additional test report is exactly the same as the original sample provided for test report No. 7191238129-MEC20/01A-ED dated 31 Aug 2020 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: Hangzhou Zhijiang Silicone Chemicals Co., Ltd.
 - Address: No. 1717 Century Avenue, Linjiang Industry Park, Xiaoshan Hangzhou, Zhejiang China
 - Name of authorised person: Mr John Zhao
 - Company telephone number: 18058736111
 - Email address: john.zhao@chinazhijiang.com

TEST METHODS:

Adopted ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants



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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TUV®



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 : Anodized aluminium and glass
Test temperature : Room temperature
No. of determinations : 3 for class 35 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

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 : Anodized aluminium and glass
 Crosshead speed : 50 mm/min
 No. of determinations : 4 per substrate

CONDITIONING:

Unless otherwise specified, all test specimens were tested at 23 ± 2°C and 50 ± 5% relative humidity.
 Standard Conditions parameters: 23 ± 2°C and 50 ± 5% relative humidity.

TEST RESULTS:

| Test | 'Finotech® SQ-490' | 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 | 411.6 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 (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 : 15.9 test piece 2, average : 15.3 average of 2 test pieces : 15.6 | 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 |



TEST RESULTS:

| Test | 'Finotech® SQ-490' | ASTM C920 : 2018 Standard Specification For Elastomeric Joint Sealants |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Adhesion & Cohesion Under Cyclic Movement, Class 35 a. anodized aluminium b. glass | 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 (1½ in. ²) with standard mortar, glass, and aluminium or any other specified substrates |
| 2. Effects Of Heat Ageing On 3. Weight Loss, Cracking And Chalking, average | 0.7% No cracking and chalking | The sealant shall not lose more than >7% of its original weight or show any cracking and chalking |
| 4. 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 1) |
| 5. Adhesion-In-Peel, average a. anodized aluminium b. glass | 157.9 N (35.6 lbf) 123.6 N (27.8 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 |

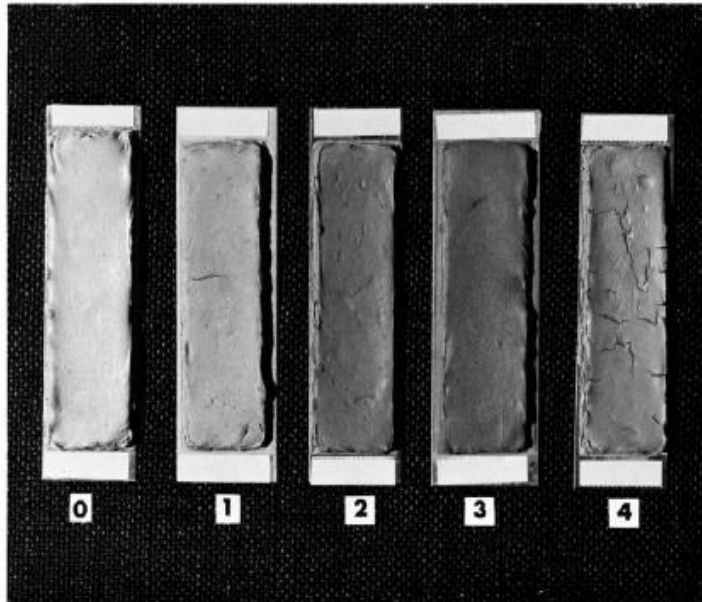
REMARKS:

- 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.
- For effects of accelerated weathering test, in ASTM C793, Photo 1 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.
- The substrates did not require priming before application of the sealant as specified by the client.
- The class and types of substrate are specified by the client for ASTM C719 joint movement and ASTM C794 peel strength tests.
- One cartridge was sent to other section for material identification/verification FTIR test.
- The anodized aluminium substrates were provided by Hangzhou Zhijiang Silicone Chemicals Co., Ltd. (refer to 7191238129-MEC20/02A-ED)

Eddie Suwand
Testing Officer
Senior Associate Engineer

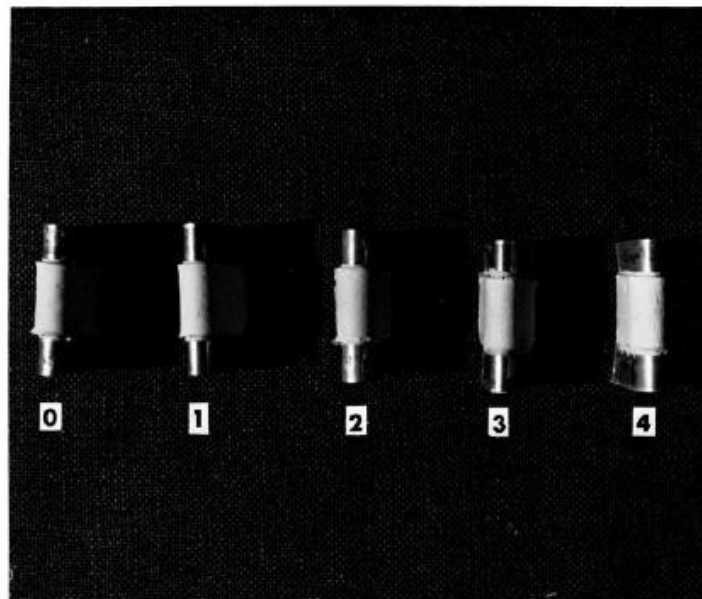
Tan Boon Kwee
Assistant Vice President
Real Estate & Infrastructure
Mechanical Centre

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 1: 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

