

Test Report No. 719170872-MEC10/03-ED
dated 7 May 2010



PSB Singapore

Note: This report is issued subject to TÜV SÜD PSB's "Terms and Conditions Governing Technical Services".
The terms and conditions governing the issue of this report are set out as attached within this report.

**Choose certainty.
Add value.**

SUBJECT:

Testing of sealant

TESTED FOR:

Guangzhou Baiyun Chemical Industry Co. Ltd
No. 1 Yunan Road
Guangzhou Civilian Science
Taihe, Guangzhou
China

Attn: Ms Echo Zhang

SAMPLE DESCRIPTION:

The following items were received on 2 Feb 2010 as shown:

Sample	Volume	Quantity
'SS621 Silicone Structural Sealant'	300 ml	10 sausages

TEST METHODS:

Staining And Colour Change

1. ASTM C510 : 1997 Standard Test Method For Staining And Colour Change Of Single Or Multi-Component Joint Sealants

Substrate : Glazed tile
Test cycle : 8 hours UV exposure at 55°C and 4 hours condensation at 45°C
Exposure duration : 100 hours
No. of determination : 1 for staining test, 1 for colour change test, 1 as control



Laboratory:
TUV SUD PSB Pte. Ltd.
Testing Services
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testing@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TUV SUD Asia Pacific Pte. Ltd.
3 Science Park Drive, #04-01/05
The Franklin, Singapore 118223
TUV®



Extrudability

2. ASTM C1183 : 1997 Standard Test Method For Extrusion Rate Of Elastomeric Sealants
(Cross Reference: ASTM D1475 : 1998 Standard Test Method For Density Of Liquid Coatings, Inks And Related Products)

Apparatus : Pycnometer and caulking gun
Test pressure : 40 psi
No. of determination : 1

Flow Properties

3. ASTM C639 : 2001 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 : 1998 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 : 1997 Standard Test Method For Tack-Free Time Of Elastomeric Sealants

No. of determinations : 2



Cyclic Adhesion & Cohesion

6. ASTM C719 : 1998 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

Cyclic Test Conditions:

Stage A-10 cycles of joint movements:

- a) The joint width was compressed from 12.7mm to 11.1mm at 3.2 mm/h
- b) It was extended from 11.1mm to 14.3mm at 3.2 mm/h
- c) It was compressed again from 14.3mm to 12.7mm at 3.2 mm/h

Stage B-10 cycles of joint movements:

- a) The joint width was compressed to 11.1mm and conditioned at 70°C for 16 to 20 hours
- b) After ageing, the test specimens were cooled to 23°C for 2 to 3 hours
- c) The joint width was extended to 14.3mm at -26°C and 3.2 mm/h
- d) The specimens were removed and allowed to condition to room temperature

No. of determinations : 3

Effects Of Heat Ageing

7. ASTM C1246 : 2000 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 : 1997 Standard Test Method For Effects Of Accelerated Weathering On Elastomeric Joint Sealants

Test cycle : 8 hours UV exposure at 55°C and 4 hours condensation at 45°C
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. ASTM C794 : 2001 Standard Test Method For Adhesion-In-Peel Of Elastomeric Joint Sealants

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 water at 23°C for 7 days

Substrate : Mortar, Aluminium and Glass
 Crosshead speed : 50.8 mm/min
 No. of determinations : 4 per substrate

Material Identification/Verification

10. Material Identification/Verification By Fourier Transform Infra-Red Spectrometric Analysis (FTIR)

CONDITIONING:

Unless otherwise specified, all test specimens were tested at 23 ± 2°C and 65 ± 5% relative humidity.

TEST RESULTS:

Test	'SS621 Silicone Structural Sealant'	ASTM C920 : 2001 Standard Specification For Elastomeric Joint Sealants
1. Staining And Colour Change	No staining and no colour change	The sealant shall not cause any visible staining on the top surface of a white cement mortar base
2. Extrudability	>10 ml/min	Type S (single component), grade NS (non-sag or gunnable sealant) shall have an extrusion rate time of not < 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 >4.8mm in vertical displacement and shall show no deformation in horizontal displacement (refers to Types II and IV sealants)
4. Indentation Hardness test piece 1, average test piece 2, average	35 35	T (traffic) sealant shall have a hardness reading of not <25 or >50 after being properly cured NT (non-traffic) sealant shall have a hardness reading of not <15 or >50 after being properly cured
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 Report No. 719170872-MEC10/03-ED
 dated 7 May 2010



PSB Singapore

TEST RESULTS:

Test	'SS621 Silicone Structural Sealant'	ASTM C920 : 2001 Standard Specification For Elastomeric Joint Sealants
6. Adhesion & Cohesion Under Cyclic Movement	No bond failure	The total loss in bond and cohesion areas among the three specimens tested for each surface shall not be >9 cm ² with mortar substrates
7. Effects Of Heat Ageing On Weight Loss, Cracking And Chalking, average	1.0% No cracking and chalking	The sealant shall not lose >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 after the specified UV exposure and shall show no cracks after exposure at cold temperature and the bend test
9. Adhesion-In-Peel, average a. Mortar b. Aluminium c. Glass	86.0 N (19.4 lbf) 83.6 N (18.8 lbf) 93.1 N (21.0 lbf)	The peel strength for each individual test shall not be <22.2 N (5 lbf) and the sealant shall show no >25% adhesive bond loss for each individual test
10. Material Identification/ Verification By FTIR	Silicone-based material (refer to Figure 1)	-

REMARKS:

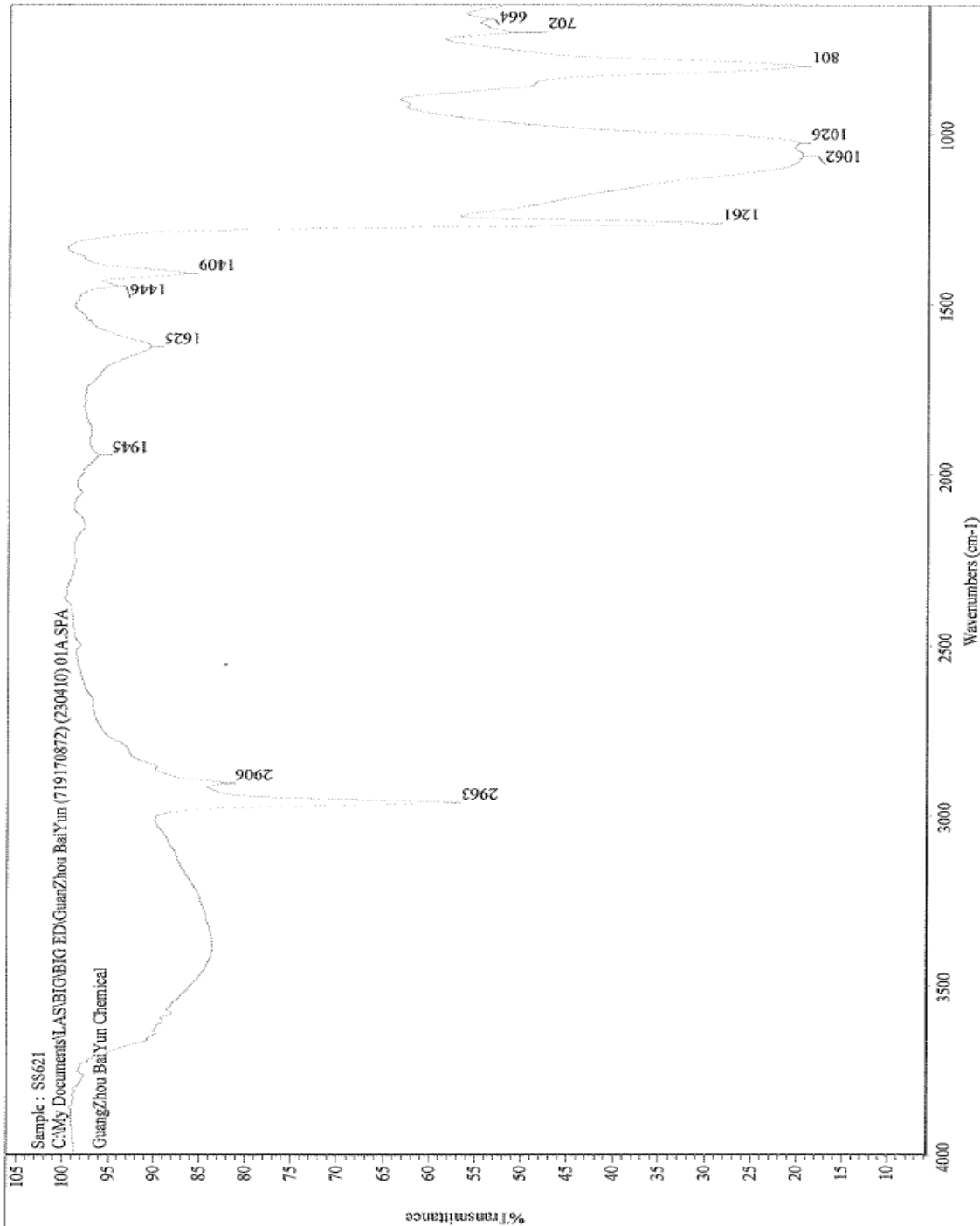
The test conditions for staining and colour change tests and effects of accelerated weathering test were adopted from ASTM G154 : 2000a Standard Practice For Operating Fluorescent Light Apparatus For UV Exposure Of Non-Metallic Materials.

Eddie Suwand
Associate Engineer

Raymond Tan
Senior Engineer
Building & Acoustics
Mechanical Centre



Figure 1 : IR spectrum of 'SS621 Silicone Structural Sealant'



Test Report No. 719170872-MEC10/03-ED
dated 7 May 2010



PSB Singapore

This Report is issued under the following conditions:

1. Results of the testing/calibration in the form of a report will be issued immediately after the service has been completed or terminated.
2. Unless otherwise requested, this report shall contain only technical results carried out by TÜV SÜD PSB. Analysis and interpretation of the results and professional opinion and recommendations expressed thereupon, if required, shall be clearly indicated and additional fee paid for, by the Client.
3. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.
4. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
5. Additional copies of the report are available to the Client at an additional fee. No third party can obtain a copy of this report through TÜV SÜD PSB, unless the Client has authorised TÜV SÜD PSB in writing to do so.
6. TÜV SÜD PSB may at its sole discretion add to or amend the conditions of the report at the time of issue of the report and such report and such additions or amendments shall be binding on the Client.
7. All copyright in the report shall remain with TÜV SÜD PSB and the Client shall, upon payment of TÜV SÜD PSB's fees for the carrying out of the tests/calibrations, be granted a license to use or publish the report to the third parties subject to the terms and conditions herein, provided always that TÜV SÜD PSB may at its absolute discretion be entitled to impose such conditions on the license as it sees fit.
8. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.
9. This report shall not be reproduced wholly or in parts and no reference shall be made by the Client to TÜV SÜD PSB or to the report or results furnished by TÜV SÜD PSB in any advertisements or sales promotion.
10. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

March 2010