ALSEAL®

Stick to Alseal's Quality

LOW VOC

AS-4002S

Premier Construction Sealant

A one-component, elastomeric joint sealant formulated with acrylic modified hybrid sealant, the premium grade of MS Polymer. The weatherability and UV resistance of the sealant is excellent, with much longer expected service life than other organic sealants in the market. The finishing is matt, less tacky, and with low electrostatic charge, thereby reducing fluid streaking issues on façade cladding caused by air-borne dust particles. Besides, the formula is also free of silicone oil, minimizing oil-staining or other building aesthetic issues caused by migration of silicone oil. It has passed ASTM C1248, the standard test method for staining of porous substrate by joint sealants. Unlike polyurethane sealants, this sealant is free of isocyanate and solvent and thus no issues like blistering or shrinkage will occur. It also can adhere well to numerous substrates without primer, fast-curing, paintable with common water-based coatings, and it is a green product that complies with SCAQMD rule 1168 Low VOC limit.

Applications: Specially formulated to seal metal (e.g. ACP) and stone (e.g. marble) façade cladding due to its excellent weatherability and non-staining/ less dirt-streaking characteristics. It is also recommended for sealing concrete joints like precast wall panel joints construction joints, control joints, expansion joints, and window frame perimeter sealing (PVC / Aluminum to concrete wall), both painted and non-painted surfaces. Other recommended applications include sealing of masonry, brickworks, anodized aluminum, stainless steel, porcelain, finished wood, coated metal, epoxy and polyester panels, uPVC, polystyrene, and many difficult substrates.

Approvals / Specifications:

- ASTM C920, Type S, Grade NS, Class 50, Use NT & A
- ASTM C1248 : 2018 Standard Test Method For Staining Of Porous Substrate By Joint Sealants
- Low VOC - USEPA Method 24 under SCAQMD Rule 1168

Product Code	Content	Carton Quantity
AS-4002S	600 ml / Sausage	20 / Carton

Available colours:
Matte black, matte grey & matte white

Features:

- ✓ Excellent weatherability – 10-year warranty
- ✓ ±50% Movement capability
- ✓ No silicone oil – Non-staining on adjacent substrates
- ✓ Paintable
- ✓ Low static charge – Less dirt streaking
- ✓ No isocyanate – No blistering
- ✓ No solvent – No shrinkage
- ✓ Bonds most substrates without primer
- ✓ Matte finish

☑ **Less fluid-streaking on facade cladding** (MS Polymer)

☒ **Fluid-streaking on facade cladding** (Silicone Sealant)

Less fluid-streaking

- Minimise Fluid-streaking issue introduced by silicone sealants.
- Reduce building cleaning and maintenance costs.

☑ **Non-staining on natural stone facade** (MS Polymer)

☒ **Staining on natural stone facade** (Silicone Sealant)

Non-staining / Less dirt streaking

- No silicone oil, hence no oil migration and staining issues on adjacent substrates.
- Minimise dirt-streaking issues introduced by silicone sealants.
- Reduce building cleaning and maintenance costs.

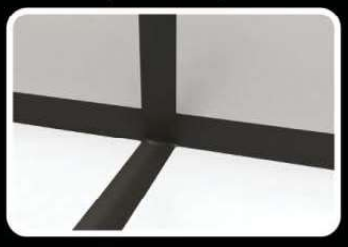
☑ **Less dirt-streaking** (MS Polymer)

☒ **Streaking** (Silicone Sealant)

Paintable

- Paintable with various types of paint.

☑ **Good UV resistance** (MS Polymer)



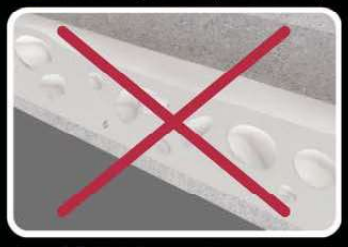
☒ **Poor UV resistance - Sealant cracking** (PU Sealant)

Flexible seal & Good UV resistance

- ±50 % Movement capability, suitable for working joints that experience significant movements.
- Durable, remain elastomeric for long time.

☑ **No blistering** (No isocyanate)

☒ **Blistering issue** (PU Sealant)



No blistering

- The blisters in PU sealants are due to the formation of CO_2.
- The formation of CO_2 is the result of moisture reaction with isocyanate.

☑ **No shrinkage** (MS Polymer)

☒ **Shrinkage after cure** (PU Sealant)

No Shrinkage

- PU sealant shrinks while curing.
- MS sealant will not shrink due to its solvent-free property.

☑ **Green sealant** (MS Polymer)

☒ **Hazardous material** (PU Sealant)

Green sealant

- Compliant with SCAQMD rule 1168.
- No hazardous materials such as isocyanate, solvent, heavy metals, etc.

Issuance Date	27/05/15
Revision Date	06/09/19
Revision No.	19-03

Technical Data Sheet

AS-4002 / AS-4002S
Premier Construction Sealant

Physical Properties

Appearance:
Soft paste

Colours:
Matte black, matte grey & matte white

Tack-free / Skin-form time:
20 – 40 minutes

Application temperature:
5 °C to 40 °C

Service temperature:
-20 °C to 90 °C

Storage:
Store in a dry and cool place with temperature below 30 °C.

Shelf life:
9 months (cartridge)
12 months (sausage)

Packaging:

Content	Quantity/ carton
290 mL cartridges	20
600 mL sausages	20

Scan and learn

Visit product page:
https://www.alsealmarketing.com/as-4002-premier-construction-sealant/

Description

ALSEAL Premier Construction Sealant is a one-component, elastomeric joint sealant formulated with acrylic modified hybrid sealant, the premium grade of MS Polymer. The weatherability and UV resistance of the sealant is excellent, with much longer expected service life than other organic sealants in the market. The finishing is matt, less tacky, and with low electrostatic charge, thereby reducing fluid streaking issues on façade cladding caused by air-borne dust particles.

Besides, the formula is free of silicone oil, minimizing oil-staining or other building aesthetic issues caused by migration of silicone oil. Unlike polyurethane sealants, this sealant is free of isocyanate and solvent and thus no issues like blistering or shrinkage will occur. It also can adhere well to numerous substrates without primer, fast-curing, paintable with common water-based coatings, and it is a green product that complies with SCAQMD rule #1168 Low VOC limit.

Features

- Excellent weatherability – 10-year warranty
- ASTM C920 (Class 50) compliant
- Paintable
- No silicone oil – Non-staining on adjacent substrates
- Low static charge – Less dirt streaking
- No isocyanate – No blistering
- No solvent – No shrinkage
- Bonds most substrates without primer
- Matte finish

Applications

Specially formulated to seal metal (e.g. ACP) and stone (e.g. marble) façade cladding due to its excellent weatherability and non-staining/ less dirt-streaking characteristics. It is also recommended for sealing concrete joints like precast wall panel joints construction joints, control joints, expansion joints, and window frame perimeter sealing (PVC / Aluminum to concrete wall), both painted and non-painted surfaces. Other recommended applications include sealing of masonry, brickworks, anodized aluminum, stainless steel, porcelain, finished wood, coated metal, epoxy and polyester panels, uPVC, polystyrene, and many difficult substrates.

Technical Data

Curing system	: Moisture curing
Density	: 1.53 g/mL
Maximum tensile at break (ASTM D412)	: 1.0 N/mm²
Elongation (ASTM D412)	: 530 %
Shore A hardness (ASTM C661)	: 27
Joint movement capability (ASTM C719)	: ±50 %
VOC content (USEPA Test Method 24)	: 46.61 g/L

Usage Instructions

1. Surfaces must be clean, dry and free of dirt, grease, oil or water.
2. For a neat finish, apply masking tape and remove it before sealant skins over.
3. 602 Primer is recommended for porous substrates such as natural stone for excellent adhesion.
4. Cut the tip off and puncture the internal foil seal with the nozzle. Cut the nozzle at 45° angle to desired bead-width and apply the sealant to substrate with a cartridge gun.
5. Tool the sealant before it skins.
6. Uncured sealant can be cleaned up with mineral spirits.
7. Use approved backing material for joints over 10 mm deep.

Alseal Marketing Sdn Bhd

www.alsealmarketing.com

AS-4002 Premier Construction Sealant

Clean Up

- Wet sealants can be cleaned up with acetone or mineral spirits.
- Cured sealants can only be removed mechanically.

Joint Design

- Joint dimension should be designed by taking into consideration the movement capability of the sealant and the anticipated joint movement
- Generally the joint width-to-depth ratio is 2:1 for joint width ≥12 mm, or 1:1 for joint width <12 mm
- Joint width: minimum = 6 mm, maximum = 35 mm *
- Joint depth: minimum = 6 mm, maximum = 12 mm

* Sealing joints with larger joint width is possible but sealant may sag in vertical applications.

Caution

Toxic to aquatic life with long lasting effect. Avoid release to the environment. Collect spillage. Keep out o reach of children. Contains aminosilane. May produce an allergic reaction. Safety data sheet available o request.

Disclaimer

Every endeavour has been made to ensure that the information given herein is true and reliable but it is given only for the guidance of our customers. The company cannot accept any responsibility for the loss or damage that may result from the use of the information, due to the possibility of variations of processing or working conditions and of workmanship outside our control. Users are advised to confirm suitability of this product by their own tests.

No. 0307/ **6048**

To MRGA (THAILAND) CO., LTD.

The Department of Science Service presents the test report for the sample named "ALSEAL" Laboratory No. L62/01004.1 as the total of 1 sample with reference to the request No. L62/01004 dated 7 February 2019.

Enclosed herewith the following result avails for your acknowledgement.

Department of Science Service

29 April 2019

Division of Engineering Materials
Tel. 0 2201 7130
Fax. 0 2201 7127
E-mail : physics@dss.go.th

Certified true translation

Pimonrat Iadkaeo

(Miss Pimonrat Iadkaeo)
General Administration Officer, Practitioner Level
Acting, Chief Registration Sub-Division

TEST REPORT

Sample's name	Mark / Brand	Laboratory No.
ALSEAL	-	L62/01004.1

Test Results

Hardness, shore A	26
Tensile strength, MPa	1.4
Elongation at break, %	785
Tear strength, kN/m	8.9
Tensile adhesive strength, MPa	
- Mortar	0.2
- Aluminium	0.7
Peel strength, N/25 mm in width	
- Mortar	25.0
- Aluminium	48.5
Heat resistance at 70°C for 21 days	
- Weight loss, %	0.6
- Cracking	Not found
Accelerated weathering resistance for 1,000 hrs. (Test cycle: UVA-340 (0.89 W/(m^2 · nm)) at 60°C/8 hrs., Condensation at 50°C/4 hrs.)	No cracks

Certified true translation

Pimonrat Iadkaeo

(Miss Pimonrat Iadkaeo)

General Administration Officer, Practitioner Level

Acting, Chief Registration Sub-Division

Laboratory No. L62/01004.1

Customer's name	MRGA (THAILAND) CO., LTD.
Customer's address	455/83 Pattanakarn Road, Pravate, Pravate, Bangkok 10250
Sample's description	White viscous liquid stored in an aluminium foil tube

Test date	26 February – 23 April 2019
Test method	1. Hardness : ASTM C661-15
	2. Tensile strength and elongation at break : ASTM D412-16, Die C
	3. Tear strength : ASTM D624-00(2012), Die C
	4. Tensile adhesive strength : ASTM C1135-15
	5. Peel strength : ASTM C794-15a
	6. Heat resistance : ASTM C1246-17
	7. Accelerated weathering resistance : ASTM C793-05(2017)
Remark	1. Test pieces of tensile strength, elongation at break and tear strength were cured at (23 ± 2)°C, (50 ± 10) %RH for 21 days.
	2. Test pieces of tensile adhesive strength were prepared by the customer.

Approved by
(Sgd.) Kartpan Sakulkaew
(Mr. Kartpan Sakulkaew)
Scientist, Senior Professional Level

Reported by
(Sgd.) Pawadee Sriyota
(Miss Pawadee Sriyota)
Scientist

Certified true translation
Pimonrat Jadkaeo
(Miss Pimonrat Jadkaeo)
General Administration Officer, Practitioner Level
Acting, Chief Registration Sub-Division

ที่ วท 0307/ **6048**

ถึง บริษัท เอ็มอาร์จีเอ (ประเทศไทย) จำกัด (สำนักงานใหญ่)

กรมวิทยาศาสตร์บริการขอส่งรายงานผลการตรวจ วิเคราะห์ ทดสอบ ตัวอย่าง ALSEAL หมายเลขปฏิบัติการ L62/01004.1 จำนวน 1 ตัวอย่าง ตามคำร้อง เลขรับ L62/01004 วันที่ 7 กุมภาพันธ์ 2562

พร้อมนี้ได้แนบผลการ วิเคราะห์ ทดสอบ มาเพื่อทราบ

กรมวิทยาศาสตร์บริการ
29 เมษายน 2562

กองวัสดุวิศวกรรม
โทร. 0 2201 7130
โทรสาร 0 2201 7127
E-mail : physics@dss.go.th

รายงานการทดสอบ

ชื่อวัตถุตัวอย่าง	เครื่องหมาย / ตรา	หมายเลขปฏิบัติการ
ALSEAL	-	L62/01004.1

ผลการทดสอบ

ความแข็ง, ชอร์เอ	26
ความต้านแรงดึง, เมกะพาสคัล	1.4
ความยืดเมื่อขาด, ร้อยละ	785
ความต้านแรงฉีกขาด, กิโลนิวตันต่อเมตร	8.9
ความต้านแรงยึดเหนี่ยว, เมกะพาสคัล	
- มอร์ตาร์	0.2
- อะลูมิเนียม	0.7
ความต้านแรงลอก, นิวตัน/ความกว้าง 25 มิลลิเมตร	
- แผ่นมอร์ตาร์	25.0
- แผ่นอะลูมิเนียม	48.5
การทนความร้อน ที่ 70 องศาเซลเซียส เป็นระยะเวลา 21 วัน	
- น้ำหนักที่หายไป, ร้อยละ	0.6
- รอยแตก	ไม่พบ
ความคงทนต่อสภาพลมฟ้าอากาศโดยวิธีเร่งภาวะ เป็นเวลา 1,000 ชั่วโมง (วงจรทดสอบ : แสงอัลตร้าไวโอเลต UVA-340 (0.89 W/(m^2 · nm)) ที่อุณหภูมิ 60°C เป็นเวลา 8 ชม.,บรรยากาศอิ่มไอน้ำที่อุณหภูมิ 50°C เป็นเวลา 4 ชม.)	ไม่แตก

หมายเลขปฏิบัติการ L62/01004.1

ชื่อผู้ใช้บริการ บริษัท เอ็มอาร์จีเอ (ประเทศไทย) จำกัด (สำนักงานใหญ่)
ที่อยู่ผู้ใช้บริการ 455/83 ถ.พัฒนาการ แขวงประเวศ เขตประเวศ กรุงเทพมหานคร 10250
ลักษณะตัวอย่าง ของเหลวหนืดสีขาว บรรจุในหลอดอะลูมิเนียมฟอยล์

วันที่ทดสอบ 26 กุมภาพันธ์ – 23 เมษายน 2562
วิธีทดสอบ 1. ความแข็ง : ASTM C661-15
2. ความต้านแรงดึงและความยืดเมื่อขาด : ASTM D412-16, Die C
3. ความต้านแรงฉีกขาด : ASTM D624-00(2012), Die C
4. ความต้านแรงยึดเหนี่ยว : ASTM C1135-15
5. ความต้านแรงลอก : ASTM C794-15a
6. การทนความร้อน : ASTM C1246-17
7. ความคงทนต่อสภาพลมฟ้าอากาศโดยวิธีเร่งภาวะ ASTM C793-05(2017)

หมายเหตุ 1. ชิ้นทดสอบ ความต้านแรงดึง ความยืดเมื่อขาด และ ความต้านแรงฉีกขาด ทำให้คงรูปที่อุณหภูมิ (23 ± 2) องศาเซลเซียส, ความชื้นสัมพัทธ์ ร้อยละ (50 ± 10) เป็นระยะเวลา 21 วัน
2. ชิ้นทดสอบความต้านแรงยึดเหนี่ยวเตรียมโดยผู้ส่งตัวอย่าง

ผู้รับรอง
(นายกาจพันธ์ สกุลแก้ว)
นักวิทยาศาสตร์ชำนาญการพิเศษ

ผู้รายงาน
(นางสาวภาวดี ศรีโยธา)
นักวิทยาศาสตร์

ALSEAL MARKETING SDN. BHD. Co.No.: 200301022720 (625140-D)
No. 86, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor.
Tel: +603-6094 2088 **Fax:** +603-6099 2930 **Email:** info@alsealmarketing.com
Website: www.alsealmarketing.com

Our reference: 20/J20/LTR/Y428

20th October 2020

Dear Valued Customer / Business Partners,

RE: "ALSEAL" AS-4002 Premier Construction Sealant – Staining Test Performance

This is to confirm that the staining test performance for **"ALSEAL" AS-4002 Premier Construction Sealant** has been tested by an independent third-party testing lab. The following standard was used to test the staining test performance of AS-4002:

Test Standard	Description	Report no.
ASTM C1248	Standard Test Method for Staining of Porous Substrate by Joint Sealants	7191241376-MEC20/02-ED (221419683)

Conclusion

Based on testing report: 7191241376-MEC20/02-ED (221419683), AS-4002 is considered to meet the requirement of ASTM C1248.

Should you require further information concerning the above product, please do not hesitate to contact us.

Thank you.

Yours sincerely,

For Alseal Marketing Sdn. Bhd.

Prepared by: Yap Wai Hoong
(R&D Chemist)

Verified by: Alex Ng
(General Manager (Technical))

Test Report No. 7191241376-MEC20/02-ED (221419683)
dated 14 Oct 2020

PSB Singapore

Add value.
Inspire trust.

SUBJECT:

Testing of sealant submitted by Vital Technical Sdn Bhd

TESTED FOR:

Alseal Marketing Sdn Bhd
No. 86, Jalan Industri 3/3
Rawang Integrated Industrial Park
48000 Rawang
Selangor Darul Ehsan
Malaysia

Attn: Mr Cheong Chee Leong

SAMPLE DESCRIPTION:

The following items were received on 23 Jul 2020 as shown:

Sample/Substrate	Size	Quantity
'AS-4002 Premier Construction Sealant'	200 ml/cartridge	4 cartridges
marble	75 mm x 25 mm x 20 mm	24 pcs
granite	75 mm x 25 mm x 25 mm	24 pcs

TEST METHOD:

Adopted ASTM C1248 : 2018 Standard Test Method For Staining Of Porous Substrate By Joint Sealants

Test: Standard Conditions, 23°C and 50% relative humidity

Curing conditions	:	23°C and 50% relative humidity for 21 days Compression at class 50
Test conditions	:	Standard Conditions, 23°C and 50% relative humidity, 14 and 28 days
No. of determinations	:	4 pcs for standard conditions, 23°C and 50% relative humidity, 2 for 14 days and 2 for 28 days

TÜV SÜD PSB

Laboratory:
TÜV SÜD PSB Pte. Ltd.
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: enquiries@tuvsud.com
https://www.tuvsud.com/en-sg
Co. Reg : 199002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
1 Science Park Drive, #02-01
Singapore 118221

Test: Heat Ageing in Oven

Test equipment	:	Thermal Oven
Curing conditions	:	23°C and 50% relative humidity for 21 days Compression at class 50
Test conditions	:	Heat ageing: 70°C in oven, 14 and 28 days
No. of determinations	:	4 pcs, 2 for 14 days and 2 for 28 days

Test: UV Exposure

Test equipment	:	QUV Weatherometer
Lamp designation	:	Fluorescent UVA 340 mm
Curing conditions	:	23°C and 50% relative humidity for 21 days Compression at class 50
Test conditions	:	UV exposure: 4 Hours UV at 60°C and 4 hours condensation at 50°C, 14 and 28 days (ASTM G154)
No. of determinations	:	4 pcs for UV exposure, 2 for 14 days and 2 for 28 days

Standard Condition parameters: 23 ± 2°C and 50 ± 5% relative humidity.

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, Standard Conditions, 23°C and 50% RH	'AS-4002 Premier Construction Sealant'	
	Marble	Granite
Staining On Porous Substrates Observation for Staining after		
a. Standard conditions, 23°C and 50% relative humidity, 14 days	No surface stain	No surface stain
b. Standard conditions, 23°C and 50% relative humidity, 28 days	No surface stain	No surface stain

Test, Heat Ageing in Oven	'AS-4002 Premier Construction Sealant'	
	Marble	Granite
Observation for Staining after		
a. Heat ageing: 70°C in oven, 14 days	No surface stain	No surface stain
b. Heat ageing: 70°C in oven, 28 days	No surface stain	No surface stain

Test, UV Exposure	'AS-4002 Premier Construction Sealant'	
	Marble	Granite
Observation for Staining after		
a. UV exposure, 14 days	No surface stain	No surface stain
b. UV exposure, 28 days	No surface stain	No surface stain

REMARKS:

1. The test conditions were adopted from ASTM G154 : 2016 Standard Practice For Operating Fluorescent Light Apparatus For UV Exposure Of Non-Metallic Materials.
2. The test was requested by the client.
3. The joint movement class was specified by the client.
4. The substrates did not require priming before application of the sealant as specified by the client.

Eddie Suwand
Testing Officer
Senior Associate Engineer

Fabien Tan
Engineer
Real Estate & Infrastructure
Mechanical Centre

Please note that this Report is issued under the following terms :

1. 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.

2. 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.

3. 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.

4. 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.

5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

6. The tests carried out by TÜV SÜD PSB and this report are subject to TÜV SÜD PSB's General Terms and Conditions of Business and the Testing and Certification Regulations of the TÜV SÜD Group.

Effective 01 September 2020

ALSEAL MARKETING SDN. BHD. Co.No.: 200301022720 (625140-D)
No. 86, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor.
Tel: +603-6094 2088 **Fax:** +603-6099 2930 **Email:** info@alsealmarketing.com
Website: www.alsealmarketing.com
A MEMBER OF THE NIPPON PAINT GROUP

Our reference: 03/A22/LTR/Y480

3rd January 2022

Dear Valued Customer / Business Partners,

RE: AS-4002 Premier Construction Sealant Statement of Product Compliance

This letter is to elaborate on AS-4002 Premier Construction Sealant contributing to Leadership in Energy and Environmental Design (LEED) v4.1 credit. The EQ Credit: Low-Emitting Materials requires 75 % of adhesives and sealants to meet the volatile organic compound (VOC) emissions evaluation and 100 % of adhesives and sealants to meet the VOC content evaluation.

For VOC emissions, the product is to be tested as per the California Department of Public Health (CDPH) Standard Method v1.2-2017. The product must comply with the VOC allowable concentration listed in Table 4-1 of the standard method. The total VOC (TVOC) after 14 daysis required to be reported in ranges as specified in the standard method.

The parameters for the modelling scenario are as follows:

Parameter	**Value**	
	Standard School Classroom	**Standard Private Office**
Volume	231 m^3	30.6 m^3
Air change rate	0.82 hr^{-1}	0.68 hr^{-1}
Estimated exposed area	1.62 m^2	0.21 m^2

The TVOC of AS-4002 Premier Construction Sealant after 14 days is as follow:

Elapsed exposure hour after 10 days conditioning	**Predicted Air Concentration**	
	Standard School Classroom	**Standard Private Office**
96	0.5 mg/m³ or less	0.5 mg/m³ or less

Formaldehyde content was not detected for all results (refer to Table 2 and Table 3 of test report 7191274108-CHM21-01-MA-AD2).

ALSEAL MARKETING SDN. BHD. Co.No.: 200301022720 (625140-D)
No. 86, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor.
Tel: +603-6094 2088 **Fax:** +603-6099 2930 **Email:** info@alsealmarketing.com
Website: www.alsealmarketing.com
A MEMBER OF THE NIPPON PAINT GROUP

For VOC content, the product is to be tested as per the South Coast Air Quality Management District (SCAQMD) Rule 1168. The VOC content of AS-4002 Premier Construction Sealant is 10.21g/L (refer to certificate CCN21120080H03-0). This is below VOC limit (50g/L) under “All Other Architectural Sealants” category.

Based on the test result of VOC emission (test report 7191274108-CHM21-01-MA-AD2) and VOC content (certificate CCN21120080H03-0), AS-4002 Premier Construction Sealant complies to requirements of LEED v4.1 EQ Credit: Low-Emitting Materials.

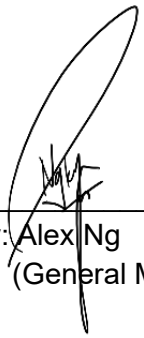
Should you require any additional information, please do not hesitate to contact us.

Thank you.

Yours sincerely,

For Alseal Marketing Sdn. Bhd.

Prepared by: Yap Wai Hoong
(R&D Chemist)



Verified by: Alex Ng
(General Manager (Technical))

TEST REPORT: 7191274108-CHM21-01-MA-AD2

Date: 16 DEC 2021 Tel: +65 69736154

Client's Ref: 221420148 Email: zhou.xiao@tuvsud.com

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

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SUBJECT

Evaluation of "AS-4002" product sample in accordance with CDPH/EHLB/Standard Method Version 1.2

CLIENT

Alseal Marketing Sdn. Bhd.
No. 86, Jalan Industri 3/3,
Rawang Integrated Industrial Park
48000 Rawang,
Selangor DE

DESCRIPTION OF SAMPLE

Two 600 ml tubes of sample as follows were received on 05 Jul 2021. Sample was submitted by Vital Technical Sdn Bhd:

Product Name	Premier Construction Sealant
Model / Series	AS-4002
Product Type	Sealant

DATE OF ANALYSIS

15 Sep 2021 – 03 Nov 2021

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Note:

1. No physical test sample was submitted for testing for the specific product which is the subject of this additional test report.

2. Test results stated in this additional test report was based exclusively on the test results of a past submitted and tested sample reported in Test report No. 7191274108-CHM21-01-MA dated 16 DEC 2021.

3. This additional test report was issued on the basis of the declaration by the Customer that the specific product which is the subject of this additional test report is exactly the same as the original sample provided for Test report No. 7191274108-CHM21-01-MA dated 16 DEC 2021 in terms of technical specification and performance.

4. Details of the product, including name, brand, article number and any technical specification are solely provided by the Customer. No verification has been done by TUV SUD PSB Pte Ltd whether such details are true and correct.

5. Details of Customer's declaration are as follows :

Company Name :	Vital Technical Sdn. Bhd.
Address :	No. 93, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor DE, Malaysia
Name of Authorised person :	Mr Cheong Chee Leong
Contact Telephone / Email address :	+603-60942088 / cl.cheong@vitaltechnical.com

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METHOD OF TEST

1. Emission Test

The following emission tests were conducted according to CDPH/EHLB/Standard Method Version 1.2 – *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers*

1) Total Volatile Organic Compounds (TVOC) Emission Rate
2) Formaldehyde Emission Rate

Emission Test Condition

1)	Chamber Volume:	about 1m^3
2)	Temperature:	23°C
3)	Relative Humidity:	50%
4)	Air Exchange Rate:	n=1 (air change rate per hour in the chamber)
5)	Chamber Loading Ratio:	0.3-1.0 m^2/m^3 (total exposed surface area of the test specimen divided by the net air volume of the emission test chamber)
6)	Air Velocity:	0.1 m/s to 0.3 m/s (over the surface of the test specimen)

Note: Chamber Loading ratio for the tested sample: 0.007 m^2/m^3

2. Sampling, Desoprtion, Analysis

1) For analysis, the air was sampled using constant flow rate pumps, equipped with absorbent containing Tenax TA to trap VOCs. (sampling and assay carried out according to ISO 16000-6 / ASTM D5116).
2) In addition, the air was sampled using constant flow rate pumps, provided with absorbent containing di-nitrophenylhydrazine (DNPH) grafted silica cartridge to trap aldehydes. (sampling and assay performed according to ISO 16000-3)
3) The Tenax samples were then desorbed by Automated Thermal Desorber System and then analyzed by Gas Chromatography coupled with Mass Spectrometry (ATD-GCMS).
4) The samples on DNPH cartridge were then desorbed to form the stable compound hydrazone, which was then assayed by Liquid Chromatography (HPLC) with UV / Diode Array Detector.

METHOD OF TEST *(cont'd)*

3. Calculation of Results

Air Concentration Determinations

Emission Factor Calculations

EF = C X (N/L)

EF = emission factor (µg/m^2·hr) or (µg/unit·hr)
C = chamber concentration (µg/m^3)
N = chamber air exchange rate (hr $^{-1}$)
L = product loading (m^2/m^3)

The model measurements were made with the following assumptions: air within open office areas of the building is well-mixed at the breathing level zone of the occupied space; environmental conditions are maintained at 50 % relative humidity and 23°C (73°F); there are no additional sources of these pollutants; and there are no sinks or potential re-emitting sources within the space for these pollutants.

The predicted exposure concentrations ($C_{P,t}$) (µg/m^3) are calculated from the modelled emission factors as:

$$C_{P,t} = EF_{m,t}\left(\frac{A}{V}\right)\left(\frac{1}{N}\right)$$

where,

$C_{P,t}$ = predicted exposure concentration at time t (µg/m^3)
$EF_{m,t}$ = modelled emission factor at time t (µg/m^2·hr) or (µg/unit·hr)
A = product area exposed in room (m^2 or unit)
V = room volume (m^3)
N = room air change per hour (hr $^{-1}$)

The model was set as Private Office and/or Standard Classroom scenario as defined in Table 4-4 and Table 4-5 with reference to California Department of Public Health (CDPH) *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers* V 1.2 (2017). The following parameters are used for estimating VOC air concentrations at 336 hours for the modelling scenarios.

Parameter	Units	Value	
		Standard Classroom	Private Office
Volume	m^3	231	30.6
Air Change Rate	1/h	0.82	0.68
Loading Factor *	m^2/m^3	0.007	0.007
Estimated Exposed Area	m^2	1.62	0.21

* Based on Clause 4.2.2 of EN16516 - Construction products: Assessment of release of dangerous substances – Determination of emissions into indoor air. Loading factor for very small surfaces, e.g. sealants.

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RESULTS

Table 1. Summary of TVOC Chamber Concentrations, Emission Factors and Predicted Air Concentrations for "AS-4002"

Elapsed Exposure Hour after 10 Days Conditioning *	Chamber Concentrations (µg/m³)	Emission Factor (µg/m²·hr)	Predicted Air Concentration (µg/m³)	
			Standard Classroom	Private Office
0 (Background)	BQL	BQL	-	
24	52.4	7440.8	62.8	77.0
48	41.0	5829.4	49.3	60.3
96	49.6	7041.9	59.6	72.9

* Exposure hours are nominal (± 1 hour)
BQL = Below quantifiable level of 0.02 µg based on a standard 12 L air collection volume

Table 2. Summary of Formaldehyde Chamber Concentrations, Emission Factors and Predicted Air Concentrations for "AS-4002"

Elapsed Exposure Hour after 10 Days Conditioning *	Chamber Concentrations (µg/m³)	Emission Factor (µg/m²·hr)	Predicted Air Concentration (µg/m³)	
			Standard Classroom	Private Office
0 (Background)	BQL	BQL	--	--
24	BQL	BQL	--	--
48	BQL	BQL	--	--

* Exposure hours are nominal (± 1 hour)
BQL = Below quantifiable level of 0.05 µg based on a standard 30 L air collection volume

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RESULTS *(cont'd)*

Table 3. Chamber Concentrations, Emission Factors and Predicted Air Concentrations of Target CRELs Compounds for "AS-4002" at 96 Hours Following 10 Day of Conditioning.

Cas Number	Target CRELs Compound Name	Chamber Concentrations (µg/m³)	Emission Factor (µg/m²·hr)	Predicted Air Concentration (µg/m³)		Half CREL (µg/m³)
				Standard Classroom	Private Office	
75-07-0	Acetaldehyde	14.7	2084.3	17.6	21.6	70
71-43-2	Benzene†	BQL	BQL	--	--	1.5
75-15-0	Carbon Disulfide	BQL	BQL	--	--	400
56-23-5	Carbon Tetrachloride	BQL	BQL	--	--	20
108-90-7	Chlorobenzene†	BQL	BQL	--	--	500
67-66-3	Chloroform	BQL	BQL	--	--	150
106-46-7	Dichlorobenzene (1,4-)†	BQL	BQL	--	--	400
75-35-4	Dichloroethylene (1,1)	BQL	BQL	--	--	35
68-12-2	Dimethylformamide (N,N)†	BQL	BQL	--	--	40
123-91-1	Dioxane (1,4-)†	BQL	BQL	--	--	1500
106-89-8	Epichlorohydrin†	BQL	BQL	--	--	1.5
100-41-4	Ethylbenzene†	BQL	BQL	--	--	1000
107-21-1	Ethylene Glycol	BQL	BQL	--	--	200
110-80-5	Ethylene Glycol Monoethyl Ether	BQL	BQL	--	--	35
111-15-9	Ethylene Glycol Monoethyl Ether Acetate	BQL	BQL	--	--	150
109-86-4	Ethylene Glycol Monomethyl Ether	BQL	BQL	--	--	30
110-49-6	Ethylene Glycol Monomethyl Ether Acetate	BQL	BQL	--	--	45
50-00-0	Formaldehyde	BQL	BQL	--	--	9
110-54-3	Hexane (n-)†	BQL	BQL	--	--	3500
78-59-1	Isophorone	BQL	BQL	--	--	1000
67-63-0	Isopropanol†	BQL	BQL	--	--	3500
71-55-6	Methyl Chloroform	BQL	BQL	--	--	500
75-09-2	Methylene Chloride	BQL	BQL	--	--	200
1634-04-4	Methyl t-Butyl Ether†	BQL	BQL	--	--	4000
91-20-3	Naphthalene†	BQL	BQL	--	--	4.5
108-95-2	Phenol†	BQL	BQL	--	--	100
107-98-2	Propylene Glycol Monomethyl Ether	BQL	BQL	--	--	3500
100-42-5	Styrene†	BQL	BQL	--	--	450
127-18-4	Tetrachloroethylene†	BQL	BQL	--	--	17.5
108-88-3	Toluene†	BQL	BQL	--	--	150
79-01-6	Trichloroethylene†	BQL	BQL	--	--	300
108-05-4	Vinl Acetate	BQL	BQL	--	--	100
108-38-3 /95-47-6 /106-42-3	Xylenes†	BQL	BQL	--	--	350

* Indicates Wiley ver. 8.0 best library match only based on retention time and mass spectral characteristics
† Denotes quantified using authentic standard curve. Other VOCs quantified relative to toluene
BQL = Below quantifiable level of 2.0 µg/m³

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RESULTS *(cont'd)*

Table 4. Chamber Concentrations, Emission Factors and Predicted Air Concentrations of Identified Individual Organic Compounds (VOCs) for "AS-4002" at 96 Hours Following 10 Day of Conditioning for Standard Classroom and Private Office scenario.

Cas Number	Compound Identified	Chamber Concentrations ($\mu g/m^3$)	Emission Factor ($\mu g/m^2 \cdot hr$)	Predicted Air Concentration ($\mu g/m^3$)		Half CREL ($\mu g/m^3$)
				Standard Classroom	Private Office	
71-36-3	1-Butanol	6.2	882.5	7.5	9.1	not listed
57-55-6	1,2-Propanediol	2.9	408.2	3.4	4.2	not listed
816-79-5	2-Pentene, 3-Ethyl	2.2	310.0	2.6	3.2	not listed
54549-80-3	Cyclopentane, 2-Ethyl-1,1-Dimethyl	3.6	515.8	4.4	5.3	not listed
110453-78-6	(S)-(+)-6-Methyl-1-Octanol	3.2	455.2	3.8	4.7	not listed

* Indicates Wiley ver. 8.0 best library match only based on retention time and mass spectral characteristics
† Denotes quantified using authentic standard curve. Other VOCs quantified relative to toluene
BQL = Below quantifiable level of 2.0 $\mu g/m^3$

MS MARIANA AHMAD
EXECUTIVE CHEMIST

DR XIAO ZHOU
PRODUCT MANAGER
MICROCONTAMINATION DIAGNOSIS
CHEMICAL & MATERIALS

PSB Singapore

Please note that this Report is issued under the following terms :

1. 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.

2. 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.

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6. The tests carried out by TÜV SÜD PSB and this report are subject to TÜV SÜD PSB's General Terms and Conditions of Business and the Testing and Certification Regulations of the TÜV SÜD Group.

Effective 26 January 2021

Mérieux NutriSciences Malaysia Sdn. Bhd. *(514926-V)*
(Formerly known as Acumen Scientific Sdn. Bhd.)
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Taman Perindustrian Subang,
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Phone + 603 5634 5618 / Fax + 603 5634 5619
www.merieuxnutrisciences.com/my/

CERTIFICATE OF ANALYSIS

ALSEAL MARKETING SDN. BHD.
No. 86, Jalan Industri 3/3,
Rawang Integrated Industrial Park,
48000, Rawang, Selangor DE.

Tel : +603-60942088 Fax :
Attn :

Certificate No	:	CCN21120080H03-0
Sample Received Date	:	21-Dec-2021
Analysis Start Date	:	29-Dec-2021
Complete Analysis Date	:	31-Dec-2021
Date Issued	:	31-Dec-2021

Sample Description : One sample of sealant
Product name: Premier Construction Sealant
Product code: AS-4002
Brand: Alseal

Analysis Results :

PARAMETER	ANALYSIS RESULTS	UNIT	STANDARD METHOD / TECHNIQUE / EQUIPMENT USED
Volatile Organic Compound	10.21	g/L	USEPA method 24 under SCAQMD Rule 1168 (All other architectural sealants, <50g/L)

[1]denotes Externally Provided and Accredited
[2]denotes Externally Provided but not Accredited

ND denotes below limit of quantification (< ***Numeric number***) denotes quantification limits

For Microbiological testing
ND denotes not detected (< ***Numeric number***) denotes detection limits

Remark : The result reported are based on the calculation from Total Volatile Compound, Density testing parameter and information declaration of exempted solvent and water provided by customer.

Cheng Pui Wah
Senior Chemist
B.Sc.(Hons),
L/1828/6037/11

ALSEAL MARKETING SDN. BHD. (625140-D)
LOT PT 2291, JALAN KAMPUNG BARU, KAMPUNG BARU SUNGAI BULOH,
47000 SUNGAI BULOH, SELANGOR.
TEL: 603-6157 9698, 603-6157 6398 **FAX:** 603-6157 8002
EMAIL: Info@alsealmarketing.com **WEBSITE:** http://www.alsealmarketing.com
GST No.: 001625505792

Our reference: 12/I18/LTR/Y322

12th September 2018

Dear Valued Customer / Business Partners,

RE: "ALSEAL" AS-4002 Premier Construction Sealant - Product Performance

This is to confirm that the product performance of **"ALSEAL" AS-4002 Premier Construction Sealant** has been tested by ISO/IEC 17025 accredited independent third-party testing labs. The following standards were used to test the performance of AS-4002:

Test standard	Description	Report No.
ASTM C920	Standard Specification for Elastomeric Joint Sealants	7191188811-MEC18/A-ED (2191084112)

AS-4002 is classified as a **Type S** (single-component sealant), **Grade NS** (non-sag sealant), **Class 50** (±50% movement), Use **NT** (non-traffic), **A** (aluminium) according to ASTM C920.

Should you require further information concerning the above product, please do not hesitate to contact us.

Thank you.

Yours sincerely,
For Alseal Marketing Sdn. Bhd.

Prepared by: Yap Wai Hoong
(R&D Chemist)

Verified by: Alex Ng
(Technical Manager)

Test Report No. 7191188811-MEC18/A-ED (2191084112)
dated 5 Sep 2018

PSB Singapore

Choose certainty.
Add value.

SUBJECT:

Testing of sealant

TESTED FOR:

Alseal Marketing Sdn Bhd
No. 2291, Jalan Kampung Baru
Kg. Baru Sungai Buloh
47000
Selangor Darul Ehsan
Malaysia

Attn: Mr Cheong Chee Leong

SAMPLE DESCRIPTION:

The following items were received on 13 Jun 2018 as shown:

Sample	Size	Quantity
'AS-4002 Premier Construction Sealant'	600 ml/sausage	6 sausages

TEST METHODS:

Adopted ASTM C920 : 2014a 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)

TÜV SÜD PSB

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Co. Reg : 199002667R

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Singapore 118221

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 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 : 2006 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 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	:	Aluminium
Test temperature	:	Room temperature
No. of determinations	:	3 for class 50

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 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 : 2015a Standard Test Method For Adhesion-In-Peel Of Elastomeric Joint Sealants

Test Conditions:
23°C and 50% relative humidity for 21 days

Substrate	:	Aluminium
Crosshead speed	:	50 mm/min
No. of determinations	:	4

Material Identification/Verification

10. ASTM E1252 : 2007 Standard Practice For General Techniques For Obtaining Infra-Red Spectra For Qualitative Analysis
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 50 ± 5% relative humidity.
Standard Conditions parameters: 23 ± 2°C and 50 ± 5% relative humidity.

TEST RESULTS:

Test	'AS-4002 Premier Construction Sealant'	ASTM C920 : 2014a 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	18.2 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 : 22.8 test piece 2, average : 21.6 average of 2 test pieces : 22.2	Use T_1 (traffic) sealant shall have a hardness reading, after being properly cured, of not less than 25 Use T_2 (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 50	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

TEST RESULTS:

Test	'AS-4002 Premier Construction Sealant'	ASTM C920 : 2014a Standard Specification For Elastomeric Joint Sealants
7. Effects Of Heat Ageing On Weight Loss, Cracking And Chalking, average	1.1% 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 1)
9. Adhesion-In-Peel, average	60.8 N (13.7 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
10. Material Identification/ Verification By FTIR	Phthalate-based material (refer to Figure 1)	-

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 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.
3. The class 50 joint movement for cyclic adhesion/cohesion test was specified by the client.
4. The type of substrate was specified by the client for cyclic adhesion/cohesion and adhesion-in-peel tests.
5. The substrates do not require priming prior to application of the sealant as specified by the client.

Eddie Suwand
Testing Officer
Senior Associate Engineer

Fabien Tan
Engineer
Real Estate & Infrastructure
Mechanical Centre

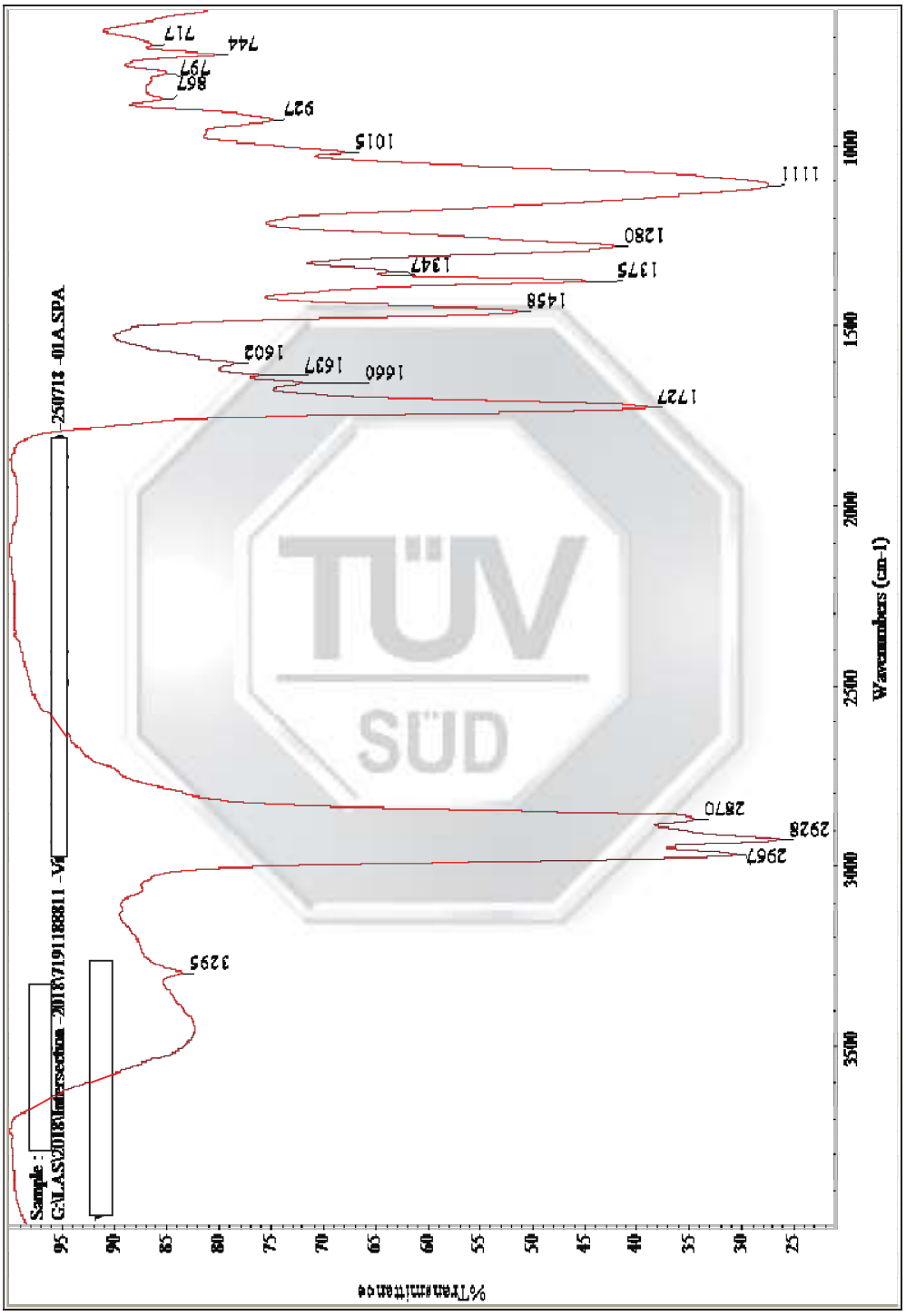
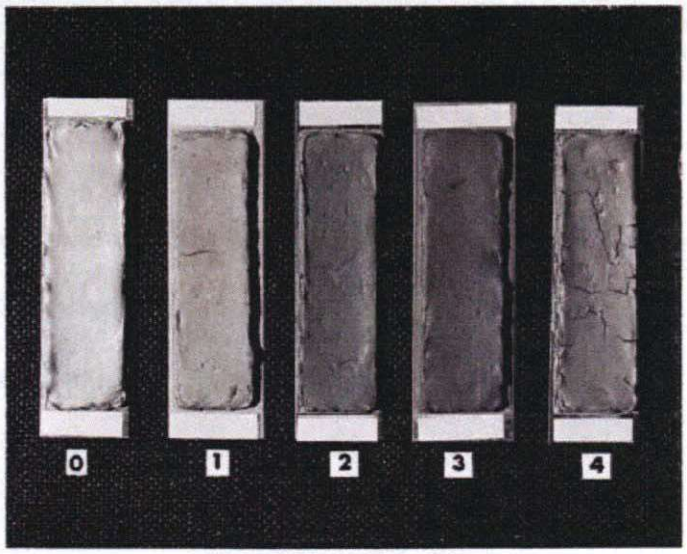
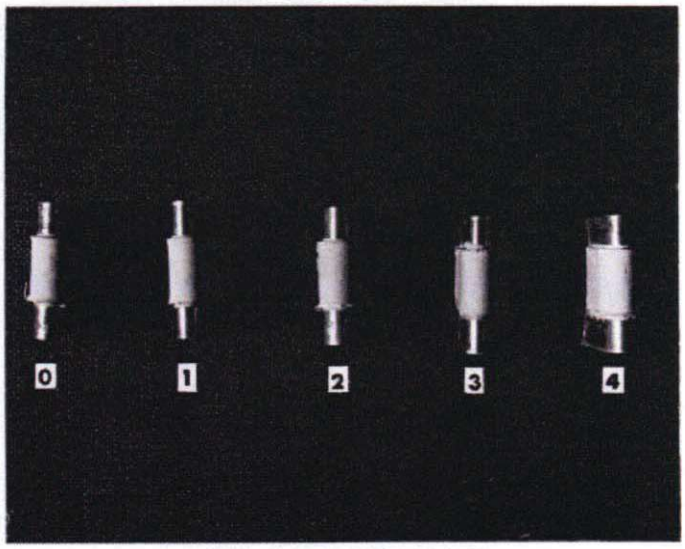


Figure 1 : IR spectrum of 'AS-4002 Premier Construction Sealant'



Nom 1—Number *0* represents no cracks.

FIG. 1 Examples of Cracking Obtainable After the Weathering Test



Nom 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)

ALSEAL MARKETING SDN. BHD. Co.No.: 200301022720 (625140-D)
No. 86, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor.
Tel: +603-6094 2088 **Fax:** +603-6099 2930 **Email:** info@alsealmarketing.com
Website: www.alsealmarketing.com

12th October 2020

Int. Ref: AS/SEA/2020/10/01

To whom it may concern,

Re: Alseal AS-4002S Produced With MS Polymer from Kaneka Corporation Japan

Alseal Marketing Sdn. Bhd. is producing a range of adhesive and sealant products under **"Alseal"** brand in Malaysia. These Alseal products are exported to a number of countries in the world.

This is to confirm that **Alseal AS-4002S Premier Construction Sealant** is a sealant product formulated with the premium grade of MS Polymer content, a product from **Kaneka Corporation**, Japan. AS-4002S is excellent in UV and weathering resistance, and comes with ±50% movement capability (ASTM C719).

If you need more information about Alseal products, please contact our local sales representatives.

Thank you for your support.

Alseal Marketing Sdn Bhd (625140-D)

Liow Song Ching
General Manager (Business Development)
Alseal Marketing Sdn. Bhd.

SAFETY DATA SHEET

AS-4002 PREMIER CONSTRUCTION SEALANT

Compilation date: 03/05/2018

Revision No: 0

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: AS-4002 PREMIER CONSTRUCTION SEALANT

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of substance / mixture: PC1: Adhesives, sealants.

1.3. Details of the supplier of the safety data sheet

Company name: Alseal Marketing Sdn. Bhd.
Lot 2291, Jalan Kampung Baru,
Kampung Baru Sungai Buloh
Sungai Buloh
Selangor
47000
Malaysia
Tel: +603-61433808
Fax: +603-61578002
Email: info@alsealmarketing.com

1.4. Emergency telephone number

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Aquatic Chronic 3: H412; -: EUH208

Most important adverse effects: Contains n-(3-(trimethoxysilyl)propyl)ethylenediamine, dibutylbis(pentane-2,4-dionato,o,o')tin. May produce an allergic reaction. Harmful to aquatic life with long lasting effects.

2.2. Label elements

Label elements:

Hazard statements: EUH208: Contains n-(3-(trimethoxysilyl)propyl)ethylenediamine, dibutylbis(pentane-2,4-dionato,o,o')tin. May produce an allergic reaction.
H412: Harmful to aquatic life with long lasting effects.

Precautionary statements: P273: Avoid release to the environment.
P501: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

[cont...]

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

LIMESTONE

EINECS	CAS	PBT / WEL	CLP Classification	Percent
215-279-6	1317-65-3	Substance with a Community workplace exposure limit.	-	50-70%

DIISONONYLPHTHALATE - REACH registered number(s): 01-2119432682-41-0000

271-090-9	68515-48-0	Substance with a Community workplace exposure limit.	-	10-30%

N-(3-(TRIMETHOXYSILYL)PROPYL)ETHYLENEDIAMINE

217-164-6	1760-24-3	-	Eye Dam. 1: H318; Skin Sens. 1B: H317	<1%

DIBUTYLBIS(PENTANE-2,4-DIONATO,O,O')TIN

245-152-0	22673-19-4	-	Acute Tox. 4: H302; Skin Corr. 1B: H314; Skin Sens. 1: H317; Muta. 2: H341; Repr. 1A: H360; STOT SE 1: H370; STOT RE 1: H372; Aquatic Chronic 1: H410	<1%

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes.

Ingestion: Wash out mouth with water.

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

[cont...]

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Mark out the contaminated area with signs and prevent access to unauthorised personnel.

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Hazardous ingredients:

LIMESTONE

[cont...]

Workplace exposure limits:

			Respirable dust	
State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	10 mg/m³	-	4 mg/m³	-

DIISONONYLPHTHALATE

UK	5 mg/m³	-	-	-

DNEL/PNEC Values

DNEL / PNEC No data available.

8.2. Exposure controls

Respiratory protection: Respiratory protective device with particle filter.

Hand protection: Protective gloves.

Eye protection: Safety glasses. Ensure eye bath is to hand.

Skin protection: Protective clothing.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Paste

Colour: Black

Odour: Odourless

Evaporation rate: Not applicable.

Oxidising: Not applicable.

Boiling point/range°C: Not applicable.

Melting point/range°C: Not applicable.

Flash point°C: No data available.

Relative density: 1.51-1.56 g/ml

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.

Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

[cont...]

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

LIMESTONE

ORAL	RAT	LD50	2000	mg/kg

DIISONONYLPHTHALATE

DERMAL	RBT	LD50	3160	mg/kg
DUST/MIST	RAT	4H LC50	4.4	mg/l
ORAL	RAT	LD50	10000	mg/kg

N-(3-(TRIMETHOXYSILYL)PROPYL)ETHYLENEDIAMINE

DERMAL	RBT	LD50	2000	mg/kg
DUST/MIST	RAT	4H LC50	1.49	mg/l
ORAL	RAT	LD50	2295	mg/kg

Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

LIMESTONE

Daphnia magna	48H EC50	100	mg/l
FISH	96H LC50	100	mg/l
GREEN ALGA (Selenastrum capricornutum)	72H ErC50	14	mg/l

[cont...]

DIISONONYLPHTHALATE

Daphnia magna	48H EC50	74	mg/l
Scenedesmus Subspicatus	72H ErC50	88	mg/l
ZEBRAFISH (Brachydanio rerio)	96H LC50	102	mg/l

N-(3-(TRIMETHOXYSILYL)PROPYL)ETHYLENEDIAMINE

Daphnia magna	48H EC50	81	mg/l
GREEN ALGA (Selenastrum capricornutum)	72H ErC50	8.8	mg/l
ZEBRAFISH (Brachydanio rerio)	96H LC50	597	mg/l

12.2. Persistence and degradability

Persistence and degradability: Not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: Bioaccumulation potential.

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Toxic to aquatic organisms. Toxic to soil organisms.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

Transport class: This product does not require a classification for transport.

Section 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

[cont...]

Section 16: Other information

Other information

Other information: according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

* indicates text in the SDS which has changed since the last revision.

Phrases used in s.2 and s.3: EUH208: Contains <name of sensitising substance>. May produce an allergic reaction.

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

H341: Suspected of causing genetic defects.

H360: May damage fertility or the unborn child.

H370: Causes damage to organs.

H372: Causes damage to organs through prolonged or repeated exposure.

H410: Very toxic to aquatic life with long lasting effects.

H412: Harmful to aquatic life with long lasting effects.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.