

***MS(Modified Silicone) Polymer
Sealant Technologies***



ALSEAL

www.alseal.com.au

Introduction

- Manufacturing, packaging & distribution of **adhesive, sealant & waterproofing** products
- ISO-9001 & ISO14001 certified
- Products exported to >70 countries
- Largest MS Polymer sealant/adhesive manufacturer in South East Asia
- OEM of global sealant/adhesive brands

Range of Products

Sealants

- **MS Polymer Sealants**
- Silicone Sealants
- Polyurethane(PU) sealants
- Acrylic Sealants
- Construction Adhesive
- Caulking materials
- RTV Gasket Maker
- Small joint sealant
- SSG Structural Silicone Sealant
- Insulating Glass sealant
- Duct Sealants
- Butyl Sealants

Adhesives

- Solvent Cement
- Epoxy adhesives
- Contact adhesives
- Spray Adhesives
- Super glue
- Household adhesives
- Anaerobic adhesives
- Automotive adhesives
- MS flooring adhesive
- PVAC (Wood Flooring) adhesives
- Vinyl Flooring adhesives

Waterproofing

- Bitumen emulsion coating
- Acrylic elastomeric coating
- Bitumen flashing tape
- SBR Latex
- Cement based

Others

- Putty Fillers
- Wood Fillers
- Butyl/Bitumen Tapes
- Primer
- Caulking /Sausage Guns

4 Factories In Malaysia



R & D Facilities



○ R&D Laboratory



○ Viscometer



○ Rheometer



○ Tensile Tester



○ QUV Weathering Tester



○ KF Titrator

Production Facilities



Sealant – Insignificant material?

Case Study 1: KLCC, Kuala Lumpur



Sealant crazed badly and lost functionality

Sealant – Insignificant material?

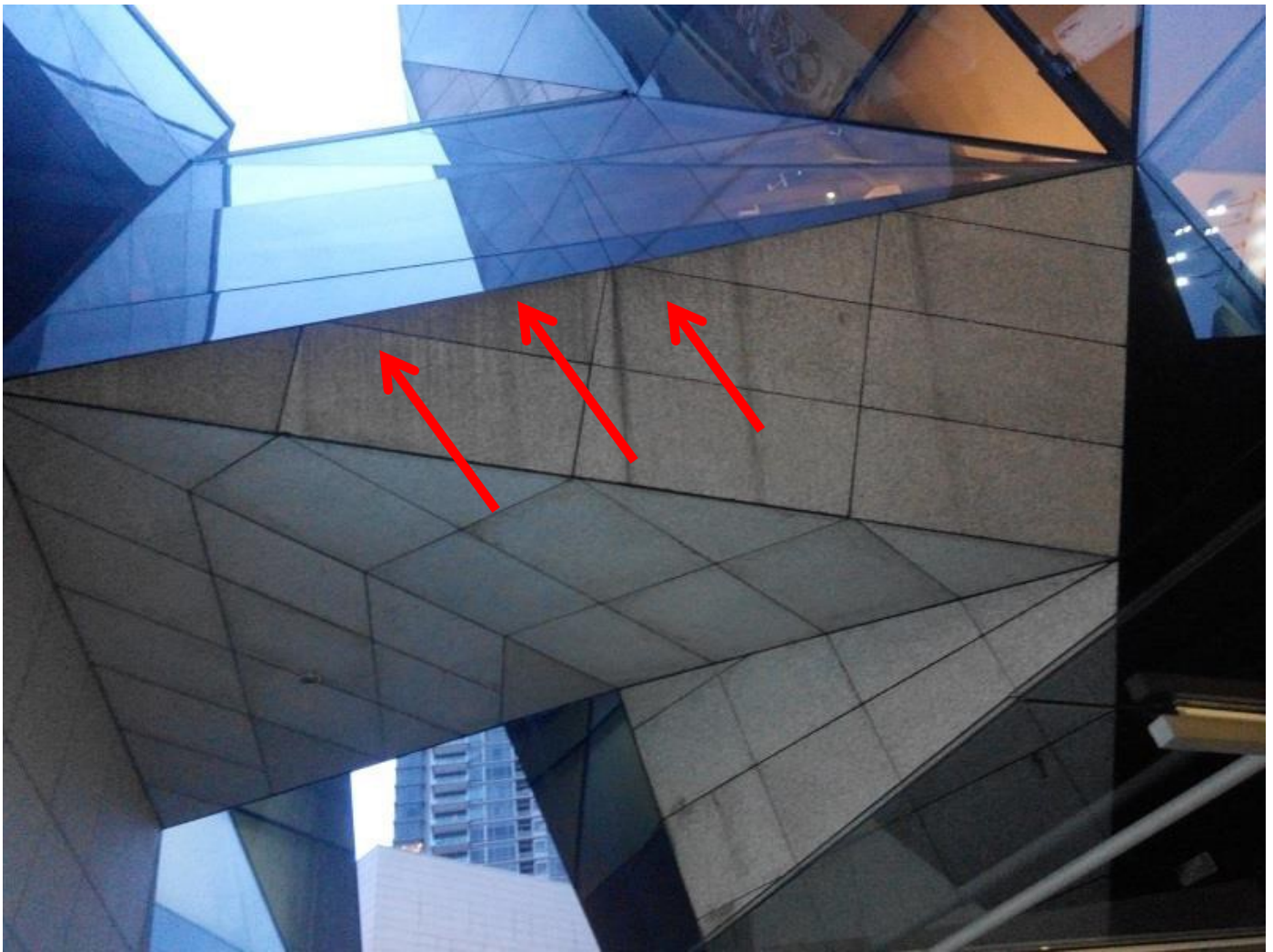
Case Study 5: Starhill Gallery (retail mall), Kuala Lumpur



Silicone oil-staining issues caused unsightly façade

Sealant – Insignificant material?

Case Study 5: Starhill Gallery (retail mall), Kuala Lumpur



Sealant – Insignificant material?

Case Study 6: UE Square Shopping Mall, Clark Quay, Singapore



Silicone oil-staining issues caused unsightly façade



Basic functions of sealants

- Sealing joints between building elements and accommodate movement
- Prevent ingress/egress of:
 - *Water/Moisture/Snow*
 - *Noise – Acoustic Control*
 - *Heat/Fire*
 - *Air/Vapor/Smoke*
 - *Dust/Dirt*
 - *Light*
 - *Chemicals*
- Improve aesthetics

Types of sealants



**new advanced
technologies**

- Hybrid sealants
 - **STPE(MS)**, STPU/SPUR, STP, SMP
- Polyurethane(PU) sealants (*old version of STPU*)
- Silicone sealants – *neutral & acetic*
- Acrylic sealants
- Polysulfide sealants
- Others

MS POLYMER SEALANTS

- MS (*Modified Silicone/Silane*) Polymer sealants
 - a.k.a. Hybrid, STPE (Silyl Terminated Polyether), or SMP (Silyl Modified Polymer) sealants
- MS polymers are products of Kaneka Corporation Japan
- most used type of construction sealant in Japan
- Available in Japan since >30 years ago
- Combine the strengths of PU and silicone sealants without their inherent weaknesses
 - e.g. *Better weathering characteristics than PU sealants, but without the odor and unpaintability problems of silicone sealants.*

History of MS Polymer Sealants

1978

Started commercial production of MS Polymer in **Japan**

1997

Started commercial production of MS Polymer in **Europe**

2008

Started introduction of MS Polymer in **SE Asia**

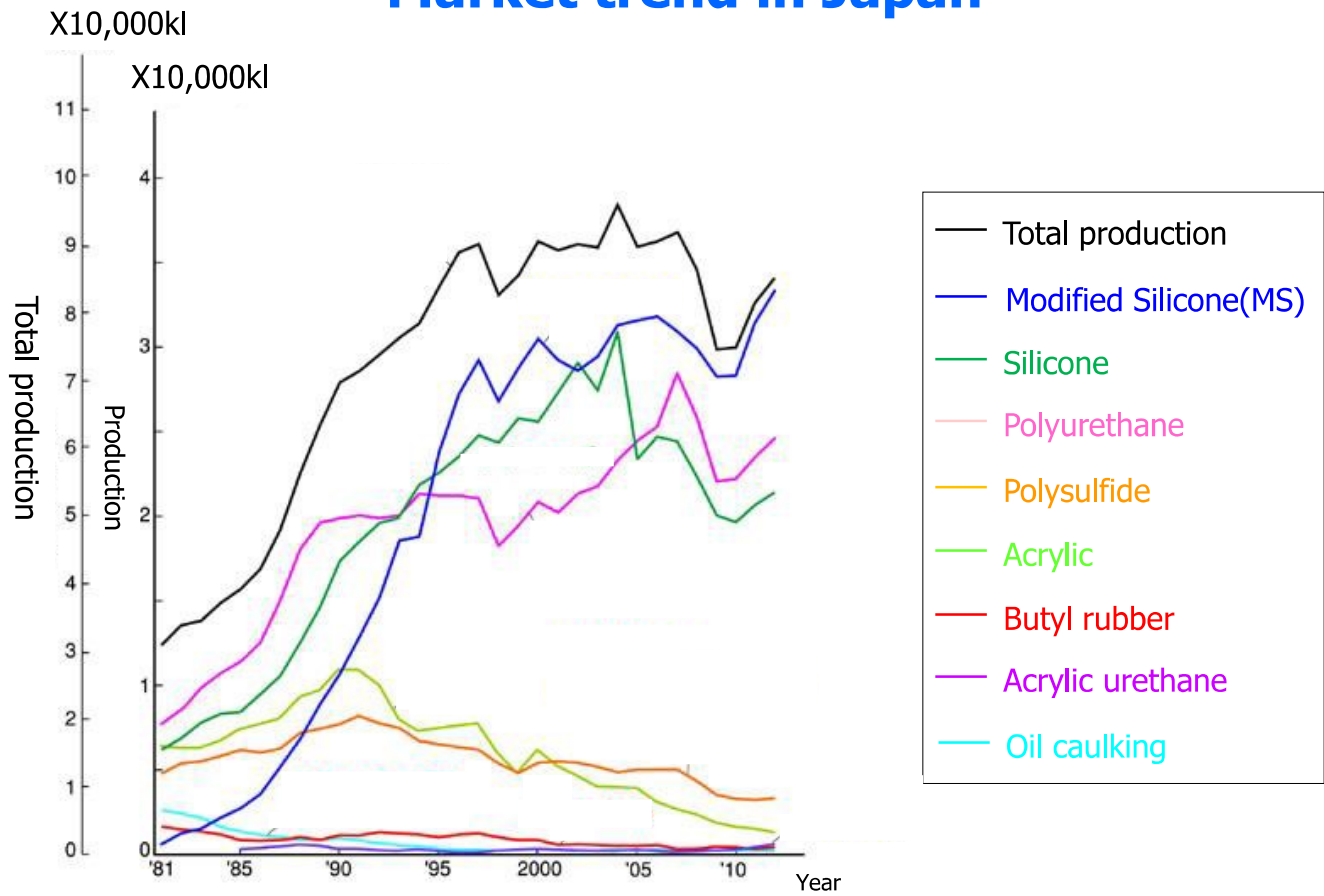
2009

Started commercial production of MS Polymer in **US**

2010

Started marketing work as **Kaneka Malaysia**

Elastomeric Construction Sealant Market trend in Japan



ASTM C920 compliant

Standard Specification for Elastomeric Joint Sealants

Test Report No. 7191108038-MEC15/02-ED (221406823)
dated 23 Oct 2014



PSB Singapore

TEST RESULTS:

Test	'Aseal AS-4001 MS Construction Sealant'	ASTM C920 : 2008 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	31 32	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
6. Adhesion & Cohesion Under Cyclic Movement, Class 25	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	0.8% 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	33.0 N (7.4 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 <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	MS Polymer-based material (refer to Figure 1)	-

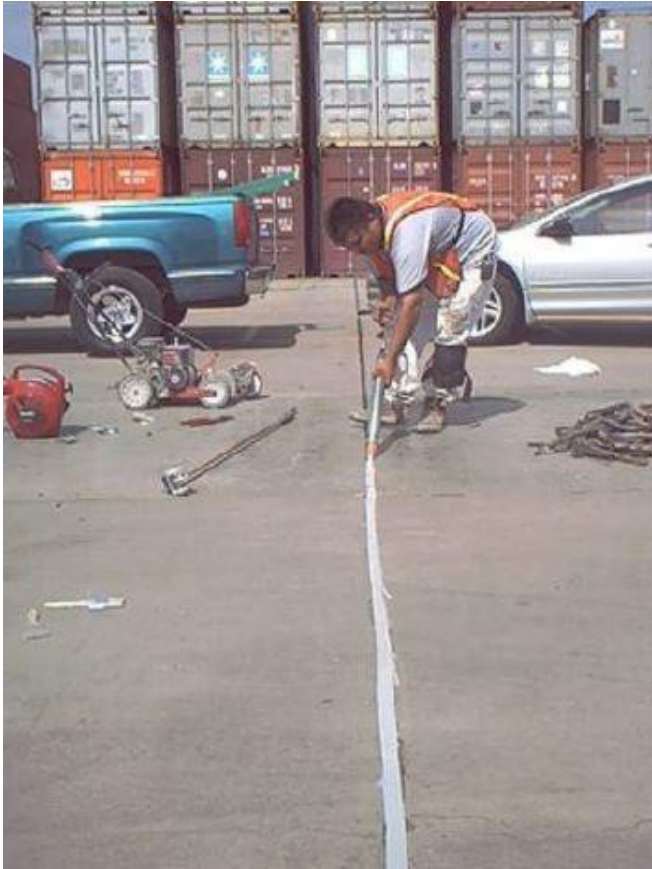
MS Polymer Sealant Application 1/5 (AS-4001) Precast Concrete Wall Panel Joints



MS Polymer Sealant Application 2/5 (AS-4001)

Concrete Joints

(Construction, Expansion, Contraction, Control, Isolation Joints etc.)



MS Polymer Sealant Application 3/5 (AS-4001)

Door/Window Perimeter Joint

(gap between door/window aluminum/PVC frame and concrete wall)





(Scan and learn more)

Description: 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 matte, 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.

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 fluid-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.

Limitation: Not recommended for constant water immersion, outdoor glass sealing, sealing substrates such as PE, PP, Teflon, Neoprene, and bitumen. Not paintable with alkyd paints.

Available colors: Matte black, matte grey & matte white
Content: 290 ml (cartridge), 600 ml (sausage)
Carton quantity: 20 cartridges / carton, 20 sausages / carton

Premium MS Polymer



AS-4002 / AS-4002S Premier Construction Sealant

Features:

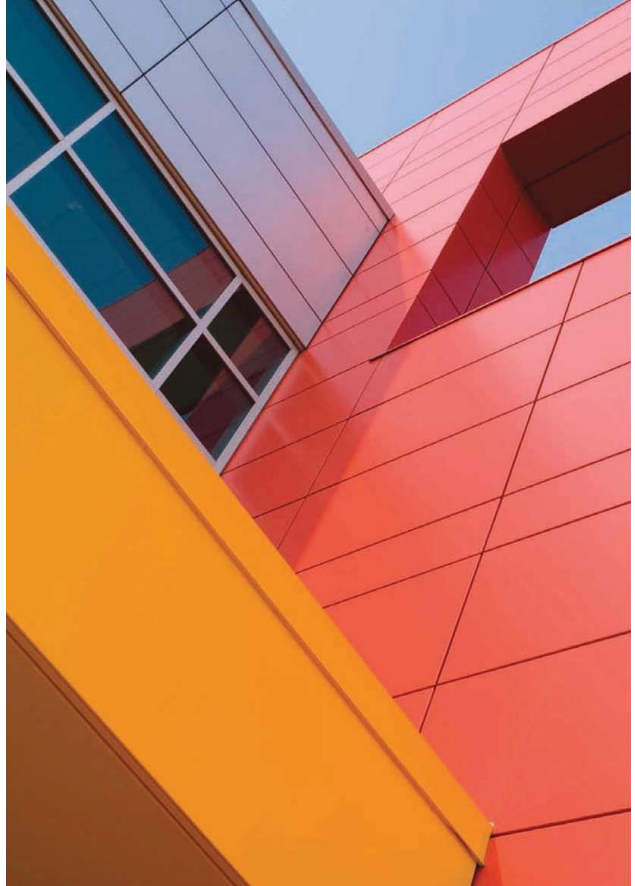
- Excellent weatherability – 10-year warranty
- ASTM C920 (Class 50) compliant
- Paintable
- Low static charge – Less fluid-streaking
- No silicone oil – Non-staining on adjacent substrates
- No isocyanate – No blistering
- No solvent – No shrinkage
- Bonds most substrates without primer
- Matte finish



Product Specifications:

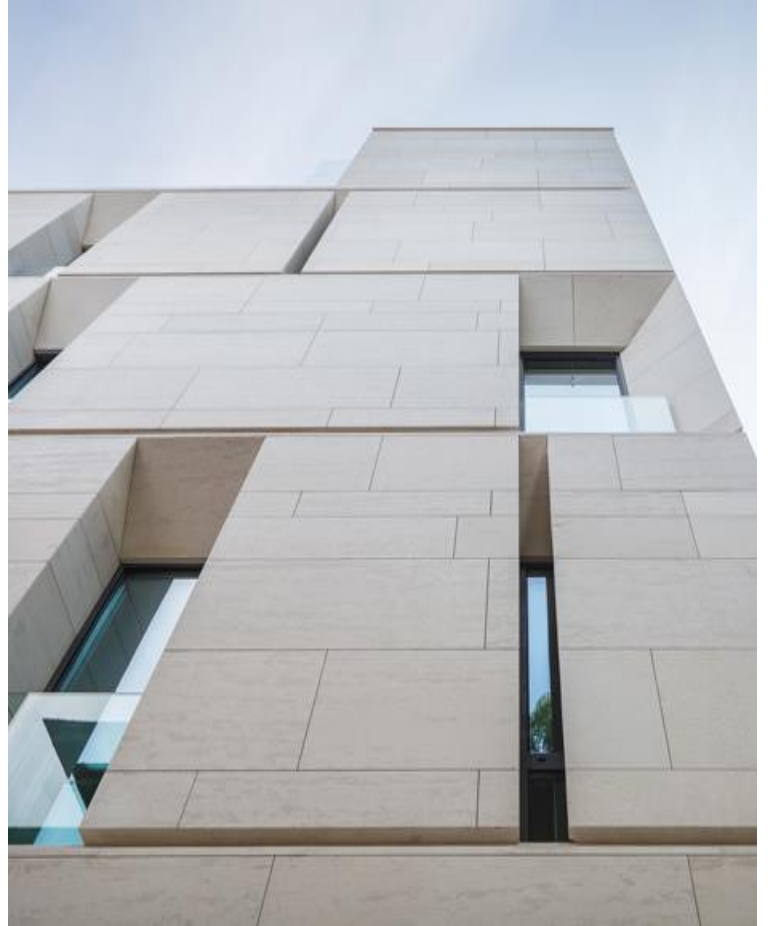
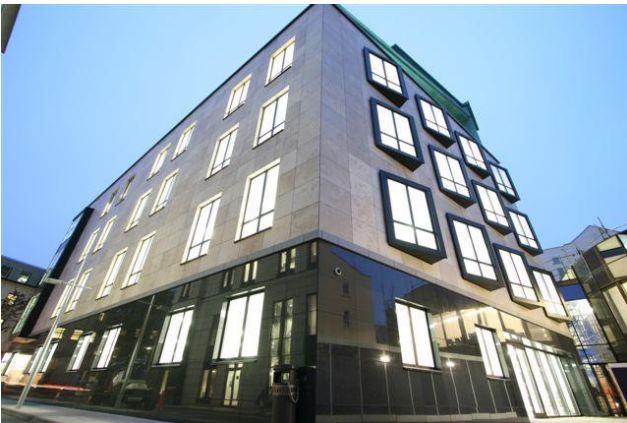
Curing system	: Moisture curing
Density	: 1.52 - 1.54 g/mL
Tack-free time	: 30 - 60 minutes
Tensile strength (ASTM D412)	: >0.7 N/mm ²
Elongation at break (ASTM D412)	: >600 %
Movement capability (ASTM C719)	: ±50 %
Shore A hardness (ASTM C661)	: 25 - 30
VOC content (USEPA Method 24)	: <50 g/L
Application temperature	: 5 °C - 40 °C
Service temperature	: -30 °C - 100 °C
Shelf life	: 9 months (cartridge) : 12 months (sausage)

MS Polymer Sealant Application 4/5 (AS-4002) Metal Panel Façade Cladding (e.g. ACP)





MS Polymer Sealant Application 5/5 (AS-4002) Stone Façade (e.g. marble, granite, limestone)



MS Polymer Sealant Applications in Constructions

PU Sealant Replacement

- Concrete joints
 - Control/Expansion/Isolation/Construction Joints etc.
 - Precast Wall Panel Joints
- Door/Window frame perimeter sealing

Silicone Sealant Replacement

- Weather seal
 - Metal Panels (ACP)
 - Natural Stone

Like PU sealant, MS polymer sealants are not suitable for outdoor glass sealing/bonding

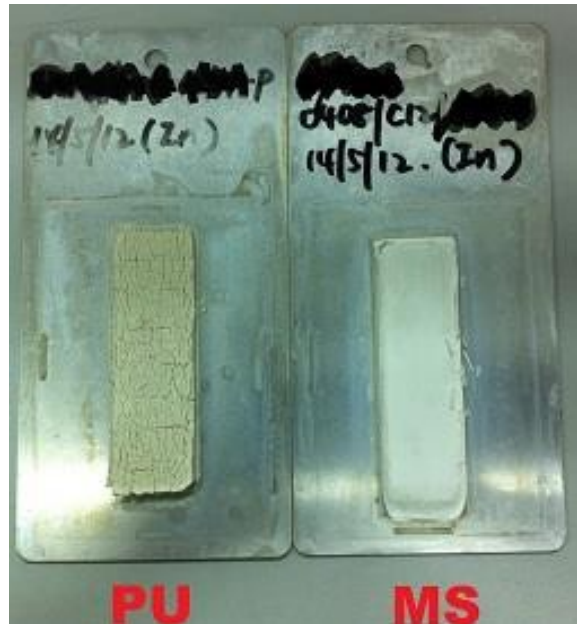
MS POLYMER SEALANTS – ADVANTAGE **1/12**

**Good Weather /
UV Resistance**

much better than Polyurethane (PU) sealants!

Problem of PU sealants

Bad UV resistance - Cracking problem



ASTM C 1442-06 (QUV test)
Standard Practice for Conducting Tests on Sealants Using
Artificial Weathering Apparatus

ASTM C 1442-06 (QUV test)

QUV chamber with fluorescent UVA-340 lamps. To determine the effects of actinic radiation, elevated temperature, and moisture on sealants and their constituents under controlled laboratory artificial weather test conditions.



ASTM C 1442-06 (QUV test)

**Test result after 9,000 QUV hours
(Appx. 9 years of actual weather),**

**PU sealant specimen(left) cracked badly
(and lost its designed functionality)**

MS sealant specimen (right) remained good.



PU



MS





MS sealant QUV test result

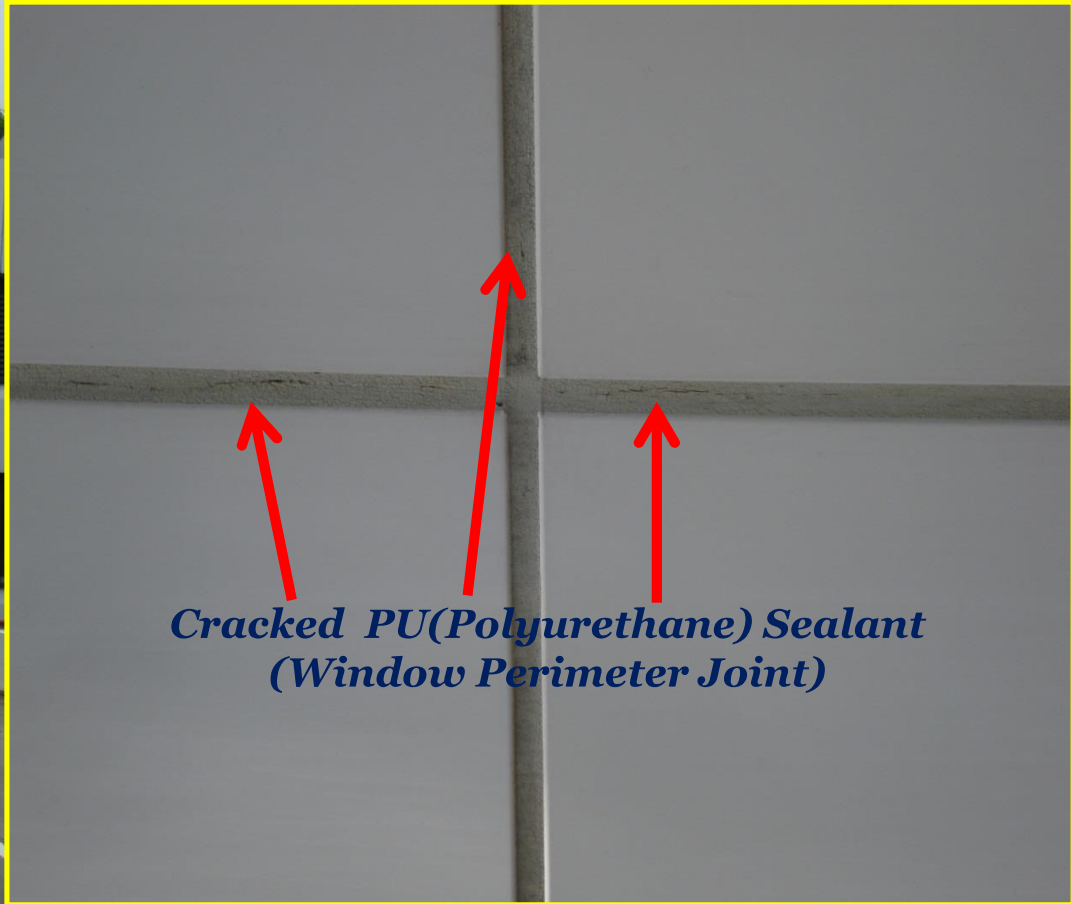
After >20,000 QUV hours (abt 20 years of actual weather)

Observed on 25/10/214, test started 14/05/2012

Problem of PU sealants

Bad UV resistance - cracking problem





*Cracked PU(Polyurethane) Sealant
(Window Perimeter Joint)*



Valley Block

Problem of PU sealants

Bad UV resistance - cracking problem



*Cracked PU(Polyurethane) Sealant
(Window Perimeter Joint)*

Problem of PU sealants

Bad UV resistance - cracking problem



No Bubbling

*Which is a common problem of
Polyurethane (PU) sealants!*

- ✓ *The bubbles/foams/blisters in PU sealants are due to the formation of CO².*
- ✓ *The formation of CO² is the result of the reaction of the isocyanate with moisture.*
- ✓ *Polyurethane sealants contain isocyanate*
- ✓ *MS Polymer sealants do not contain isocyanate*

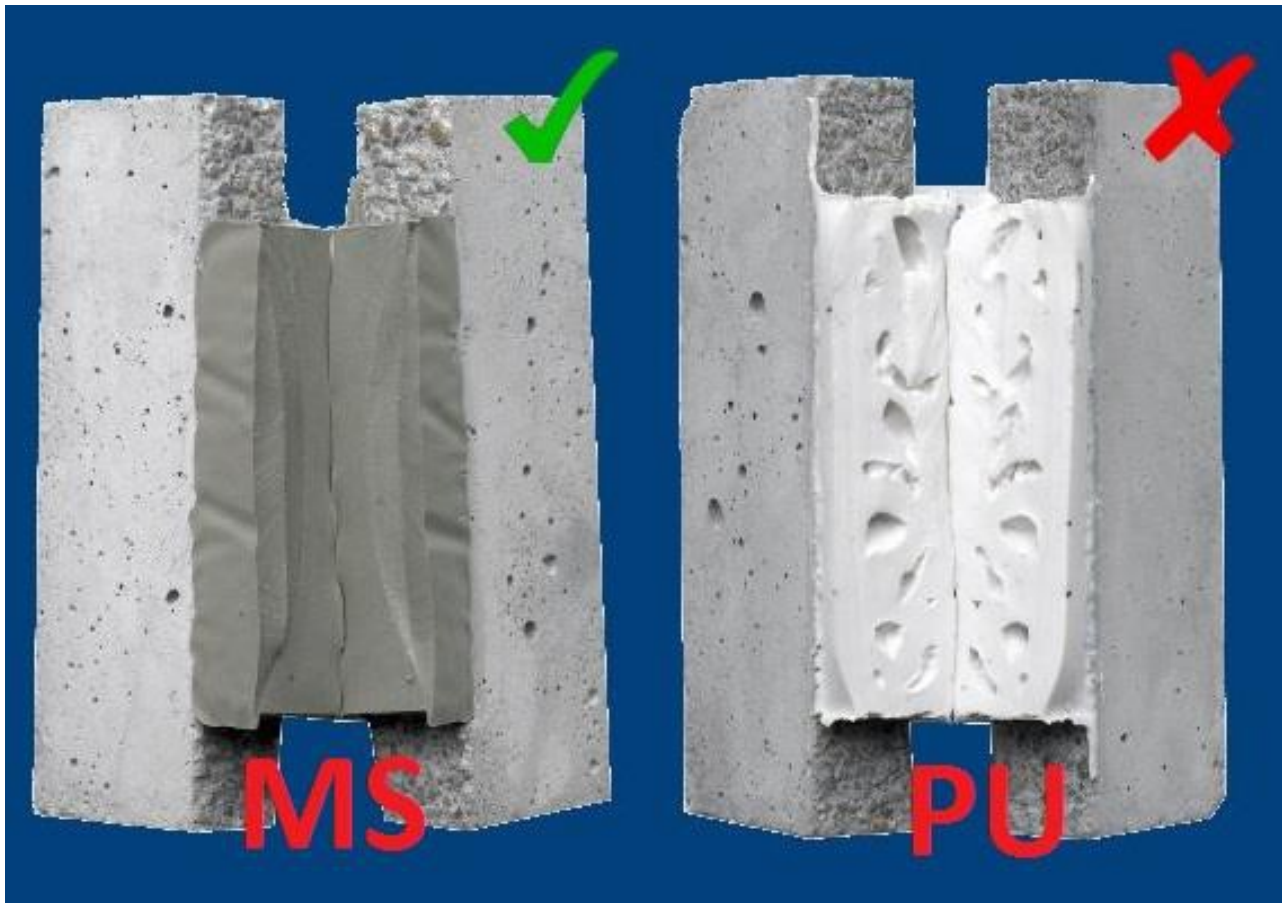
Problem of PU sealants

Bubbling

Bubble - formation of CO_2 , result of the reaction of the isocyanate with moisture during curing of PU sealants



Problem of PU sealants Bubbling



Problem of PU sealants Bubbling

*Can cause cohesive failure of sealant over time
(sealant bead breaks within itself)*



Damp Substrate Bonding/Sealing

- *Applying sealants before or after rain?*
- *Taboo of polyurethane (PU) sealants!*

MS POLYMER SEALANTS – ADVANTAGE **4/12**

No Shrinkage After Cure

because MS Polymer sealants do not contain solvent or water

unlike Polyurethane/Acrylic sealants, which can contain solvent/water that evaporates during curing process and causes shrinkage!

Problem of PU sealants Shrinkage After Cure



PU Brand "A"



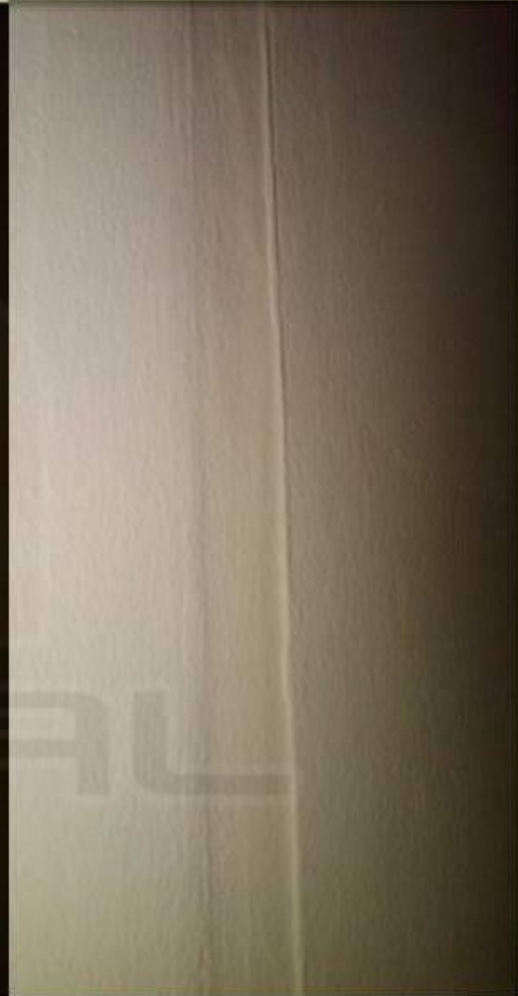
Shrunk and paint cracked

PU Brand "B"



Shrunk and recessed

Our MS Sealant



No shrinkage problem

MS POLYMER SEALANTS - ADVANTAGE 5/12
(LOW MODULUS)

Excellent Mechanical Performance

- Elongation at Break (>600% ASTM D412)
- Movement Capability ($\pm 50\%$, ASTM C719)

They matter for working joints!

AS-4001 – ASTM C719 COMPLIANT

TEST METHOD FOR ADHESION AND COHESION OF ELASTOMERIC JOINT SEALANTS UNDER CYCLIC MOVEMENT (HOCKMAN CYCLE)

Test Report No. 7191108038-MEC15/01-ED (221406823)
dated 23 Apr 2014



PSB Singapore

Cyclic Test Conditions:

Stage A-10 cycles of joint movements:

- a) The joint width was compressed from 12.7mm to 6.4mm at 3.2 mm/h
- b) It was extended from 6.4mm to 19.1mm at 3.2 mm/h
- c) It was compressed again from 19.1mm to 12.7mm at 3.2 mm/h

Stage B-10 cycles of joint movements:

- a) The joint width was compressed to 6.4mm 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 19.1mm at -26°C and 3.2 mm/h
- d) The specimens were removed and allowed to condition to room temperature

No. of determinations : 3 for Class 50

CONDITIONING:

Unless otherwise specified, all test specimens were tested at $23 \pm 2^\circ\text{C}$ and $65 \pm 5\%$ relative humidity.

TEST RESULT:

Test	'Aiseal AS-4001 MS Construction Sealant'	ASTM C920 : 2008 Standard Specification For Elastomeric Joint Sealants
Adhesion & Cohesion Under Cyclic Movement, Class 50	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

Shorter Curing Time

PU sealants generally have longer skinning/curing time, hence more susceptible to issues like:

- *dirt pickup* and *raindrop damage* before skin forming
- *adhesion/cohesion failure* occurs due to joint movement before sealant fully cures

MS POLYMER SEALANTS – ADVANTAGE **7/12**

Green Product



No hazardous materials
like isocyanate & solvent.

<4% of VOC(Volatile Organic Compound) contents
-Complies to SCAQMD rule 1168 (AS-4001)



AS-4005 - SGBPLS certified



CERTIFICATE OF ANALYSIS

ALSEAL MARKETING SDN. BHD.
Lot 2291, Jalan Kampung Baru,
Kg. Baru Sungai Buloh,
47000 Selangor, Malaysia.
Tel : +603-61579698

Fax : +603-61578002

Certificate No : CN/nCML0080/0215
Sample Log Code : nCML0074/0215
Sample Received Date : 17-Feb-2015
Complete Analysis Date : 02-Mar-2015
Date Issue : 02-Mar-2015

Sample Description : AS-4001 MS Construction Sealant
Analysis results :

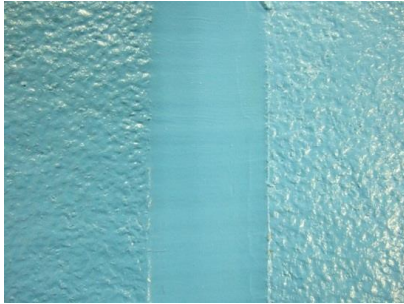
Parameter	Unit	Analysis Result	Standard Method/Technique/Equipment Used
VOC Test	g/L	ND(<10)	USEPA Test method 24 and SCAQMD Method 303-91 and using equations set out in L.N. 107 of 2009 Air Pollution Control (VOC) (Amendment) Regulation 2009

ND denotes not detected

(< Numeric number) denotes detection limits

MS POLYMER SEALANTS – ADVANTAGE 8/12






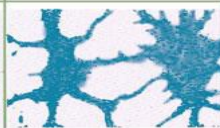






Good paintability on cured sealant (water based paint)



MS Polymer Sealant



Silicone sealant

PAINTABILITY			
Sealant	waterborne acrylic paint		
	A	B	C
MS SEALANT			
SILICONE			
POLYSULFIDE			
POLYURETHANE			

MS SEALANT'S PAINTABILITY IS EXCELLENT

MS POLYMER SEALANTS – ADVANTAGE 9/12

Good Workability

- *1-pass tooling*
- *No soap water or water required*

**** Save time**

**** No skillful workers required**

MS POLYMER SEALANTS – ADVANTAGE 10/12

Less “Fluid Streaking” on Metal Facade Cladding

- Because of *lower electrostatic charge* (5-8 times lower than silicone sealants) that attracts less air-borne dust
- Because there is no “*silicone oil*”, like that contained in silicone sealants

ASTM D4470 -Standard Test Method for Static Electrification:
Silicone sealants have 5-8 times higher electrostatic charge than MS Polymer Sealants – and will pick up more air-borne dusts

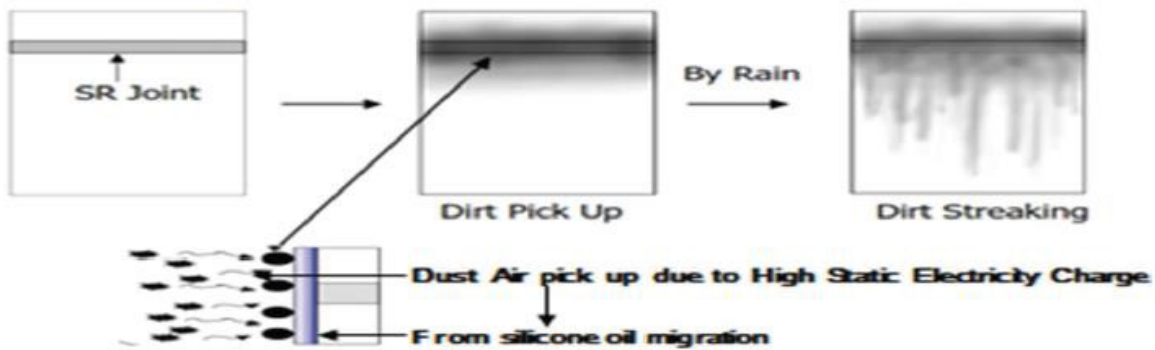
Static electricity of MS and Silicone sealant

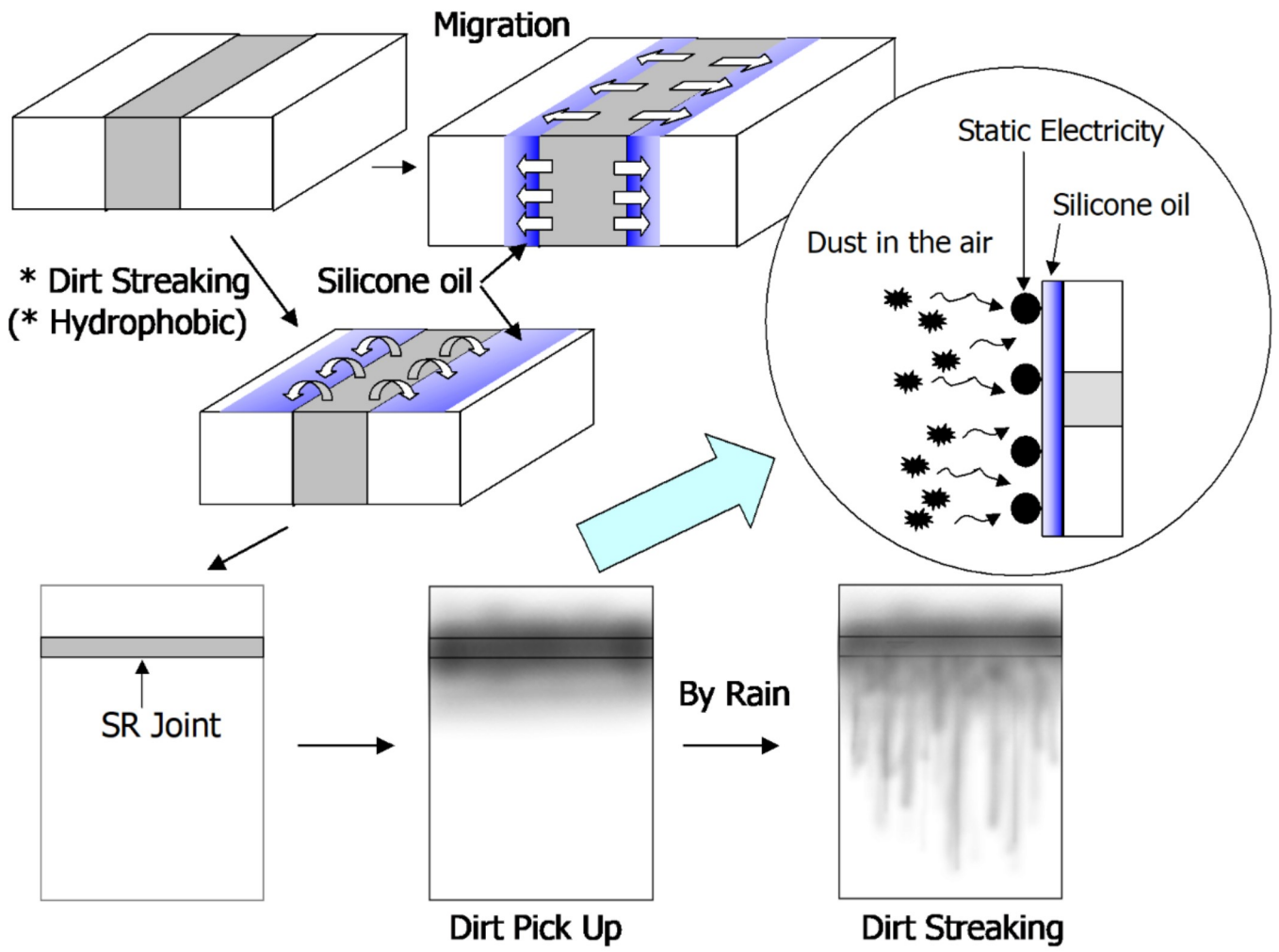
Product Name	Color	Product category		Max. Electrostatic Charge(KV), ASTM D4470*
NF 1105 (Kaneka's lab sample)	White	MS sealant	MS	0.154
SR A	White	1K silicone sealant	SR	0.887
SR B	Gray	1K silicone sealant with non-stone staining feature	SR	1.130

- Data obtained by Trace Laboratories, Inc. MD, USA.
- Sample size: 150mm x 150mm x 3mm

Comments

- SR shows relatively higher electrostatic charge.
- The fact that SR (Silicone) shows dirt streaking when used for building joint sealant is said to be caused by high electrostatic charge.
- Particularly, SR B, supposed to be best non-staining SR available showed highest electrostatic charge.





Fluid-Streaking Test on Aluminum Composite Panels MS VS Silicone

Comparison Sealants

– Before on 29th November 2011



MS



Silicone A



Silicone B

Fluid-Streaking Test on Aluminum Composite Panels MS VS Silicone

Comparison Sealants on Dirt Streaking issue

– After 1 year plus since November 2011



MS



Silicone A



Silicone B

*Latest observed was on 4th March 2013

Fluid-Streaking Test on Aluminum Composite Panels MS VS Silicone

Sealant specimens applied on panels in September 2013



MS

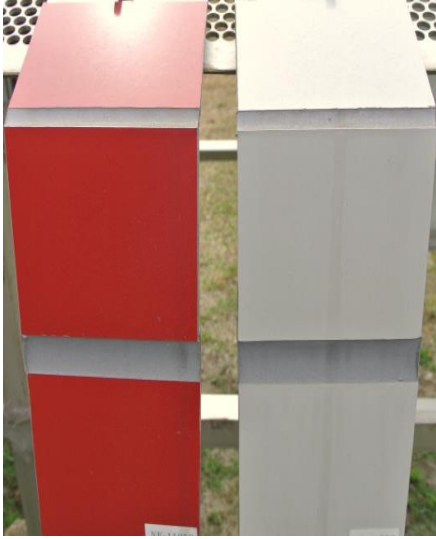


Silicone A

Silicone B

Fluid-Streaking Test on Aluminum Composite Panels MS VS Silicone

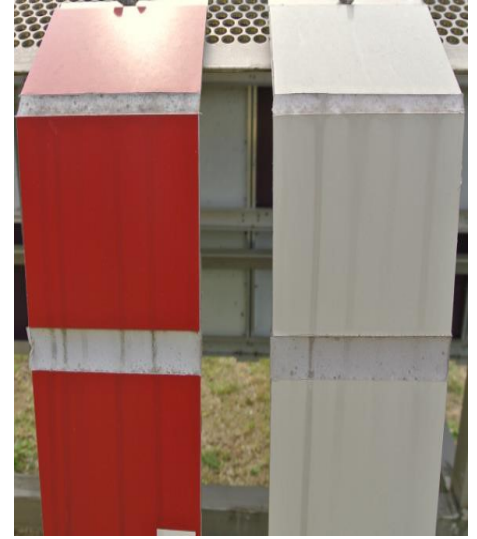
After 5 months – ‘fluid streaking’ observed on panels applied with silicone sealants but not the one with MS



MS



Silicone A

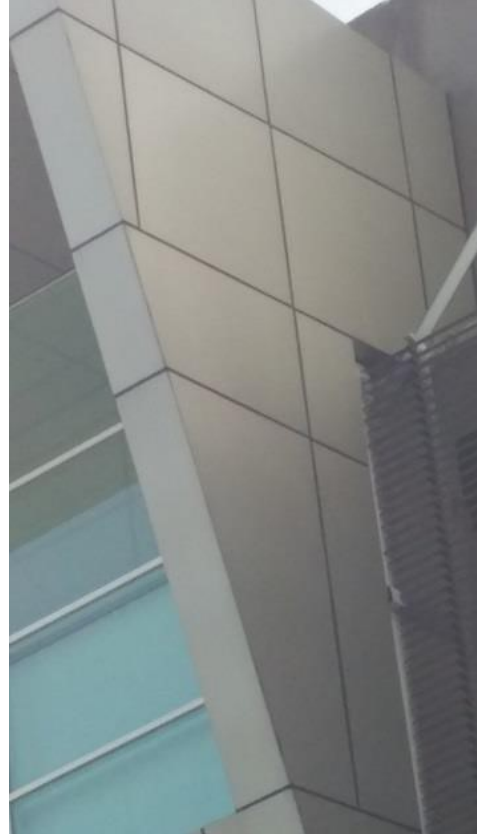


Silicone B

Case Study: Tiong Nam Industrial Park, PJ, Selangor, Malaysia
ACP cladding of 18 units of factories sealed with MS Polymer sealant
**** images taken in November 2013**



Case Study: Tiong Nam Industrial Park, PJ, Selangor, Malaysia
ACP cladding of 18 units of factories sealed with MS Polymer sealant
**** images taken in Jun 2016 (after >30 months)**
– no significant fluid streaking issues observed on ACP panels of ALL factories



Case Study: A Factory in Sungai Buloh, Malaysia

ACP cladding with serious fluid streaking issues (caused by silicone sealant) was cleaned up and then re-sealed with MS Polymer sealant

**** images taken in Jun 2014**



Case Study: A Factory in Sungai Buloh, Malaysia

ACP cladding with serious fluid streaking issues (caused by silicone sealant) was cleaned up and then re-sealed with MS Polymer sealant

**** images taken in Jun 2016 (after >24 months)**

– no significant fluid streaking issues observed on ACP panels



Stable Storage /Shelf Life

*PU sealants are bad in heat resistance and
unstable in storage/shelf life*

Competitive Pricing

*comparable with PU and silicone sealants,
and very competitive against
hybrid sealants of other brands*

Silyl Terminated Construction Sealants

SpecialChem | Edward M Petrie - Aug 26, 2009

Property	MS Polymer	Polyurethane	Silicone
Environmental friendliness	10	5	9
Non-bubbling	10	6	10
Low temperature gunnability	10	8	10
Slump resistance	10	10	10
Quick cure	10	7	10
Storage stability	10	7	9
Body (tooling)	8	10	8
Weather resistance	8	6	10
Adhesion to various substrates	10	5	8
Mechanical properties	10	10	10
Heat resistance, mechanical stability	9	8	10
Non-dirt pickup	10	10	5
Stain resistance	8	8	5
Paintability with water-based paint	10	10	3

Table 2: Performance Comparison of MS, Polyurethane, and Silicone Sealants³

Sources:

[http://www.adhesives.org/docs/default-document-library/hybrid_sealants_may2010-final-\(1\).pdf](http://www.adhesives.org/docs/default-document-library/hybrid_sealants_may2010-final-(1).pdf)

<http://www.specialchem4adhesives.com/resources/articles/article.aspx?id=3042>

Sealant Cost Is Insignificant In Overall Project Cost, But When Sealant Fails, It Fails Big Time!

- *Adhesive/cohesive failure causes water leakage and units unlivable*
- *Stained/Streaked stone/metal panel façade causes unsightly aesthetic issues and high maintenance fee*
- *Very significant cost, time, and effort required to identify and repair failed sealant (especially sealant applied at external wall of high floors!)*

So why still use PU sealants which are known to have short service life (3-10 years), and silicone sealants, which will stain/streak the building façade??



Project Reference

MS Polymer Sealant



- Project Name: **Bayport West (Naia Garden Residences)**
- Project Type: Condominium
- Location: **Manila, Philippines**
- Application: Precast Wall Panel Joint
- Owner: Mega Pacific Property Holdings & Dev't Corp.
- Main Contractor: One Asia Builders
- Year: 2015



- Project Name: **Conrad Manila Bay Hotel**
- Project Type: Hotel
- Location: **Manila, Philippines**
- Application: Precast Wall Panel Joint
- Year: 2016



Project Reference

MS Polymer Sealant



- Project Name: **Torre Sur**
- Project Type: Condominium
- Location: **Philippines**
- Application: Precast Wall Panel Joint
- Owner: Torre Lorenzo Development Corp.
- Main Contractor: ASEC Development and Construction Corp.
- Year: 2015



- Project Name: **Twin Oaks Place**
- Project Type: Condominium
- Location: **Philippines**
- Application: Precast Wall Panel Joint
- Owner: Greenfield Development Corporation
- Main Contractor: MB Technosolutions Corporation
- Year: 2015



Project Reference

MS Polymer Sealant



- Project Name: **Sunpower Plant**
- Project Type: Manufacturing plant
- Location: **Laguna, Philippines**
- Application: Precast Wall Panel Joint
- Year: 2016



- Project Name: **The Florence**
- Project Type: Condominium
- Location: **Fort Bonifacio, Taguig City, Philippines**
- Application: Precast Wall Panel Joint
- Year: 2016

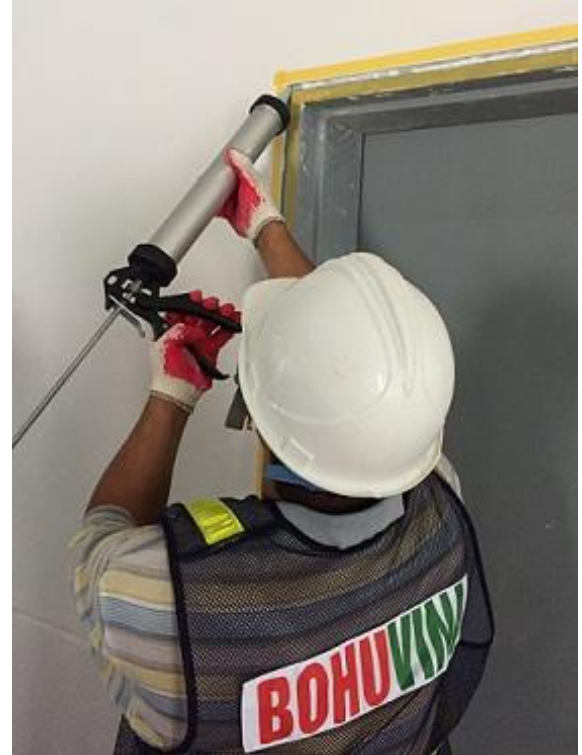


Project Reference

MS Polymer Sealant



- Project Name: **SMC Plant**
- Project Type: Factory Building
- Location: **Dong nai, Vietnam**
- Application: Various building joints
- Year: 2017





Project Reference

MS Polymer Sealant



- Project Name: **Vivo City**
- Project Type: Shopping Mall
- Location: **Singapore**
- Application: Expansion Joint
- Year: 2016





Project Reference

MS Polymer Sealant



- Project Name: **Gateway Shopping Centre**
- Project Type: Shopping Mall
- Location: **Yarrowonga, Australia**
- Application: perimeter sealing, expansion joint
- Year: 2017



Project Reference

MS Polymer Sealant



- Project Name: **Festival Walk**
- Project Type: Shopping Mall
- Location: **Kowloon, Hong Kong**
- Application: Expansion joint
- Year: 2016



- Project Name: **Pak Fook Building**
- Project Type: Commercial Building
- Location: **Wan Chai, Hong Kong**
- Application: Expansion joint
- Year: 2017



Project Reference

MS Polymer Sealant



- Project Name: **Soho Suites**
- Project Type: Condominium
- Location: **KLCC area, KL, Malaysia**
- Application: Window Perimeter Sealing
- Developer: Monoland
- Sub Contractor: Signature Aluminum
- Year: 2013



- Project Name: **Quadro Residences**
- Project Type: Condominium
- Location: **KLCC area, KL, Malaysia**
- Application: Window Perimeter Sealing
- Developer: Monoland
- Sub Contractor: Signature Aluminum
- Year: 2013



Project Reference

MS Polymer Sealant



- Project Name: **The Mansion**
- Project Type: Bungalow
- Location: **Desa Park City, KL, Malaysia**
- Application: Window Perimeter Sealing
- Developer: Perdana Parkcity
- Sub Contractor: Alumeco
- Year: 2013



- Project Name: **The Breezeway**
- Project Type: Terrace & Condo
- Location: **Desa Park City, KL, Malaysia**
- Application: Window Perimeter Sealing
- Developer: Perdana Parkcity
- Sub Contractor: Alumeco
- Year: 2013



Project Reference

MS Polymer Sealant



- Project Name: **28 Mont Kiara**
- Project Type: Condominium
- Location: **Mont Kiara, KL, Malaysia**
- Application: Window Perimeter Sealing
- Developer: Sunrise
- Sub Contractor: Alumeco
- Year: 2012



- Project Name: **The Greens**
- Project Type: Condominium
- Location: **Kuala Lumpur**
- Application: Window Perimeter Sealing
- Developer: Bellworth
- Sub Contractor: LDE Aluminum
- Year: 2015



Project Reference

MS Polymer Sealant



- Project Name: **The Fennel @ Sentul East**
- Project Type: Condominium
- Location: **Sentul, Kuala Lumpur**
- Application: Wall Termination Joint
- Year: 2016



- Project Name: **Banyan Tree Signatures**
- Project Type: Serviced Residence
- Location: **KL, Malaysia**
- Application: Wall Termination Joint
- Developer: Pavilion Group
- Sub Contractor: Angkasa Jasa
- Year: 2016



Project Reference

MS Polymer Sealant



- Project Name: **Second Penang Bridge**
- Project Type: Bridge
- Location: **Penang, Malaysia**
- Application: Bridge Girder Expansion joint
- Year: 2013



- Project Name: **Seri Jati**
- Project Type: Apartment (IBS)
- Location: **Selangor, Malaysia**
- Application: Precast Wall Panel joint
- Developer: SP Setia
- Main Contractor: Setia Precast
- Sub Contractor: Infocast Triangular
- Year: 2014



Project Reference

Premier MS Polymer Sealant



- Name: **Southkey Mosaic**
- Project Type: Commercial Buildings
- Location: **Johor Bahru, Malaysia**
- Application: ACP
- Sub Contractor: Seng Hiap Glass
- Year: 2016



- Project Name: **KULIM LANDMARK CENTRAL**
- Project Type: SHOPPING MALL
- Location: **KULIM, MALAYSIA**
- Application: ACP
- Year: 2017



Project Reference

Premier MS Polymer Sealant



- Project Name: **Robinson Lifestyle Mall**
- Project Type: Shopping Mall
- Location: **Lopburi, Thailand**
- Application: ACP Metal Cladding
- Year: 2016



- Name: **The Prio Condo**
- Project Type: condominium
- Location: **Chiang Mai, Thailand**
- Application: ACP
- Year: 2016



Project Reference

Premier MS Polymer Sealant



- Project Name: **NagaWorld**
- Project Type: Mall/Casino/Hotel
- Location: **Cambodia**
- Application: ACP Metal Cladding
- Year: 2014

Thank You

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