Shin-Etsu

Shin-Etsu Silicone

Silane-based penetrating water absorption prevention agent (anti-algae type)

Shin-Etsu Biowaterguard M

When Shin-Etsu Biowaterguard M is applied to concrete, mortar, etc., it penetrates deep into the base material, forming a durable, strong water absorption prevention, water repellency, and salt shielding layer.

Shin-Etsu Biowaterguard M exhibits excellent penetration

1 Features

1. The main ingredient is silane monomer, so it has excellent penetration.
2. Because it penetrates deep into the capillary voids inside the base material, the water absorption prevention performance does not change even if the water repellency of the surface decreases over time.
3. Prevents the growth of algae and moss for a long period of time.
4. A thick water absorption prevention layer is formed inside the base material, so it provides water absorption prevention, water repellency, and salt shielding effects for a long period of time.
5. Unlike film-forming types, it does not change the appearance of the base material.
6. The water absorption prevention layer allows water vapor to pass through, so it does not interfere with the movement of architectural structures.
7. The applied surface can also be treated with finishing materials such as various paints and sealants.

2 Applications

Shin-Etsu Biowaterguard M can be used in both new and existing buildings.

Applicable substrates	Concrete, mortar, PC (Prestressed Concrete) boards, extrusion moldings, secondary cement products such as slate boards, bricks, roof tiles, stone, wood, etc.
Applications	- Civil engineering structures such as bridges, dams, and embankments - Walls, balcony, corridors, and staircases of buildings, houses, warehouses, etc.
Effects	- Anti-algae action maintains the appearance of surface - Prevents water absorption - Prevents frost damage - Prevents salt damage - Prevents efflorescence * When water in concrete or mortar dissolves alkali and dries on the surface, the alkali remains as crystalsand appears white.

3 General properties and performance test results

Main component	Special silane compound
Type	Alkylsilane (methoxy type)
Appearance	Colorless to pale yellow transparent liquid
Viscosity 25°C mm²/s	2.5
Specific gravity 25°C	0.80
Active ingredient (%)	Approximately 15
Solvent	Isopropyl alcohol
Flash point (℃)	12

(Not specified values)

Test specimen A	300mL/m² of Shin-Etsu Biowaterguard M was applied to one side of the de-saturated mortar (40×40×4mm) and cured for 7 days at 25°C and 50% RH. The de-saturation was performed by immersing the piece in tap water (running water) for 3 days and then drying for 2 weeks.
Test specimen B	300mL/m2 of Shin-Etsu Biowaterguard M was applied to mortar (5x5x25mm) conforming to JIS R 5201 and cured for 7 days under conditions of 25°C and 50% RH.

(1) Anti-algae properties

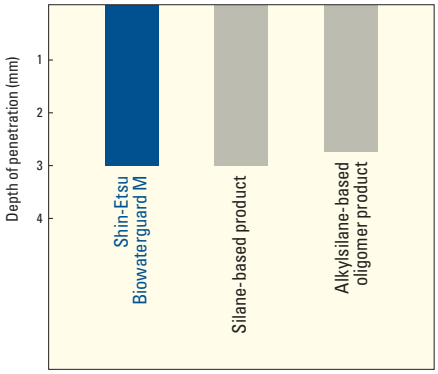
	Untreated	Silane-based product	Shin-Etsu Biowaterguard M	Test conditions
Initial anti-algae properties	Bad	Bad	Good	Test specimen A was placed on inorganic salt agar and inoculated with 5mL of algae suspension. Next, the test specimen was cultured in a sunlight constant temperature incubator for 28 days and observed for algae growth.
Durable anti-algae properties	Bad	Bad	Good	Test specimen A was exposed to a Sunshine Weather Meter (manufactured by Suga Testing Instruments) for 1,000 hours, and then an algae culture test was conducted in the same manner as for initial anti-algae properties.

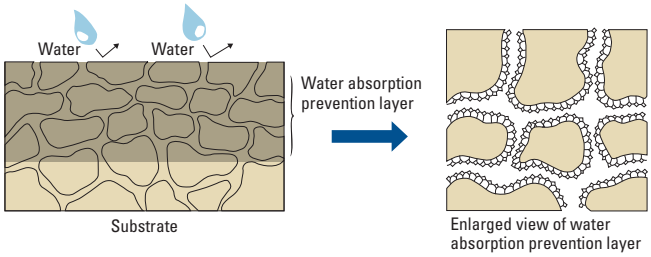
Judgment criteria Good: No algae contamination was observed on the test specimen
Bad: Algae contamination occurred on more than 2/3 of the total area of the test specimen.

(Test strains: Chlorella vulgaris/Hormidium sp./Anabaena sp. Culture temperature: 25±2°C)

(2) Permeability

Water was poured onto the cut surface of specimen B, and the depth of the water absorption prevention layer was measured.





Reaction mechanism

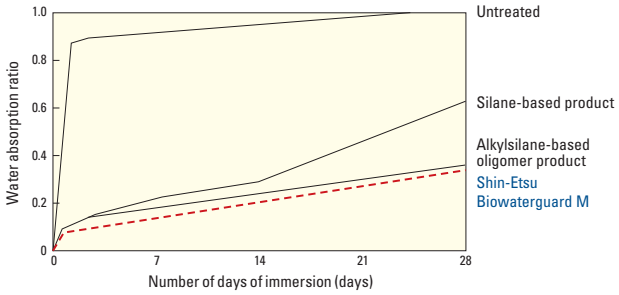
$$R-Si-(OR)_3 - 3H_2O \xrightarrow{} R-Si-(OR)_3 \xrightarrow{} R-Si-(OR)_3 + HO-Substrate \xrightarrow{} R-\underset{\displaystyle O-Substrate}{\overset{\displaystyle |}{Si}}-O-Substrate$$

(3ROH; H_2O)

(3) Water absorption prevention

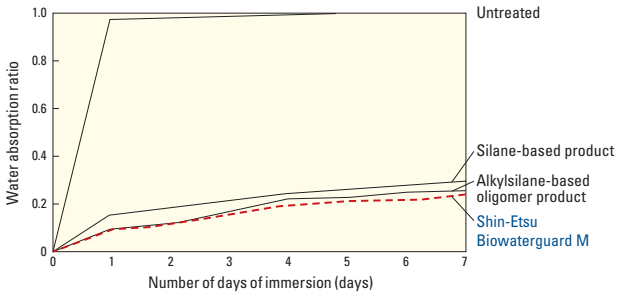
Specimen B was completely immersed in tap water, and the change in water absorption was measured over 28 days, and the water absorption ratio was calculated according to the following formula.

$$\text{Water absorption ratio} = \frac{\text{Water absorption}}{\text{Saturated water absorption of untreated product}}$$



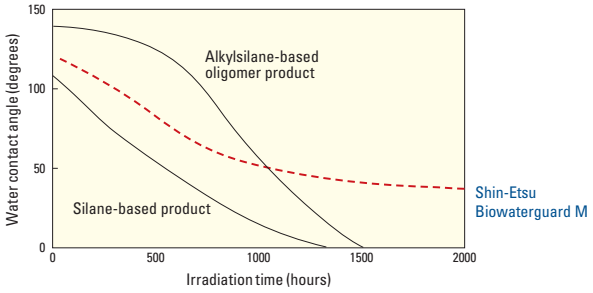
(4) Alkaline resistance

Test specimen B was completely immersed in a 5% NaOH aqueous solution, and the change in water absorption was measured over 7 days, and the water absorption ratio was calculated according to the formula (3).



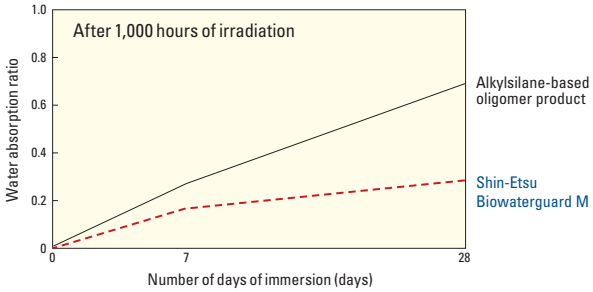
(5) Durable water repellency

Test specimen B was exposed using a Sunshine Weather Meter (manufactured by Suga Test Instruments Co.,Ltd.). Next, the contact angle of water on the test specimen was measured to measure the change in water repellency over time.



(6) Weather resistance

Test specimen B was exposed for 1,000 hours using a Sunshine Weather Meter (manufactured by Suga Test Instruments Co.,Ltd.). Next, the test specimen was fully immersed in tap water, and the change in water absorption over 28 days was measured, and the water absorption ratio was calculated according to the formula (3).



(7) Salt shielding

After immersing the entire surface of specimen B in 3% saline for 28 days, it was removed and split into two pieces. Next, the depth of penetration of chloride ions in the cross section was calculated by the fluorescein color reaction.

	Depth of chloride ion penetration (mm)
Shin-Etsu Biowaterguard M	1 or less
Silane-based product	1 or less
Alkylsilane-based oligomer product	1
Untreated	12.5 or more

(8) Overall evaluation

	Anti-algae properties	Permeability	Water absorption prevention	Alkaline resistance	Durable water repellency	Salt shielding
Shin-Etsu Biowaterguard M	◎	◎	◎	◎	○	◎

◎ : Excellent ○ : Good

4 How to use

Pretreatment

- Thoroughly remove mud, dirt, oil, etc. from the applied surface with a scraper or brush.
- If old coating remains, thoroughly remove it with a high-pressure water wash or disk sander.
- Fill cracks (0.3 mm or more) with sealant, waterproof mortar, etc.
- Mask (protect) areas other than the applied surface that may be affected by the solvent with a sheet, etc.
- If the applied surface is wet after washing with water or after rain or rain, discontinue application.
- Make sure the applied surface is sufficiently dry before applying.

Application (coating)

- Use as is without diluting.
- Apply with a spray, roller, brush, etc., taking into consideration the conditions of the surrounding environment.
- When the applied surface dries, it will be indistinguishable from unapplied areas. Apply continuously to each block so that no unapplied areas remain.
- To achieve excellent results, do not apply a thick coat all at once, but apply the specified amount in two or more coats.
  - Concrete and other application surfaces: 300mL/m^2
  - ALC and other application surfaces with high absorption: 600mL/m^2

Curing

- After application, be careful not to expose the surface to water for 3 hours. If rain is expected, mask the surface with a sheet or other material (curing).
- If water is applied within 3 hours due to rain, apply the specified amount again after the surface has dried.

Inspection

- Shin-Etsu Biowaterguard M exhibits excellent water repellency about one day after application.
- Check the water repellency by spraying water on it. If it becomes polka dots, it is complete. If it turns wet, apply again.

*When applying finishing treatment to the applied surface, check the compatibility of each material before use.

5 Packaging

1kg square can, 16kg square can
UN No.1139

6 Storage and handling precautions

1. Store unopened in a cool, dark place.
2. If there are trees or flowers around the application area, we recommend using a roller or brush to prevent the product from scattering. If using a spray, mask the surrounding area with a sheet or other material.
3. Shin-Etsu Biowaterguard M is flammable, so do not use it near open flames. Also, be careful not to absorb solvent vapors when applying.
4. Furthermore, when using indoors, ensure adequate ventilation. If using in a place with insufficient ventilation, wear an organic gas respirator.
5. When handling the product, take care to avoid contact with the skin or mucous membranes by wearing protective gloves and protective glasses. In case of the skin contact, immediately wipe off with dry cloth and then flush thoroughly with running water. When using, be careful not to rub eyes with hands.
6. In case of accidental eye contact, flush immediately plenty of clean water for at least 15 minutes and then seek medical attention. Contact lens wearers must take special care.
7. Keep out of the reach of children.
8. Be sure to read the Safety Data Sheet (SDS) before use. SDS are available from the Shin-Etsu Silicone website. If the SDS is not listed on the website, please contact the sales department.

   SDS download URL: https://www.shinetsusilicone-global.com/support/sdstds

For inquiries about Shin-Etsu Biowaterguard M

Shin-Etsu Chemical Co., Ltd

Silicone Division Sales and Marketing Department Ⅳ

Marunouchi Eiraku Bldg., 4-1, Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-0005, Japan
Phone : +81-(0)3-6812-2411 Fax : +81-(0)3-6812-2415

Shin-Etsu do Brasil Representação de Produtos Químicos Ltda.

Rua Coronel Oscar Porto, 736 - 8°Andar - Sala 84, Paraíso São Paulo - SP Brasil CEP: 04003-003
Phone : +55-11-3939-0690 Fax : +55-11-3052-3904

Shin-Etsu Singapore Pte. Ltd.

1 Kim Seng Promenade #15-05/06 Great World City, Singapore 237994
Phone : +65-6743-7277 Fax : +65-6743-7477

Shin-Etsu Silicones (Thailand) Ltd.

7th Floor, Harindhorn Tower, 54 North Sathorn Road, Silom Bangrak, Bangkok 10500, Thailand
Phone : +66-(0)2-632-2941 Fax : +66-(0)2-632-2945

Shin-Etsu Silicone Korea Co., Ltd.

GT Tower 15F, 411, Seocho-daero, Seocho-gu, Seoul 06615, Korea
Phone : +82-(0)2-590-2500 Fax : +82-(0)2-590-2501

Shin-Etsu Silicones Vietnam Co., Ltd.

Unit 4, 11th Floor, A&B Tower, 76A Le Lai Street, Ben Thanh Ward, District 1, Ho Chi Minh City, Vietnam
Phone : +84-(0)28-35355270

Shin-Etsu Silicone International Trading (Shanghai) Co., Ltd.

29F Junyao International Plaza, No.789, Zhao Jia Bang Road, Shanghai 200032, China
Phone : +86-(0)21-6443-5550 Fax : +86-(0)21-6443-5868

Shin-Etsu Silicones India Pvt. Ltd.

Unit No. 403A, Fourth Floor, Eros Corporate Tower, Nehru Place, New Delhi 110019, India
Phone : +91-11-43623081 Fax : +91-11-43623084

The Development and Manufacture of Shin-Etsu Silicones are based on the following registered international quality and environmental management standards.

Gunma Complex	ISO 9001 (JCQA-0004)	ISO 14001 (JCQA-E-0002)
Naoetsu Plant	ISO 9001 (JCQA-0018)	ISO 14001 (JCQA-E-0064)
Takefu Plant	ISO 9001 (JQA-0479)	ISO 14001 (JQA-EM0298)

JAB CM009

https://www.shinetsusilicone-global.com/

The contents of this catalog are current as of Sep 2024.