

SILBLOCK* WMS

masonry water repellent

COATINGS ADDITIVES - MASONRY WATER REPELLENTS



Silblock WMS masonry water repellent, an aqueous emulsion based upon silane technology, is an excellent candidate to consider for outstanding water resistance as an admixture and/or penetrating sealer. When Silblock WMS masonry water repellent added as an integral water repellent during the concrete mixing process (admixture), it can significantly reduce water absorption and efflorescence. When used as a sealer for masonry, Silblock WMS masonry water repellent can offer deep penetration resulting in excellent surface protection from water, rain and de-icing agents, and potentially providing resistance to chloride intrusion of masonry substrates. The treated surface also typically maintain excellent water vapor permeability and a natural appearance. Examples of masonry substrates that can be benefited are concrete block, pavers, stucco and porous or dense brick. In both applications Silblock WMS masonry water repellent can help improve the freeze-thaw resistance significantly.

Key Features and Typical Benefits

- can help reduce capillary water absorption in masonry applications.
- high alkali resistance.
- offers flexibility in applications. Outstanding water repellent as an integral blend/admixture or surface treatment (penetrating sealer).
- can help provide excellent protection against deterioration caused by freeze-thaw cycling, chloride ion intrusion, efflorescence and water penetration.

Typical Physical Properties	
Property	Value
Active Substance Content, % Silane	40
Appearance	Milky white liquid
Emulsifier Ionic Type	Non-ionic
Specific Gravity at 25°C	0.925
pH	8.5
Flash Point, °C (°F)	>94 (>200)
Viscosity at 25°C, mPa*s	25
Water Thinnable	Yes
Solvent Thinnable	No

Typical product data values should not be used as specifications. Assistance and specifications are available by contacting Momentive Performance Materials.

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Silblock WMS Masonry Water Repellent as an Integral Water Repellent - Test Results

Water Absorption Testing

Silblock WMS masonry water repellent was added to a concrete mix at the dosage rate of 1.1% by weight of cement. Concrete specimens were cast and cured for 12 days at room temperature. After 24 hours, water absorption testing was conducted and compared to control. Concrete specimens with Silblock WMS masonry water repellent showed water absorption reduction of 83%.

Salt Transmission Testing

Concrete specimens containing Silblock WMS masonry water repellent at the dosage rate of 1.1% by weight of cement (prepared in the same manner as the samples for water absorption testing) were exposed to 15% NaCl solution for 48 hours. Any changes on the surface of the tested specimen were subsequently determined. This method may be considered to be an accelerated testing of chloride intrusion.

Concrete specimens with Silblock WMS masonry water repellent did not show salt crystallization on the surface whereas the control specimens showed salt crystallization on the surface.

Silblock WMS Masonry Water Repellent as a Penetrating Sealer - Test Results

Silblock WMS Masonry Water Repellent as a Penetrating Sealer

Silblock WMS masonry water repellent can be used as received or at an application concentration of ~ 20% w/w. It is generally recommended that an application rate of 100-200 square feet per US gallon be used as a starting point. The 20% w/w active concentration can be achieved by thinning as follows:

1 part w/w	Silblock WMS masonry water repellent
1 part w/w	Water

Silblock WMS masonry water repellent was evaluated as a penetrating sealer on cement mortars prepared according to Japanese Industrial Standards (JIS) R 5201 - Physical Testing Methods for Cement published through Japanese Standards Association (JSA). Silblock WMS masonry water repellent (as received-no dilution) was applied onto cement mortars at an application rate of 200g/ sq. meter (189 sq. ft./US gallon or 227 sq. ft./Imperial gallon) and air dried at 25°C and 50% relative humidity for 7 days. Five tests were performed on cement mortars treated with Silblock WMS masonry water repellent. They included - water absorption, penetration depth, contact angle, paintability and physical appearance after a second coating.

Water Absorption Testing

Two cement mortars were immersed in tap water for 24 hours, and for 7 days. Water absorption was determined from weight gained compared to the sample weight prior to immersion. Silblock WMS masonry water repellent showed a reduction in water absorption by 93% after 24 hours and 83% after 7 days as compared to control (i.e., untreated samples).

Penetration Depth Testing

Cement mortars treated with Silblock WMS masonry water repellent were cut in half. An aqueous solution of India ink was applied onto the cut mortars. Penetration depths were measured: The penetration depth is the average thickness of the non-wet band (or non-pigmented bands) of 10 measurements (excluding minimum and maximum measurements). Silblock WMS masonry water repellent showed a penetration depth of 4 mm - see Figure 1.

Figure 1: India Ink Penetration Depths with Silblock WMS Masonry Water Repellent (right) as Compared to Control (left)



Contact Angle Testing

The contact angle of distilled water droplets was measured on a treated concrete surface. Silblock WMS masonry water repellent showed a very slight beading effect on concrete - see Figure 2. If a more significant beading effect (or contact angle about 100 to 110 degree or higher) is desired, the addition of paraffin wax emulsion or fluorocarbon resin emulsion is required. In general, beading effects are not considered as a true measure of the efficacy of water repellency.

Figure 2: Slight Beading Effect of Silblock WMS Masonry Water Repellent Treated Concrete



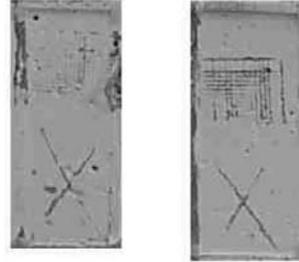
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Silblock WMS Masonry Water Repellent as a Penetrating Sealer - Test Results (continued)

Paintability Testing

Silblock WMS masonry water repellent-treated concrete specimens were painted with commercially available solvent-based acrylic paint. After one month at room temperature, the adhesion values of the paint were determined according to JIS K5600-5-6 - Testing Methods for paints - Part 5: Mechanical properties of film - Section 6: Adhesion test (Cross-cut test). Pursuant to this method - a lattice pattern and an X-cut was cut into the painted substrate. Then pressure sensitive tape was applied to the pattern, cut and then pulled off - subsequently checking for paint flakes. Silblock WMS masonry water repellent showed excellent paintability on concrete; Silblock WMS masonry water repellent had minimal effect on the adhesion of paint - few or no paint flakes from substrates were observed in cross cut tests - see Figure 3. Silblock WMS masonry water repellent may be considered for use as a water repellent primer. However, always apply on a test area to determine actual paintability.

Figure 3: Paintability of Silblock WMS Masonry Water Repellent Treated Concrete (left – Control, right – Treated with Silblock WMS Masonry Water Repellent). Silblock WMS Masonry Water Repellent as Primer Showed Minimal Effects on Acrylic Paint Adhesion



Appearance After Second Coating

Two coats of Silblock WMS masonry water repellent were applied onto concrete at 200g/ sq. meter to evaluate if there would be changes in appearance for wet on wet application and wet on dry application. For wet on wet application, the second application (same application rate) was applied about 30-60 mins. after the first. For wet on dry application, the second application was applied 24 h. after the first. There were no physical appearance differences observed between wet on wet application or wet on dry application after 7 days curing at room temperature. In addition, the concrete specimen did not show any changes in physical appearance after Silblock WMS masonry water repellent was applied.

Patent Status

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

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MOM-113-620-10E-GL 03/11 Printed in U.S.A.

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