

Efflorescence of Cementitious Base Coats

EFFLORESCENCE

Efflorescence is a crystalline deposit, usually white, that may develop on the surface of a cementitious base coat. Applicators may have seen these white deposits on base coats that have been exposed to rain or damp conditions.

Weather conditions are the primary factor controlling the development of efflorescence. Generally, it is minimized in hot, dry conditions where rainwater evaporates quickly from the surface. Cold, damp weather conditions favor the development of efflorescence.

Efflorescence accumulated on the base coat is a bond breaker and will prevent adhesion of the finish or coating. The delamination begins as a blistered or bubbled area seen during a rainfall. The blister may shrink back to be unnoticeable when the finish dries out, or it may delaminate. The delamination may be in the form of large sheets or small pop-offs. The finish is always weakened when a blister occurs, even if it does not delaminate. Delamination may occur after exposure to several rainfalls. The delaminated finish area is usually brittle and flaky.

Additionally, efflorescence accumulated on the base coat can also cause the textured acrylic finish to fade or appear blotchy due to the high pH of the alkali salts, causing alkali burn.

Note: Efflorescence can be difficult to see when the process of crystallation starts. It may be necessary to inspect the surface with a magnifying lense.

PREVENTION OF EFFLORESCENCE

Steps to prevent the formation of efflorescence when using cementitious base coats:

1. When possible, avoid poor drying conditions. For instance, application of a cementitious product late in the afternoon on a cool damp day could result in the formation of heavy efflorescence. Work in the sun when temperatures are low.
2. Comply with Dryvit specifications requiring protection of materials from inclement weather until they are dry. If rain, sleet, dew, or sprinkler water come in contact with a partially dried cementitious product, efflorescence will form on the surface. Of course, temperatures must remain above 40°F (4°C) until the material is fully cured.
3. Use only fresh Portland cement. Old, lumpy cement that has been partially hydrated may result in efflorescence.
4. Heavy, localized deposits of efflorescence may result from water migrating from behind the base coat. The installation should be checked for proper detailing, flashing, caulking, etc.
5. Aesthetic joints or outside corners that were brushed smooth with water are also prone to localized efflorescence, as are areas below unguttered roof valley or scuppers. Particular attention should be paid to protecting these areas.
6. Do not over water the cementitious material since the excess water will dissolve more salts and lead to efflorescence. The resulting material is more porous, allowing easier migration of water.

CLEANING EFFLORESCENCE

Light accumulations of efflorescence can be cleaned with general cleaning compounds and pressurized water. Testing the cleaning compound on a small and isolated area of the actual finish surface is always advised prior to commencing on a large scale. The following procedure is recommended.

1. Prewet the surface with water.
2. Apply a solution of water and the chosen cleaning solution – follow manufacturer's instructions.
3. Light scrubbing with a soft bristle brush may be necessary as well
4. Rinse thoroughly with water. When pressurized water is used for rinsing, follow guidelines for use of power washing equipment described in DryvitCARE EIFS Repair Procedures DS498. All acid residues must be washed off because it may cause adhesion problems.
5. Allow the treated area to dry, and thoroughly inspect the surface for any signs of efflorescence prior to application of finish.

For heavier accumulations of efflorescence, it is recommended to remove by washing with diluted acid solutions. Muriatic acid or commercially available acidic cleaners may be used. Do not use acidic cleaners for general cleaning of textured finishes on Dryvit systems. The following procedure is recommended.

1. Prewet the surface with water.
2. Apply a solution of one (1) part Sure Klean No. 600 (www.prosoco.com) mixed with twenty (20) parts water. Efflorescence cleaners from other companies may also be used, as suggested below. The surface will "fizz" indicating that the salts are being dissolved by the acid solution. Light scrubbing with a soft bristle brush may be necessary to remove all the efflorescence.
3. **DO NOT APPLY ACID SOLUTIONS BY HIGH PRESSURE SPRAY APPLICATION.**
4. Rinse thoroughly with water. When pressurized water is used for rinsing, follow guidelines for use of power washing equipment described in DryvitCARE EIFS Repair Procedures DS498. All acid residues must be washed off because it may cause adhesion problems.
5. Allow the treated area to dry, and thoroughly inspect the surface for any signs of efflorescence prior to application of finish.

Suggested cleaning solutions include:

- Enviro Klean® Klean 'N Release Cleaner, manufactured by Prosoco, Lawrence, KS, (800) 255-4255
- 2600 EIFScrub, manufactured by Shore Corporation, Pittsburg, PA, (800) 860-4978
- Building Wash 3, ABR Products, Inc., Franklin, WI, (414) 421-4125
- CitraShield, The Clean-Up Group, Naples, FL, (239) 455-2225

CAUTION

Since the cleaning solution is acidic, protective equipment, such as rubber gloves and goggles, must be worn. Follow all safety precautions on the label and Safety Data Sheet. Protect all surrounding vegetation, and dispose of containers in compliance with environmental regulations.

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