



Efflorescence – Causes, Prevention and Removal For Masonry Veneers TDS 159M

The occurrence of efflorescence is a potential problem whenever portland cement products are used.

Efflorescence is a white crystalline deposit which is composed of salts, lime and/or other soluble minerals. Efflorescence may become visible on many types of building product surfaces such as concrete, stucco, grout, masonry, brick, natural stone, clay, ceramic and even wood. These salts and minerals are water-soluble and generally come from the ground or where cementitious or alkali substances exist. These salts and minerals travel to the surface, using water as their transport mechanism, where exposure to the environment evaporates the water and exposure to carbon dioxide changes the deposits chemically leaving behind salts and minerals (white residue) on the surface.

There have been many industry articles and resources available that speak on the issue of efflorescence. It is important to note that efflorescence is not considered a defect of the installation materials, but rather a naturally occurring issue common to all portland cement based products.

The best way to prevent efflorescence is to better understand what it is and how it happens. Three things have to happen for efflorescence to become a problem;

1. There must be soluble salts present (these salts are present in portland cement products from the manufacturing process),
2. Water must be present in the setting bed, mortar bed and/or pointing mortar, and
3. Some type of force (evaporation, gravity, capillary movement, etc...) has to bring the salts to the surface of the installation.

Salts can then be put into solution and brought to the surface. If all 3 things occur then the water evaporates, the salts remain on the surface where they react with carbon dioxide in the air. The reaction turns the salts into a visible white material that collects on the surface. These salts can be calcium carbonate, sodium carbonate, potassium carbonate, or calcium hydroxide depending on the source of the portland cement raw materials and any additives that may have been added to the concrete or mortar.

Eliminating any of the 3 needed circumstances will eliminate the occurrence of efflorescence. It is important to note that efflorescence may occur again if all three of the factors which cause efflorescence are not dealt with, even if a suitable sealer is used.

The best ways to help minimize the occurrence of efflorescence are;

1. Use a polymer fortified mortars (e.g. [MVIS Veneer Mortar](#), [MVIS Hi-Bond Veneer Mortar](#), [MVIS Thin-Brick Mortar](#) or [MVIS LIGHTWEIGHT Mortar](#));
2. Use a calcium aluminate cement based pointing mortars (e.g. [MVIS Pointing Mortar](#), or [MVIS Premium Pointing Mortar](#));
3. The use of a [MVIS Air & Water Barrier](#) membrane used over wall surface (Concrete, CMU, Concrete Backer Board and wall renders/floats) can reduce the amount of soluble materials through system.
4. For Paving, slope the area to evacuate water from the surface to the sides of the installation - if most of the moisture moves away from the slab or wall then there is less of a chance for efflorescence to occur. In addition, the use of [MVIS Air & Water Barrier](#) membrane will help with the amount of soluble materials.

Removal of Efflorescence from Surfaces Which Are Not Sensitive to Acid (e.g. granite, slate, clay brick, etc...)

Most types of efflorescence are acid-sensitive and because they are typically a buildup of limes, salts and/or soluble mineral deposits usually dissolve when in contact with acid. Since efflorescence is sensitive to acid, STONETECH® [RESTORE™](#), a heavy duty acidic cleaner, works well in dissolving and removing efflorescence in most instances. It is good practice and strongly recommended to conduct a test area in an inconspicuous area to determine suitability and acceptability. If it is determined that the procedure is acceptable then follow the application instructions below:

1. Mask off and protect any surrounding areas that will not be treated. Cover or protect any steel or metal (especially if used interior) to protect from acid corrosion.

2. Apply mixed solution at the light duty dilution level as listed on the product label. Stronger dilutions may be used if required.
3. Apply to the surface using clean towel, sponge, or sprayer. Be careful not to apply to areas which are not affected by efflorescence.
4. Agitate with a stiff white nylon scrub brush, white nylon pad. (do not use colored pads or brushes as this can lead to color bleeding in the substrate)
5. Rinse area with a lightly dampened clean sponge, towel or sprayer. Do not over apply rinse water. Water is one of the key factors in the development of efflorescence. Rinse well enough to remove any cleaner residues only. **DO NOT OVERWET.**
6. Allow the surface to completely dry to determine the desired results. Repeat as necessary.
7. Sealing the surface using a STONETECH impregnating sealer (e.g. [BULLETPROOF®](#), [Stone Sealer](#), [IMPREGNATOR PRO® Sealer](#), [Heavy Duty Exterior Sealer](#) or [Grout Sealer](#) should minimize efflorescence from recurring.

Removal of Efflorescence from Surfaces Which Acid Sensitive (e.g. marble, limestone, concrete, travertine, etc...)

STONETECH RESTORE is an acid based product which, when applied to acid-sensitive surfaces, can react with the surface and alter its appearance. If an acid-sensitive surface is already textured, this may not cause a problem which is noticeable. If this is the case, you should conduct a test area in an inconspicuous area to determine suitability and acceptability. If the user determines that this procedure is acceptable, then proceed as directed above.

To remove efflorescence from acid-sensitive surfaces follow these application instructions below:

1. On flat surfaces, remove the efflorescence by using a dry, white nylon scrub pad and by hand or rotary sander with the white nylon pad attached. Oftentimes, most of the efflorescence deposits can be removed following this process.
2. If this process does not completely remove the efflorescence, or on textured surfaces where the above step is not possible, additional treatment is required. Use STONETECH [Polishing Powder](#) for polished surfaces or STONETECH [Honing Powder](#) for unpolished surfaces. These two products contain abrasives, so it is strongly recommended to conduct a test area to see the effect on the surface finish.
3. Mask off and protect any surrounding areas that will not be treated.
4. Apply the STONETECH Polishing Powder or STONETECH Honing Powder to the affected surface.
5. Add water until you achieve a milk-like consistency.
6. Agitate with a stiff white nylon scrub brush, white nylon pad.
7. Rinse area with a lightly dampened clean sponge, towel or sprayer. Do not over apply rinse water. Water is one of the key factors in the development of efflorescence. Rinse well enough to remove any cleaner residues only. **DO NOT OVERWET.**
8. Allow the surface to dry completely to determine the effectiveness of the process. Repeat if necessary.
9. Sealing the surface using a STONETECH impregnating sealer (e.g. [BULLETPROOF®](#), [Stone Sealer](#), [IMPREGNATOR PRO® Sealer](#), [Heavy Duty Exterior Sealer](#) or [Grout Sealer](#) should minimize efflorescence from recurring.

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