

## Prevention and Treatment of Efflorescence

### Description

Efflorescence is a crystalline deposit that typically appears on masonry surfaces. Unfortunately, its occurrence is not restricted to masonry, and can appear on the surfaces of other exterior claddings, such as concrete, stucco and EIFS. It is generally accepted that the occurrence and amount of efflorescence bears some relationship to the composition of the cement used within these claddings.

Efflorescence is a common and unsightly problem in many areas of the country. Efflorescence usually forms shortly after a building has been erected. It manifests itself on walls as heavy white splotches, to the dismay of the owner and those associated with its construction.

Efflorescence is caused when moisture dissolves the salts contained within masonry, concrete, stucco or an EIFS base coat. Each of those materials contains water or moisture when they are created. The escaping moisture serves as a vehicle or carrying agent for the salt. As the water moves toward the surface, the liquid carries the dissolved salts with it. At the surface, the water evaporates into the air. However, the salts cannot vaporize under normal conditions and thus are deposited on the surface as small crystals.

Even when a decorative coating such as an acrylic finish or paint is applied over masonry, concrete, stucco or EIFS there is a possibility that the salts will migrate through the coating and adversely affect the aesthetics of the wall.

### Weather and Efflorescence

It has been observed that efflorescence is usually a seasonal problem. Cool days and nights seem to bring out salts, which were not visible on the surface during warm periods. The intensity of efflorescence usually increases throughout the winter season and starts to decrease only in the spring. By summer the salt deposits have generally entirely lessened through rain wash off or wind.

In many cases, the amount of efflorescence decreases from year to year, so that a building badly affected in the first winter after construction may be much less marked in the second season and so on.

The cause behind "cold weather" efflorescence can be linked to seasonal variations in the rate of evaporation of moisture. Under summer conditions, the rate of evaporation may be very high, so that moisture evaporates within the cladding rather than on the surface. In colder weather, however, evaporation may be quite slow, allowing moisture to move to the outer surface of the masonry or stucco before it evaporates, leaving the salt deposits on the surface.

### Precautions against Efflorescence

Since various factors may contribute to the development of efflorescence, no one precautionary measure can be expected to be a cure-all. In order for efflorescence to form, however, soluble salts must be present. Some control of this "root source" may therefore be possible through the selection of materials that are low in salt content. A low-alkali Portland cement will greatly reduce the capacity to contribute to efflorescence.

It is desirable to integrate building design elements that minimize the wetting of the walls and prevent contamination of "clean" parts by those containing salts of efflorescence. These could include extended roof overhangs, gutters, downspouts, etc.

### Removing Efflorescence

You can usually remove efflorescence by dry brushing the surface and then flushing the surface with plenty of clean water to remove the dislodged salts. Sure Klean No. 600 manufactured by ProSoCo (available in most hardware stores) may be

utilized to clean efflorescence (and other acid soluble stains) from the surface of the walls. A test area should be cleaned first, using a concentration of one part Sure Klean 600 to twenty parts water (1:20). The concentration may be increased if a stronger solution is needed. Concentration should not exceed one part Sure Klean 600 to six parts water (1:6). Rinse the wall area with clean water prior to application of cleaning solution. Perform limited treatment on a test area before moving ahead over the entire area. A soft bristle brush may be used on the effected area. Do not allow the solution to dry on the wall. Rinse thoroughly with plenty of clean water.

### **Use of a Tinted Acrylic Primer**

To reduce the potential for efflorescence, apply a BASF Wall System tinted acrylic primer to the masonry, concrete, stucco or EIFS base coat prior to the application of the selected BASF Wall Systems Finish Coat. This reduces the absorption of new moisture into the stucco.

### **Summary**

The problem of efflorescence on walls is an old one that has been studied for many years. Several factors may influence the occurrence of efflorescence in a particular case. But in every case of efflorescence, salts must be present, and must have been taken into solution by water to be deposited on the surface when the moisture dries. The movement of the solutions within masonry is controlled to some considerable extent by seasonal weather. Efflorescence is generally considered a "cold weather" problem.

### **Note**

BASF Wall Systems is an operating unit of BASF Construction Chemicals, LLC. (herein after referred to as "BASF Wall Systems")

### **Residential Policy**

Apply wall systems in accordance with local building codes in force at the time of construction. On one and two-family residential framed construction, BASF Wall Systems requires that the wall system selected be one that includes provisions for moisture drainage. Please view the Senergy Residential Policy Bulletin on the Senergy website for a more detailed discussion of this topic.

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### **BASF Wall Systems**

3550 St. Johns Bluff Road South  
Jacksonville, FL 32224-2614  
Phone 800 • 221 • 9255  
Fax 904 • 996 • 6300  
[www.senergy.basf.com](http://www.senergy.basf.com)