



MASONS SUPPLY COMPANY

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What is Efflorescence?

Efflorescence is a white powdery deposit or milky film which can appear on the surface of concrete as water evaporates. Efflorescence occurs with all concrete and is most noticeable with colored concrete. It is generally accepted that the addition of inorganic color pigments does not enhance or retard the occurrence. Efflorescence is caused when soluble salts and other water dispersible materials migrate upward to the surface of concrete. This is caused by the sun evaporating the moisture on the surface. This capillary wicking action continues to draw moisture from within until the moisture is exhausted. Efflorescence is enhanced by low temperatures and moist conditions; condensation, rain, and dew. If concrete placement happens during a dry period of the year, the next cycle of colder, wet weather may trigger the efflorescence to occur. Efflorescence will continue until all the salts have been exhausted. It may remain for months and some of it may wear away. In no way does it affect the structural integrity of the concrete.

Any concrete product containing portland cement can produce efflorescence. Calcium hydroxide (free lime) a by-product is produced in the hydration process of portland cement with water (approximately 140 pounds per cubic yard of concrete). During this reaction period, the excess water mixture, a calcium hydroxide solution migrates through capillaries in the concrete to the surface where it evaporates. There it combines with carbon dioxide from the air to produce calcium carbonate (insoluble salt). Only 0.2 ounce of calcium carbonate per square yard of surface area is needed to cause a significant change in color. In colder temperatures calcium hydroxide is actually more soluble to migrate to the surface. Efflorescence can also be caused by sulfates of either sodium or potassium that are more soluble in water than calcium and can easily be rinsed away. These type of salts can come from cement, aggregates, water, or admixtures.

Removing Efflorescence

Powdery Efflorescence

The recommended procedure is to allow the natural process to occur. Powdery efflorescence can often be removed with a stiff brush on a dry surface. Pressure washing or wet scrubbing can put the efflorescence in solution with water so it can be rinsed away. You must be careful to rinse the entire surface with fresh water so that no residue is left to dry on the concrete. Use an air jet or a wet vacuum to remove any standing water. Any remaining water can cause new efflorescence to appear. Cleaning on dry sunny days is best.

Hard Efflorescence (Milky Film)

Best results are obtained by using a proprietary masonry and concrete cleaner with pressure washing equipment. The acid in proprietary cleaning chemicals are buffered and blended with other chemicals to provide effective cleaning without damage to the surface when used properly. Always refer to the manufacturers recommendations for proper dilution, application and protection of adjacent surfaces. Cleaners are generally applied in sections beginning at the lowest point of the surface. If the area is large, a sprayer is an efficient means to apply the cleaner. The chemicals are scrubbed on the surface, then pressure washed away. Results can be verified after letting the area dry for 24 hours. In most instances one application is sufficient. However, in severe instances of efflorescence, a second application may be necessary.

Note: All acid based cleaners and acidic residues are dangerous to cars, plants and people. Wear proper safety gear and take adequate precautions. It is always recommended to do a small scale test section to determine dilution ratios and effectiveness before a full scale cleaning operation are performed.

Natural Process

If no attempt is made to remove efflorescence it can naturally breakdown after a period of time. Soluble calcium hydrogen carbonate gradually formed from the insoluble calcium carbonate with the continued influence of carbon dioxide and water. Calcium hydrogen carbonate is very soluble and easily washed away with rainwater. Depending on weather conditions this process may however take up to two years to complete.

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