Technical Services
Information Bureau

TECHNICAL BULLETIN

JULY 2008

60.195

Efflorescence

WHAT IS IT?

Efflorescence is a whitish bloom that can appear on the surface of plaster, masonry or concrete. This “bloom” may appear in a powder form. It may also appear as an unattractive green or brown stain. It must be noted that usually these stains do no physical harm to the plaster system and are typically a cosmetic concern. For cleaning, refer to TSIB Technical Bulletin 60.196

Efflorescence is the exudation of soluble salts to the surface of a cement product. The salts may be present in the cement, sand or even in the water used to make concrete, mortar, brick or plaster. Efflorescence is not an indication of inferior products or improper application. The products previously mentioned are natural products and as such they may contain soluble salts.

The major source of efflorescence is calcium hydroxide from hydrated Portland cement. When calcium hydroxide leaches to the plaster surface, it combines with carbon dioxide in the air (carbonation) to form a salt-calcium carbonate.

HOW DOES IT GET TO THE SURFACE?

The transport mechanism is water. Water will bring the salts to the surface and as the water evaporates, the salt is left on the surface as a whitish bloom. This is why efflorescence tends to be more of a problem in the rainy seasons. Efflorescence will diminish over time as the salts wash out of the plaster.

The presence of efflorescence does not necessarily mean water is penetrating plaster or washing down the backside. Site investigations have discovered what is more likely to happen is the rain water runs down the outside face of the wall and soaks into a hairline crack, often without even reaching the building paper behind the plaster. The water will sit in the crack and absorb the trace amounts of calcium hydroxide. As the sun comes out and heats the wall surface, the cracks are typically the last areas to dry out. Water with the soluble salts is drawn to the outer surface by the sun. This is why spring rains followed by a warm sun is the most common precursor for efflorescence to appear on newly applied stucco. Dark colors are more prone to the efflorescence problem. The evaporation process is faster on sun drenched walls with a dark color and this rapid acceleration draws the salt laden moisture out faster as opposed to a slower evaporation and the salts returning to the plaster. The dark colors also tend to highlight the efflorescence more than light colors.

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