Globally Proven Construction Solutions

Efflorescence – Causes and Prevention

TDS-1159

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

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 grout.
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.

The best ways to help minimise the occurrence of efflorescence are:

1. Use a latex fortified thin-set (e.g. LATICRETE® 254 Platinum Adhesive or LATICRETE 211 Powder gauged with LATICRETE 4237 Latex Additive).
2. Use LATICRETE PERMACOLOR® or add a latex additive to the grout - adding a latex to a grout powder lowers the absorption rate of the mortar and helps to minimise the movement of moisture through the mortar.
3. 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 then there is less of a chance for efflorescence to occur.
4. Allow the drying of the substrate and the various stages of the installation system.

For exterior installations over occupied space, we would recommend the use of the LATICRETE Plaza and Deck System. This system prevents much of the moisture from getting into the mortar bed and allows for runoff of water that gets beneath or into the mortar bed.

Unfortunately, at this point, there is no clear cut answer for the total elimination of efflorescence. The use of an epoxy setting material (e.g. LATAPOXY® 300 Adhesive) may also help reduce efflorescence, but no guarantee can be provided that efflorescence won't occur. A mild sulfamic or phosphoric acid wash or proprietary efflorescence remover can be used to remove minor cases of efflorescence.

Install tile and stone with the LATICRETE System materials and your installation will be covered by a comprehensive 100% labour and materials warranty however efflorescence is not regarded as a defect but a natural condition of Portland cement where included in a system.

For technical support, answers to installation questions and information on how to obtain a full LATICRETE System Warranty covering labour and materials, contact LATICRETE Technical Support on 1800 331 012 or technicalservices@laticrete.com.au