

Efflorescence Fact Sheet

What Is Efflorescence?

Efflorescence is a naturally occurring phenomenon which may appear on the surface of cement based products. The visual effect of efflorescence is often characterised by a chalky white deposit. However, the nature of the deposit may vary from a fluffy powder to a harder and less distinct hazy bloom or scum like sediment. This can lead to random white patches appearing on the surface of the product or indeed an overall lightening which is often mistaken for colour fading. Although in some circumstances efflorescence may be a nuisance it does not alter the strength, durability or performance of the product. It is a purely aesthetic and transient phenomenon and will disappear. Furthermore it is harmless.

Efflorescence is created when soluble salts naturally present in both aggregates and cement chemically react together to produce Calcium Hydroxide. As the concrete continues to weather Calcium Hydroxide migrates to the surface of the product and reacts with Carbon Dioxide in the atmosphere to produce Calcium Carbonate, which is manifested as a white deposit.

There are many variable and contributory factors which determine whether or not efflorescence will appear. Oakdale take all possible precautionary measures during production to minimise the likelihood of efflorescence, however, it is extremely difficult to predict or completely avoid. Furthermore, the same soluble salts present in both aggregates and cement used in the manufacture of concrete products are also often used in the foundation sub-base. Environmental and climatic conditions are additional contributory factors all of which are beyond any concrete manufacturers control.

What Causes Efflorescence?

All concrete products contain natural substances which in turn contain soluble salts. Furthermore, all concrete products are, to a greater or lesser extent, porous. Moisture from the manufacturing process or indeed from natural precipitation will inevitably interact with the soluble salts as they migrate to the surface of the product. Calcium Hydroxide reacts with Carbon Dioxide in the atmosphere to form Calcium Carbonate and as the moisture evaporates the characteristic white crystalline efflorescence is left behind as a residue on the surface.

The mechanism to stimulate efflorescence begins as soon the concrete product is manufactured and will continue to the point whereupon the soluble salts are used up within the product and thereafter the efflorescence will gradually fade. As the Carbonate salts are exposed to further Carbon Dioxide in the atmosphere, so they will slowly convert into soluble Hydrogen Carbonate which will wash away and dissipate naturally.

Efflorescence can come and go over a period of a few weeks but in some instances it may linger for many months. Local conditions, geographical variances, climate and environmental factors all contribute. Coastal sites and damp shaded areas tend to be more prone to efflorescence than dryer sunny aspects and efflorescence can be more pronounced during springtime following a wet winter.



Can Efflorescence Be Removed?

There are three different approaches to deal with efflorescence should it occur.

1. Leave it to naturally fade

Simply allowing the efflorescence to naturally fade away and vanish is a guaranteed solution. However, a degree of patience is required.

2. Regular dry brushing

Our recommended and preferred remedial method to encourage the natural and permanent dissipation of efflorescence is regular dry brushing. Using a medium stiff-bristled brush (not a wire brush) scrub the affected areas and sweep away as much from the whole surface as possible to prevent any residue from re-dissolving when wet. Foot-traffic has a similar effect and repeated footfall is helpful. Avoid wet brushing as this will redistribute the dissolved salts across the surface which will ultimately reappear when dry.

The process of dry brushing should be repeated regularly. Should the efflorescence appear to worsen do not be alarmed, this is conversely a positive sign that the salts are being brought to the surface and the abrasion is helping speed up the natural exhaustion of efflorescence causing compounds.

3. Chemical treatments

Many proprietary products are available which claim to deal with efflorescence. These are usually either detergent or acid based. Such products may be effective in removing initial efflorescence. However, salts will continue to naturally migrate to the surface to form new deposits. Furthermore, the chemicals contained within the proprietary treatments may damage the surface of the concrete product. For this reason we do not recommend the use of strong chemical treatments and advocate the dry brushing method.

Can Efflorescence Be Prevented?

Oakdale take every practical measure to minimise the possibility of efflorescence occurring. However, the salient fact remains that the natural and unavoidable constituents of the product can cause efflorescence to a lesser or greater extent and there is no way to predict this. Consequently there is little that can be done to eliminate efflorescence occurring and the only approach is to deal with it once it appears. Dry brushing will hasten the process to the point it permanently disappears.

As manufacturers we cannot be held responsible or liable for efflorescence, it is a naturally occurring phenomenon which is harmless, completely non-detrimental to the performance of the product and will disappear over the passage of time.

The Use Of Sealants?

Sealants can be a useful method to preserve the appearance of paving long-term and provide added resistance to stains and spillage. However, we caution the use of sealants specifically to deal with efflorescence. A surface sealant cannot prevent efflorescence. Indeed, a sealant may simply impede the natural migration of salts thereby permanently trapping the problem.