

Efflorescence Explained



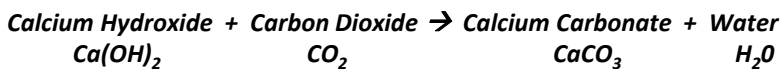
Oxerra's construction pigments are inert metal oxides. They do not cause or exacerbate the occurrence of efflorescence. Similarly, they do not prevent or inhibit its occurrence. This information describes how efflorescence occurs in concrete products.



Efflorescence, or 'lime bloom', is a whitish deposit found on the surface of concrete. It is generally more noticeable on darker colours because of its white appearance. There is no known method to achieve 100% prevention.



As cement hydrates, free **calcium hydroxide** is formed which is slightly soluble in water. During the setting process the soluble calcium hydroxide can move to the surface generally by capillary action. Once at the surface the calcium hydroxide reacts with the **carbon dioxide** in the air to form insoluble **calcium carbonate** (the visible efflorescence).



The calcium hydroxide moves through the concrete rather than the water moving through the water-filled capillary system. As the calcium hydroxide reacts at the surface to form calcium carbonate, the concentration of calcium hydroxide at the surface in the water-filled system is therefore reduced. This effectively draws more calcium hydroxide up through the water from the higher internal concentration to the relatively lower concentration at the surface.

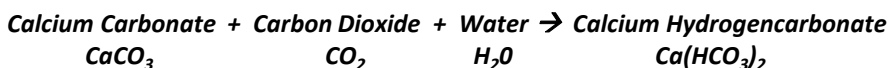


Thus the process continues as the concrete hardens. Efflorescence can occur both during the hardening process of the concrete and during the weathering of the hardened concrete. On hardened concrete, surface water such as rain or dew can seep into the concrete and draw calcium hydroxide to the surface thus allowing it to react with carbon dioxide in the air as described above. Efflorescence will naturally eventually cease.



Once efflorescence has occurred, it can only be quickly removed by acid washing. However, with the luxury of time, natural weathering will have a similar result.

The calcium carbonate (efflorescence) reacts with carbon dioxide in the air to gradually form water-soluble **calcium hydrogencarbonate** as shown below.



Efflorescence disappears after a certain time. Generally in areas with significant rainfall, i.e. not arid desert conditions, efflorescence should be mostly removed after about 12 months of exposure.

Efflorescence

