

TECHNICAL BULLETIN

What Causes Paint to Deteriorate?

How does paint breakdown over time?

The main cause of paint film deterioration is the degradation of several components, including the binder and certain pigments. This is caused by the formation of free radicals, or molecules, that generate in the paint film from prolonged



exposure to UV light (sunlight), moisture and freeze-thaw cycles. Free radicals are highly reactive and either form or breakdown chemical bonds in substances. In the case of paint durability on exposure, free radicals actually damage the film. As the exposure persists, the free radicals continue to be produced and accelerate film deterioration. This process is very similar to how skin ages. Skin contains free radicals that, when exposed to years of sunlight, will show signs of aging, including wrinkling, peeling, sun spots and overall dryness.

How do you know when it is time to re-paint?

Change in appearance is the first indication that the paint film is deteriorating. These early indicators are loss of gloss, color or increased chalkiness. There are analytical ways to measure

gloss and color change on smooth surfaces but it is much more challenging, if not impossible, on textured surfaces. In most cases, if the color or sheen of a painted surface starts to look different, it may be time to consider a repaint project. If left ignored, substrate damage may result as the protective properties of the paint erode. A best practice is to inspect the exterior surfaces annually and maintenance paint or repair the problem areas in order to prolong the paint lifespan of the entire project. When deciding on a paint, it is best to use the highest quality exterior paint in order to achieve the longest lifespan. Paying \$5 more per gallon for quality paint is actually less costly to the building owner because of increased paint life. The benefit to the applicator is their improved reputation as a quality painter and a better chance for referrals.

Why does one paint last longer than another?

Not all paints are created equal. The binder type, pigment choice and other formulation variables determine the ultimate lifespan and durability of paint. Just as all paints are not created equal, it is true that not all binders and pigments are equal in quality. There are varying degrees of quality in the resin and pigment choices, just as there are varying degrees of quality in paint choices. The saying, "you get what you pay for," applies to paints probably more so than any other building material. Some paint manufacturers choose to formulate using a 100% acrylic resin that may not have all the performance qualities associated with those kinds of resins. There are low-cost acrylics available that may not have the important monomers for adhesion, gloss retention or alkali resistance. Using these types of resins lowers manufacturing costs, but increases the cost to the building owner through inferior quality and more frequent repainting.

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