

a stitch in time

You just know, when you feel that stab of pain in the tooth that it isn't going to go away by itself: and you know, joy of joys that you will have to go to the dentist: and you know that the sooner the better. But, procrastination rules, and, by the time we make it to the dentist, what could have been a relatively simple fix, has become more complex, painful, time consuming and expensive.

Building maintenance, particularly in the area of coatings, can also fall into a similar trap. All coatings, even the most durable, are under constant duress. All exterior coatings are attacked by U.V. light; rain (made slightly acid by dissolved carbon di-oxide); heat; biological agents including moulds, algae, lichen and, more or less, some physical abrasion. Of course, there are many other possible aggressors such as salt and other chemicals, but the above are ubiquitous.

Although acid rain can attack certain paint extender pigments such as calcium carbonate, it is the organic binder that is most susceptible to general attack. As this binder is responsible for the adhesion of the coating; its flexibility, cohesive strength and the gloss of the coating, the degradation of this important ingredient is of concern. This is, of course, why the paint industry puts so much importance on the durability of its chosen binders.

Binder degradation occurs at, but not only at, the surface. The first sign of degradation is a loss of gloss. As further degradation occurs, pigment is left unbound on the surface leading to the phenomenon of 'chalking'. Concurrent with this, however, some binder is being lost within the film. This leads to an increase in pigment to binder ratio resulting in a loss of cohesive strength and flexibility. In other words, it becomes a poorer foundation for subsequent repaints.

At the onset of chalking, preparation for recoating is typically a simple wash down. Where the coating is chalking but otherwise sound, applying a clear coat will significantly assist with durability. Loss of cohesive strength is more difficult to quantify.

Testing is, by necessity, empirical. Your scribe's favourite test is to lightly scrape the surface with a sharp pen knife blade. If the coating can be scraped off as a powder, then the danger alarms should sound. Complete removal may be needed or the use of a penetrating surface consolidator may be indicated.

The onset of 'chalking' is a very good indicator that maintenance should be indicated.

This has been written with relatively stable substrates in mind – such as concrete.

When the coating is providing more than a decorative effect over a stable substrate, other considerations come into play. Untreated wood can rot and steel can corrode when the coating system loses its ability to protect. Often, the loss of protection, in these cases, may occur at isolated points (rather than the general surface) and more critical inspections are needed for such surfaces.

Corrosion on steel invariably occurs at spots where surface preparation was inadequate or where coating film builds were difficult to achieve, such as sharp edges. Once the protection is lost at an edge, corrosion can travel, even under the well protected areas. The saving grace of steel is that degradation is almost immediately obvious, either via rust staining or blistering.

Believe me, it will not stop. Maintenance should be undertaken as soon as it appears and when the extent of the damage is ascertained.

Timber is different and more difficult. It can quietly rot underneath coatings that are substantially performing well and it only needs a few inlets, such as unsealed end grain, to open the whole substrate to attack. Without a moisture meter it is difficult to know what is exactly going on beneath a paint film, however, the presence of excess water is invariably accompanied by an increase in the surface grain profile.

The other area where premature failure occurs, as mentioned above for steel, is over sharp edges, especially on a 'rusticated' profile. Surface tension effects result in substantially lower film builds over such areas and flaking along the edge is common.

Uncoated timber degrades rapidly when exposed to the weather, losing the binding lignins and hemi celluloses, leaving a loose mat of cellulose fibres on the surface. The longer flaked areas are left untreated the more labour intensive the remediation becomes. All the degraded surface must be removed in order to achieve a suitable surface for recoating – a good guide being the restoration of the original colour of the timber.

The message of this memo, and the facts, are clear that prompt attention to paint degradation is the cheapest in the long run

Arghh! Ouch! That sore tooth again... nah! She'll be right! Yeah right!