

TECHNICAL ADVICE

CARE & MAINTENANCE

Chalking



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What

What is chalking?

“Chalking” is defined in AS/NZS 2310:2002 “Glossary of paint and painting terms” as... “The appearance of a loosely adherent fine powder on the surface of a paint film, arising from the degradation of one or more of its constituents”.

If the coating itself is breaking down due to ultra violet (UV) degradation, there will be some evidence of a white or coloured powdery “chalking” residue on the wipe-cloth. Some chalking is to be expected as all paints will be affected by UV radiation to some degree, over time.

The rate of this degradation will vary depending on the topcoat colour, environmental conditions and the type of paint used (ie. the particular resin system used in a given paint product).

The Dulux® Weathershield® guarantee covers premature blistering, flaking and peeling of the coating system however it does not cover fading (colour change) or “chalking” of the paint film. This is because there are factors outside of the manufacturer’s control – such as prevailing climate and weather conditions – that can strongly influence the performance of a paint film.

Why

Chalking occurs due to ultra violet (UV) radiation from sunlight interacting with the constituents within the paint film. Over time UV degradation of the binder or resin within the paint film will allow the exposed pigment particles to become more loosely bound to the surface. A powdery surface is the result.

When attempting to diagnose the issue, there are several important factors that will need to be considered closely:

- 1. Dirt pick-up.** When the surface is wiped down with a damp cloth, the cloth will indicate varying levels of surface contamination however it should be noted that the residue on the cloth may simply be dirt, dust, grime, industrial pollution, salt deposits or other extraneous materials that have no relation to the paint coating.
- 2. Fading.** The colour change or Fading that may have occurred due to exposure to UV which could be present in conjunction with chalking.

How does it occur

Chalking is a natural process that happens slowly over time. Chalking may also result in colour fading or poor colour retention. Some chalking/fading is expected as the paint film weathers and an acceptable level of deterioration is set-out under various sub-sections of AS 3730 (2006) Latex-Exterior-coatings.

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The following factors, beyond the control of the manufacturer or applicator, are known to accelerate such behaviour in paints:

- 1. Sunlight and ultraviolet (UV) radiation:** Chalking occurs more quickly in exterior environments where the painted surface is fully exposed to high levels of sunlight over an extended period. Surfaces protected from direct sunlight will deteriorate at a much slower rate. Also, the intensity of the solar radiation will affect the degree of chalking. In the southern hemisphere, north facing aspects and locations closer to the equator will receive much more UV radiation per square metre, resulting in more pronounced or rapid degradation.
- 2. Hot/cold temperature cycling:** The greater the extremes of UV radiation and temperature, the greater the stress on the coating system.
- 3. Application of darker coloured paint:** Darker colours absorb more energy (heat and UV radiation) from sunlight than lighter colours thereby putting greater stress on paint coating. High UV intensity and greater energy absorption will result in more deterioration of the paint surface. Also, chalking is visually more obvious on darker colours.
- 4. Coastal environments:** The combination of salt and atmospheric moisture creates a corrosive environment and constant exposure will cause coatings to start showing signs of deterioration more quickly than otherwise might be expected.
- 5. Correct film thickness:** Product application at lower than the recommended film build can accelerate the overall ageing process of the coating system, resulting in premature deterioration.

If chalking occurs prematurely or non-uniformly, this is often a sign that there may have been some inconsistencies during application, resulting in fluctuations in the applied film build, leaving some areas more vulnerable to early degradation. This is clearly an application or workmanship issue.
- 6. Wrong product:** Using a paint that is designed primarily for interior use, on an exterior application. For example, oil based alkyd enamel paints when used on exterior exposed surfaces tend to lose their gloss and become powdery, after about 2 years of direct exposure to UV radiation. Epoxy resin coatings, in the absence of a suitable topcoat, will undergo yellowing and chalking on exterior exposure.

Solution

Unfortunately, degradation due to the “chalking” is irreversible once it begins to occur and the appearance can often become quite irregular or patchy in appearance.

To eliminate the effect completely, the entire surface will need to be pressure washed and/or scrubbed with a non-metallic scouring pad to remove all surface contaminants and chalking prior to repainting with an approved UV resistant coating system*.

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- Prevention** The use of a water based 100% acrylic latex topcoat will provide superior exterior durability and gloss retention relative to many alternative coatings systems, especially oil based enamels.
- A number of Dulux® decorative paint products could be considered but for maximum gloss retention, the Dulux Weathershield® range provides the best performance.
- A range of Dulux Protective Coatings for exterior steel & concrete along with Dulux AcraTex® Texture Coating systems for exterior masonry façade surfaces and metal/tiled Roofing are also available. Consult your Dulux representative for specific details.
- To minimise or delay the onset of chalking:
1. Specify & apply paint products and coating systems that are acknowledged by the manufacturer to be UV resistant.
 2. Select lighter colours in general as they tend to absorb less heat & UV radiation.
 3. Select colours based on inorganic pigments and/or oxides which are generally more UV resistant.
 4. Establish a maintenance program from the start to ensure that the painted surfaces are washed annually and repainted within a predetermined time period to keep them in good condition.

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- References** For information on the methods for assessment of chalking, refer to AS 1580.481.1.11
- Further information relating to paint degradation processes can be found in Australian Standard AS/NZS 2311 "The Painting of Buildings" Sections 1.6.2 & 1.9.4
- *Information on UV resistant products and coating systems can be also be found in AS/NZS 2311 Table 5.2

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