

PAINTING—MAINTENANCE

This technical note discusses good painting maintenance practices and paint system compatibility. Common types of paint surface conditions and issues are identified and appropriate surface preparation methods that have been approved under General Exemption are outlined.

Background

Repainting is part of a preventative maintenance program. Ideally, repainting should be carried out before the failure of the paint system and the deterioration of the substrate. This is particularly important for timber substrates. Heavy chalking and the appearance of defects indicate that maintenance is required. Deciding to repaint should be based on paint wear and tear. Be aware that continual repainting of a sound paint system may lead to too thick a build-up of paint layers that obscure the detail of the building and is more likely to peel away from the substrate.

Why is it important to take care with surface preparation and painting?

Taking care with repairs:

- protects valuable historic information and significant paint finishes
- ensures paint finishes are properly conserved
- ensures paint removal methods do not harm significant heritage fabric.

Painting and surface preparation under General Exemption

Under General Exemption, painting work using an existing or a previously approved colour scheme can be carried out at any time, provided that the substrate is protected and preserved and the historic paint layers are retained. To achieve these objectives, a compatible paint system needs to be chosen and the gentlest method of surface preparation selected.

Under General Exemption, the objectives of repainting are the continued protection and conservation of the substrate and the retention of historic paint layers. . Therefore the gentlest method of surface preparation must be selected.

The following surface preparation methods are approved:

- cleaning, hand-scraping and hand-sanding
- mechanical sanding by orbital sander when used as a smoothing/finishing tool (its small diameter and

circular motion are useful for feathering areas that have been scraped, however it must not be used for removing multiple layers of paint).

Disturbance or removal of earlier paint layers—other than small areas that have failed by chalking, flaking, peeling or blistering—is not approved under General Exemption.

Compatible paint systems

Successful repainting is dependent upon the compatibility of the new paint with the existing paint. Under General Exemption, repainting should be carried out using the same paint system as the existing system. Sometimes it may not be possible or practicable and, in some cases, it may be hazardous to replicate historic paints. Modern substitutes containing safer ingredients may be used. Most paint manufacturers make latex and solvent-borne paints in colours that match historic colours in a range of gloss levels that contain no white lead or volatile organic compounds.

If you are unsure of the compatible paint system, seek advice from an experienced painting contractor or a trade representative. For reference, the Australian Standard AS2311:2009 Guide to the painting of buildings has a useful section on maintenance painting systems.

Solvent-borne vs. latex paint

The most common paint systems available are latex or solvent-borne alkyd paints.

Solvent-borne paint

Solvent-borne paint, today's oil paint equivalent, uses linseed oil as a binder with improved, often soy-based synthesised oils known as alkyds. These paints dry hard, have flexibility and discolour less than paints with linseed oil alone. They have high gloss levels.

Latex paint

Latex paints are synthetic resins carried in water. Most quality latex paints contain acrylic resins. Advantages of latex paints include quick drying ability, great strength and cleanable with water. Latex paint often has very

good colour retention with very little fading and is available in a complete range of gloss levels.

Which one?

Generally, quality solvent-borne paint should be applied when repainting over an existing oil-based system and latex paint should be applied over an existing water-based system. Oil paints continue to harden with age and the old surface is sensitive to the added stress of shrinkage that occurs as a new coat of paint dries. Compared with old oil paint, solvent-borne paints generally provide better adhesion than latex paint and shrink less, reducing the likelihood of pulling the old paint loose. Also as exterior oil paint ages, the binder releases pigment causing a chalky surface. While this should be cleaned off before repainting, a new coat of solvent-borne paint is more able to penetrate the chalky residue and adhere than latex paint.

If applying latex paint over several layers of old oil paint, firstly apply an oil primer to create a flat, porous surface. Once thoroughly dry, a latex topcoat can be applied.

Limewash

Limewash was an economic traditional water-based finish for exterior walls. It can be reproduced today in its traditional form but will not adhere to previously painted walls. Some modern proprietary limewash is available with an acrylic sealer that can be applied to painted surfaces prior to the application of the lime wash. This achieves a limewash finish similar to the original finish without removing paint layers back to the substrate.

Distemper

Distemper was a traditional water-based interior paint popular in the nineteenth century. It provided a flat velvety finish and was used on walls and decorative plaster. Distemper had a thin consistency and could be readily removed with hot water. As with limewash, this finish can be reproduced today in its traditional form but will not adhere to previously painted walls. There are also some modern proprietary distempers available that require an acrylic sealer undercoat.

Oiled finishes

Modern oiled finishes are available that can be applied over oils, stains and penetrating finishes on joinery items. Oiled finishes rely on the previous finish being permeable, otherwise the finish will require sanding before the oiled finish is applied.

Epoxies and urethanes

Epoxies and urethanes are hard, inflexible finishes that cannot be easily removed and should not be used to replicate a traditional finish. Use of epoxies and urethanes is not approved under General Exemption.

Take care

Prior to carrying out any surface preparation, the presence of lead paint and the associated health dangers of any paint removal to building occupants and neighbours must be determined and addressed.

Surface preparation

When planning to repaint, the surface condition of the existing painted finish needs to be identified and an appropriate method of surface preparation chosen.

Paint surface conditions can be grouped into three basic categories:

1. minor blemishes or dirt collection that do not require paint removal
2. failure of the top layer or layers of paint which may require limited paint removal
3. substantial or multiple-layer failure requiring total paint removal.

Surface conditions and treatments

Common types of paint surface conditions and failures are identified below and appropriate methods of surface preparation for best adhesion and greatest durability are recommended.

No paint removal

If the surface requiring repainting is sound, cleaning is most often all that is required to prepare it for repainting. Typical conditions that are found on sound surfaces that generally only require cleaning are given below with suggested treatments.

Dirt, pollution and insects

Environmental grime or organic matter can be a barrier to the proper adhesion of paint layers and can cause peeling if it is not removed prior to repainting.

Treatment

Loosen surface material using water—the exterior can be hosed down but not soaked. Using a medium-soft bristle brush, wash the surface using half a cup of household detergent in four litres of water or sugar soap in accordance with the manufacturer's instructions.

Rinse surface thoroughly and allow it to dry before further inspection to determine if repainting is necessary. Cleaning often provides a satisfactory enough result to postpone repainting.

Mould

Mould is caused by fungi that feed on nutrients contained in the paint film or on dirt adhering to the surface, and needs moisture to grow. Moisture in buildings can be the result of flooding, leaks in the roof

or plumbing, inadequate ventilation and excess humidity due to cooking facilities or showers.

Mould is common in damp areas such as bathrooms, kitchens and basements and can also be found under sills and eaves and on shaded areas of the exterior. It most often appears as dark spots, stains or patches and can be identified by dabbing the spot with a small amount of chlorine bleach. If the colour changes or disappears, the stain is likely to be organic and is probably mould whereas dirt will still look like dirt.

Treatment

Altering the environment where mould thrives is one way of preventing fungal growth. Make sure the roof of the building is weatherproof, prune trees to allow sunshine onto a surface, improve drainage around a building and ensure adequate ventilation is provided. A recommended solution for removing fungal growth is one cup of non-ammoniated detergent, one litre of household bleach and four litres of water. The mould should disappear when the surface is scrubbed with this solution using a medium soft brush. For particularly stubborn spots, an additional litre of bleach may be added. Rinse thoroughly.

When repainting, consider using specially formulated mould resistant primer and finish coat.

Excessive chalking

Chalking is a powdery surface deposit caused by the gradual disintegration of the binder in the paint film. It is commonly found on coatings that have been exposed to sun and rain. The powder is the pigment and extender that remains after the binder has been destroyed by weathering.

Treatment

The chalk should be cleaned off with a solution of half a cup of household detergent to four litres of water, using a medium-soft bristle brush. After scrubbing, rinse thoroughly and allow to dry thoroughly (but not long enough for the chalking process to recur) then repaint.

Staining

Staining can be caused by excess moisture reacting with materials in the substrate. There are two common types of staining. One is due to the oxidation or rusting of iron nails or metal. The other is caused by leaching, a chemical reaction between moisture and natural extractives in certain woods that leaves coloured surface deposits.

Leaching is most likely to occur in new timbers within the first 10-15 years, but can occur in older timber if it is redressed.

Treatment

Locate the source of the stain and correct the moisture problem. If the source is a rusting or oxidizing metal element, hand sand and coat with a rust-inhibitive primer followed by two finish coats. Exposed nail heads should ideally be countersunk, spot primed and the holes filled with a high-quality wood filler except where exposure of the nail head was part of the original construction system or the timber is too fragile to withstand the countersinking procedure.

Timber leaching stains can be cleaned with a solution of equal parts methylated spirits and water. After rinsing and drying, a 'stain-blocking' primer can be applied (two coats are recommended for severe cases of bleeding prior to the finish coat).

Limited paint removal

Some surface conditions require cleaning and partial removal of the top layers of paint to provide a sound surface. When the surface is in a reasonably good condition this should only require light hand scraping and hand sanding.

Crazing

Crazing usually occurs on a timber substrate and is distinguished by fine, jagged interconnected breaks in the top layer of paint. Paint that is several layers thick becomes excessively hard and brittle with age and can no longer expand and contract with its substrate in response to changes in temperature and humidity. As the timber swells, the bond between paint layers is broken and hairline cracks appear. If not corrected, exterior moisture can enter the crazed surface resulting in further swelling of the wood and, eventually, deep cracking or 'alligatoring' may occur and will require total removal.

Treatment

Treat crazing by hand scraping or hand sanding. Repaint to protect the surface against exterior moisture penetration.

Inter-coat peeling

Inter-coat peeling can be the result of improper surface preparation prior to the last repainting. It most often occurs on protected areas such as eaves that are not regularly rinsed by rainfall. Salt from airborne pollutants builds and if not cleaned off, new paint will not adhere properly and that layer will peel.

Another common cause of inter-coat peeling is incompatibility between paint systems. For example if solvent-borne paint is applied over latex paint, peeling of the topcoat can sometimes occur because the solvent-borne paint becomes harder and less elastic than the latex paint. If latex paint is applied over old, chalking oil

paint, peeling can also occur because the latex paint is unable to penetrate the chalky surface and adhere.

Treatment

Where salts have caused the peeling, wash down the affected area thoroughly after scraping and wipe dry. Hand sand and repaint.

Where the problem has resulted from incompatibility between the paints, the peeling topcoat needs to be scraped and hand sanded. A high quality oil exterior primer will provide a suitable surface over which either a solvent-borne or latex topcoat can be successfully applied.

Solvent blistering

Solvent blistering is caused by the action of ambient heat on the paint solvent or thinners in the paint film. Solvents can be trapped under drying paint film when the paint is applied in direct sunlight. The surface of the paint film blisters as the solvent vaporizes and forces its way through the paint film.

This problem is more common with darker paints as they absorb more heat than lighter ones. Cutting open the blister with a scalpel will identify if the problem is solvent blistering or moisture. Solvent blisters are usually small and the layer of paint beneath will generally be visible. If the substrate is visible it is probably a moisture problem.

Treatment

Blistered areas can be scraped and hand sanded to the next sound layer then repainted. Avoiding painting in direct sunlight will help prevent solvent blistering.

Wrinkling

Wrinkling is caused by the top layer of paint drying before the layer beneath. As the layer below dries the top layer moves. Applying paint too thickly; applying a second coat before the first dries and painting during temperatures higher than recommended are all causes of wrinkling.

Treatment

Remove the wrinkled layer by scraping then sanding to provide as even a surface as possible. Repaint following manufacturer's instructions.

Total paint removal

Total paint removal is not covered by General Exemption.

References

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- NSW Heritage Office 1998, The Maintenance of heritage assets: a practical guide, NSW Heritage Office, Sydney.
- Stapleton, I 2001, How to restore the old Aussie house, The Flannel Flower Press, Yeronga, Qld.

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