strictly controlled conditions. The Greater London Council’s Historic Buildings Division in the U.K. is an example of such an organization.

Before discussing methods which can be recommended for the removal of old paint, we should consider why the paint should be removed in the first place.

There are two basic justifications for removing paint from exterior woodwork. First, because the accumulation of paint layers has become so thick that it is obscuring architectural detail such as mouldings or fretwork; and/or second because the paint surface or sub-layers have deteriorated to such a degree that they cannot be painted over. Unless one or both of the above conditions exist the removal of paint layers will most probably be a waste of time and money in addition to being damaging to the original “artifact”. To understand the latter point one need only consider the current values of pieces of early Canadian painted furniture. It is well accepted that a piece which has its original paint finish is worth many times more than one which has been stripped. The original paint finish is an integral part of the artifact and should be left alone unless it is essential to remove it.

In most cases failures of paint “films” or layers are due to moisture resulting from defects in the structure or defects in the paint surface, insufficient preparation of surfaces, or poor painting. The following descriptions of paint failures will help the reader in deciding whether or not paint needs to be removed.

— Blistering and peeling is usually caused by moisture, in and behind the wood, being drawn out by the heat of the sun. Whenever the adhesion of the paint film is weak, the moisture builds up to form blisters filled with water. The blisters burst and peeling continues to occur as more water gets in through the broken film. Areas of blistered or flaking paint should be removed and it is essential that the sources of the original moisture should be traced and eradicated. Sometimes blistering is caused by the sun heating up unevaporated solvents, particularly in dark paints and causing them to vaporize and blow up the surface film. This is usually a problem which occurs during painting and is avoided by painting while the surface is shaded. It will most often occur on the south side of buildings where solvent rich paints were used or where paint was applied over very resinous wood. In the latter case the paint should be removed and the resin sources sealed off with a coat of shellac or patent “knotting”.

— Alligatoring or checking is caused by the sun heating up unevaporated solvents, particularly in dark paints and causing them to vaporize and blow up the surface film. This is usually a problem which occurs during painting and is avoided by painting while the surface is shaded. It will most often occur on the south side of buildings where solvent rich paints were used or where paint was applied over very resinous wood. In the latter case the paint should be removed and the resin sources sealed off with a coat of shellac or patent “knotting”.

— Intercoat peeling or “tissue paper” peeling occurs when the last paint film or two let go and peel away from sound coats beneath. The problem is caused by water soluble salts deposited on a surface that are not cleaned off prior to repainting. Faulty surface coats should be removed, the surface cleaned with water from a garden hose, wiped dry and repainted before more salts build up.

— Alligatoring or checking is caused by the surface of the paint drying out and embritting before the underlying layer. As the lower layers dry out they contract and will often cause the dry inelastic surface to crack under tension. Alligatoring also occurs if the undercoat or previous paint films are softer than the
Blistering and peeling paint. A burst blister (a) and a series of fresh blisters (b) are seen here on a dark brown south-facing door frame. Alligatoring is just developing to the right of the upper blisters. (c)

Water soluble salts often build up on sheltered surfaces like this porch ceiling where the rain never reaches. Intercoat peeling is occurring in association with cracking which may indicate some leaks in the roof above.

Cracking is here occurring in the heavily painted boards of an old porch deck.

Moisture has entered the end grain of these boards and has caused the wood to expand cracking the old brittle paint. So much moisture has then got into the wood that all the paint has come off.
latest finishing coat. Alligatored paint should be removed to sound layers, sanded and repainted.

— Chalking describes the phenomenon of a powdery surface which rubs off on your hand. Such surfaces should be washed with water, dried, and then painted over.

— Dirt, soot and pollution should be removed with water and “non-ionic” detergents. Rinse well with clean water afterwards. It may not be necessary to repaint.

— Mildewed paintwork is washed off with non-ionic detergent in water and then rinsed. Remaining mildew can be scrubbed off with a solution of one part by volume of household bleach and three parts of warm water. This solution should be allowed to remain on the surface for a few minutes and should be rinsed off with clear water.

CAUTION: NEVER MIX HOUSEHOLD BLEACH WITH AMMONIA OR DETERGENTS OR BLEACHES CONTAINING AMMONIA, OR WITH MURIATIC OR HYDROCHLORIC ACID. SUCH MIXTURES PRODUCE VAPOURS WHICH CAN BE VERY DANGEROUS.

For your safety always use goggles and rubber gloves.

— Staining from rusting or corroding iron and copper can be painted over after cleaning and sanding but the original source of the corrosion should be treated to prevent further staining.

Having briefly discussed some of the major types of paint problems and the reasons for removing paint, we can now consider appropriate removal techniques.

Paint removal techniques are of four basic types:
— softening and raising paint layers by applying heat;
— softening paint with chemical solvents or “strippers”;
— paint removal using various types of abrasion;
— combination techniques using some or all of the above techniques.

For the removal of paint from heritage buildings, we have already stressed that burning-off with the butane torch is not normally an acceptable method. However, if a torch is used on plain areas where there are no major fire hazards, there is a further hazard if one is removing old lead-based paints. The flame of the torch will cause the formation of extremely toxic lead vapours. Even in well ventilated exterior conditions it is good to avoid burning-off lead based paints.

Probably the best removers using heat are the electric heat guns which work on the same principle as a hair dryer (See sources list at end of article). One can also use infra-red lamps, special heat pads, and “hot wire” paint removers. All these devices use electricity and can cause fires if left on too long or if misused in some way.

The base of this wooden column shows a combination of cracking and alligatoring. There are so many layers of paint on the mouldings that their profiles are beginning to be lost.

The distinctive warping and cracking visible in the underside of this wooden cornice is due to an attack by a wood destroying fungus. No amount of paint treatment will cure this problem which basically concerns the wood beneath the paint.
It is a good idea to use dark glasses when using the infra-red lamp.

Of the chemical removers the best are undoubtedly the water rinseable paste or thin jelly-like removers which are non-flammable. These removers usually contain methylene chloride and it should be remembered that this too gives off vapours which are harmful to your health. Always work in well ventilated conditions and if you are using a lot of methylene chloride based remover, invest in a protective mask. Should you use benzol or carbon tetrachloride or benzol, both of which have toxic fumes. Benzol or benzene is also flammable and if one must use it, great care should be taken to avoid all open flames, sparks, heaters, and electrical equipment. (It is generally inadvisable to use benzol-type removers indoors because of their hazardous nature.)

Chemical removers all require the scraping-off of the sludge. For scraping-off use a putty knife, a wallpaper stripping knife with the sharp corners ground-off so that it doesn't dig-in; or an especially profiled scraper for mouldings.

The sludge can cause an awful mess if not properly disposed of. A useful hint is to stretch a wire across the top of an old one gallon paint can and to wipe the scraper blade across the wire so that the sludge drops neatly into the can.

Always use safety goggles when using paint removers. They may be a little inconvenient but a lost eye is a great deal more so!

Sandpapers and various grades of steel wool are used to take off remnants of paint sludge and to prepare old paint and wood surfaces for repainting.

Rotary sanders and wire brushes can also be used for paint removal but care should be taken not to gouge down into the wood.

All the above methods may be used in combination providing one observes the safety precautions and uses common sense. A useful combination method for tough paint removal problems has been recommended by the National Paint, Varnish and Lacquer Association of the U.S.A. The Association suggests that first you apply a water-rinseable paint remover. Then after allowing it to stand for 15 minutes you apply steam through the pan of an ordinary wall paper steamer. The pan is moved slowly across the surface and is followed with a wide-bladed scraper. Be sure to have adequate ventilation and don't use steam with removers containing benzol or carbon tetrachloride. As a final comment it is worth repeating some safety hints:

- Always read and follow manufacturer's instructions.
- Always find out the major chemical ingredients of a paint remover. In event of an accident which necessitates a visit to the doctor, an effective treatment will depend on this information. If in doubt take the labelled can to the doctor.
- Use safety goggles and masks. Chips of paint are especially liable to fly up when scraping and sanding. Paint chips can be very sharp and can seriously damage an eye.
- Always have fire extinguishers and plenty of water handy. The water is for putting out accidental fires and for quickly washing off spots of paint remover which have managed to get on your skin.
- Use rubber gloves when using paint removers.
- Keep a clean and tidy site and don't get drips of paint remover or sludge all over the place. Watch out particularly for drips on ladders and on electrical equipment or cables, these can cause serious accidents.

If you are still in doubt about removing paint from the exterior of a particular heritage building, you would be best advised to leave it alone. The worst thing you can do is to rush in and strip-off exterior painted woodwork only to discover that you have destroyed the only evidence for the history of the external appearance of the building. The restoration of original paint colour schemes will be the subject of a future technical article in this magazine.

Sources list

The following sources might be useful for obtaining further information:

- Paint Colour Research and Restoration by Penelope Hartshorne Batcheler. Technical Leaflet 15. American Association for State and Local History. 50¢ from the A.A.S.L.H. 1400 Eighth Avenue, South, Nashville, Tennessee 37203 U.S.A.


Back issues are available from:

![History of the external appearance of a building.](image)

The following sources might be useful for obtaining further information:


- Conservation and Architectural Restoration Supply Sources and Brief Bibliographies edited by Richard O. Byrne. A.P.T. Publication Supplement. $3.00 + 50¢ postage.

- Paint Colour Research and Restoration of Historic Paint edited by Kevin Miller. A.P.T. Publication Supplement. $3.00 + 50¢ postage. Available from The Association for Preservation Technology 2487 Station D, Ottawa, Ontario. K1P 5W6

An electric heat gun, Model No. HG501 manufactured by Master Appliance Corporation, Racine, Wisconsin is distributed wholesale in Canada by White Radio Ltd. 4445, Harvester Road, Burlington, Ontario L7L 4X1 (416) 632-6894. Price in U.S.A. $60.00. Price in Canada $73.50.
Paint Removing

Following the publication of my short article "When and how to remove paint from old exterior woodwork", we received a letter from H.E. Ashton of the National Research Council expressing concern over some points which I had raised. Since Mr. Ashton is probably Canada’s leading expert on architectural paints, I would like to discuss his comments.

His first comment related to my statement about paint blistering being caused by moisture being drawn out by the heat of the sun. Mr. Ashton rightly took me to task, saying that this was against the laws of physics, and that the moisture was in fact moving from an area of high pressure, resulting from high temperature, to one of low vapour pressure i.e. low temperature. Our readers will see that although the heat of the sun can cause the phenomenon, it causes the moisture to move by creating vapour pressure differentials. In trying to save space, I fear I made a slightly misleading simplification. Mr. Ashton added an important extra point — that in winter, moisture is frequently driven from the interior of buildings when temperature and humidity are high, through walls to the exterior where temperature and humidity levels are lower. In old buildings with no vapour barriers, this is often the cause of paint failures on wooden siding.

On another point, Mr. Ashton drew our attention to the fact that the National Painting Standard being prepared on the basis of a manual issued by the Master Painters and Decorators of B.C., states that Shellac should no longer be used for sealing knots and resinous areas. Although they are still not completely guaranteed to solve all problems, current practice recommends the use of either knot sealer C.G.S.B. Standard 1-GP-126, or aluminum paint.

Readers are referred to the Canadian Building Digest and the other excellent publications issued either free or at a low cost by the Division of Building Research of the National Research Council, Ottawa, Ontario, K1A 0R6. Write to the Publications Section at the above address for information and lists of available material.

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