

# **Surface Treatment**

# Summary

This text is about traditional surface treatments for wood and describes the differences between traditional paints such as linseed oil paint and flour paint, and modern products. It also provides practical advice on preparation, maintenance, and the proper use of traditional paint to preserve a house's aesthetics, functionality, and historical value.

Painting and other surface treatments for buildings have traditionally had two purposes:

- We paint to decorate houses.
- We paint to protect the wood from decay.

However, we do not paint to keep moisture out. No paint can achieve this, even though some modern paint manufacturers advertise it.

# Traditional Surface Treatments

In the Nordic countries, there have traditionally been several types of surface treatment for wooden houses, linseed oil painting and flour paint being the two main types:

## Linseed Oil Paint

Linseed oil paint came into use in the 17th century, at the same time as we began to clad houses with paneling. The main components are boiled linseed oil and pigment. In the Nordic countries, linseed oil paint was common until the 1960s, after which it fell out of use before seeing a revival in the 1990s. Linseed oil paint has good properties and is environmentally friendly when the product is not mixed with organic solvents such as turpentine or white spirit. Painted surfaces with linseed oil develop a matte finish over time.



Figure 1. Linseed oil paint should be applied with a thin stroke.

## Flour Paint

The use of flour paint can also be traced back to the 17th century and was common until the 1950s. The paint generally consists of rye flour, water, sulfate compounds, and pigment. It is cheap and easy to produce, and was often used on outbuildings. The surface of a flour-painted area is matte. Flour paint is also an environmentally friendly house paint.



Figure 2. Boiling flour paint. The paint should be stirred continuously.

These two treatments have long traditions and are adapted to the Nordic climate. Knowledge of these traditions is important when maintaining and restoring older houses. In general, traditional paint becomes diffusion-open relatively quickly, meaning it allows moisture to escape from the wall and pass through the paint layer. Traditional paints develop a more matte finish over time compared to modern paint products.

## Modern Paint Products



Figure 3. Layers of red plastic paint peeling off in larger flakes.

Houses in the Nordic countries built prior to the 1950s belong to what we refer to as the older building tradition. It was not until the 1950s and '60s that the market for house paint and other surface treatments expanded. After the second world war, latex, acrylic, and alkyd-based paint products became available. The main differences between these various paint products are their ability to penetrate the surface, their degree of diffusion resistance, and their appearance.

### Alkyd Paint

Pure alkyd oil paints appeared in the early 1960s, making them a "modern" paint. The binder is alkyd acids, a type of polyester made from alcohol, a polyvalent acid, and 60-80% vegetable oils. Pure alkyd paints without additives can be used on older houses, but alkyd paint differs from traditional paint by being smoother and staying glossy for a longer time.

### Acrylic and Latex Paint

Acrylic and latex paints are products that entered the market after 1950 and are often referred to as "plastic paints." The binder is a latex or acrylic product. Acrylic and latex paints form a tight surface when they dry, and as a result, they release less moisture through the paint film. Moisture can become trapped

behind the paint layer, leading to rot in the wood. Acrylic and latex paints generally have a semi-gloss or glossy finish that lasts for a long time.

## **“Truths” about Paint**

In the Nordic region, we spend a lot of time and money maintaining our houses. For many, the goal is for the facade to shine and appear glossy. These are modern ideals. Traditional paints based on linseed oil were glossy when freshly painted, but the surface quickly became matte. Modern glossy paints, therefore, give an incorrect impression. Old houses should not look new.

## **Painting and Maintenance – How to Proceed**

Painting your house too frequently does more harm than good. The paint layers can become too tight, and the result might be that the surface treatment is no longer diffusion-open. As a general rule: Do not paint too often, and only paint the parts of the house that need it! Paint should create diffusion-open surfaces that allow moisture to move in and out of the building structure. We paint primarily to protect the wood from external stresses, such as sunlight.

What type of paint should be used if there are layers of modern paint on the cladding? The general rule is that the house should be painted with the type of paint traditionally used. However, a good surface is crucial for ensuring that the new coat of paint adheres properly. Therefore, scrape off as much of the modern paint as possible. Facades with blisterings are often the result of painting with rich linseed oil paint, followed by modern oil paint. The linseed oil in the wood can heat up from sunlight, producing gases trapped by the modern paint layer, causing the blistering. If you are unsure of what the house was previously painted with, the best solution is to use linseed oil paint. Linseed oil has what we call "adhesion," meaning that linseed oil paint adheres best regardless of the underlying surface.



Figure 4. Modern paint cracks in larger flakes. The underlying linseed oil paint develops a crazed pattern, almost resembling alligator skin.

## **Preparatory Work**

Preparatory work is the most important part of a painting process and is crucial for achieving a good final result. It is important to spend time on these preparations.

## **Paint Removal**

Chemical paint removal is not recommended because it can leave chemical residues that are difficult to neutralize completely.

## **Scraping**

Old houses have historical value, so it should not be the goal to create smooth surfaces. Scraping should only remove loose paint. The exception is layers of modern plastic paints, which should be scraped off as thoroughly as possible. Older layers of traditional paint that adhere well to the surface should be preserved. These layers strengthen protection against external elements and provide important information about the house's color history. Use quality scrapers, at most 50-60 mm wide, to allow access to corners. The edges of the panel boards can be sanded with sandpaper. Be careful not to be too rough with the scraper, as this can damage the wood and profiles. If you have light/white paint layers on the house that are older than around 1900, there is a high likelihood that the paint contains lead white. If it is necessary to remove paint layers containing lead white, this requires safety precautions with approved protective equipment and respiratory protection. From an environmental perspective, it is advisable to collect the paint debris, as we do not always know what it contains. The debris should be disposed of properly as hazardous waste.



Figure 5. Scraping the facade is a tedious job.

## Surface cleaning

Always clean the surfaces before you paint. For pre-painting cleaning, use a wood cleaner. Several manufacturers offer this type of detergent. It both cleans the facade and mattes down the previous paint layers. Many strong cleaning products also contain mold and algae killers. Use a garden hose with low water pressure and set the nozzle to spray. Wash from top to bottom. Do not use a pressure washer! The pressure from such devices destroys the wood fibers and forces water into the wall. The water can remain in the structure for a long time, causing moisture damage, mold, and rot. Washing is important for the guarantee provided by paint manufacturers. If you don't wash before painting, the guarantee won't apply.

### General Cleaning Procedure:

1. Apply the cleaner and mold remover according to the manufacturer's instructions on the packaging.
2. After applying the cleaning agent, brush the wall with a special house-washing brush.
3. If you've used a cleaner with mold remover, you don't need to do more. If mold remover was applied, let it dry before painting.

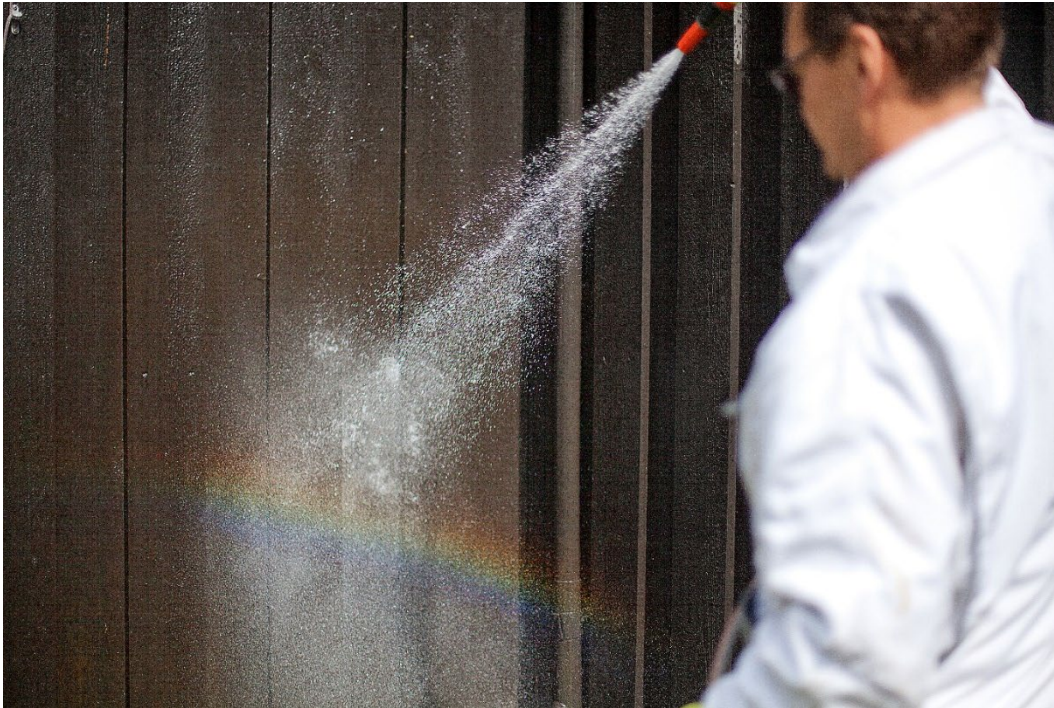


Figure 6. Rinsing the facade must be done with a garden hose, not a pressure washer.

## **Assessment of the Wood**

After cleaning, you should assess the condition of the wood in the cladding before painting. If any boards are damaged or weakened by rot, they should be replaced. However, if the building is listed, there may be strict rules regarding the replacement of materials.

## **Preparation of Untreated Surfaces**

Wood and cladding that have been left untreated often develop a gray surface. This will always be attacked by fungi. The fungi are harmless on the wall but should not be painted over. If the wood is to be painted, you must first brush the surface with a steel brush. The steel brush should be used in the direction of the wood fibers. After steel brushing, the wood should be washed with strong cleaner and then treated with mold and algae remover before painting.

## **Ready to Paint**

After the preparation work is complete, the wall is ready for painting. It is important that the wall is thoroughly dry before painting, except when using flour paint. Moisture should be measured using a moisture meter. The moisture content should be below 15% when painting, but in more humid climates, painting is possible when the moisture content of the wood is up to 20%.



## Covering

Before starting the painting process, cover the areas that should be protected with tarpaulins. Attach the tarpaulins to the scaffolding or gutters, and let them hang on the outside of the scaffolding, or secure them with pegs and ropes on the ground. The tarpaulins protect against direct sunlight while the paint dries, as well as against dust, falling leaves, and rain/moisture. For linseed oil, it is important that the wall can dry in as protected an environment as possible, as linseed oil paint has a long drying time. The tarpaulin should remain in place for about a week after the paint has been applied to ensure proper protection.

## Linseed Oil Paint

Measured by the liter, linseed oil paint is more expensive than alkyd and flour paint. However, because most linseed oil paints have excellent coverage, the costs are often balanced out compared to cheaper paints.

Linseed oil paint without solvents is environmentally friendly, as it contains only organic ingredients. Over time, linseed oil paint becomes matte and changes appearance. However, it is not necessary to repaint frequently. Many layers of paint can become too tight and ruin the diffusion-open surface of the linseed oil paint. Paint only when the paint starts to flake or the existing pigment layer becomes thin or rubs off heavily.

## Application

There is debate among experts about how to apply linseed oil paint – there are two "schools of thought". The main difference is whether the paint layers should be built up from a lean base coat, where the first coat contains a small amount of linseed oil and is thinned with white spirit or turpentine, or whether the first coat should contain extra linseed oil. It is recommended to carefully read the manufacturer's instructions and follow their guidelines.

Regardless of the method, there are some general tips for applying linseed oil paint:

- Rags and textiles that contain linseed oil are self-igniting and highly flammable. Therefore, it is important to place the rags in water after use and either throw them away or hang them up to dry.
- To prevent a skin from forming on the paint, make the paint can as airtight as possible. For example, place a layer of plastic wrap inside the can before closing the lid.
- Cleaning the paintbrush: Place the brush in a can of pure boiled linseed oil – one can for each color. Remove excess paint. It's helpful to use a can with hooks, so the brush hangs instead of standing on its bristles. Another

option is to wrap the brushes in plastic to keep them airtight until the next day.

- When finished painting: Clean the brushes thoroughly with linseed oil soap. You can also clean them with turpentine or white spirit. Alternatively, you can place them in the freezer.

## Flour paint

Flour paint is an inexpensive paint used primarily on outbuildings such as barns and sheds. The finished surface has a matte appearance, and over time, the paint will rub off when touched. Flour paint is completely diffusion-open. The paint is easy to make and is very environmentally friendly. The pigment in flour paint is usually iron oxide pigments, and it contains a small amount of iron vitriol.

### Preparation:

- Remove any loose paint, but do not scrape older layers. Instead, brush gently with a steel brush or a stiff floor scrubber.
- Wet the wall with a garden sprayer with a cleaning solution.
- After applying the cleaning solution, scrub the wall with a brush.
- Rinse with a garden hose.
- Apply mold remover. Allow it to dry.

### Application:

- The surfaces to be painted should be lightly moistened before painting.
- Flour paint should be applied warm. Ready-made flour paint is heated in a water bath before application.
- Apply flour paint in a thick layer.
- Do not paint in direct sunlight.
- Flour paint is used on rough surfaces such as logs and unplanned paneling.
- Flour paint becomes completely matte. A good flour paint has a long lifespan.

### Cleaning the brush

If the flour paint is reinforced with linseed oil, the brush can be stored in linseed oil until the next day. Otherwise, simply rinse with water.

### After painting

Clean the brush with linseed oil soap.