

Tunncliffe's

Tunncliffe Timber Company Limited

Painting Exterior Timber Joinery

Part 1

The aim of this article is to provide an update on painting exterior timber joinery in New Zealand, an essential part of long term product performance. See also our previous article "Durability of Exterior Timber Joinery" available on our website. The world of paint is big, there is a lot involved around this subject. We've tried not to be too technical and please accept that this article is by no means complete or pretending to be an industry standard. It's a guide to help joiners get their heads around the subject. There is some confusion in the market about paint products and there seem to be a few myths about. We believe the paint industry and its marketing strategic are somewhat responsible for this. Terminology is often mixed up, two people can end up arguing about the same thing using different names.



Paint is a coloured liquid substance which is spread over a surface and dries to leave a coating for decorative and protective purposes. This liquid substance is a mixture of several different ingredients formulated to suit a particular application mainly determined by the substrate and the environment it is in. In our case the substrate is timber and the environment is the New Zealand weather all year round.

For the painting industry, timber in exterior applications is one of the most challenging areas of business. Timber moves during its life; this movement can be between 1 to 5%. This does not sound much, but at say 2% over a width of 180mm this can be up to 3.6mm, while an average coat of paint is only 0.035 mm thick (35µm). Timber varies from species to species depending on cell structure, density, stability, absorbency. Timber contains a number of natural substances or extracts like

resin and tannin that can conflict with paint, and also added chemicals such as timber preservatives.

Before we get onto the painting itself, following the process step by step, the most important stage is the surface preparation. This forms the basis of the paint job and if it is not done right any good work on top will eventually fail altogether. To ensure the preparation is optimal, the surface of the timber must be clean, free of oil, grease, dust, dirt and have a roughness appropriate to the type of coating to be applied.



Painting involves applying several coats or layers of paint, specified as a paint system. A paint system can include the following type of layers:

Sealer

A sealer is specialised paint (in fact a specialised primer). Sealers are generally applied to ensure that the selected finishing coats are not effected by factors associated with the substrate material or previous coatings. They are normally not used on timber but applied in more problematic, complex areas such as surfaces contaminated by staining materials.

Primer

Primer is a specialised paint. It is the first and most important complete coat of paint in the overall paint system. The primer is the foundation of the paint system. The finishing coats and therefore the overall quality of the paint job relay heavily on the primer coat. The main design feature of primers is to provide optimal foundation for the finishing coats.

Undercoat

Again a specialist paint which has become almost obsolete these days with the introduction of primer/undercoats and the development of water-based direct-to-timber acrylics. One of the main purposes of an undercoat used to be evening out small imperfections in rough surfaces. The combination of better wood processing, modern primers and water-based paints are now taking care of this.

Primer/Undercoat

These are products that cater for both and are designed to act as both a primer and undercoat. One could also argue that a second coat of primer is in fact an undercoat.

Finishing Coats

The number of final coats, depending on the paint system, is generally at least two.



About the paint itself. There are a lot of products on the market, the main differentiation between paint formulas is the binder or resin used to keep all the ingredients together; Water-based paints and Oil-based paints.

In an effort to take out some of the confusion here are a few definitions of some paint terminology:

Acrylic

A polymer resin binder.

In a generic sense acrylic usually describes a water based paint.

Latex

As with acrylic, the terminology most often used to describe a water based paint.

Alkyd

A modified polyester resin binder.

In a generic sense usually used to describe an oil based paint.

Enamel

A complex ester.

In a generic sense usually used to describe an oil based paint.

The word enamel is often used in the paint industry to imply a harder surface. There are in fact water-based enamels on the market.

Gloss

A description of the surface shine ranging from High Gloss to Flat and Low Sheen.

The more gloss the less pigment there is on the surface of the paint. Gloss is not a factor when determining the hardness of the surface of the paint.

Chalking

The formation of a powdery layer on the surface of some coatings caused by the disintegration of the binding medium due to weathering (exposure to ultraviolet light (sunlight) etc.). The chalking of a paint film can be considerably affected by pigment selection and concentration. It can also be affected by binder/resin selection.

Blocking

Refers to the degree that two painted surfaces stick together, for example in a sash window frame. It's therefore an issue important to consider when choosing a paint system.

Water based enamels, being harder have good block resistance.

Spreading Rate

The area covered by a given volume of paint at a given thickness.

The spreading rate determines the thickness of the coat which is an important durability factor.

OIL BASED VERSUS WATER BASED

New technology has changed how paints work considerably. We are often faced with the opinion that oil based paints are better than water-based paints. Researching this subject and consulting with today's experts it seems fair to say, without wishing to offend anyone, that this opinion is based on old school sentiment. Oil based paints in traditional full gloss used to be the most durable solution 40 years ago. However the development of water-based paints has changed the landscape in New Zealand. With its increased U.V. resistance and flexibility the water-based paint coat system has gained precedence. Oil-based enamels have a tendency to harden, crack and fail in the harsh New Zealand sunlight and require more maintenance sooner.

However for radiata the use of oil-based primer/undercoat products is still recommended. Technically it is more appropriate to talk about 'solvent-based' than 'oil-based' as the solvent carrier of the primer/undercoat is more compatible to the chemical make-up of substances in the timber such as resin, residual LOSP and tannin. Solvent based primer/undercoats have better penetration capacity into the timber surface than water-based products making them more effective in both adhesion and water resistance.

Further it is recommended to invest in a premium quality brand of paint, as with anything else you only "get what you pay for", keeping in mind that the majority of cost (75%) is in the labour. Following the recommended spreading rate on the can ensures the amount of paint per m² will provide the required dry film thickness for good performance.

To be continued...

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