

# STAIN & PAINT SYSTEM GUIDELINES



# Introduction

This brochure has been prepared by Nelson Pine Industries Ltd as a guide to on site painting and staining systems for NelsonPine Laminated Veneer Lumber (LVL). This guide endeavours to cover a comprehensive range of finishes, with information sourced from leading paint manufacturers, as well as outlining surface preparation and application methods. More information can be obtained from the specific manufacturers listed below:

Dulux – [www.dulux.co.nz](http://www.dulux.co.nz)

Mirotone – [www.mirotone.com](http://www.mirotone.com)

Churton Pacific – [www.churton.co.nz](http://www.churton.co.nz)

WoodX – [www.wood-x.co.nz](http://www.wood-x.co.nz)

Resene – [www.resene.co.nz](http://www.resene.co.nz)

Sikkens – [www.sikkens.com](http://www.sikkens.com)

Protective Paints – [www.protectivepaints.co.nz](http://www.protectivepaints.co.nz)

Wattyl – [www.wattyl.co.nz](http://www.wattyl.co.nz)

## NelsonPine LVL material properties

NelsonPine LVL is an engineered wood product made by laminating rotary peeled radiata pine veneers laid up with parallel grain orientation using dark brown phenolic resin. The veneers are positioned in a specific sequence that improves the performance of the raw material and allows continuous long length beams to be produced. One of the improvements with laminated radiata pine is enhanced stability and homogeneous material properties in the radial (R), tangential (T) and longitudinal (L) axis. The main application of LVL is residential framing, commercial beam, joist and columns as a structural member. The product is produced to an industrial finish, similar to a D grade plywood face.

## Visual appearance

NelsonPine LVL is made from a natural product. The veneers are proprietary graded according to structural properties to achieve the correct structural performance, whilst simultaneously grading the best visual quality sheets from the mix to apply to the surfaces of the product to enhance the appearance.

The surface of laminated veneer lumber may contain the following characteristics:

- Knots
- Holes
- Small amount of wane of size similar to knots and holes
- Splits
- Resin streaks
- Glue smears
- Brands/Stamps/Marks associated with production and quality control

Nelson Pine Industries grading and production process is set up to minimise the occurrence of the above characteristics on the faces of the product.

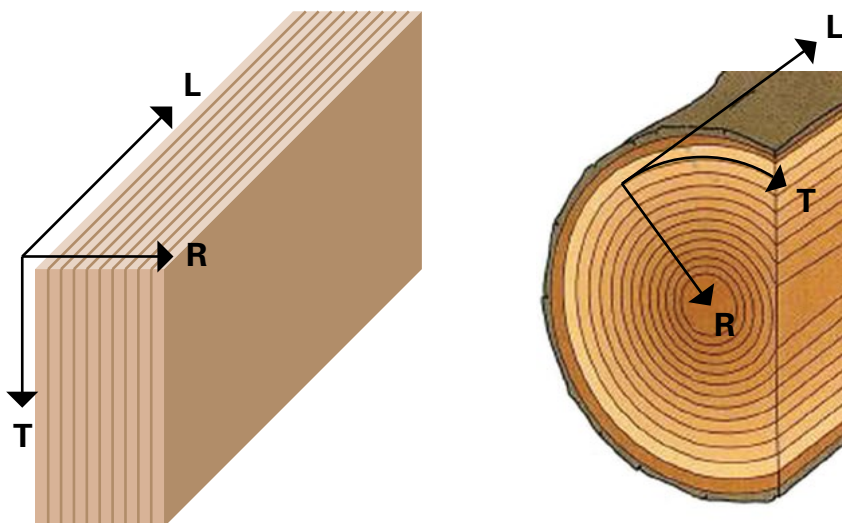
NelsonPine LVL may be re-laminated into larger structural components. In this process the LVL billets surfaces will be sanded to ensure the quality and consistency of the secondary bonds.

*LVL dimensional axis*

L - Longitudinal

T - Tangential

R - Radial



# Surface Preparation

NelsonPine LVL billets in standard thicknesses come with an industrial type finish that can have normal timber paint and stain systems satisfactorily applied to them. Enhancement of the visual appearance and coating adhesion can be achieved by relatively coarse sanding the surface prior to the first coat. The edges and ends of both hot pressed and re-laminated LVL will have a fine saw cut or milled finish. Ensuring that any sharp timber edges are sanded to at least a 2mm radius will help paint systems resist cracking along the edges.

LVL must be dry (10-17% moisture content) and all grease, wax, dirt and foreign matter should be removed from the surface prior to coatings either mechanically or with an appropriate chemical cleaner from a coatings supplier.

## Stopping/filler,

Stopping to fill holes, cracks and remedial work can be carried out with an appropriate filler. Sand smooth prior to application of the finish coats. When painting, stopping is done after first coat priming.

## Application methods

The application system is to be applied as advised by the Manufacturer.

# LVL Temporary Water Repellency and Industrial Finishes

## Suitable one coat temporary water repellency products

| Manufacturer      | Product       | Application  | Coats  | Clean up   |
|-------------------|---------------|--------------|--------|------------|
| Resene            | Weathershield | Brush/Roller | 1 or 2 | Turpentine |
| Protective Paints | Rimu Oil Seal | Brush/Roller | 1 or 2 | Turpentine |

## Moisture during construction

On site procedures to minimise exposure to the elements will benefit the final finish of LVL and help the construction process. NelsonPine LVL will typically leave the manufacturing facility at 10-12% moisture content which is similar to the ambient moisture content in an air-conditioned building. If NelsonPine LVL is exposed to water it will swell mainly in the radial axis and the tangential axis (similar to standard sawn timber) which may cause issues with construction and there may be visual weathering, such as silvering and water staining.

To assist with these onsite temporary construction issues LVL may be coated prior to construction with a one coat temporary water proof clear coating to help resist weathering degradation. This type of temporary coating is also a suitable final finish for industrial applications. Should a permanent paint or stain system be required on product with a temporary coating then advice should be sought from the coating supplier to ensure the top coats are compatible.

Special attention needs to be paid to exposed cut ends of NelsonPine LVL e.g. the top or bottom of columns. During construction the exposed LVL should have additional protection (such as plastic wrapping or a flexible coating like acrylic paint) to protect NelsonPine LVL from water ingress.



Nelson Pine Industries warehouse. (two coats weathershield)



Tumu ITM Napier. (one coat weathershield)

# Interior Systems

## Uncoated LVL

In interior environments NelsonPine LVL can be left uncoated. It may be sanded to enhance its visual appearance and remove manufacturing marks such as glue stains, branding and dye marks. If the product is exposed to the UV from the sun it may break down parts of the wood cells, weakening and discolouring (yellowing) the surface fibres.



Sanded LVL finish on face

## Natural oils

| Product           | Application     | Coats        | Clean up |            |
|-------------------|-----------------|--------------|----------|------------|
| Protective Paints | Murray Oil Seal | Brush/Roller | 1 or 2   | Turpentine |
| Dulux             | Cabot's Oil     | Brush/Roller | 1 or 2   | Turpentine |
| Resene            | Danska Teak Oil | Brush/Roller | 1 or 2   | Turpentine |
| Mirotone          | Finishing Oil   | Brush/Roller | 1 or 2   | Turpentine |
| Wattyl            | Estapol Tungoil | Brush/Roller | 1 or 2   | Turpentine |

Modern natural vegetable oil can provide a deeper glow and bring out the natural colours of timber. Modern vegetable oils (derived from plants such as linseed) can act as feed stock for mould. Natural oils perform best when they are kept dry therefore not allowing fungi and mould to grow on the LVL surface. These oils will be broken down by oxidation and UV exposure and need to be reapplied periodically to maintain their finish.

## Penetrating stains and clears

| Manufacturer      | First Coat/Primer                    | Second Coat               | Third Coat                | Application  |
|-------------------|--------------------------------------|---------------------------|---------------------------|--|
| Dulux             | Intergrain UltraClear Interior Satin | UltraClear Interior Satin | UltraClear Interior Satin | Commercial general purpose – walls, ceilings etc                 |
| Dulux             | Intergrain UltraFloor Satin          | UltraFloor Satin          | UltraFloor Satin          | Hardwearing for floors, stairs and high traffic                  |
| Resene            | Maxi Proof                           | Maxi Proof                | Maxi Proof                | Hardwearing for floors, stairs and high traffic                  |
| Resene            | Colorwood                            | Aquaclear                 | Aquaclear                 | Commercial general purpose – walls, ceilings etc                 |
| Resene            | Colorwood                            | Uracryl                   | Uracryl                   | Commercial general purpose – walls, ceilings etc – solvent based |
| Mirotone          | Mirostain                            | Aqua Pro WB DURAPOL       | Aqua Pro WB DURAPOL       | Hardwearing for floors, stairs and high traffic                  |
| Protective Paints | 935 NGR Stain                        | 777 Portco Polyurethane   | 777 Portco Polyurethane   | Hardwearing for floors, stairs and high traffic                  |
| Wattyl            | Colourwood Pigmented Stain           | Instant Estapol           | Instant Estapol           | Commercial general purpose – walls, ceilings etc                 |
| Wattyl            | Colourwood Dye Stain                 | Estapol Speed Clear       | Estapol Speed Clear       | Commercial general purpose – walls, ceilings etc                 |

The stains outlined in the table are interior timber stains that must be over coated to protect the timber. The pigmented stains have better light fastness but give a muddier appearance than the dye stains. Any area exposed to direct sunlight, even through a window, should only have a pigmented stain applied if a stained finish is desired.

Clear coatings for timber and are available in water based or solvent based formulations. Please consult with your chosen manufacturer for more specific recommendations.

### Polyurethanes

Polyurethanes are suitable for clear coating timber and are available in water or solvent based formulations. Solvent based Polyurethanes can provide a tougher more durable resistant surface due to their chemical cross linking they can also yellow faster than acrylic based alternatives. Both systems will flake and bubble if exposed to long periods of UV light making maintenance harder.

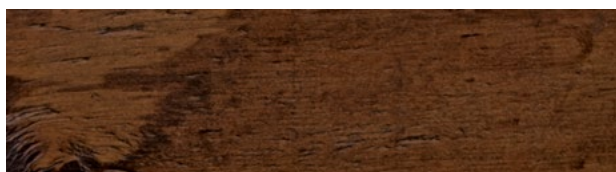
### Swimming pool environments

For interior swimming pool environments it is recommended to apply three coats of a solvent based polyurethane or water borne enamel paint system. Equilibrium moisture content in an interior swimming pool environment is generally controlled by air conditioning or alternatively by good ventilation design.

### Interior paint systems

| Manufacturer      | First Coat/Primer                        | Second Coat                 | Third Coat                  | Application                                      |
|-------------------|--|-----------------------------|-----------------------------|--|
| Dulux             | 1 step - Acrylic Primer                  | Wash & Wear                 | Wash & Wear                 | Commercial general purpose – walls, ceilings etc |
| Resene            | Quick Dry Undercoat                      | Enamacryl                   | Enamacryl                   | Commercial general purpose – walls, ceilings etc |
| Mirotone          | Mirotec WB                               | Mirotec WB                  | Mirotec WB                  | Commercial general purpose – walls, ceilings etc |
| Protective Paints | A102 Duralon Acrylic                     | Imperlon Water Based Enamel | Imperlon Water Based Enamel | Commercial general purpose – walls, ceilings etc |
| Wattyl            | Interior Design Acrylic Sealer Undercoat | Interior Design             | Interior Design             | Commercial general purpose – walls, ceilings etc |

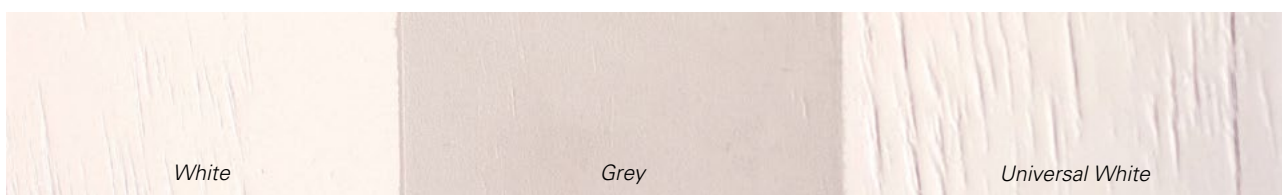
Common acrylic timber paint three coat systems are suitable to paint NelsonPine LVL and provide good quality protection for moisture, UV, mould and general wear and tear. It is common practice to specify lighter colours which attract less heat than darker colours. This minimises the amount of substrate movement due to temperature variation within the substrate which may cause higher stresses in the paint coatings. Sharp edges should be removed from timber to reduce the paint film from pulling back during application and the specified film build needs to be applied to ensure that the completed paint film can flex.



Mirostain / Mirothane Clear Brown Oak



Resene Qristal Clear True Blood



Mirotone Mirotec WB

# Exterior Systems

The longevity of exterior stain and paint coat systems is influenced by the condition and stability of the substrate that the coating is applied to. The moisture content of NelsonPine LVL at the time of construction and during the life of the structure is the most critical factor affecting the coating performance. The life span of the coating system will be enhanced by paying special attention to surface preparation of the substrate ensuring a good initial coating-to-substrate bond. Due to paints providing a solid opaque film they provide better protection from the elements than a stain or clear finish.

Film forming stains can exhibit flaking and bubbling of their film in external environments due to UV degradation, which can be time consuming to prepare and recoat successfully for maintenance. Please consult with your manufacturer if you are considering a film forming stain.

## Exterior oils

| Manufacturer    | First Coat                     | Second Coat                    | Third Coat                     | Application                          |
|-----------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------------|
| Dulux           | Intergrain Nature's Timber Oil | Intergrain Nature's Timber Oil | Intergrain Nature's Timber Oil | Exterior above ground exposed timber |
| Wood X          | Wood X                         | Wood X                         |                                | Exterior above ground exposed timber |
| Drydens         | Drydens Wood Oil               | Drydens Wood oil               |                                | Exterior above ground exposed timber |
| Churton Pacific | CD 50                          | CD 50                          |                                | Exterior above ground exposed timber |

Exterior mineral oils penetrate into the timber cell structure and provide good moisture resistance helping to make NelsonPine LVL more dimensionally stable. The oils may have fungicides to resist mould growth. Generally an exposed oil finish will be required to be recoated every 6-12 months to maintain a bright timber finish.

## Exterior penetrating stains

| Manufacturer      | First Coat/Primer        | Second Coat              | Third Coat               | Application         |
|-------------------|--------------------------|--------------------------|--------------------------|---------------------|
| Dulux             | Intergrain Natural Stain | Intergrain Natural Stain | Intergrain Natural Stain | Natural look finish |
| Dulux             | Intergrain UltraDeck     | Intergrain UltraDeck     | Intergrain UltraDeck     | Exterior decking    |
| Resene            | Woodsman                 | Woodsman                 | Woodsman (optional)      | Natural look finish |
| Sikkens Cetol     | HLSe                     | Filter 7 plus            | Filter 7 plus            | Natural look finish |
| Protective Paints | A072 Original Oil Satin  | A072 Original Oil Satin  | A072 Original Oil Satin  | Natural look finish |
| Protective Paints | 300 Durawood Aquawood    | 300 Durawood Aquawood    | 300 Durawood Aquawood    | Natural look finish |
| Wattyl            | Aquatech Oil Satin       | Aquatech Oil Satin       | Aquatech Oil Satin       | Natural look finish |

Penetrating stains are a natural looking way to develop semi transparent coatings. The oils penetrate into the outer layer of timber and the pigments offer some protection from UV light. Additionally the stains contain fungicides to help offer resistance to moulds and in some cases also contain waxes to offer additional water repellency. There is a big difference in the durability of penetrating stains when applied to unsanded or sanded LVL. Sanded LVL has had its cells cut and exposed by sanding therefore absorbing more stain and offering a longer life.

Dulux Intergrain Natural Stain



## Exterior paint systems

| Manufacturer      | First Coat/Primer            | Second Coat                  | Third Coat                   | Application                          |
|-------------------|------------------------------|------------------------------|------------------------------|--------------------------------------|
| Dulux             | 1 Step Acrylic Primer        | Weathershield X10            | Weathershield X10            | Exterior above ground exposed timber |
| Resene            | Quick Dry Primer             | Enamacryl                    | Enamacryl                    | Exterior above ground exposed timber |
| Protective Paints | Duragard Acrylic House Paint | Duragard Acrylic House Paint | Duragard Acrylic House Paint | Exterior above ground exposed timber |
| Wattyl            | Solagard                     | Solagard                     | Solagard                     | Exterior above ground exposed timber |

Common acrylic timber paint three coat systems are suitable to paint NelsonPine LVL and provide good quality protection for moisture, UV, mould and general wear and tear.

It is good practice to specify lighter colours, preferably with an LRV greater than 40%, which attract less heat than darker colours. This minimises the amount of substrate movement due to temperature variation within the substrate which would cause stresses in the paint film.

Ensure that any sharp timber edges are sanded to at least a 2mm radius to help paint systems resist cracking along the edges.

Specified film build need to be applied to ensure that the completed paint film reaches the advertised durability.

Typically a good quality paint system outside will last 7-15 years or longer on sheltered faces, depending on the colour applied. Modern acrylics are flexible and can cope with small amounts of movement in the LVL substrate through moisture and temperature variations.

Modern paint systems also contain in film biocides that help increase the life span of paint systems.



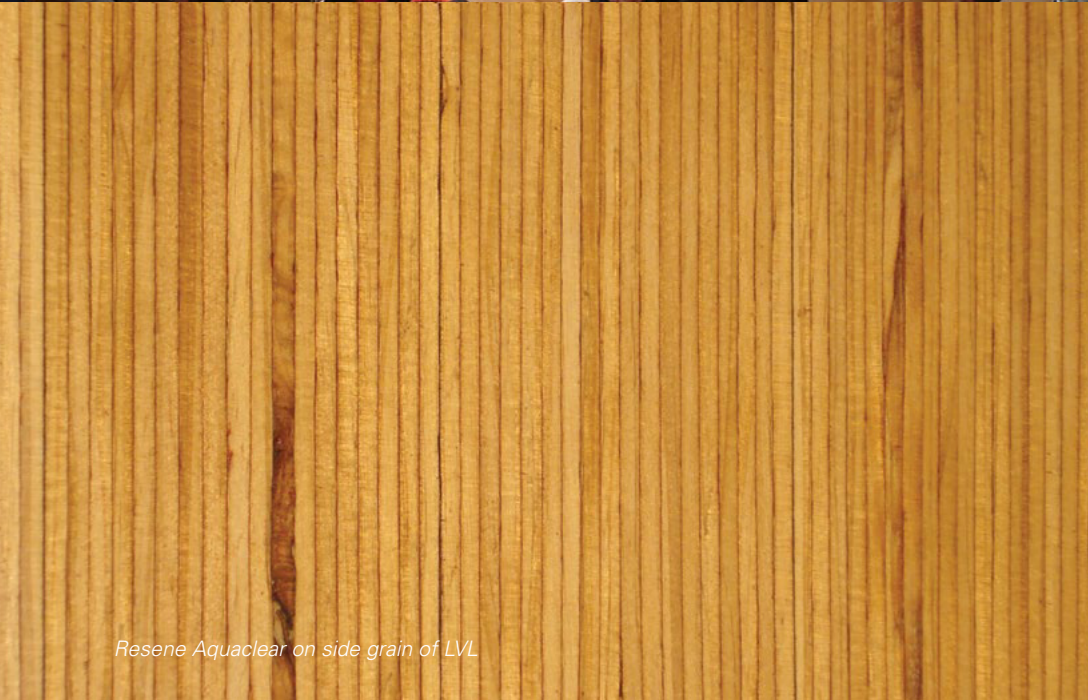
*College of Creative Arts (CoCA), Wellington (maintained two coats of Drydens wood oil for exterior exposure),*



*CoCA (one coat of Drydens wood oil for interior exposure).*



Waitomo Visitors Centre (Three coats Drydens Wood Oil)



Resene Aquaclear on side grain of LVL

NelsonPine LVL and laminate device are registered tradenames and trademarks of Nelson Pine Industries Ltd

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**Plantation Grown.** All veneers used in the manufacture of NelsonPine LVL are peeled from sustainable plantation grown Pinus Radiata logs.