

# JOINERY & INTERIOR FITTINGS

All products are available in solid clear, as well as in finger-jointed and laminated forms. Knotty products are suitable as core for overlaying with veneer or other materials. Generally, the knot structure of New Zealand pine is not suitable for 'knotty pine' appearance products such as are traditionally produced from Scandinavian pine.

A number of properties of New Zealand pine contribute to the ready acceptance for these products.



## TEXTURE & APPEARANCE

One of its unique properties is its uniform density, i.e. the small variation in density between spring wood and summer wood within a growth ring. It is this property which confers on New Zealand pine its excellent machining, painting and staining properties.

Consisting mainly of creamy white sapwood, with prominent fine resin canals, it presents a uniform appearance with little colour variation between pieces. This is an advantage for subsequent finishing.

## MACHINING

Comprehensive tests undertaken at the New Zealand Forest Research Institute, Buckinghamshire College of Higher Education in England, and University of California, Berkeley (USA) have shown that New Zealand pine has machining

properties (cross-cutting, turning, planing, moulding, boring, sanding) equal or superior to many of the internationally traded softwoods. Its fast growth does not adversely affect its working properties and good results can be obtained with all types of hand and machine tools.

## FINISHING

The full range of interior and exterior stains, oils, varnishes and paints may be used on New Zealand pine. The absence of high concentrations of extractives prevents any incompatibility with finishes and eliminates the need for special primers. A very high standard of finishing can be obtained.

The wood can be stained to resemble a wide range of traditional timber species.

## FASTENING

Being of medium density and even texture and having a good resistance to splitting, New Zealand pine can be nailed particularly well. The same properties allow the production of efficient joints using other systems, e.g. screws and proprietary connections.

Low extractives content and uniform density allow achievement of above-average glued connections, e.g. dowels and finger-joints. The high strength of glued dowel joints (compared to other species, e.g. meranti) is due to the contribution from the end grain to the joint.

## DIMENSIONAL STABILITY

This is a crucial wood property for interior fittings and joinery uses. New Zealand pine has a low shrinkage which contributes to its stability.

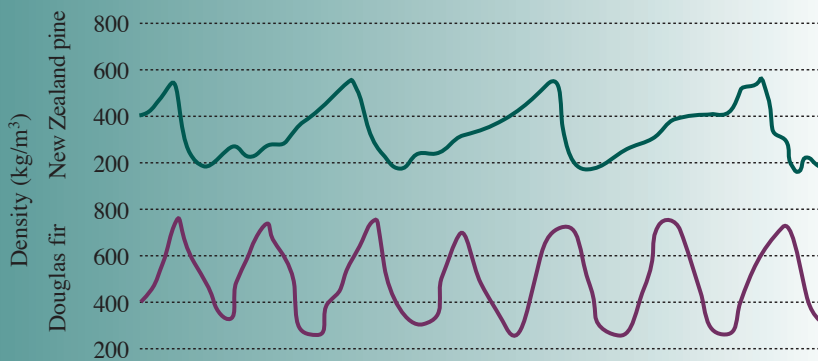
However, stability is also affected by a number of other properties, including: equilibrium moisture content, straightness of grain, spiral grain, rate of moisture uptake, permeability to liquids and gases.

Long term movement is the property which best describes the dimension changes which occur when joinery is exposed to dry summer conditions and later to wet winter conditions.

The dimensional response of cladding and joinery when exposed to fluctuating weather conditions, such as alternating rain wetting and sunshine, is best described as short-term movement.

Because of the presence of spiral grain, the corewood of New Zealand pine should not be used where stability is vital to performance.

### WOOD DENSITY VARIATION WITHIN GROWTH RINGS



### AVERAGE DENSITY & SHRINKAGE VALUES

Species	Average density at 12% moisture content	Shrinkage from green to 12%	
		Radial	Tangential
New Zealand pine	470-560	2.0	4.0
Cedar, western red	390	1.5	2.5
Douglas fir	530	2.5	4.0
Western hemlock	470-500	2.8	4.0
Light red meranti	400-640	3.5	7.0
European redwood	510	3.0	4.5
European whitewood	470	2.0	4.0
Ponderosa pine	480	2.3	3.8

### DIMENSIONAL MOVEMENT PROPERTIES IN NEW ZEALAND PINE

#### Long-term movement

E.M.C. at 90% humidity	21.2%
E.M.C. at 60% humidity	12.3%
Corresponding tangential movement	2.0%
Corresponding radial movement	1.0%

**Classification** **small**

#### Short-term movement

Tangential swelling after 24 hr at 95% RH	2.2%
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**Classification** **average**

*New Zealand pine is being*

*successfully used for a wide*

*range of interior fittings and*

*fixtures, including: windows,*

*doors, frames and jambs,*

*mouldings, stairs, cabinetry*

*and bench tops.*

Dimensional performance can be increased by use of finger-jointing, and/or lamination. Such highly processed laminated, finger-jointed clear products are used widely in Japan where maximum stability is required, e.g. sliding door tracks (kamoi and shikii), mouldings, and door frames.

### DURABILITY

New Zealand pine must be preservative-treated for exterior uses. However, it is one of the most permeable wood species and can, therefore, be acceptably treated by pressure impregnation, double vacuum and simple immersion methods. LOSP treatments are very successful for joinery.