

MACHINING

CHARACTERISTICS

Machining tests have confirmed that New Zealand pine compares favourably with a variety of other internationally traded lumbers.

Most wood products require machining in one form or another. The machining characteristics of any wood species can be as important as its strength, hardness, or durability in deciding which species is best for a given end use. The most common form of machining is planing, closely followed by shaping and turning. Cross-cutting, boring, mortising and sanding are also common types of machining.

The average density of New Zealand pine is 350 kg/m³ in early wood and 550 kg/m³ in late wood, reflecting the comparatively even texture of the wood. It is this small variation in density within the growth ring and gradual transition from early wood to late wood which confer on New Zealand pine its excellent machining, painting, and staining properties. These figures are compared with other species in the table below:

COMPARATIVE SOFTWOOD DENSITY

Species	Density of Late Wood (kg/m ³)	Density of Early Wood (kg/m ³)
New Zealand pine	550	350
Ponderosa pine	580	315
Douglas fir	690	300
Western hemlock	615	390

Comprehensive tests to compare the machinability of New Zealand pine with other wood species have confirmed the ease of machining of both outerwood and juvenile wood in planing and turning. It also compares favourably with other softwood species in routing, fingerjointing, sanding, and fastening characteristics.

As with all wood species, care must be taken in planing to ensure that knives are kept sharp, especially when dealing with knotty material. Dry, short grained lumber may be planed successfully at 100 metres/minute using medium cutting angles (around 20°). The accumulation of wood resin on planer knives is not normally a problem but, when it does occur, it can be handled by regular cleaning of the knives with a suitable solvent.





The superior machining

properties of New Zealand

pine are a result of its even

texture and relatively small

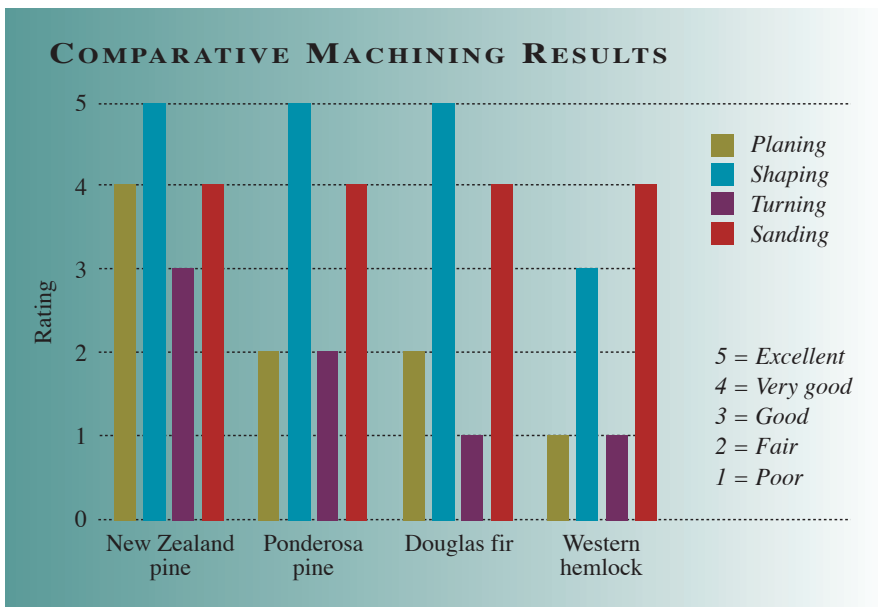
difference in density between

early wood and late wood.

Ease of moulding,

turning and planing are

strong features.



COMPARATIVE STUDIES

“A Comparative Study of New Zealand Pine and North American Timbers” was carried out by the New Zealand Forest Research Institute in collaboration with the University of California, Berkeley. New Zealand pine and 13 North American timbers were tested to assess the various species suitability for panelling, mouldings, joinery, and furniture manufacture. Fourteen criteria were used to rate each species, including planing, shaping, turning, sanding, and gluing. The quality of primary machining is critical to the manufacture of high-value products. While most finishes do require sanding, the severity and type of defect resulting

from the primary machining will impact on the cost, time, and effort required to bring the product to an acceptable finish. New Zealand pine’s performance confirms its suitability for a broad range of uses. It’s fast growth does not adversely affect its working properties and good results can be obtained with all types of hand and machine tools. Further details of this study are available from the New Zealand Ministry of Forestry.

Studies comparing New Zealand pine with English and European species were also carried out and confirmed by the Buckinghamshire College of Higher Education in England.