

Timber Advisory Notes



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and Land Management

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Species: *Pinus radiata* D. Don

Standard Trade Name: Radiata pine.

Common Names: Radiata pine, Monterey pine.

1. Size of tree / type of forest: Radiata pine is a large-sized softwood native to a very limited area of the west coast of North America but planted widely in the world's south temperate zone, especially in South Africa, Chile, New Zealand and Australia. In Western Australia major plantations have been established in the south-west on fertile soil and in rainfall areas greater than 700 mm, but preferably south of Perth.

2. Wood description: Heartwood pale yellow-brown. Sapwood pale yellow-white and not always clearly visible. The texture is fine. Grain usually straight except for the central core which often has pronounced spiral grain.

3. Wood density:

Green density (kg/m ³):	About 1000 kg/m ³ .
Air-dry density (kg/m ³):	About 590 kg/m ³ . (30-40 year old). About 480 kg/m ³ . (10-20 year old).
Basic density (kg/m ³):	About 490 kg/m ³ . (30-40 year old). About 405 kg/m ³ . (10-20 year old).

4. Drying and shrinkage:		<u>Tangential Shrinkage (%)</u>	<u>Radial Shrinkage (%)</u>
	Before reconditioning:	5.1	3.4
	After reconditioning:	5.0	3.5

5. Workability: Relatively easy to work but knots and resin pockets are common.

6. Durability Class: 4 Decay 4 Decay + termites (CSIRO revised ratings 1996).

7. Strength Groups: S6 and SD6.

8. Strength Properties:

Property	Units	Green	Dry
Modulus of Rupture	MPa	42	81
Modulus of Elasticity	MPa	8100	10000
Max Crushing Strength	MPa	19	42
Hardness	kN	2.1	3.3

9. Uses: General construction, house framing, moulding architraves, doors, shelves, joinery and turnery, decorative panelling, furniture, construction plywood, sliced veneer as a facing for particleboard, pulp and paper and reconstituted products e.g. particleboard and medium density fibreboard (MDF). If preservative treated it can be used for posts, poles, sleepers, retaining walls, decking, cooling towers and mining timber.

10. Availability: Readily available in Western Australia and eastern states.

BACKGROUND INFORMATION

1. Size of tree and type of forest

Small trees have average heights up to 15 m, medium 15 to 30 m, and large over 30 m. Types of forest are sclerophyll (with closed canopy), woodland (with scattered trees), or rain forest. Diameter breast height is stem diameter at 1.3 m above ground.

2. Wood description

For example, sapwood and heartwood colour, grain, figure

3. Wood density (kg/m³)

Green density is the density of wood in the living tree, defined as green mass divided by green volume, and useful for estimating transport costs. It varies with season and growing conditions. Air-dry density is the average mass divided by volume at 12 per cent moisture content (this is the average environmental condition in the coastal capital cities around Australia). Basic density is oven-dry mass divided by green volume. This measure has the advantage that moisture content variations are avoided.

4. Drying and shrinkage

As wood dries, it shrinks more in the tangential direction (i.e. parallel to the growth rings) than it does in the radial direction (i.e. at right angles to the growth rings). The figures given are shrinkage from green to 12 per cent moisture content, before and after steam reconditioning treatment. Reconditioning recovers any cells that may have collapsed during drying, and is essential for species such as the ash-type eucalypts.

5. Workability

Comments are made on the comparative ease or difficulty of turning, nailing and bending, on susceptibility to splitting and other working properties.

6. Durability

The CSIRO Durability Classes are based on the performance in ground of outer heartwood when exposed to fungal and termite attack. Class 1 gives more than 25 years life, Class 2 gives 15 to 25 years, Class 3 gives 8 to 15 years, and Class 4 less than eight years. The ratings are not relevant to above-ground use. In late 1996, CSIRO published revised ratings, which include termite susceptibility.

7. Strength grouping

In grading of structural timber, each species is allocated a ranking for green timber of S1 (strongest) to S7, and for seasoned timber SD1 (strongest) to SD8.

Minimum values for strength groups for green timber (units are MPa)

Strength property	S1	S2	S3	S4	S5	S6	S7
Modulus of rupture	103	86	73	62	52	43	36
Modulus of elasticity	16300	14200	12400	10700	9100	7900	6900
Maximum crushing strength	52	43	36	31	26	22	18

Minimum values for strength groups for seasoned timber (units are MPa)

Strength property	SD1	SD2	SD3	SD4	SD5	SD6	SD7	SD8
Modulus of rupture	150	130	110	94	78	65	55	45
Modulus of elasticity	21500	18500	16000	14000	12500	10500	9100	7900
Maximum crushing strength	80	70	61	54	47	41	36	30

8. Strength Properties

Values are from Bootle, K.R. (1983). 'Wood in Australia. Types, properties and uses'. (McGraw-Hill)

9. Uses

Various past and potential uses are given, but the list is obviously not conclusive.

10. Availability

Timber from many species is available only near the areas that the trees grow naturally or in plantations. Imported timbers and their current availability are identified.