Timber Advisory Notes

Department of Conservation and Land Management

CALM Timber Technology Weir Road Harvey WA 6220 (097) 29 1913 50 Hayman Road Como 6152 (09) 334 0333

IMPORTED TIMBER

14

Species: *Tectona grandis* L.f.

Standard Trade Name: Teak.

Common Names: Djati (Java), kyun (Burma) and teck (Thailand).

1. Size of tree / type of forest: Teak is variable in size and form depending on local conditions. Clear boles may be up to 27 m, but more often are 9 to 10 m. In drier areas trees are smaller, and older trees may have fluted and buttressed boles. A native tree of India, Burma, Thailand, Vietnam and Indonesia. Plantations are established in its natural range and other tropical areas, e.g. Papua New Guinea, Solomons, Fiji and northern Australia.

2. Wood description: Heartwood golden brown, often with dark markings. Sapwood pale yellow, to 25 mm wide and easily distinguished. The wood contains many oleoresins which give it a greasy feel and a distinctive odour to freshly cut material. Texture is uneven, being alternately smooth and coarse because of the wood's porous nature. Grain usually straight. The freshly cut wood can be very variable in colour, with blotches and streaks, but prolonged exposure to light reduces the more extreme variations.

3. Wood density:

Green density (kg/m^3):	Unavailable
Air-dry density (kg/m^3):	About 670 kg/m^3 (mature trees)
	About 550 kg/m^3 (plantation trees)
Basic density (kg/m^3):	Unavailable

4. Drying and shrinkage:

	Tangential Shrinkage (%)	Radial Shrinkage (%)
Before reconditioning:	2.5	1.5
After reconditioning:	Unavailable	Unavailable

5. Workability: Generally easy to work but silica can be present and this will necessitate frequent sharpening of tools or the use of tungsten carbide-tipped tools and a 20° cutting angle when planing. Peels easily, nails satisfactorily but gluing may be difficult because of the oily nature of the wood, and a freshly dressed surface is needed. Teak seasons well but rather slowly, showing marked variation in drying rate between individual boards. Some collapse may occur if high kiln temperatures are used. Very stable in-service; good resistance to acids and non-corrosive to metal fixings.

6. Durability Class: 2 Decay (Burmese) 2 Decay and termites (CSIRO revised ratings 1996).

7. Strength Groups: S4 and SD5.

8. Strength Properties:

(Burmese teak)

Property	Units	Green	Dry
Modulus of Rupture	**MPa**	84	106
Modulus of Elasticity	**MPa**	8800	10000
Max Crushing Strength	**MPa**	43	60
Hardness	**kN**	4.1	4.5

9. Uses: Boat building (mainly tropics), ship's decking, garden furniture, decorative veneer, cabinet work/ furniture and in industrial chemical plants. Dust may cause dermatitis.

10. Availability: Available from a limited number of suppliers.

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/m^3)**

   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.