



## IMPORTED TIMBER

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**Species:** *Intsia bijuga* (Colebr.) O.Ktze.  
*I. palembanica* Miq.

**Standard Trade Name:** Kwila

**Common Name:** Kwila, ipil, merbau, vesi

**1. Size of tree / type of forest:** Kempas are large hardwoods of wide distribution in south-east Asia and eastwards to Papua New Guinea, Philippines, Solomon Islands and Fiji. Occurs occasionally in north Queensland.

**2. Wood description:** Heartwood may be bright yellow when first cut but becomes pale to dark reddish brown. Sapwood is pale yellow to about 8 cm wide, and distinct from the heartwood. Texture is moderately coarse but even and the grain is slightly interlocked, producing a ribbon figure to the radial surface. The timber has a characteristic oily odour when freshly cut, and is rather greasy to touch.

**3. Wood density:**  
Green density (kg/m<sup>3</sup>): About 1200 kg/m<sup>3</sup>.  
Air-dry density (kg/m<sup>3</sup>): About 825 kg/m<sup>3</sup> (Before reconditioning).  
Basic density (kg/m<sup>3</sup>): About 700 kg/m<sup>3</sup>.

**4. Drying and shrinkage:**

	<u>Tangential Shrinkage (%)</u>	<u>Radial Shrinkage (%)</u>
Before reconditioning:	2.5	1.5
After reconditioning:	2.1	1.1

**5. Workability:** The timber cuts cleanly but saw teeth tend to become clogged with a gummy substance. The cutting angle of the planer needs to be reduced, especially on the radial surface. Pre-drilling may be needed for nailing. Glues and turns reasonably satisfactorily, and sanding dust can irritate both skin and mucous membranes. The vessels contain a yellow substance that will stain textiles and concrete. Contact with iron under moist conditions will cause formation of a black stain.

**6. Durability Class:** 3/2 Decay      3/2 Decay and termites      (CSIRO revised ratings 1996).  
Sapwood susceptible to *Lyctus* borer attack.

**7. Strength Groups:** S2 and SD3.

**8. Strength Properties:**

Property	Units	Green	Dry
Modulus of Rupture	MPa	103	147
Modulus of Elasticity	MPa	15000	18000
Max Crushing Strength	MPa	55	81
Hardness	kN	7.6	8.6

**9. Uses:** Furniture, flooring, panelling, turnery, sills, boatbuilding, crossarms, carving, vats, window joinery and veneer.

**10. Availability:** Occasionally imported.

## 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<sup>3</sup>)

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.