TIMBER TECHNOLOGY BULLETIN

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Timber Notes - Light Hardwoods IV (Jongkong, Petai, Pulai, Ramin, Rubberwood)

by

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Trade name: Jongkong

Species: *Dactylocladus stenostachys*.

1. Tree type and distribution: Large tree to 40 m tall, 150 cm diameter. Endemic to Borneo (Sabah, Sarawak, Brunei and Kalimantan). Common in all types of peat swamp and mixed swamp forests.

2. Wood characteristics: Heartwood light brown weathering to pink-brown or red-brown. Sapwood is lighter in colour and not well defined. Texture is fine and even. Grain straight to interlocked. Small 'pinhole' type of 'included phloem' present on surface.

3. Timber classification: LHW

4. Wood density: Ranges from 495 to 610 kg m^{-3} air dry.

5. Drying and relative movement: Air drying of 15 mm and 40 mm boards takes 3 months and 5 months respectively. Tendency to warping and end-check.

6. Machining properties: Easy to machine and produces a smooth and lustrous surface. Nailing property is rated poor.

7. Durability: Non-durable.

8. Strength grouping: D

9. Strength properties: Not fully tested in FRIM.

10. Uses: Suitable for light utility purpose, weather boarding veneer and plywood, box and crate.

Trade name: Petai

Species: *Parkia* spp. Two species, *Parkia speciosa* (petai meranti) and *P.javanica* (petai kerayong), present in Peninsular Malaysia.

1. Tree type and distribution: Big buttressed trees to over 30 m tall and 25 m girth. Present throughout the lowland forest, locally common, never gregarious.

2. Wood characteristics: Heartwood is seldom developed but if found, is dark brown. Sapwood is white to yellow brown. Texture is coarse and uneven. Grain is straight or shallowly interlocked.

3. Timber classification: LHW

4. Wood density: Ranges from 415 to 815 kg m^{-3} air dry.

5. Drying and relative movement: 15 mm boards take approximately $3^{1/2}$ months to air dry and 40 mm boards take 5 months. Tendency to slight warping. Type II movement.

6. Machining properties: Easy to saw and work. Planed surface is smooth.

7. Durability: Non-durable. Susceptible to powder-post beetle and sapstain fungal attacks. Timber very easy to treat.

8. Strength grouping: D

9. Strength properties: Data based on tests carried out on *Parkia speciosa.*

Property (MPa)	Green	Air dry
Modulus of rupture	49	55
Modulus of elasticity	9600	10 700
Maximum crushing strength	24.3	30.8

10. Uses: Suitable for interior works such as partitioning, stair railing, skirting and pattern-making

Trade name: Pulai

Species: *Alstonia* species. Six species recorded in Peninsular Malaysia.

1. Tree type and distribution: Small to very big trees. Found in the forest where the trees sometime reach huge size and are also common in secondary forest, even in open, highly disturbed places.

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2. Wood characteristics: Heartwood and sapwood not differentiated, wood cream-white with occa- sional zig-zag markings on tangential surface. Texture moderately fine to moderately coarse. Grain interlocked.

3. Timber classification: LHW

4. Wood density: Ranges from 370 to 495 kg m^{-3} air dry.

5. Drying and relative movement: 15 mm boards take about $1^{1/2}$ months and 40 mm boards $2^{1/2}$ months to air dry Susceptible to stain, mould and insect attack. For kiln drying, schedule J is recommended and requires high temperature and humidity treatment in kiln to prevent the attacks mentioned.

***6. Machining properties**:* The timber is weak. Easy to saw and work and the planed surface is smooth.

7. Durability: Non-durable. Timber very easy to treat.

8. Strength grouping: D

9. Strength properties: Data based on tests carried out on *Alstonia angustiloba*.

Property (MPa)	Green	Air dry
Modulus of rupture	33	43
Modulus of elasticity	6200	7100
Maximum crushing strength	15.9	24.8

10.Uses: Suitable for pattern-making, fret work, carving, picture frame, toys, wooden clogs and disposable chopsticks.

Trade name: Ramin

Species: *Gonystylus acuminatus, G. affinis* (ramin dara elok), *G. bancanus* (r. melawis), *G. brunnescens* (r. daun tebal), *G. confucus* (r. pinang muda), *G. macrophyllus*, *G. maingayi* (r. pipit).

1. Tree type and distribution: Trees small to large with rather straight boles. *Gonystylus brunnescens* has been reported to grow to 36 m tall, 300 cm girth. Widely distributed with habitats ranging from peat swamps, seasonal swamps, plains, low undulating country, to hillsides to an altitude of 600 m.

2. Wood characteristics: Heartwood white to yellowish-white weathering to a pale straw colour and not differentiated from the sapwood. Planed surface not lustrous. Texture moderately fine and even. Grain straight to shallowly interlocked. Susceptible to 'blue stain' infestation. Dark coloured core may occur in some logs.

3. Timber classification: LHW

4. Wood density: Ranges from 530 to 785 kg m^{-3} air dry, averaging 675 kg m^{-3}.

5. Drying and relative movement: Air drying of 15 mm and 40 mm boards takes about 3 1/2 months and 4 months respectively. For kiln drying, schedule C is recommended for thickness up to 38 mm. Thickness greater than 38 mm is prone to surface checking and splitting and schedule B is suggested. Type IV movement.

6. Machining properties: Easy to saw, plane, bore and turn. Planed surface is smooth. Timber is very easy to treat.

7. Durability: Non-durable. Very susceptible to stain fungi and power-post beetles.

8. Strength grouping: C

9. Strength properties: Data based on tests carried out on *Gonystylus bancanus.*

Property (MPa)	Green	Air dry
Modulus of rupture	62	88
Modulus of elasticity	14 200	15 900
Maximum crushing strength	46	84

10. Uses: Highly sought after for decorative cabinet timber, furniture, squash court flooring and interior decorative work.

Trade name: Rubberwood

Species: *Heavea brasiliensis.*

1. Tree type and distribution: Rubber tree, introduced into Malaysia more than a century ago, is widely cultivated in plantation throughout the country for the production of latex. The wood is harvested after the tree has been felled for replanting.

2. Wood characteristics: Heartwood white or pale cream weathering to a light straw or light brown in colour and not distinct from the sapwood. Texture moderately coarse to coarse and even. Grain straight to interlocked.

3. Timber classification: LHW

4. Wood density: Ranges from 560 to 640 kg m^{-3} air dry.

5. Drying and relative movement: 15 mm boards take $2^{1/2}$ months to air dry and 40 mm boards take $3^{1/2}$ months. For kiln drying, schedule D is recommended. Specific-conditioning treatments are essential for manufacturing laminated products.

6. Machining properties: Easy to resaw and cross-cut. Planes easily and the finish is smooth. Nailing property is rated as good.

7. Durability: Non-durable. Susceptible to both fungal and insect attacks. Very easily treated.

8. Strength grouping: D

9. Strength properties:

Property (MPa)	Green	Air dry
Modulus of rupture	58	66
Modulus of elasticity	8800	9240
Maximum crushing strength	3.65	4.69

10.Uses: Suitable for furniture manufacture, staircase, utility article, flooring, interior finishing, panelling, moulding and laminated products.

Jongkong

Petai

Pulai

Ramin

Rubberwood

BACKGROUND INFORMATION

1. Tree type and distribution

The distribution and size of tree are given.

2. Wood characteristics

The colours of sapwood and heartwood, figure, appearance on planed surface and any other characteristic features of the timber.

3.Timber classification

Under the Malaysian Grading Rules (1984), timbers are classified as Heavy Hardwood (HHW) when their density exceeds 800 kg m^{-3} and the timbers are naturally durable. Medium Hardwoods (MHW) are timbers with density 720 - 800 kg m^{-3} but lack sufficient natural durability. Light Hardwoods (LHW) are timbers with density below 720 kg $m^{-3}$and are not naturally durable in exposed condition.

4. Wood density

Green density of freshly sawn board, defined as green mass divided by green volume. It varies with the freshness of the log in the log yard before processing and seasoning. Air dry density is the average mass divided by volume at 15 per cent moisture content.

5. Drying and relative movement

Air drying time for 15 mm and 40 mm boards and moisture content are from Grewal (1979). "Air-seasoning Properties of Some Malaysian Timbers", Timber Trade Leafet No. 41. Suitable kiln drying schedule is mentioned [schedules based on Grewal (1988), "Kiln Drying Characteristic of Some Malaysian Timbers", Timber Trade Leaflet No. 42]. The relative movement (whenever is available) is defined as the change in dimension of a piece of timber when exposed to the service conditions of 60 % RH/30 ^{0}C and 95 % RH/30 ^{0}C respectively, and expressed as percentage of the value at 60 % RH/30 ^{0}C. The movement ratings stated are based on values of the corresponding tangential movement [Choo *et al*. (1998), "Movement of Seasoned Timber in Service", FRIM Technical Information Handbook No. 18]

Movement rating	Tangential movement (%)
Type I	< 1.5
Type II	1.5-2.0
Type III	2.1-2.5
Type IV	2.6-3.0
Type V	> 3.1

6. Machining properties

Comments are made on the comparative ease or difficulty of sawing, planing, turning, boring, peeling, gluing and other wood working properties.

7. Durability

Durability ratings of Malaysian Timbers are based on performance of test-stacks in graveyard testing. Test-stacks of 50 x 50 x 600 mm are buried in test grounds and their performance monitored. The number of years that the timber can last under such condition is used to classify the durability of the timber. Under the system, timbers are classified as follows:

Rating	Number of years
Very durable	more than 10
Durable	5-10
Moderately durable	2-5
Non-durable	0-2

Susceptibility to fungal, termite attacks and treatability may be mentioned.

8. Strength grouping

In the strength grouping of timber under each trade name, ranking is allocated from A (strongest) to D (weakest). Minimum values for strength groups are based on common grade for dry timber (below 19 % moisture content) (units are in MPa).

Strength group	A	B	C	D
Modulus of elasticity	9700	6600	5500	3100
Bending and tension parallel to grain	12.41	9.65	7.24	4.83
Compression parallel to grain	11.03	7.93	5.51	4.14
Compression perpendicular to grain	1.45	0.90	0.55	0.45
Shear parallel to grain	1.45	0.90	0.62	0.62

9. Strength properties

Values are from Lee *et al*. 1979, "The Strength Properties of Some Malaysian Timbers", Malaysian Forest Service Trade Leaflet No. 34.

10. Uses

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