

Timber Notes - Light Hardwoods V (Mersawa, Nyatoh, Pelajau, Penarahan, Perupok)

by

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- Trade name:** Mersawa
- Species:** *Anisoptera* species. About six species in Peninsular Malaysia.
- 1. Tree type and distribution:** Very large tree and widely distributed throughout the country from coastal peat swamp forest up to 850 m altitude.
- 2. Wood characteristics:** Heartwood not differentiated from the sapwood which is yellow-brown weathering to straw brown. Texture moderately coarse but even. Grain interlocked.
- 3. Timber classification:** LHW
- 4. Wood density:** Ranges from 515 to 735 kg m⁻³ air dry.
- 5. Drying and relative movement:** 15 mm boards take 6 months to air dry and 40 mm boards take 9 months. For kiln drying, schedule E is recommended. A slow drying species with a tendency to retain high moisture content in the core. Both mersawa durian (*A. laevis*) and mersawa paya (*A. marginata*) have type III movement.
- 6. Machining properties:** Difficult to resaw, cross-cut and plane, but planed surface produced is smooth. Nailing property is rated good.
- 7. Durability:** Moderately durable. Difficult to treat with preservatives.
- 8. Strength grouping:** C
- 9. Strength properties:** Data based on test carried out on the lower values of *Anisoptera laevis* and *A. marginata* tested.

Property (MPa)	Green	Air dry
Modulus of rupture	49	-
Modulus of elasticity	9200	-
Maximum crushing strength	26.0	-

- 10. Uses:** Suitable for veneer and plywood manufacture. Other uses include light construction, furniture manufacture, pallet, box and crate.

- Trade name:** Nyatoh
- Species:** Most species of the family *Sapotaceae*, principally *Palaquium* species,
- 1. Tree type and distribution:** Medium to very big tree. Present in fresh water swamps and sea-coasts ton mountains at 1680 m altitude.
- 2. Wood characteristics:** Heartwood deep pink-brown to red-brown and moderately distinct from the sapwood which is lighter in colour. Texture moderately fine and even. Grain interlocked. Streaky figure on radial surface.
- 3. Timber classification:** LHW
- 4. Wood density:** Ranges from 400 to 1075 kg m⁻³ air dry.
- 5. Drying and relative movement:** Generally for *Palaquium* spp., 15 mm boards take 2 to 4 months to air dry and 40 mm boards take 4 to 6 months. For kiln drying, schedule E is recommended. Taban merah (*P. gutta*) has tendency to warp. Nyatoh (*Palaquium* spp.) has a type 11 movement.
- 6. Machining properties:** The lighter species are easy to saw and work, producing surfaces that are smooth. The heavier species are very difficult to saw, cross-cut and work but planed surface is only moderately smooth.
- 7. Durability:** Nyatoh surin (*P.impressinervium*) is durable, while taban merah (*P.gutta*) is non-durable. The timber is difficult to treat.
- 8. Strength grouping:** C and B for most species but strength group A for *P. impressinervium*.
- 9. Strength properties:** Data based on *Palaquium gutta*.

Property (MPa)	Green	Air dry
Modulus of rupture	64	79
Modulus of elasticity	11 300	12 200
Maximum crushing strength	34.3	44.5

- 10. Uses:** Suitable for furniture manufacture, decorative interior finishing such as paneling and partitioning.

- Trade name:** Pelajau
- Species:** *Pentaspadon* spp. (family Anacardiaceae).
- 1. Tree type and distribution:** Large tree with thin spreading buttresses. Three species in Peninsular Malaysia, in the lowland and hill forests and on coastal limestone.
- 2. Wood characteristics:** The wood is fairly hard and heavy. Heartwood light yellow-green darkening to grey- green on exposure and not clearly defined from the sapwood which is white or light yellow. Texture fine and even. Grain straight to interlocked.
- 3. Timber classification:** LHW
- 4. Wood density:** Ranges from 480 to 835 kg m⁻³ air dry.
- 5. Drying and relative movement:** Air drying of 15 mm and 40 mm boards takes 3 months and 4^{1/2}, months respectively.
- 6. Machining properties:** Easy to resaw and cross-cut. Planing is easy and the planed surface is smooth. Poor nailing property.
- 7. Durability:** Moderately durable. Timber very difficult to treat.
- 8. Strength grouping:** D
- 9. Strength properties:** Based on tests carried out on *Pentaspadon velutinus*.

Property (MPa)	Green	Air dry
Modulus of rupture	53	-
Modulus of elasticity	8600	-
Maximum crushing strength	31.8	-

- 10. Uses:** Suitable for interior finishing, panelling, partitioning, moulding, skirting, flooring, veneer and plywood, and other planking works.

- Trade name:** Penarahan
- Species:** Most species of the family *Myristicaceae*.
- 1. Tree type and distribution:** Small to large tree. Mainly in lowland forests, not gregarious and not common in the mountains.
- 2. Wood characteristics:** Heartwood pale brown or pink-brown but occasionally some species develop a distinctive corewood which is deep purple-red or chocolate-red and distinct from the sapwood. Texture moderately fine and purely uneven. Grain straight to inter-locked.
- 3. Timber classification.** LHW
- 4. Wood density:** Ranges from 370 to 770kg m⁻³ air dry.
- 5. Drying and relative movement:** 15 mm boards take about 3 months to air dry and 40 mm boards take 4 months. Tendency to slight warping (cup and bow). *Myristica gigantea* (penarahan arang bukit) has type III movement.
- 6. Machining properties:** Easy to saw and work and the planed surface is moderately smooth to smooth.
- 7. Durability:** Susceptible to powder-post beetles and dry wood termite. Very easy to treat.
- 8. Strength grouping:** C
- 9. Strength properties:** Data based on test carried out on *Myristica maingayi*.

Property (MPa)	Green	Air dry
Modulus of rupture	51	-
Modulus of elasticity	9380	-
Maximum crushing strength	25.4	-

- 10. Uses:** Suitable for packing case, crate, plywood, light construction, internal partitioning and flooring.

- Trade name:** Perupok
- Species:** *Lophopetalum beccarianum* (perupok), *L. floribundum*(perupok), *L. javanicum* (perupok), *L. multinervium* (tinjau tasek), *L. pachyphyllum* (perupok), *L. pallidum* (karueh), *L. subovatum* (perupok) and *L. wightianum* (perupok).
- 1. Tree type and distribution:** The trees of perupok are small- to medium-sized. The largest tree of perupok recorded is the species of *Lophopetalum wightianum* measuring 45 m tall and 540 cm girth. Perupok is found in all States of Peninsular Malaysia and occurs in low-land forests, ridge tops, hillsides, by streams and in swamps
- 2. Wood characteristics:** Heartwood light yellow to light yellow-brown when dry and pink when freshly cut with a greyish tinge. Sapwood lighter in colour and not well defined. Flat-sawn surface with attractive feathery figure due to the presence of wood parenchyma bands. Texture fine to moderately fine and even. Grain straight to interlocked.
- 3. Timber classification:** LHW
- 4. Wood density:** Ranges from 480 to 640 kg m⁻³ air dry.
- 5. Drying and relative movement:** Air drying of 15 mm and 40 mm boards takes about 1 month and 1^{1/2} months respectively. Tendency to end-check and splitting. For kiln drying, schedule E (tentative) is recommended. Susceptible to powder-post beetles for *L. subovatum* (perupok).
- 6. Machining properties:** Easy to saw, plane, bore and turn. Planed surface is smooth.
- 7. Durability:** Non-durable for *L. floribundum* (perupok). The amenability to treatment is average.
- 8. Strength grouping:** B
- 9. Strength properties:** Data based on test carried on out on *Lophopetalum subovatum*.

Property (MPa)	Green	Air dry
Modulus of rupture	64	76
Modulus of elasticity	11 700	12 200
Maximum crushing strength	32.8	42.8

- 10.Uses:** Suitable for interior finishing, panelling and furniture manufacture. Also suitable of veneer and plywood, manufacturing of mathematical instruments.



Mersawa



Nyatoh



Pelajau



Penarahan



Perupok

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 $720 - 800 \text{ kg m}^{-3}$ 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 Leaflet 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 °C and 95 % RH/30 °C respectively, and expressed as percentage of the value at 60 % RH/30 °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.

TIMBER TECHNOLOGY BULLETIN

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