

Yellow balau

Family. Dipterocarpaceae

Botanical Name(s).

Shorea glauca

Shorea laevis

Shorea maxwelliana

Shorea superba

Shorea subgen. Eushorea p.p.

Continent. Asia-Oceania

CITES. This species is not listed in the CITES Appendices (Washington Convention 2023).

Notes. Shorea subgen. Eushorea species. Yellow Balau is usually used for woods imported from Malaysia, Bangkirai for woods imported from Indonesia.

Description of logs

Diameter. From 70 to 90 cm

Thickness of sapwood. From 2 to 8 cm

Floats. No

Log durability. Good

Description of wood

Colour reference. Yellow brown

Sapwood. Not clearly demarcated

Texture. Medium

Grain. Straight or interlocked

Interlocked grain. Slight

Notes. Yellow brown to reddish brown more or less dark. White resin canals. Sawnwoods may present black holes. This defect is acceptable if it remains limited and not frequent.

Physics and mechanics

The properties indicated are for mature wood. These properties may vary significantly depending on the origin and growing conditions of the wood.

Property	Average value
Specific gravity ¹	0.91
Monnin hardness ¹	7.3
Coefficient of volumetric shrinkage	0.68 % per %
Total tangential shrinkage (St)	9.5 %
Total radial shrinkage (Sr)	4.2 %
Ratio St/Sr	2.3
Fibre saturation point	23 %
Thermal conductivity (λ)	0.29 W/(m.K)
Lower heating value	19,910 kJ/kg



Flat sawn



Quarter sawn

Crushing strength ¹	85 MPa
Static bending strength ¹	150 MPa
Modulus of elasticity ¹	22,940 MPa

¹ At 12 % moisture content, with 1 MPa = 1 N/mm

Natural durability and heartwood treatability

Resistance of heartwood to xylophagous fungi. Durability class 2 - durable

Resistance of heartwood to xylophagous dry wood borers. Class D - durable (heartw. durable but sapw. not clearly demarcated)

Resistance of heartwood to termites. Class D - durable

Heartwood treatability. Class 4 - not permeable

Use class ensured by natural durability of heartwood.

Class 4 - in ground or fresh water contact

Notes. This species is listed in the NF EN 350 (2016) standard. The possible presence of few demarcated sapwood in sawnwood may have an influence on expected durability.

Only *Shorea laevis* has a good enough natural durability to allow end-uses under use class 5 (wood permanently or regularly submerged in salt water, sea water or brackish water). It is due to its high specific gravity and high silica content.

According to the European standard NF EN 335 (2013), performance length might be modified by by conditions in which it is used.

Requirement of a preservative treatment

Against dry wood borer. Requires appropriate preservative treatment

In case of temporary humidification. Does not require any preservative treatment

In case of permanent humidification. Does not require any preservative treatment

Drying

Drying rate. Slow

Risk of distorsion. Slight risk

Risk of casehardening. No known specific risk

Risk of checking. High risk

Risk of collapse. No known specific risk

Notes. Initial surface drying is recommended prior to kiln drying.

Suggested drying program.

Phases	Duration (H)	MC (%) probes	T (°C)	Rh (%)	UGL (%)
Prewarm 1		> 50	40	86	17.0
Prewarm 2	4	> 50	43	85	16.5
Drying		> 50	45	83	15.7
		50 - 40	45	80.0	14.6
		40 - 35	45	77.0	13.8
		35 - 30	45	74.0	12.9
		30 - 27	47	69.0	11.5
		27 - 24	49	61.0	9.9
		24 - 21	50	52.0	8.4
		21 - 18	53	48.0	7.7
		18 - 15	56	41.0	6.6
		15 - 12	59	36.0	5.9
		12 - 9	61	30.0	5.0
		9 - 6	65	29.0	4.7
Conditioning	8		58	(3)	(2)
Cooling	(1)		Stop	(3)	(2)

(1) Cooling: until the temperature inside the kiln no longer exceeds external temperature by more than 30 °C.

(2) UGL = final H% x 0,8 to 0,9.

(3) Subtract RH from the UGL determined in (2) and temperature, using the Hailwood-Horrobin equation.

Sawing and machining

Blunting effect. Fairly high

Sawteeth recommended. Stellite-tipped

Cutting tools. Tungsten carbide

Peeling. Not recommended or without interest

Slicing. Not recommended or without interest

Notes. Requires power. Some difficulties due to interlocked grain during planing.

Assembling

Nailing and screwing. Good but pre-boring necessary

Notes. Tends to split with nailing. High specific gravity: important that gluing be performed in compliance with the code of practice and instructions for the glue used.

Commercial grading

Appearance grading for sawn timbers.

According to MGR grading rules (2009) Possible grading: Prime, Select, Standard, Serviceable, Utility

Visual grading for structural applications

According to European standard EN 1912 (2012) and associated national standards (see explanatory note), strength class D50 can be provided by visual grading.

Fire safety

Conventional French grading.

Thickness > 14 mm: M3 (moderately inflammable)

Thickness < 14 mm: M4 (easily inflammable)

Euroclasses grading. D-s2, d0

Default grading for solid wood, according to requirements of European standard EN 14081-1+A1 (August 2019). It concerns structural graded timber in vertical uses and ceiling with mean density upper 0.35 and thickness upper 22 mm.

End-uses

- Boxes and crates
- Bridges (parts in contact with water or ground)
- Bridges (parts not in contact with water or ground)
- Cooperage
- Decking
- Exterior joinery
- Flooring
- Heavy carpentry
- Hydraulic works (fresh water)
- Industrial or heavy flooring
- Poles
- Ship building (planking and deck)
- Sleepers
- Vehicle or container flooring

Notes. Other possible end-uses: garden furniture.



Sound abatement wall - motorway A10 - Châtelleraut (France)

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Main local names

Country	Local name
Indonesia	Balau
Indonesia	Bangkirai
Indonesia	Kedawang
Indonesia	Pooti
Indonesia	Selangan batu kumus
Malaysia	Balau
Malaysia	Balau kumus
Malaysia	Damar laut
Malaysia	Selangan batu
Malaysia	Sengkawang
Myanmar	Thitya
Philippines	Gisok
Philippines	Yakal
Thailand	Chan