

Common name:	BANGKIRAI
Family:	DIPTEROCARPACEAE
Scientific name(s):	Shorea glauca* (note) Shorea laevis* (note) Shorea spp.* (note)
Note:	* Shorea sub-genus Eushorea. YELLOW BALAU is usually used for woods imported from Malaysia, BANGKIRAI for woods from Indonesia.

LOG DESCRIPTION		WOOD DESCRIPTION	
Diameter:	from 70 to 90 cm	Colour:	Yellow brown
Thickness of sapwood:	from 2 to 8 cm	Sapwood:	Not clearly demarcated
Floats:	no	Texture:	Medium
Durability in forest :	Good	Grain:	Straight or interlocked
		Interlocked grain:	Slight
Note:	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.		

PHYSICAL PROPERTIES		MECHANICAL PROPERTIES	
Physical and mechanical properties are based on mature heartwood specimens. These properties can vary greatly depending on origin and growth conditions.			
	mean	standard deviation	
Density *:	0.91 g/cm ³		
Monnin hardness*:	7.3	Crushing strength *:	85 MPa
Coef of volumetric shrinkage:	0.68 %	Static bending strength *:	150 MPa
Total tangential shrinkage:	9.5 %	Modulus of elasticity *:	22940 MPa
Total radial shrinkage:	4.2 %		
Fibre saturation point:	23 %		
Stability:	Moderately stable	(* : at 12 % moisture content ; 1 MPa = 1 N/mm ²)	

NATURAL DURABILITY AND TREATABILITY

Fungi and termite resistance refers to end-uses under temperate climate.

Except for special comments on sapwood, natural durability is based on mature heartwood.

Sapwood must always be considered as non-durable against wood degrading agents.

Fungi:	Class 2 - durable	* ensured by natural durability (according EN standards).
Dry wood borers:	Heartwood durable but sapwood not clearly demarcated	
Termites:	Class D - Durable	
Treatability:	4 - not permeable	
Use class*:	4 - in ground or fresh water contact	
Note:	Shorea laevis is listed in the European standard NF EN 350-2. The possible presence of few demarcated sapwood in sawnwood may have an influence on the expected durability. Only Shorea laevis has a good enough natural durability to allow end-uses under use class 5 (end-uses in marine environment or in brackish water). It is due to its high specific gravity and high silica content. According to the European standard NF EN 335, performance length might be modified by the intensity of end-use exposition.	

MAIN LOCAL NAMES

Countries	Local names	Countries	Local names
Indonesia	BALAU	Philippines	GISOK
Indonesia	BANGKIRAI	Philippines	YAKAL
Indonesia	KEDAWANG	Thailand	CHAN
Indonesia	SELANGAN BATU KUMUS		
Indonesia (Sulawesi)	POOTI		
Malaysia (islands)	SELANGAN BATU		
Peninsular Malaysia	BALAU		
Peninsular Malaysia	BALAU KUMUS		
Peninsular Malaysia	DAMAR LAUT		
Peninsular Malaysia	SENGKAWANG		
Myanmar	THITYA		

BANGKIRAI

REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks:	Requires appropriate preservative treatment
In case of temporary humidification risk:	Does not require any preservative treatment
In case of permanent humidification risk:	Does not require any preservative treatment

DRYING

Possible drying schedule

Drying rate:	Slow	Temperature (°C)			Air humidity (%)
		M.C. (%)	dry-bulb	wet-bulb	
Risk of distortion:	Slight risk				
Risk of casehardening:	No				
Risk of checking:	High risk				
Risk of collapse:	No	30	42	41	94
		25	42	39	82
		20	48	43	74
		15	48	43	74

This schedule is given for information only and is applicable to thickness < 38 mm.

It must be used in compliance with the code of practice.

For thickness from 38 to 75 mm , the air relative humidity should be increased by 5 % at each step.

For thickness over 75 mm , a 10 % increase should be considered.

Note: Initial surface drying is recommended prior to kiln drying.

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
Note:	Requires power. Some difficulties due to interlocked grain during planing.

ASSEMBLING

Nailing / Screwing:	Good but pre-boring necessary
Gluing:	Correct (for interior only)
Note:	Tendency to split.

END-USES

Main known end-uses; they must to be implemented according to the code of practice.

Important remark: some end-uses are mentionned for information (traditional, regional or ancient end-uses).

Note: Other possible end-uses: garden furniture.

Sleepers

Ship building (planking and deck)

Bridges (parts in contact with water or ground)

Industrial or heavy flooring

Flooring

Vehicle or container flooring

Heavy carpentry

Bridges (parts not in contact with water or ground)

Cooperage

Hydraulic works (fresh water)

Posts

Exterior joinery

Boxes and crates
