BINTANGOR

Family: CALOPHYLLACEAE (angiosperm)

Scientific name(s): Calophyllum inophyllum
Calophyllum papuanum
Calophyllum parviflorum
Calophyllum vitiense
Calophyllum spp.* (voir note)

Commercial restriction: no commercial restriction

Note: Calophyllum spp.*: origins from Asia-Oceania.

WOOD DESCRIPTION

Color: dark red

Sapwood: clearly demarcated

Texture: medium

Grain: interlocked

Interlocked grain: slight

Note: Wood dark red to brown red or pinkish brown, with darker veins.

LOG DESCRIPTION

Diameter: from 50 to 100 cm

Thickness of sapwood: from 5 to 10 cm

Floats: yes

Log durability: moderate (treatment recommended)

PHYSICAL PROPERTIES

Physical and mechanical properties are based on mature heartwood specimens. These properties can vary greatly depending on origin and growth conditions.

	Mean	Std dev.
Specific gravity *:	0,74	0,11
Monnin hardness *:	5,7	1,5
Coeff. of volumetric shrinkage:	0,52 %	0,08 %
Total tangential shrinkage (TS):	7,7 %	1,4 %
Total radial shrinkage (RS):	5,8 %	1,1 %
TS/RS ratio:	1,3	
Fiber saturation point:	31 %	

Stability: stable

MECHANICAL AND ACOUSTIC PROPERTIES

	Mean	Std dev.
Crushing strength *:	66 MPa	13 MPa
Static bending strength *:	105 MPa	23 MPa
Modulus of elasticity *:	14800 MPa	3224 MPa

(*: at 12% moisture content, with 1 MPa = 1 N/mm²)

Musical quality factor: 107,4 measured at 2217 Hz

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.
E.N. = Euro Norm

Funghi (according to E.N. standards): class 3 - moderately durable

Dry wood borers: durable - sapwood demarcated (risk limited to sapwood)

Termites (according to E.N. standards): class M - moderately durable

Treatability (according to E.N. standards): class 4 - not permeable

Use class ensured by natural durability: class 2 - inside or under cover (dampness possible)

Species covering the use class 5: No

Note: This species is listed in the European standard NF EN 350-2.

REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks: does not require any preservative treatment

In case of risk of temporary humidification: requires appropriate preservative treatment

In case of risk of permanent humidification: use not recommended

DRYING

Drying rate: normal to slow

Risk of distortion: high risk

Risk of casehardening: no

Risk of checking: slight risk

Risk of collapse: yes

Note: Risks of end checks. It is recommended to stack the piles in the alignment of spacer sticks in order to avoid warping.

Possible drying schedule: 6

M.C. (%)	Temperature (°C) dry-bulb	wet-bulb	Air humidity (%)
Green	42	41	94
50	48	43	74
30	54	46	63
20	60	51	62
15	60	51	62

This schedule is given for information only and is applicable to thickness lower or equal to 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.

SAWING AND MACHINING

Blunting effect: normal

Sawteeth recommended: ordinary or alloy steel

Cutting tools: ordinary

Peeling: good

Slicing: nood

Note: Risks of internal stresses. Tendency to woolliness. Filling is recommended to obtain a good finish.

ASSEMBLING

Nailing / screwing: good but pre-boring necessary

Gluing: correct (for interior only)

COMMERCIAL GRADING

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

FIRE SAFETY

Conventional French grading: Thickness > 14 mm : M.3 (moderately inflammable)
Thickness < 14 mm : M.4 (easily inflammable)

Euroclasses grading: D s2 d0
Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

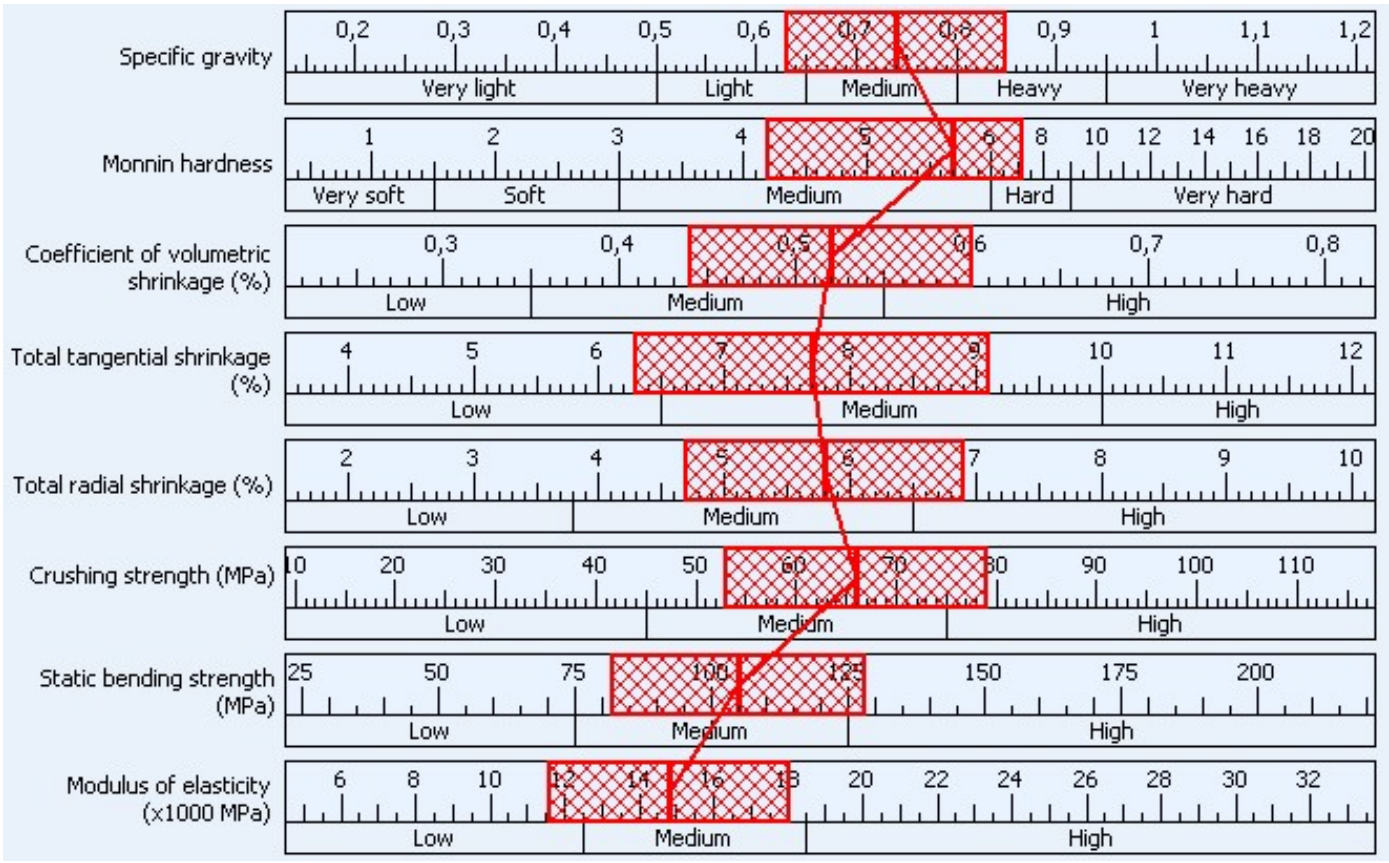
END-USES

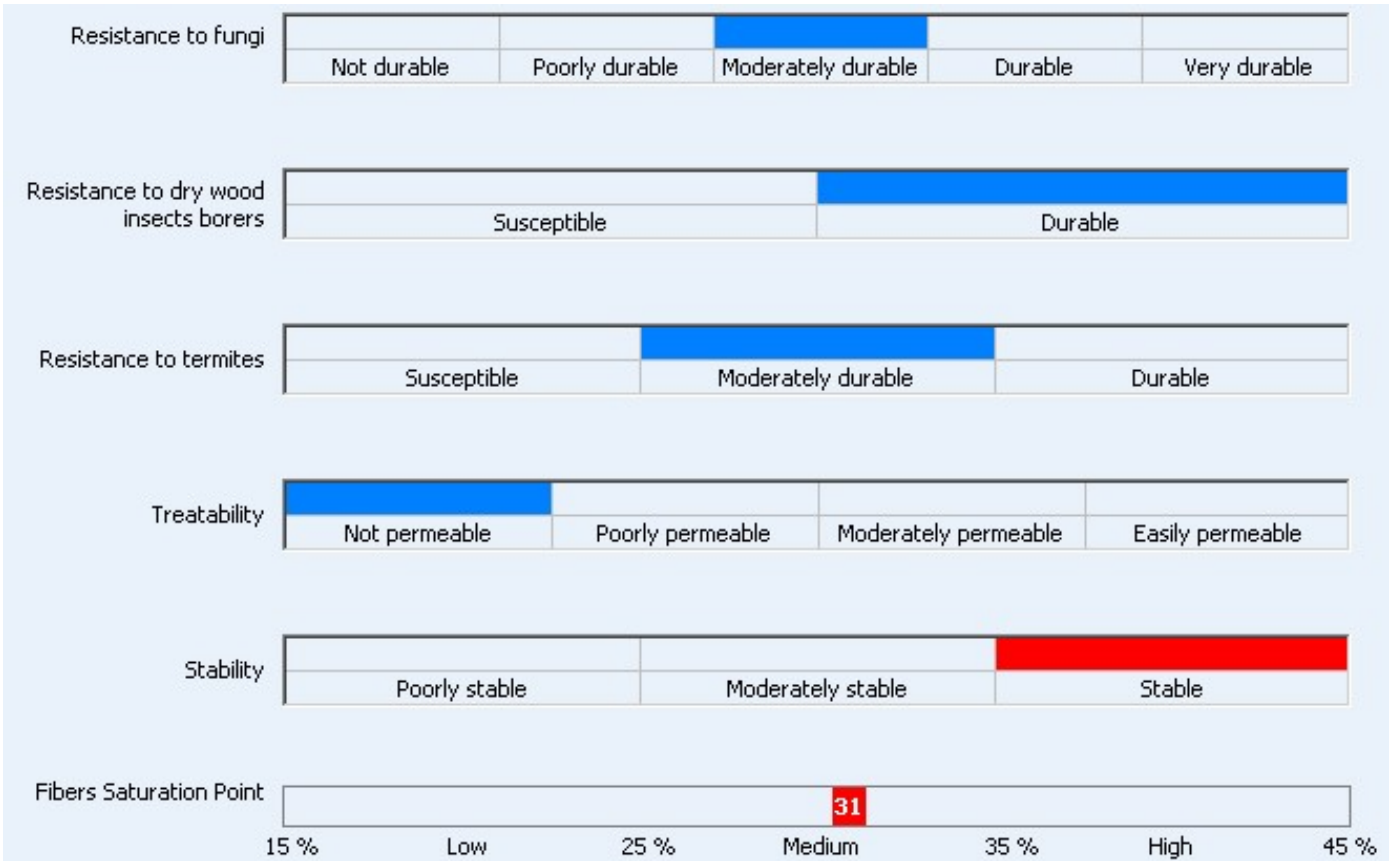
Current furniture or furniture components
Interior panelling
Wood frame house
Ship building (planking and deck)
Flooring
Veneer for back or face of plywood
Formwork
Heavy carpentry
Interior joinery
Sliced veneer
Ship building (ribs)
Exterior joinery
Stairs (inside)
Boxes and crates
Cabinetwork (high class furniture)

Note: Can be used for high class furniture if the grain is not highly interlocked.

MAIN LOCAL NAMES

Country	Local name	Country	Local name
Indonesia	BINTANGUR	Magadascar	VINTANINA
Peninsular Malaysia	PENAGA	Malaysia (islands)	BINTANGOR
Myanmar	SULTAN CHAMPA	Myanmar	THARAPI
New Caledonia	TAMANOU	Papua New Guinea	CALOPHYLLUM
Philippines	BANSANGHAL	Philippines	VUTALAU
Solomon Islands	KOILA	Sri Lanka	DOMBA-GASS
Thailand	KATHING	Thailand	POON
Thailand	TANGHON	Vanuatu	TAMANOU
Vietnam	CONG	Vietnam	MU-U


Specific gravity
0,2 0,3 0,4 0,5 0,6 0,7 0,8 0,9 1 1,1 1,2
Very light
Light
Medium
Heavy
Very heavy
Monnin hardness
1 2 3 4 5 6 8 10 12 14 16 18 20
Very soft
Soft
Medium
Hard
Very hard
Coefficient of volumetric shrinkage (%)
0,3 0,4 0,5 0,6 0,7 0,8
Low
Medium
High
Total tangential shrinkage (%)
4 5 6 7 8 9 10 11 12
Low
Medium
High
Total radial shrinkage (%)
2 3 4 5 6 7 8 9 10
Low
Medium
High
Crushing strength (MPa)
10 20 30 40 50 60 70 80 90 100 110
Low
Medium
High
Static bending strength (MPa)
25 50 75 100 125 150 175 200
Low
Medium
High
Modulus of elasticity (x1000 MPa)
6 8 10 12 14 16 18 20 22 24 26 28 30 32
Low
Medium
High


Resistance to fungi
Not durable
Poorly durable
Moderately durable
Durable
Very durable
Resistance to dry wood insects borers
Susceptible
Durable
Resistance to termites
Susceptible
Moderately durable
Durable
Treatability
Not permeable
Poorly permeable
Moderately permeable
Easily permeable
Stability
Poorly stable
Moderately stable
Stable
Fibers Saturation Point
31
15 %
Low
25 %
Medium
35 %
High
45 %