

Coconut wood

Family. Arecaceae

Botanical Name(s).

Cocos nucifera

Continent. Asia-Oceania

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

Notes. COCONUT TREE is a monocotyledon. The material of the stipe (trunk) is falsely called wood by analogy with Gymnosperms' and Angiosperms' wood. It has neither sapwood nor heartwood. Only the outlying crown has wood characteristics.

Description of logs

Diameter. From 30 to 60 cm

Thickness of sapwood. -

Floats. Pointless

Log durability. Low (treatment necessary)

Description of wood

Colour reference. Red brown

Sapwood. Absent

Texture. Coarse

Grain. Straight to entangled

Interlocked grain. Absent

Notes. Beige to pinkish beige, punctuated with or criss-crossed by red-brown to dark brown fibres, whatever the stock orientation. Proportion of fibre grows from the heart to the outer of the stem.

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	0.90
Monnin hardness ¹	8.3
Coefficient of volumetric shrinkage	0.52 % per %
Total tangential shrinkage (St)	6.1 %
Total radial shrinkage (Sr)	5.6 %
Ratio St/Sr	1.1
Fibre saturation point	23 %
Thermal conductivity (λ)	0.29 W/(m.K)
Lower heating value	18,640 kJ/kg
Crushing strength ¹	60 MPa
Static bending strength ¹	82 MPa



Flat sawn



Flat sawn

Modulus of elasticity ¹	13,800 MPa
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¹ At 12 % moisture content, with 1 MPa = 1 N/mm

Notes. Stem with a very soft and fibrous heart with a great variation of density (along with other properties) from the heart to the periphery (in a ratio of 1 to 5 for density). The material giving the best properties is at the periphery of the stem. This peripheral part has the same end-uses as wood. The indicated values are those of the material taken from this zone.

Natural durability and preservation

Resistance to fungi. Class 5 - not durable

Resistance to dry wood borers. Class S - susceptible (risk in all the wood)

Resistance to termites. Class S - susceptible

Treatability. Class 2-3 - poorly to moderately permeable

Use class ensured by natural durability.

Class 1 - inside (no dampness)

Notes. Durability and permeability to preservative products vary greatly with density: wood is denser at the periphery, more durable but less permeable to preservative products.

Requirement of a preservative treatment

Against dry wood borer. Requires appropriate preservative treatment

In case of temporary humidification. Requires appropriate preservative treatment

In case of permanent humidification. Use not recommended

Drying

Drying rate. Slow

Risk of distorsion. High risk

Risk of casehardening. No known specific risk

Risk of checking. Slight risk

Risk of collapse. Yes

Notes. Risks of collapse is usually localised in the central area.

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. High

Sawteeth recommended. Stellite-tipped

Cutting tools. Tungsten carbide

Peeling. Not recommended or without interest

Slicing. Not recommended or without interest

Notes. Variable density from the heart (< 0,25), which is unusable, to the periphery (> 1). The log turning sawing with unique taking of the peripheral stocks is compulsory to obtain pieces with homogeneous characteristics. The rate of silica may be very high. It is hard to have a careful finish because of the entanglement of the fibres.

Assembling

Nailing and screwing. Good but pre-boring necessary

Notes. High specific gravity: gluing must be especially performed in compliance with the code of practice.

Commercial grading

Appearance grading for sawn timbers.

Grading according to final uses.

Visual grading for structural applications

No visual grading for structural applications.

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

- Blockboard
- Cabinetwork (high class furniture)
- Current furniture or furniture components
- Flooring
- Industrial or heavy flooring
- Insulation
- Interior joinery
- Interior panelling
- Light carpentry
- Shingles
- Turned goods
- Wood-ware

Notes. Only the heart, very soft and very fibrous, can be used for insulation.



Coconut sheathing on ceiling frame (*Pinus caribaea*) (New Caledonia).

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Main local names

Country	Local name
Brazil	Coqueiro
France (importated tropical timber)	Cocotier
Gabon	Mbanga
Indonesia	Kelapa
Malaysia	Kelapa
Mexico	Cocotero
Philippines	Niog
Portugal (importated tropical timber)	Coqueiro
Spain (importated tropical timber)	Cocotero
United Kingdom (importated tropical timber)	Coconut
United States of America (importated tropical timber)	Coconut
United States of America (importated tropical timber)	Coconut wood
Viet Nam	Dua