

## Teak

Family. Lamiaceae

Botanical Name(s).

*Tectona grandis*

Continent. Asia-Oceania

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

Notes. Native to South-East Asia, this species has been widely planted throughout the tropical and subtropical world.

### Description of logs

Diameter. From 50 to 100 cm

Thickness of sapwood. From 2 to 6 cm

Floats. No

Log durability. Good

### Description of wood

Colour reference. Yellow brown

Sapwood. Clearly demarcated

Texture. Coarse

Grain. Straight

Interlocked grain. Absent

Notes. The wood darkens and presents golden glints with age. Sometimes black brown veins. Oily to the touch.

### 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 <sup>1</sup>	0.67
Monnin hardness <sup>1</sup>	4.2
Coefficient of volumetric shrinkage	0.34 % per %
Total tangential shrinkage (St)	4.7 %
Total radial shrinkage (Sr)	2.6 %
Ratio St/Sr	1.8
Fibre saturation point	24 %
Thermal conductivity (λ)	0.22 W/(m.K)
Lower heating value	19,270 kJ/kg
Crushing strength <sup>1</sup>	56 MPa
Static bending strength <sup>1</sup>	98 MPa
Modulus of elasticity <sup>1</sup>	13,740 MPa

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



Half-quarter sawn



Flat sawn

**Notes.** The physical and mechanical properties of timbers grown in plantation or in natural forest are most often similar.

## Natural durability and preservation

**Resistance to fungi.** Class 1 to 3 - very durable to moderately durable (according to origin and age of the stands)

**Resistance to dry wood borers.** Class D - durable (sapwood demarcated, risk limited to sapwood)

**Resistance to termites.** Class M - moderately durable

**Treatability.** Class 3-4 - poorly or not permeable

**Use class ensured by natural durability.**

Class 3 (not in ground contact, outside) to class 4 (in ground or fresh water contact), according to origin

**Notes.** Nowadays, almost all Teak wood sold on the market comes from plantations. The durability of plantation-grown teak varies greatly compared to that of natural forest teak, which is generally highly resistant to attack by fungi and insects. Depending on tree age and origin, plantation Teak is moderately to highly resistant to decay fungi, and not resistant to termites. In that respect, some mature plantation Teak from Indonesia, Costa Rica and other plantation regions have a natural durability equivalent to that of natural forest Teak. This species is mentioned in standard NF EN 350 (2016), which distinguishes between Asian Teak (implied to be natural forest, although this species is also planted in Asia) and African plantation Teak (although Teak is also planted on other tropical continents). Whatever the origin of the wood, its performance length might be modified by the intensity of end-use exposition (as described in NF EN 335 of May 2013). This species naturally covers the use class 5 (wood permanently or regularly submerged in salt water, sea water or brackish water) due to its high silica content.

## Requirement of a preservative treatment

**Against dry wood borer.** Does not require any preservative treatment

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

**In case of permanent humidification.** Does not require any preservative treatment (when class 1 or 2 for natural resistance to fungi)

## Drying

**Drying rate.** Slow

**Risk of distorsion.** No risk or very slight risk

**Risk of casehardening.** No known specific risk

**Risk of checking.** No risk or very slight risk

**Risk of collapse.** No known specific risk

**Notes.** The drying rate may vary from one board to other by reason of the specific gravity and the important differences of moisture content when green.

**Suggested drying program.**

Phases	Duration (H)	MC (%) probes	T (°C)	Rh (%)	UGL (%)
Prewarm 1		> 50	50	87	17.0
Prewarm 2	4	> 50	50	86	16.5
Drying		> 50	53	83	15.2
		50 - 40	53	80.0	14.1
		40 - 35	54	80.0	13.9
		35 - 30	55	75.0	12.5
		30 - 27	57	70.0	11.0
		27 - 24	58	61.0	9.4
		24 - 21	59	51.0	7.9
		21 - 18	60	47.0	7.3
		18 - 15	61	39.0	6.1
		15 - 12	62	35.0	5.6
		12 - 9	62	30.0	5.0
		9 - 6	62	26.0	4.4
Conditioning	8		55	(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. Good

Notes. Variable silica content. Sawdust may cause skin irritations.

## Assembling

Nailing and screwing. Good but pre-boring necessary

Notes. Pre-boring recommended due to a slight tendency to split when nailing. Satisfactory gluing on surfaces freshly machined or sanded just before application of the adhesive (the wood contains oleoresins).

## Commercial grading

Appearance grading for sawn timbers.

Plantation teak producers offer different grading rules for sawn timber. In this respect, Latin American producers offer 5 choices: Premium grade, AB grade, B/B grade, B/C grade, C grade.

Visual grading for structural applications

According to European standard EN 1912 (2012) and associated national standards, strength class D40 can be provided by visual grading. Strength class D30 can also be provided by visual grading according to French standard NF B 52-001-1 (2018).

## 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

- Arched goods
- Bridges (parts in contact with water or ground)
- Bridges (parts not in contact with water or ground)
- Cabinetwork (high class furniture)
- Cooperage
- Decking
- Exterior joinery
- Exterior panelling
- Flooring
- Indoor staircases
- Interior joinery
- Interior panelling
- Light carpentry
- Open boats
- Poles
- Rolling shutters
- Ship building (planking and deck)
- Sliced veneer
- Stakes
- Turned goods

**Notes.** The end-uses mentioned depend on the level of natural durability of the wood (see note above under "Natural durability and preservation").



U Bein Bridge: the longest teakwood bridge in the world. It is 1.2 km long and was built in 1849 with timber reclaimed from a former royal palace - Mandalay, Burma.

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## Main local names

<b>Country</b>	<b>Local name</b>
Brazil	Teca
Costa Rica	Teca
Côte d'Ivoire	Teck
France (importated tropical timber)	Teck
Germany (importated tropical timber)	Java teak
Germany (importated tropical timber)	Teak
Ghana	Teak
India	Sagwan
India	Teak
Indonesia	Jati
Indonesia	Tek
Italia (importated tropical timber)	Teck
Laos	May sak
Myanmar	Kyun
Netherlands (importated tropical timber)	Teak
Spain (importated tropical timber)	Teca
Thailand	May sak
Thailand	Teak
Togo	Teck
United Kingdom (importated tropical timber)	Teak
Viet Nam	Giati