

TEAK PROPERTIES



BOTANICAL NAME : Tectona Grandis

FAMILY : Lamiaceae

KINGDOM : Plantae

ORDO : Lamiales

Distribution : Asia

Other Names : Sagwan, Jati, May sak, Giati, Teck, Javateak

HABITUS

Teak tree (*Tectona grandis* sp.) Can grow large for 40-45 meters and a diameter of 1.8-2.4 meters. However, teak trees reach an average height of 9-11 meters, with a diameter of 0.9-1.5 meters. Teak trees that are considered good are trees with large stripes, straight trunk, and few branches. The best teak wood from 80 years.

GENERAL CHARACTERISTICS

Tree

Tree height can reach 50 meters with \emptyset up to 1.2 meters. The ideal age for teak trees to get the best quality is above 40 years. The growth speed of teak trees is relatively slow so that the wood density is better. To obtain \emptyset 40 cm, a minimum of 50 years of growth is needed.

Wood color

Dark brown and gold on the wood terrace. Parts of sapwood are creamy or even brownish white. In some types of teak wood there is a reddish color when it has just been cleaved. After a long time in the open air and especially in the sun, the color will turn light brown.

Density

at MC level, an average of 12%, the density of teak wood is in the range of 700 - 930 kg / m³.

Color:	yellow brown
Sapwood:	clearly demarcated
Texture:	coarse
Grain:	straight
Interlocked grain:	absent
Note:	The wood darkens and presents golden glints with age. Sometimes black brown veins. Oily to the touch

STRUCTURE

Teak consists mostly of vessel cells whose length is parallel to the long stem. These cells are composed of cellulose and are bound together by a cementing material called lignin. The direction of the long axis is referred to as the direction of wood fiber and it is important to know, because the nature of wood parallel to the fiber is very different from that which is perpendicular to the fiber.

PHYSICAL, MECHANICAL AND ACOUSTIC PROPERTIES

Specific gravity *:	0,67
Monnin hardness *:	4,2
Coeff. of volumetric shrinkage:	0,34%
Total tangential shrinkage (TS):	4,70%
Total radial shrinkage (RS):	2,60%
TS/RS ratio:	1,8
Fiber saturation point:	24%
Stability:	stable
Crushing strength*:	56 MPa
Static bending strength*:	98 MPa
Modulus of elasticity*:	13740 MPa

CHEMICAL PROPERTIES

Long rotation teak has no juvenile wood and has higher core wood content compared to short rotational teak. the content of cellulose and cellulose in teak wood core aged 50-70 years were 57.5 and 44.6%, respectively.

content contained in sapwood (holocellulose 56.2% and cellulose 43.7%), while the lignin content is more or less similar (32.2% in core wood and 32.4% in sapwood).

DURABILITY AND TREATABILITY

Funghi (according to E.N. standards):	class 1 - very 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 4 - in ground or fresh water contact
Species covering the use class 5:	Yes
Note:	The durability of teak wood from plantation is much lower than that of the teak from natural forest. It is moderately resistant to fungi and classified as sensible to durable against termites. This species is listed in the standard NF EN 350-2 which makes a difference between the Teak from Asia (meaning natural forest) and the teak planted in Asia and other countries; the first one is classified in the natural durability class 1 towards fungi and in natural durability class M towards termites; the second is in the natural durability class 1-3 towards fungi and in natural durability class M-S towards termites. The use class mentioned in Tropix is given for teak from natural forest. According to the European standard NF EN 335, performance length might be modified by the intensity of end-use exposition. This species naturally covers the use class 5 (end-uses in marine environment or in brackish water) due to its high silica content.

SAWING, MACHINING AND ASSEMBLING

Blunting effect:	high
Sawteeth recommended:	stellite-tipped
Cutting tools:	tungsten carbide
Peeling:	not recommended or without interest
Slicing:	nood
Note:	Variable silica content. Sawdust may cause skin irritations.
Nailing / screwing:	good but pre-boring necessary
Gluing:	correct
Note:	Pre-boring recommended due to a slight tendency to split when nailing. Satisfactory gluing on surfaces freshly machined or sanded (the wood contains oleoresins).

SILVICULTURES

HABITAT

It grows in dry climates, with the characteristics of the soil rather wet, rainfall between 1500 - 2000 mm per year with an average temperature of 27 ° - 36 ° C. Many are found in the forests Asia and of Central Java, East Java, Bali Island, Muna Island, Nusa Tenggara, Madura, Sumbawa, Sulawesi, and many more.

REGENERATION

Teak is a deciduous tree with an average height and DBH (diameter at breast height) of 20 to 35 meter and 29 to 54 cm in 50 years, respectively, often fluted near the base and pale brown and grey in colour. The giant teak tree in Thailand is 3.2 meters in DBH and 46 meters in height, while the largest standing teak tree is in the Baw Forest Reserve of Myanmar measuring 2.4 m in DBH and 46 m in height, and in India the largest teak tree (40 m tall and 2.1 m DBH) is available at Parambikulam, Kerala. It has been reported that teak can grow upto 500 year

FRUITING

Fruit is a drupe, globose, 5 to 20 mm in size, enclosed by an accrescent calyx with thick shaggy exocarp of matted hairs, epicarp inflated, spongy, and staellate pubes-cent, endocarp stony, 4-celled, seeds 1-4, oblong and exalbuminous. The fruits ripen from November to January and fall gradually, some remaining on the tree throughout the hot season. The fruits are yellowish and brownish in colour and the number varies from 1150 to 2800 per kg. Fruits in moist areas are heavy compared to drier areas.

PESTS AND DISEASES

The teak defoliators of *Hyblaea puera* and *Eutectona machaeralis* commonly known as teak skeletonizer are the main teak pests. *Puera* eats tender leaves during the early part of the growing season and *E. machaeralis* eats older leaves towards the end of the season. When younger plantations are infested, deforestation by these pests can cause 44 percent loss of potential increase in volume. Different morphological, physiological and biochemical differences are found in relationships with varying degrees of vulnerability, tolerance and resistance. Other pests include *Alctrogystia cadambae* tree borer, flower and seed feeders, sap suckers, root and bark feeders, bile forming and underage leaves.

Data are from romealegnami.com, id.wikipedia.org , Bath K.M., Priya P.B., Rugmini P. (2001) Characterisation of juvenile wood in teak. Wood , Science and Technology v. 34, 517 - 532, European standard EN 113.(1996) Wood preservatives, researchgate.net.