

Teak

(*Tectona grandis*)



Common Names:

Burma teak, Rosawa, Djati, Sagon, Genuine teak, Sagwan, Gia thi, Tadi



Mechanical Values

Category	Green	Dry	Units
Weight	51	40	lbs/cu.ft.
Density (air-dry)		40	lbs/cu.ft.
Specific Gravity	0.53	0.59	
Hardness		1000	lbs
Stiffness	1408	1543	1000 psi
Bending Strength	10975	13710	psi
Shearing Strength		1890	psi
Max. Crushing Strength	5543	7605	psi
Work to Maximum Load	13	12	in-lbs/in ³
Radial Shrinkage (G->OD)		3	%
Tangential Shrink. (G->OD)		6	%
Volumetric Shrink (G->OD)		7	%

Environmental Profile

This species is reported to be relatively secure, with little or no threat to its population within its natural growth range (Source - World Conservation Monitoring Center - 1992).

Distribution

Teak is reported to be indigenous to India, Burma, Thailand, Indochina and Java, but it has been extensively planted for timber or as an ornamental within its natural range and throughout the tropical regions of the world, including East and West Africa, the West Indies, from Cuba and Jamaica to Trinidad, and from Panama to Brazil. It is also grown in southern Florida. The species has also been cultivated experimentally or at low elevations in Puerto Rico.

Product Sources

Some materials (semi-finished or finished products) from this species are reported to be available from environmentally responsible or sustainably managed sources. Although it is higher in price than most other imports, Teak is reported to be available in veneer and lumber forms. Its consumption on the United States market is reported to be rather tiny compared to other domestic hardwoods. The wood is reported to be offered as an expensive option by many US shipbuilders, with most imports originating from Burma, which is reported to be the source of Teak with superior and the most desirable qualities. Good quality teak is reported to be difficult to acquire, and imports are usually in transit for about two months. Although US importers usually have some in stock, orders for the timber are reported to be slow to fill and can take up to a year. The following species in the database have been suggested as potential substitutes for Teak: Afrormosia (*Pericopsis elata*), Kindal (*Terminalia paniculata*), Iroko (*Chlorophora excelsa* , *C. regia*), Freijo (*Cordia goeldiana*) for shipbuilding, Itauba (*Mezilaurus navalium*). The following species in the database are reported to be similar in properties to Teak: Courbaril (*Hymanaea courbaril*), Andaman padauk (*Pterocarpus dalbergioides*), Yellow sanders (*Buchenavia capitata*), Indian white cedar (*Dysoxylum malabaricum*). The following species is reported to be superior in strength properties to Teak: Burma padauk (*Pterocarpus macrocarpus*)

Tree Data

Teak trees are reported to attain heights of 130 to 150 feet (39 to 45 m) under favorable conditions. Stems are reported to be often clear of branches to 80 to 90 feet (24 to 27 m) high. Trunk diameters are reported to be often from 36 to 60 inches (90 to 150 cm), and older trees are typically fluted and buttressed. Plantation trees are reported to grow to heights of 150 feet (45 m), and can be ready for harvesting after only 60 years. Teak logs are reported to be very heavy, and are rather difficult to transport. Standing trees are sometimes girdled and left to stand for two to eight years before they are harvested. This practice is reported to allow moisture in the tree to dissipate, and hence make the logs less heavy and easier to transport. Sawdust from machining operations is reported to cause skin irritation in some individuals. The timber is reported to be resistant to water and numerous chemical reagents, including acids, and will not cause rust or corrosion when it comes in contact with metals. The timber is siliceous. Amount is reported to vary, but may be up to 1.4% (of oven-dry weight). Silica level of 0.05% is considered to be enough to affect the machining properties of wood.

Sapwood Color

The clearly demarcated sapwood is white to pale yellow in color.

Heartwood Color

The heartwood in its purest form, is a uniform dark golden-brown, without markings. But most other heartwood found in this species is dark golden yellow, which turns into rich brown with darker, chocolate-brown markings upon exposure. There is moderate to high color variation between boards.

Grain

The grain is generally straight, but occasionally wavy.

Texture

Texture is coarse and uneven. The wood is somewhat greasy and may contain white shiny deposits.

Odor

Freshly-milled wood is reported to have an odor similar to that of leather, but there is no distinctive taste.

Ease of Drying

The wood is reported to dry well, but slowly.

Drying Defects

Large variations in drying rates may occur. The wood may also change color temporarily upon kiln drying.

Movement in Service

Seasoned wood is reported to have very good dimensional stability, and retains its shape well after manufacture.

Natural Durability

Natural resistance to attack by decay fungi and termites is reported to be very high in the heartwood, and teak's resinous oil is reported to act as a natural insect repellent. The sapwood is susceptible to attack by powder-post beetles.

Resistance to Impregnation

The heartwood is reported to be extremely resistant to preservative treatment. The sapwood also has low permeability, but the wood has a high natural resistance to decay which tends to offset its poor response to preservative treatment.

Blunting

The wood exerts severe blunting effect on cutting edges. Tungsten carbide-tipped cutters are recommended.

Resistance to Cutting

The wood is fairly difficult to saw and tungsten-carbide cutting tools are recommended.

Planning

Cutting angles should be reduced to 20 degrees for best results.

Turning

The material is moderately easy to turn, but cutters tend to dull rapidly and severely.

Boring

Boring operations are reported to be fairly easy, but cutting edges may dull rapidly.

Routing and Recessing

Routing properties are reported to be moderately easy, but cutting edges dull rapidly.

Mortising

The material responds well to sharp cutters in mortising operations.

Moulding

Carving

Moulding properties are reported to be generally good. The material is reported to carve well.

Gluing

Freshly sanded or planed surfaces are reported to be fairly easy to glue.

Nailing

Screwing

Pre-boring is recommended in nailing. Pre-boring is recommended in screwing.

Sanding

Sanding qualities are reported to be generally good, but abrasives tend to be clogged. Frequent sandpaper changes are usually necessary.

Polishing

The wood has satisfactory polishing properties.

Staining

The wood takes stain well, but natural oils in the wood may interfere with adhesion and drying of some finishes. Removing surface resins with a solvent that is compatible with the finish to be used is suggested to reduce the wood's tendency to repel finish coats.

Painting

The wood has fairly good painting properties. (See notes under 'Staining').

Steam Bending

Steam bending properties are rated as moderate.

Response to Hand Tools

The wood responds well to hand tools but cutting edges should be kept very sharp.

Strength Properties

Teak has high bending strength in the air-dry condition (about 12 percent moisture content). It compares favorably with American oak (*Quercus*), which also has high bending strength. Compression strength parallel to grain in the air-dry condition is also high. Hardness is rated as medium, and weight and density are high.