

# Material Comparison



**Hevea Brasiliensis**



**Northern Red Oak**

Color	Pale Cream to yellowish brown.	Pinkish reddish brown
Grain Pattern	Mostly straight. A cross section of Rubberwood shows few concentric markings reminiscent of growth rings. These markings combined with the large vessels in structure give an attractive appearance with clear patterns on the longitudinal surface.	Mostly straight-grained, with a coarse texture. Small rays.
Working Properties	Easy to saw, machine, plane, turn and bore. Easy to finish due to smooth surface. Nail and screw holding is equal to hardwood. As a member of the maple family, rubberwood has a dense grain character that is easily controlled in the kiln drying process. Rubberwood has very little shrinkage.	Machines well, nailing and screwing are good although pre-boring is recommended, and it can be stained and polished to a good finish. It dries slowly with a tendency to split and warp. It has a high shrinkage and can be susceptible to movement in performance.
Density (at 12% m.c.)	600 - 650 kg/m <sup>3</sup>	680 kg/m <sup>3</sup>
Relative Density	0.63 - 0.66	0.52 - 0.69
Volume Shrinkage	Radial: 1% Tangential: 1.4%	Radial: 4% Tangential: 8.6%
Nail Holding	Average of Radial Tangential value: 91kg	Average of Radial Tangential value: 99kg
Screw Holding	Average of Radial Tangential value: 267kg	Average of Radial Tangential value: 251kg
Compression Strength	Parallel: 4641 lbf/in <sup>2</sup> Perpendicular: 680 lbf/in <sup>2</sup>	Parallel: 3000 - 8740 lbf/in <sup>2</sup> Perpendicular: 550 - 1250 lbf/in <sup>2</sup>
Bending Strength	9572 lbf/in <sup>2</sup>	7400 - 18100 lbf/in <sup>2</sup>
Sheer Parallel to Grain	1595 lbf/in <sup>2</sup>	930 - 2080 lbf/in <sup>2</sup>
Modulus of Elasticity	1.34 (10 6 lbf/in <sup>2</sup> )	1.14 - 2.28 (10 6 lbf/in <sup>2</sup> )
Hardness	975 lbf	860 - 1510 lbf
Environmental Status	Eco-Friendly Timber: Rubberwood is the most ecologically "friendly" lumber used in today's furniture industry. After the economic life of the rubber tree, which is generally 26-30 years, the latex yields become extremely low and the planters then fell the rubber trees and plant new ones. So, unlike other woods that are cut down for the sole purpose of producing furniture, rubberwood is used only after it completes its latex producing cycle and dies. This wood is therefore eco-friendly in the sense that we are now using what was going as waste.	The gradual reductions in use of old-growth forests in the US has reduced the supply of large clear logs for lumber and veneer. Wood consumption, production, supply and demand is monitored by the Forests Products Laboratory.

## Sources

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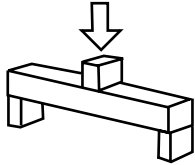
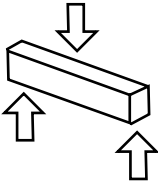
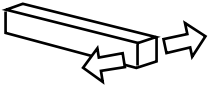
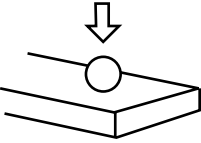
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WOOD SPECIES	Modulus of Rupture	Modulus of Elasticity	Impact Bending	Compression - Perpendicular to grain	Shear - Parallel to grain	Tension - Perpendicular to grain	Side Impact Hardness
OAK	10,300	1,300,000	29	1,200	1,800	680	1,300
MAPLE	15,800	1,830,000	39	1,400	2,300	600	1,400
TEAK	14,600	1,580,000	not avail	1,400	1,800	820	1,000
RUBBER WOOD	10,750	1,166,000	46	1,400	1,600	790	1,200
unit of measure	lb/in <sup>2</sup>	lb/in <sup>2</sup>	inches	lb/in <sup>2</sup>	lb/in <sup>2</sup>	lb/in <sup>2</sup>	lbs.
Rubber wood Comparison to Oak	comparable	comparable	better	better	comparable	better	comparable
Information	Modulus of Rupture is a standardized industry measurement that measures load carrying capacity before the wood ruptures. A larger number is better.	Modulus of Elasticity - Value is measured parallel to the grain, showing the ratio of stress to strain.	Impact Bending is a measurement of the material's overall strength. Standardized measurements is the height from which a 50 lb. hammer is dropped to cause failure of the sample. A larger number is better.	Compression - Perpendicular to Grain is a standardized industry measurement that measures fiber strength. A larger number is better.	Shear - Parallel to Grain is a standardized industry measurement that measures grain strength. A larger number is better.	Tension - Perpendicular to Grain is a standardized industry measurement of maximum tensile strength. A larger number is better.	Side Impact Hardness is a standardized industry measurement that measures impact resistance. A larger number is better.
							

### SUMMARY

In all of the standardized industry measurements above, Rubberwood performs comparable to Oak in all cases and better than Oak in some cases.

### Information sources:

- 1.) <http://www.fpl.fs.fed.us/documnts/FPLGTR/fplgtr113/Ch04.pdf>
- 2.) <http://rubberboard.org.in/ManageRubberWood.asp>