



### American White Oak (Quercus Bicolor)

<b>Botanical Name:</b>	Quercus bicolor
<b>Other Common Names:</b>	Cucharillo, Encino, Encino negro, Mamecillo, Oak, Roble, Roble amarillo, Roble colorado, Roble encino, Roblecito, Swamp white Oak, White oak
<b>Common Uses:</b>	Cooperages, Flooring, Fuelwood, Mine timbers, Piling, Poles, Posts, Railroad ties, Veneer, Core Stock, Crossties, Decorative veneer, Domestic flooring, Factory flooring, Figured veneer, Foundation posts, Parquet flooring, Pile-driver cushions, Plain veneer, Stakes, Sub-flooring, Utility poles
<b>Region:</b>	North America
<b>Country:</b>	Canada, United States
<b>Distribution:</b>	The species is found in Ontario, Quebec, Alabama, Connecticut, Iowa, Indiana, Kentucky, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, North Carolina, Delaware, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Tennessee Valley, Illinois, Virginia, Vermont, Wisconsin, and West Virginia. It usually grows in wet soils of lowlands, including stream borders, flood plains, and swamps that are subject to flooding. It is often found in mixed forests.

### Numerical Values for: Quercus bicolor

<u>Category</u>	<u>Green</u>	<u>Dry</u>	<u>Unit</u>
Bending Strength	10200	17455	psi
Crushing Strength (Perp.)	760	1190	psi
Max. Crushing Strength	4780	8360	psi
Static Bending (FSPL)		9529	psi
Impact Strength	50	49	inches
Stiffness	1810	2049	1000 psi

Work to Maximum Load	14	19	in-lbs/in <sup>3</sup>
Hardness		1620	lbs
Shearing Strength		2000	psi
Specific Gravity	0.64	0.71	
Weight	63	45	lbs/cu.ft.
Radial Shrinkage (G->OD)		5	%
Tangential Shrink. (G->OD)		9	%
Volumetric Shrink. (G->OD)		16	%

### Tree & Wood Descriptions for: *Quercus bicolor*

Product Sources	<p>It is not known at present whether some material from this species is obtainable from sustainably managed, salvaged, recycled, or other environmentally responsible sources.</p> <p>Various species in the white oak group are mixed and marketed together. Supplies are reported to be abundant, especially in the form of veneers, at moderate prices.</p>
Tree Data	The tree is typically large and attains a height of about 60 to 70 feet (18 to 21 m) and a diameter of 24 to 36 inches (60 to 90 cm) when fully grown.
Sapwood Color	The sapwood is whitish to light brown in color, and is variable in width.
Heartwood Color	The heartwood varies in color from light tan or pale yellow brown to pale or dark brown. The wood may also have a pinkish tinge. Color and grain variation among boards are reported to be considerable, but it is lesser than in red oak.
Grain	Grain is typically open, with longer rays than red oak. Quartered veneers are flake figured, while the very popular straight-line figure is prominent in rift-cut veneer.
Texture	The wood is medium to coarse textured.
Odor	There is no distinctive odor or taste.
Natural Durability	Heartwood resistance to decay is reported to be exceptionally high in white oaks. Logs are reported to be susceptible to severe attack by ambrosia beetles, and standing trees and logs are also readily attacked by forest longhorn or Butrespid

	<p>beetles.</p> <p><b>Resistance to Impregnation</b>  White oak heartwood is reported to have exceptionally poor response to treatment with preservatives. Sapwood has moderate resistance to impregnation. High natural resistance to decay allows the heartwood to be used outdoors without chemical protection.</p>
Resistance to Abrasion	White oak timbers are reported to have exceptional resistance to wear which makes them highly suitable for applications such as flooring in heavy traffic areas.
Chemical Staining	Tannin in white oak is reported to react with iron and iron compounds in the presence of moisture to produce blue-black stains in the wood.
Effect on Metals	Metals used with white oak timber should be painted or galvanized to prevent corrosion. White oak is somewhat acidic and is reported to promote corrosion in iron and steel under damp conditions. Vapors from timber in the green condition may also corrode other metals, such as lead.
Strength Properties	White oaks are reported to have moderate bending and crushing strengths, with low stiffness. Their machining properties are reported to be dictated by the rate of growth of the trees: trees that grow slowly tend to be relatively easier to work with hand and machine tools. Faster grown southern trees are reported to produce wood that is harder than wood from slower growing Appalachian trees. White oak is widely used for vats and casks for holding liquids such as wine and spirits because it is highly impermeable to liquids.

### Working Properties for: *Quercus bicolor*

Blunting Effect	The wood has moderate blunting effect on cutting tools.
Cutting Resistance	Cutting resistance is reported to be generally medium but is variable. Cross-cutting and narrow-bandsawing are reported to be satisfactory.
Planing	Machining characteristics of white oak timbers are reported to vary with species and rate of growth. Softer timber from slow-growth trees are reported to be generally easier to work. Planing properties are rated as good, but a cutting angle of 20 degrees has been recommended.
Turning	The material is reported to respond very well to ordinary machine tools to yield clean surfaces in turning operations.

Boring	Boring qualities are rated as very good, and bored surfaces are usually clean and smooth.
Mortising	The material is reported to have very good mortising characteristics.
Gluing	The wood has satisfactory gluing qualities, but it is reported to be sometimes difficult.
Nailing	Pre-boring is recommended in nailing, since the wood is hard.
Screwing	Screwing qualities are reported to be good.
Sanding	The wood responds well to sanding.
Staining	Reaction between tannins and liquid from some products, especially those with high water content such as bleach and water-based finishes, may turn the wood green or brown.
Steam Bending	White oak timbers are reported to have exceptional steam bending qualities, and defect free material is reported to bend to very small radius of curvature. Proper precautions should be taken to prevent chemical staining of steamed wood in contact with iron or steel.
Response to Hand Tools	Timber from slow-growth white oak trees are reported to be softer and are easier to work with hand tools.

### **Drying for: *Quercus bicolor***

Ease of Drying	The material is reported to dry slowly.
Drying Defects	Drying defects that may occur in this species include end- and surface-checks, iron stains, ring failure, collapse, gray sapwood stain, and honeycomb.
Kiln Schedules	Upland T4 - C2 (4/4); T3 - C1 (8/4) US Lowland T2 - C1 (4/4) US Schedule C - United Kingdom

#### Movement in Service

Dimensional stability of seasoned timber is reported to be moderate, and the wood is reported to exhibit medium movement in use.

T/R Ratio

1.74

This indicator is more meaningful if it is used together with other drying information and actual shrinkage data in the tangential and radial directions. (Refer to the Numerical Values window).

*Credits for information:*

*Woodworkersource.com*