



American White Oak (Quercus Alba)

Common Name:	White Oak
Botanical Name:	Quercus alba
Other Common Names:	Arizona oak, Arizona white oak, Cucharillo, Encino, Encino negro, Mamecillo, Oak, Roble, Roble amarillo, Roble colorado, Roble encino, Roblecito, White oak, Stave oak
Common Uses:	Domestic flooring, Exterior trim & siding, Exterior uses, Factory flooring, Figured veneer, Flooring, Furniture components, Furniture squares or stock, Interior construction, Interior trim, Light construction, Millwork, Moldings, Office furniture, Paneling , Parquet flooring, Railroad ties, Shakes, Sheathing, Shingles, Siding, Stair rails, Stairworks, Sub-flooring, Trimming, Veneer, Building materials, Cabinetmaking, Ceiling, Crossties, Decorative veneer
Region:	North America
Country:	Canada, United States
Distribution:	The geographical distribution of the White oaks, which include White oak (Q. alba), Chestnut oak (Q. prinus), Chingkapin oak (Q. muehlenbergii), Swamp chestnut oak (Q. michauxii), Swamp white oak (Q. bicolor), Bur oak (Q. macrocarpa), Post oak (Q. stellata), California white oak (Q. lobata), and Oregon white oak (Q. garryana), in North America is reported to include Ontario, Quebec, Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, Mississippi, North Carolina, Great Smoky Mountain National Park, Iowa, Illinois, Nebraska, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, Vermont, Wisconsin, and West Virginia. It is usually found in pure stands and prefers moist, well-drained upland and lowland areas.

Numerical Values for: Quercus alba

<u>Category</u>	<u>Green</u>	<u>Dry</u>	<u>Unit</u>
Bending Strength	8300	15200	psi

Crushing Strength (Perp.)	670	1070	psi
Max. Crushing Strength	3560	7440	psi
Static Bending (FSPL)	3700	4800	psi
Impact Strength	42	37	inches
Stiffness	1250	1780	1000 psi
Work to Maximum Load	12	15	in-lbs/in ³
Hardness		1360	lbs
Shearing Strength		2000	psi
Specific Gravity	0.60	0.68	
Weight	63	47	lbs/cu.ft.
Radial Shrinkage (G->OD)		6	%
Tangential Shrink. (G->OD)		11	%
Volumetric Shrink. (G->OD)		16	%

Tree & Wood Descriptions for: *Quercus alba*

Product Sources

Some material from this species is reported to be available from environmentally responsible sources.

Although commercial white oak consists of several species in the white oak group, *Q. alba* is reported to be the primary and most important source of timber in the group. White oak veneers are reported to be plentiful, and supplies of lumber are also abundant. Price of lumber is reported to be moderate, compared to other hardwoods.

Tree Data

The mature tree usually attains a height of 80 to 100 feet (34 to 30 m) and a diameter of 36 to 48 inches (90 to 120 cm).

Sapwood Color

The sapwood is whitish to light brown in color, and is variable in width.

Heartwood Color

The heartwood is variable in color, and ranges from light tan or pale yellow brown to pale or dark brown. The wood may also have a pinkish tinge. Variations in color and grain are reported to be considerable, but not as pronounced as in red oak.

Grain

The grain is described as open, with rays that are longer than those in red oak. There are occasional crotches, swirls and burls, and plainswan boards have plumed or flare-grained appearance. The grain pattern is tighter, and figuring is usually lower in riftsawn lumber. Quartersawn material often have a flake pattern which are

	sometimes referred to as tiger rays or butterflies.
Texture	The wood is medium to coarse textured.
Odor	There is no distinctive odor or taste.
Movement in Service	Dimensional stability of seasoned timber is reported to be moderate, and the wood is reported to exhibit medium movement in use.
Natural Durability	<p>Heartwood resistance to decay is reported to be 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 beetles.</p> <p>Resistance to Impregnation 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.
Veneering Qualities	Quartered veneers are often flake figured, while the very popular straight-line figure is a prominent feature in rift-cut veneer.

Working Properties for: *Quercus alba*

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. (Average number of pieces out of one hundred producing perfect planing results = 87).
Turning	Turning qualities are reported to be very good. (Percent of fair to excellent turned pieces = 85).
Moulding	The timber is reported to be difficult to mould. (Number of moulded pieces yielding good top excellent results out of one hundred = 35).
Boring	The timber responds well to ordinary tools to produce clean, bored holes. (Number of borings with good to excellent results out of one hundred = 95).
Mortising	Mortising qualities are reported to be very good. (Percent of mortised pieces yielding fair to excellent results = 99).

Drying for: *Quercus alba*

Ease of Drying	The wood is difficult to dry. It dries rather slowly and requires care.
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
T/R Ratio	1.60 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:

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