technology transfer *fact sheet*

Center for Wood Anatomy Research
USDA Forest Service • Forest Products Laboratory • One Gifford Pinchot Drive • Madison, Wisconsin 53705–2398

Juglans nigra
Family: Juglandaceae
Black Walnut

The walnut/butternut group (*Juglans* spp.) contains 15 species which grow in South America [6], Eurasia [4] and North America [6]. The word *juglans* is the classic Latin name of walnut, meaning nut of Jupiter.

North American species of *Juglans*:

Juglans californica-California black walnut, California walnut, claro walnut, southern California walnut

Juglans cinerea[a,b]-butternut

Juglans hindsii-California black walnut, hinds black walnut, northern California walnut

Juglans major-Arizona black walnut, Arizona walnut, little walnut, Mexican walnut, western walnut

Juglans microcarpa-Arizona walnut, dwarf walnut, little walnut, Mexican walnut, river walnut, Texas black walnut, Texas walnut, western walnut

Juglans nigra[a]-American walnut, American black walnut, black walnut, burbank walnut, eastern black walnut, eastern walnut, gunwood, Virginia walnut

[a]commercial species

[b]information available on a separate fact sheet

Distribution

Black walnut is native to the eastern United States, from southern Minnesota east to Pennsylvania, New Jersey, New York; south to South Carolina, Georgia, Florida, Alabama; west to Texas; and north through Oklahoma, Kansas, Nebraska, and South Dakota.

The Tree

Black walnut trees reach heights of 120 ft (37 m), with a diameter of over 3 ft (1 m).

The Wood

General

The sapwood of black walnut is nearly white, while the heartwood is light brown to dark, chocolate brown, often with a purplish cast and darker streaks. The wood is heavy, hard, and stiff and has high shock resistance.

Mechanical Properties (2-inch standard)

	Specific gravity	MOE GPa	MOR MPa	Compression Parallel MPa	Compression Perpendicular MPa	WML[a] kJ/m^3	Hardness N	Shear MPa
Green	0.51	9.8	65.5	29.6	3.38	101	4,003	8.41
Dry	0.55	11.6	100.7	52.3	6.96	74	4,492	9.45

[a]WML = Work to maximum load.
Reference (59).

Drying and Shrinkage

	Percentage of shrinkage (green to final moisture content)		
Type of shrinkage	0% MC	6% MC	20% MC
Tangential	7.8	6.2	2.6
Radial	5.5	4.4	1.8
Volumetric	12.8	10.2	4.3

References: 0% MC (98), 6% and 20% MC (90).

Kiln Drying Schedules[a]

	Stock				
Condition	4/4, 5/4, 6/4	8/4	10/4	12/4	16/4
Standard	T6-D4	T3-D3	T3-D3	T3-C2	–

[a]References (6, 86).

Working Properties Black walnut is straight grained and easily worked with hand tools and by machine. It finishes beautifully and holds paint and stain exceptionally well. It also glues and polishes well.

Durability: Rated as very resistant to heartwood decay—one of the most durable woods, even under conditions favorable to decay.

Preservation: No information available at this time.

Uses: Furniture, fixtures, cabinets, gunstocks, novelties, interior paneling, veneer.

Toxicity: No information available at this time.

Additional Reading and References Cited (in parentheses)

6. Boone, R.S.; Kozlik, C.J.; Bois, P.J.; Wengert, E.M. 1988. Dry kiln schedules for commercial woods_temperate and tropical. Gen. Tech. Rep. FPL_GTR_57. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.

29. Elias, T.S. 1980. The complete trees of North America, field guide and natural history. New York: van Nostrand Reinhold Company.

55. Little, Jr., E.L. 1979. Checklist of United States trees (native and naturalized). Agric. Handb. 541. Washington, DC: U.S. Department of Agriculture, Forest Service. U.S. Government Printing Office.

59. Markwardt, L.J.; Wilson, T.R.C. 1935. Strength and related properties of woods grown in the United States. Tech. Bull. 479. Washington, DC: U.S. Department of Agriculture, Forest Service. U.S. Government Printing Office.

68. Panshin, A.J.; de Zeeuw, C. 1980. Textbook of wood technology, 4th ed. New York: McGraw–Hill Book Co..

74. Record, S.J.; Hess R.W. 1943. Timbers of the new world. New Haven, CT: Yale University Press.

76. Rink, G. 1985. Black walnut, an American wood. FS–270. Washington, DC: U.S. Department of Agriculture, Forest Service.

86. Simpson, W.T. 1991. Dry kiln operator's manual. Ag. Handb. 188. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.

90. Summitt, R.; Sliker, A. 1980. CRC handbook of materials science. Boca Raton, FL: CRC Press, Inc. Vol. 4.

98. U.S. Department of Agriculture. 1987. Wood handbook: wood as an engineering material. Agric. Handb. 72. (Rev.) Washington, DC: U.S. Department of Agriculture.
466 p.