

Strength and Mechanical Properties (inch - pound)^a

COMMON SPECIES NAMES	MOISTURE CONTENT	SPECIFIC GRAVITY (b)	STATIC BENDING			IMPACT BENDING TO GRAIN (in.)	COMPRESSION PARALLEL TO GRAIN (lbf/in ²)	COMPRESSION PERPENDICULAR TO GRAIN (lbf/in ²)	SHEAR PARALLEL TO GRAIN (lbf/in ²)	TENSION PERPENDICULAR TO GRAIN (lbf/in ²)	SIDE HARDNESS (lbf)
			MODULUS OF RUPTURE (lbf/in ²)	MODULUS OF ELASTICITY (c) (10 ⁶ lbf/in ²)	WORK TO MAXIMUM LOAD (in-lbf/in ³)						
Alder	Green - 12%	0.37 - 0.41	6,500 - 9,800	1.17 - 1.38	8.0 - 8.4	22 - 20	2,960 - 5,820	250 - 440	770 - 1,080	390 - 420	440 - 590
Ash	Green - 12%	0.45 - 0.60	6,000 - 15,000	1.04 - 1.74	11.8 - 16.6	-- 43	2,300 - 7,410	350 - 1,420	860 - 2,030	-- 940	-- 1,320
Aspen	Green - 12%	0.35 - 0.39	5,100 - 9,100	0.86 - 1.43	5.7 - 7.7	-- 22	2,140 - 5,300	180 - 450	660 - 1,080	-- 260	-- 350
Basswood	Green - 12%	0.32 - 0.37	5,000 - 8,700	1.04 - 1.46	5.3 - 7.2	16	2,220 - 4,730	170 - 370	600 - 990	280 - 350	250 - 410
Birch	Green - 12%	0.48 - 0.65	6,400 - 16,900	1.17 - 2.17	15.7 - 20.8	29 - 33	3,540 - 7,110	360 - 690	1,130 - 1,700	560 - 570	660 - 950
Cherry	Green - 12%	0.47 - 0.50	8,000 - 12,300	1.31 - 1.49	11.4 - 12.8	34 - 55	2,360 - 8,540	270 - 1,080	840 - 2,240	-- 950	560 - 1,470
Cottonwood	Green - 12%	0.31 - 0.40	3,900 - 8,500	0.75 - 1.37	4.2 - 7.4	-- 22	1,690 - 4,910	140 - 380	500 - 1,040	-- 580	-- 430
Cypress	Green - 12%	0.42 - 0.46	6,600 - 10,600	1.18 - 1.44	6.6 - 8.2	24 - 25	3,580 - 6,360	400 - 730	810 - 1,000	270 - 300	390 - 510
Elm	Green - 12%	0.46 - 0.63	7,200 - 14,800	1.11 - 1.54	11.8 - 19.8	38 - 56	2,910 - 7,050	360 - 1,230	1,000 - 1,920	-- 660	620 - 1,320
Gum	Green - 12%	0.46 - 0.52	7,100 - 12,500	1.20 - 1.64	10.1 - 11.9	32 - 36	3,040 - 6,320	370 - 620	990 - 1,600	540 - 760	600 - 850
Hackberry	Green - 12%	0.49 - 0.53	6,500 - 11,000	0.95 - 1.19	12.8 - 14.5	43 - 48	2,650 - 5,440	400 - 890	1,070 - 1,590	580 - 630	700 - 880
Hickory/Pecan	Green - 12%	0.56 - 0.75	9,100 - 20,200	1.29 - 2.26	13.8 - 31.7	-- 104	3,920 - 9,210	760 - 1,980	-- 2,430	-- 680	-- 1,820
Hard Maple	Green - 12%	0.52 - 0.63	7,900 - 15,800	1.33 - 1.83	12.5 - 16.5	39 - 48	3,270 - 7,830	600 - 1,470	1,130 - 2,330	-- 720	840 - 1,450
Pacific Coast Maple	Green - 12%	0.44 - 0.48	7,400 - 10,700	1.10 - 1.45	7.8 - 8.7	23 - 28	3,240 - 5,950	450 - 750	1,110 - 1,730	540 - 600	620 - 850
Soft Maple	Green - 12%	0.44 - 0.54	5,800 - 13,400	0.94 - 1.64	7.8 - 12.5	23 - 32	2,490 - 6,540	370 - 1,000	1,050 - 1,850	-- 600	590 - 950
Red Oak	Green - 12%	0.52 - 0.69	7,400 - 18,100	1.14 - 2.28	8.0 - 21.5	26 - 54	3,000 - 8,740	550 - 1,250	930 - 2,080	-- 1,050	860 - 1,510
White Oak	Green - 12%	0.57 - 0.88	7,200 - 18,400	0.88 - 2.05	9.4 - 19.2	-- 50	3,290 - 8,900	530 - 2,840	1,210 - 2,660	-- 940	-- 1,620
Poplar	Green - 12%	0.40 - 0.42	6,000 - 10,100	1.22 - 1.58	7.5 - 8.8	24 - 26	2,660 - 5,540	270 - 500	790 - 1,190	510 - 540	440 - 540
Sycamore	Green - 12%	0.46 - 0.49	6,500 - 10,000	1.06 - 1.42	7.5 - 8.5	26	2,920 - 5,380	360 - 700	1,000 - 1,470	630 - 720	610 - 770
Walnut	Green - 12%	0.51 - 0.55	9,500 - 14,600	1.42 - 1.68	10.7 - 14.6	34 - 37	4,300 - 7,580	490 - 1,010	1,220 - 1,370	570 - 690	900 - 1,010

^a Results of tests on small clear specimens in the green and air-dried conditions. Definition of properties; impact bending is height of drop that causes complete failure, using 0.71-kg (50-lb) hammer; compression parallel to grain is also called maximum crushing strength; compression perpendicular to grain is fiber stress at proportional limit; shear is maximum shearing strength; tension is maximum tensile strength; and side hardness is hardness measured when load is perpendicular to grain.

^b Specific gravity is based on weight when oven-dry and volume when green or at 12% moisture content

^c Modulus of elasticity measured from a simply supported, center-loaded beam, on a span depth ratio of 14/1. To correct for shear deflection, the modulus can be increased by 10%.

Source: *Wood Handbook, Wood as an Engineering Material*, USDA Forest Service