

TABLE A2

**REFERENCE DESIGN VALUES FOR STRUCTURAL GLUED LAMINATED SOFTWOOD TIMBER**  
**(Members stressed primarily in axial tension or compression)**

(Tabulated design values are for normal load duration and dry service conditions.)

Combination Symbol	Species	Grade	All Loading				Axially Loaded				Bending about Y-Y Axis Loaded Parallel to Wide Faces of Laminations				Bending About X-X Axis Loaded Perpendicular to Wide Faces of Laminations	
			Modulus of Elasticity			Compression Perpendicular to Grain F <sub>cL</sub> (psi)	Tension Parallel to Grain F <sub>t</sub> (psi)	Compression Parallel to Grain			Bending			Shear Parallel to Grain (a)(b)(c) F <sub>vy</sub> (psi)	Bending F <sub>bx</sub> (psi)	Shear Parallel to Grain <sup>(c)</sup> F <sub>vx</sub> (psi)
			E <sub>axial</sub> (10 <sup>6</sup> psi)	0.95 E <sub>axial</sub> (10 <sup>6</sup> psi)	E <sub>axial min</sub> (10 <sup>6</sup> psi)			2 or More Laminations F <sub>c</sub> (psi)	4 or More Laminations F <sub>c</sub> (psi)	2 or 3 Laminations F <sub>c</sub> (psi)	4 or More Laminations F <sub>by</sub> (psi)	3 Laminations F <sub>by</sub> (psi)	2 Laminations F <sub>by</sub> (psi)			
			2 Lamina- tions to 15 in. Deep <sup>(d)</sup>	2 Lamina- tions to 15 in. Deep <sup>(d)</sup>												
<b>Visually Graded Western Species</b>																
1	DF	L3	1.6	1.5	0.79	560	950	1550	1250	1450	1250	1000	230	1250	265	
2	DF	L2	1.7	1.6	0.85	560	1250	1950	1600	1800	1600	1300	230	1700	265	
3	DF	L2D	2.0	1.9	1.00	650	1450	2300	1900	2100	1850	1550	230	2000	265	
4	DF	L1CL	2.0	1.9	1.00	590	1400	2100	1950	2200	2000	1650	230	2100	265	
5	DF	L1	2.1	2.0	1.06	650	1650	2400	2100	2400	2100	1800	230	2200	265	
14	HF	L3	1.4	1.3	0.69	375	800	1100	1050	1200	1050	850	190	1100	215	
15	HF	L2	1.5	1.4	0.74	375	1050	1350	1350	1500	1350	1100	190	1450	215	
16	HF	L1	1.7	1.6	0.85	375	1200	1500	1500	1750	1550	1300	190	1600	215	
17	HF	L1D	1.8	1.7	0.90	500	1400	1750	1750	2000	1850	1550	190	1900	215	
22 <sup>(e)</sup>	SW	L3	1.1	1.0	0.53	315	525	850	725	800	700	575	170	725	195	
69	AC	L3	1.3	1.2	0.63	470	725	1150	1100	1100	975	775	230	1000	265	
70	AC	L2	1.4	1.3	0.69	470	975	1450	1450	1400	1250	1000	230	1350	265	
71	AC	L1D	1.7	1.6	0.85	560	1250	1900	1900	1850	1650	1400	230	1750	265	
72	AC	L1S	1.7	1.6	0.85	560	1250	1900	1900	1850	1650	1400	230	1900	265	
73	POC	L3	1.4	1.3	0.69	470	775	1500	1200	1200	1050	825	230	1050	265	
74	POC	L2	1.5	1.4	0.74	470	1050	1900	1550	1450	1300	1100	230	1400	265	
75	POC	L1D	1.8	1.7	0.90	560	1350	2300	2050	1950	1750	1500	230	1850	265	
<b>Visually Graded Southern Pine</b>																
47	SP	N2M12	1.5	1.4	0.74	650	1200	1900	1150	1750	1550	1300	260	1400	300	
47 1:10	SP	N2M10	1.5	1.4	0.74	650	1150	1700	1150	1750	1550	1300	260	1400	300	
47 1:8	SP	N2M	1.5	1.4	0.74	650	1000	1500	1150	1600	1550	1300	260	1400	300	
48	SP	N2D12	1.8	1.7	0.90	740	1400	2200	1350	2000	1800	1500	260	1600	300	
48 1:10	SP	N2D10	1.8	1.7	0.90	740	1350	2000	1350	2000	1800	1500	260	1600	300	
48 1:8	SP	N2D	1.8	1.7	0.90	740	1150	1750	1350	1850	1800	1500	260	1600	300	
49	SP	N1M16	1.8	1.7	0.90	650	1350	2100	1450	1950	1750	1500	260	1800	300	
49 1:14	SP	N1M14	1.8	1.7	0.90	650	1350	2000	1450	1950	1750	1500	260	1800	300	
49 1:12	SP	N1M12	1.8	1.7	0.90	650	1300	1900	1450	1950	1750	1500	260	1800	300	
49 1:10	SP	N1M	1.8	1.7	0.90	650	1150	1700	1450	1850	1750	1500	260	1800	300	
50	SP	N1D14	2.0	1.9	1.00	740	1550	2300	1700	2300	2100	1750	260	2100	300	
50 1:12	SP	N1D12	2.0	1.9	1.00	740	1500	2200	1700	2300	2100	1750	260	2100	300	
50 1:10	SP	N1D	2.0	1.9	1.00	740	1350	2000	1700	2100	2100	1750	260	2100	300	

**Footnotes to Table A2**

- (a) For members with 2 or 3 laminations, the shear design value for transverse loads parallel to the wide faces of the laminations, F<sub>vy</sub>, shall be reduced by multiplying by a factor of 0.84 or 0.95, respectively.
- (b) The shear design value for transverse loads applied parallel to the wide faces of the laminations, F<sub>vy</sub>, shall be multiplied by 0.4 for members with 5, 7, or 9 laminations manufactured from multiple piece laminations (across width) that are not edge bonded. The shear design value, F<sub>vy</sub>, shall be multiplied by 0.5 for all other members manufactured from multiple piece laminations with unbonded edge joints. This reduction shall be cumulative with the adjustment in footnotes (a) and (c).
- (c) The design values for shear, F<sub>vx</sub>, and F<sub>vy</sub>, shall be decreased by multiplying by a factor of 0.72 for non-prismatic members, notched members, and for all members subject to impact or cyclic loading. The reduced design value shall be used for design of members at connections that transfer shear by mechanical fasteners. The reduced design value shall also be used for determination of design values for radial tension and torsion.
- (d) The tabulated F<sub>bx</sub> values are for members without special tension lams up to 15 inches in depth. If the member depth is greater than 15 inches without special tension lams, the tabulated F<sub>bx</sub> values must be multiplied by a factor of 0.88. If special tension lams are used, the tabulated F<sub>bx</sub> values are permitted to be increased by a factor of 1.18 regardless of the member depth.
- (e) When Western Cedars, Western Cedars (North), Western Woods, and Redwood (open grain) are used in combinations for Softwood Species (SW), the design value for modulus of elasticity shall be reduced by 100,000 psi. When Coast Sitka Spruce, Coast Species, Western White Pine, and Eastern White Pine are used in combinations for Softwood Species (SW) tabulated design values for shear parallel to grain, F<sub>vx</sub> and F<sub>vy</sub>, shall be reduced by 10 psi, before applying any other adjustments.