

Table 3 Mechanically Graded Lumber – 2" thick or less, 2" and wider

Based on Normal Load Duration and Dry Service (MC ≤ 19%) — See Tables A-1 thru A-4 for Adjustment Factors

Grade Designation ¹	Bending F _b		Tension Parallel to Grain F _t	Shear Parallel to Grain F _v ³	Compression Perpendicular to Grain F _{c⊥} ³	Compression Parallel to Grain F _c	Modulus of Elasticity ⁵	
	Single Member Uses	Repetitive Member Uses ²					E	E _{min}
Machine Stress Rated (MSR) Lumber								
1650f – 1.5E	1650	1900	1020	175	565	1700	1,500,000	760,000
1800f – 1.6E	1800	2070	1175	175	565	1750	1,600,000	810,000
1950f – 1.7E	1950	2240	1375	175	565	1800	1,700,000	860,000
2100f – 1.8E	2100	2420	1575	190 ⁴	805 ⁴	1875	1,800,000	910,000
2250f – 1.9E	2250	2590	1750	190	805	1925	1,900,000	970,000
2400f – 2.0E	2400	2760	1925	190	805	1975	2,000,000	1,020,000
2550f – 2.1E	2550	2930	2050	190	805	2025	2,100,000	1,070,000
2700f – 2.2E	2700	3110	2150	190	805	2100	2,200,000	1,120,000
2850f – 2.3E	2850	3280	2300	190	805	2150	2,300,000	1,170,000
Machine Evaluated Lumber (MEL)								
M – 12	1600	1840	850	175	565	1675	1,600,000	750,000
M – 14	1800	2070	1000	175	565	1750	1,700,000	790,000
M – 23	2400	2760	1900	190	805	1975	1,800,000	840,000
M – 26	2800	3220	1800	190	805	2150	2,000,000	930,000
M – 29	1550	1780	850	175	565	1650	1,700,000	790,000
M – 30	2050	2360	1050	175	565	1850	1,700,000	790,000
M – 31	2850	3280	1600	190	805	2150	1,900,000	890,000

(1) The most commonly produced Mechanically Graded Lumber grades are given here. See the *SPIB Grading Rules* for a complete listing of all MSR and MEL grades.

(2) Repetitive member uses apply to joists, truss chords, rafters, studs, planks, decking or similar members which are in contact or spaced not more than 24" on center, are not less than three [3] in number, and are joined by floor, roof or other load distributing elements adequate to support the design load. The Repetitive Member Factor, C_r = 1.15, has been included in the listed Repetitive Member Use design values.

(3) When a grade is qualified by test and quality controlled for specific gravity, the allowable horizontal shear and compression perpendicular-to-grain design values may be higher. See the *SPIB Grading Rules* for more details.

(4) When not qualified by test and quality controlled for specific gravity, the grademark for mechanically graded lumber grades with a 1,800,000 psi modulus of elasticity design value shall include a specific gravity value of .55, a horizontal shear value of 175 psi, and a compression perpendicular-to-grain value of 565 psi.

(5) Modulus of Elasticity, E is an estimate of the average for the species and grade of material. E_{min} represents an approximate 5% lower exclusion value on pure bending modulus of elasticity, plus a 1.66 factor of safety, and is used for beam and column stability calculations.

Table 4 Scaffold Plank¹ – 2" and 3" thick, 8" and wider

Size	Grade	Bending F _b Flatwise Use Only	Modulus of Elasticity E
2" thick, 8" and wider MC ≤ 19% ²	Dense Industrial 72 Scaffold Plank	2400	1,800,000
	Dense Industrial 65 Scaffold Plank	2200	1,800,000
3" thick, 8" and wider MC > 19%	Dense Industrial 72 Scaffold Plank	1800	1,600,000
	Dense Industrial 65 Scaffold Plank	1650	1,600,000

(1) Scaffold plank design values are for flatwise use only. They were calculated using ASTM D245 and D2555 standards and modified using procedures shown in "Calculating Apparent Reliability of Wood Scaffold Planks," as published by the Journal on Structural Safety, 2 (1984) 47-57, and updated in 1993.

(2) For exposed conditions of use (where the moisture content in service may exceed 19%) the values shall be multiplied by: 0.85 for F_b and 0.90 for E.