

Allowable Axial Loads (Pounds) for Combination No. 50 Glulam Columns – Dry-Use

Side loads are not permitted. End loads are limited to a maximum eccentricity of either 1/6 column width or depth, whichever is worse.

| Effective Column Length (ft.) | Lamination Net Width = 3 3/8 in. | | | | | | Lamination Net Width = 5 1/4 in. | | | | | | Lamination Net Width = 7 in. | | |
|-------------------------------|----------------------------------|-------|-------|--------------------------------|--------|--------|----------------------------------|--------|--------|----------------------------|--------|--------|------------------------------|--------|--------|
| | Net Depth = 3 1/2 in. (3 lams) | | | Net Depth = 5 1/2 in. (4 lams) | | | Net Depth = 5 1/2 in. (4 lams) | | | Net Depth = 7 in. (6 lams) | | | Net Depth = 7 in. (6 lams) | | |
| | Load Duration Factor | | | Load Duration Factor | | | Load Duration Factor | | | Load Duration Factor | | | Load Duration Factor | | |
| | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 |
| 8 | 6,220 | 6,500 | 6,660 | 10,270 | 10,660 | 10,880 | 25,780 | 27,780 | 28,960 | 36,090 | 38,920 | 40,560 | 53,460 | 59,380 | 63,060 |
| 9 | 5,280 | 5,490 | 5,610 | 8,620 | 8,910 | 9,070 | 23,020 | 24,530 | 25,410 | 32,240 | 34,340 | 35,550 | 50,270 | 55,300 | 58,360 |
| 10 | 4,530 | 4,680 | 4,770 | 7,330 | 7,540 | 7,670 | 20,480 | 21,650 | 22,320 | 28,650 | 30,240 | 31,160 | 46,900 | 51,070 | 53,550 |
| 11 | 3,920 | 4,030 | 4,100 | 6,300 | 6,460 | 6,550 | 18,230 | 19,150 | 19,680 | 25,460 | 26,700 | 27,420 | 43,460 | 46,860 | 48,850 |
| 12 | 3,410 | 3,500 | 3,550 | 5,460 | 5,590 | 5,670 | 16,280 | 17,010 | 17,430 | 22,680 | 23,670 | 24,240 | 40,070 | 42,840 | 44,450 |
| 13 | 2,990 | 3,060 | 3,100 | 4,780 | 4,880 | 4,940 | 14,590 | 15,180 | 15,530 | 20,290 | 21,090 | 21,550 | 36,840 | 39,110 | 40,430 |
| 14 | 2,640 | 2,700 | 2,730 | 4,220 | 4,300 | 4,350 | 13,120 | 13,620 | 13,900 | 18,220 | 18,880 | 19,260 | 33,840 | 35,730 | 36,830 |
| 15 | | | | | | | 11,860 | 12,270 | 12,500 | 16,440 | 16,980 | 17,300 | 31,110 | 32,700 | 33,620 |
| 16 | | | | | | | 10,760 | 11,100 | 11,280 | 14,890 | 15,350 | 15,610 | 28,630 | 29,990 | 30,770 |
| 17 | | | | | | | 9,790 | 10,070 | 10,220 | 13,540 | 13,930 | 14,160 | 26,410 | 27,570 | 28,240 |
| 18 | | | | | | | 8,940 | 9,160 | 9,290 | 12,370 | 12,700 | 12,890 | 24,400 | 25,400 | 25,980 |
| 19 | | | | | | | 8,180 | 8,370 | 8,490 | 11,330 | 11,620 | 11,780 | 22,600 | 23,470 | 23,970 |
| 20 | | | | | | | 7,510 | 7,680 | 7,780 | 10,420 | 10,670 | 10,810 | 20,980 | 21,740 | 22,180 |
| 21 | | | | | | | 6,920 | 7,070 | 7,150 | 9,610 | 9,830 | 9,950 | 19,510 | 20,180 | 20,570 |
| 22 | | | | | | | | | | | | | 18,190 | 18,780 | 19,120 |
| 23 | | | | | | | | | | | | | 16,990 | 17,510 | 17,820 |
| 24 | | | | | | | | | | | | | 15,900 | 16,370 | 16,640 |

Allowable Axial Loads (Pounds) for Combination No. 50 Glulam Columns – Wet-Use

Side loads are not permitted. End loads are limited to a maximum eccentricity of either 1/6 column width or depth, whichever is worse.

| Effective Column Length (ft.) | Lamination Net Width = 3 3/8 in. | | | | | | Lamination Net Width = 5 1/4 in. | | | | | | Lamination Net Width = 7 in. | | |
|-------------------------------|----------------------------------|-------|-------|--------------------------------|-------|-------|----------------------------------|--------|--------|----------------------------|--------|--------|------------------------------|--------|--------|
| | Net Depth = 3 1/2 in. (3 lams) | | | Net Depth = 5 1/2 in. (4 lams) | | | Net Depth = 5 1/2 in. (4 lams) | | | Net Depth = 7 in. (6 lams) | | | Net Depth = 7 in. (6 lams) | | |
| | Load Duration Factor | | | Load Duration Factor | | | Load Duration Factor | | | Load Duration Factor | | | Load Duration Factor | | |
| | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 | 1.00 | 1.15 | 1.25 |
| 8 | 5,080 | 5,320 | 5,460 | 8,430 | 8,760 | 8,960 | 20,650 | 22,380 | 23,400 | 28,810 | 31,250 | 32,690 | 41,890 | 46,720 | 49,750 |
| 9 | 4,330 | 4,510 | 4,610 | 7,100 | 7,340 | 7,480 | 18,610 | 19,920 | 20,670 | 25,990 | 27,830 | 28,890 | 39,670 | 43,860 | 46,430 |
| 10 | 3,720 | 3,860 | 3,930 | 6,040 | 6,220 | 6,330 | 16,660 | 17,660 | 18,240 | 23,270 | 24,660 | 25,450 | 37,300 | 40,840 | 42,960 |
| 11 | 3,230 | 3,330 | 3,380 | 5,200 | 5,340 | 5,420 | 14,890 | 15,670 | 16,130 | 20,780 | 21,850 | 22,470 | 34,820 | 37,750 | 39,470 |
| 12 | 2,820 | 2,890 | 2,930 | 4,510 | 4,620 | 4,690 | 13,330 | 13,960 | 14,320 | 18,570 | 19,420 | 19,910 | 32,310 | 34,710 | 36,100 |
| 13 | 2,470 | 2,530 | 2,560 | 3,950 | 4,040 | 4,090 | 11,970 | 12,480 | 12,770 | 16,650 | 17,330 | 17,730 | 29,870 | 31,830 | 32,970 |
| 14 | 2,180 | 2,230 | 2,260 | 3,490 | 3,560 | 3,600 | 10,790 | 11,200 | 11,440 | 14,980 | 15,540 | 15,860 | 27,550 | 29,170 | 30,110 |
| 15 | | | | | | | 9,760 | 10,110 | 10,310 | 13,530 | 14,000 | 14,260 | 25,390 | 26,760 | 27,550 |
| 16 | | | | | | | 8,860 | 9,150 | 9,320 | 12,270 | 12,660 | 12,880 | 23,430 | 24,580 | 25,250 |
| 17 | | | | | | | 8,080 | 8,310 | 8,440 | 11,170 | 11,500 | 11,690 | 21,640 | 22,630 | 23,200 |
| 18 | | | | | | | 7,380 | 7,570 | 7,680 | 10,210 | 10,490 | 10,650 | 20,030 | 20,880 | 21,370 |
| 19 | | | | | | | 6,760 | 6,920 | 7,020 | 9,360 | 9,600 | 9,740 | 18,570 | 19,310 | 19,740 |
| 20 | | | | | | | 6,210 | 6,350 | 6,440 | 8,610 | 8,820 | 8,940 | 17,250 | 17,900 | 18,270 |
| 21 | | | | | | | 5,720 | 5,850 | 5,920 | 7,940 | 8,130 | 8,230 | 16,060 | 16,630 | 16,960 |
| 22 | | | | | | | | | | | | | 14,980 | 15,490 | 15,770 |
| 23 | | | | | | | | | | | | | 14,000 | 14,450 | 14,710 |
| 24 | | | | | | | | | | | | | 13,110 | 13,510 | 13,740 |

Design property notes for both Dry-Use and Wet-Use service conditions

- (1) This table is for preliminary design use only. Final design should include a complete analysis, including bearing capacity of the foundation supporting the column.
- (2) The tabulated allowable loads apply only to one-piece glulam members made with all N1D14 Southern pine laminations (Combination 50) without special tension laminations.
- (3) The tabulated allowable loads are based on simply axially loaded columns subjected to a maximum eccentricity of either 1/6 column width or 1/6 column depth, whichever is worse.
- (4) For side loads, other eccentric end loads, or other combined axial and flexural loads, see NDS-05.
- (5) The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
- (6) Volume factor for F_{b1} is in accordance with NDS-05. Size factor for F_{b2} is $(12/d)^{1/9}$, where d is equal to the lamination width in inches.
- (7) Dry-Use compression parallel to grain (F_c) = 2,300 psi for 4 or more lams, or 1,700 psi for 2 or 3 lams. For Wet-Use, compression parallel to grain (F_c) = 2,300 x 0.73 psi for 4 or more lams, or 1,700 x 0.73 psi for 2 or 3 lams.
- (8) Dry-Use modulus of elasticity (E) = 1.9×10^6 psi. Wet-Use Modulus of elasticity (E) = $1.9 \times 0.833 \times 10^6$ psi.
- (9) Dry-Use flexural stress when loaded parallel to wide faces of lamination (F_{b1}) = 2,300 psi for 4 or more lams, or 2,100 psi for 3 lams. Wet-Use flexural stress when loaded parallel to wide faces of lamination (F_{b1}) = 2,300 x 0.8 psi for 4 or more lams, or 2,100 x 0.8 psi for 3 lams.
- (10) Dry-Use flexural stress when loaded perpendicular to wide faces of lamination (F_{b2}) = 2,100 psi for 2 lams to 15 in. deep without special tension laminations. Wet-Use flexural stress when loaded perpendicular to wide faces of lamination (F_{b2}) = 2,100 x 0.8 psi for 2 lams to 15 in. deep without special tension laminations.