SOUTHERN FOREST PRODUCTS ASSOCIATION
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NEW DESIGN VALUES

Southern Pine Span Tables

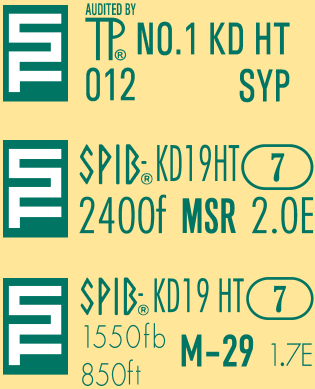
Tables 1 through 12 are abbreviated span tables for selected Southern Pine visual, Machine Stress Rated (MSR) and Machine Evaluated Lumber (MEL) grades. These tables are intended for use under dry-service conditions. For other grades, loading conditions and on-center spacings, refer to *Maximum Spans for Southern Pine Joists & Rafters* published by the Southern Forest Products Association.

Applied loads for each table are given in pounds per square foot (psf). Deflection is limited to the span in inches divided by 360, 240 or 180 and is based on live load only. The load duration factor, C_D, is 1.0 unless shown as 1.15 for snow loads or 1.25 for construction loads. Spans are given in feet and inches and are the maximum allowable horizontal span of the member from inside to inside of bearings. For sloping rafters, the span is also measured along the horizontal projection.

The spans were determined on the same basis as the code-recognized *Span Tables for Joists and Rafters* published by the American Wood Council. Standard engineering design formulas for simple span beams with uniformly distributed gravity loads were used; concentrated loads and uplift loads caused by wind were not considered. The calculated spans assume fully supported members, properly sheathed and nailed on the top edge of the joist or rafter. Maximum spans for the visual grades (No.1, No.2 and No.3) were calculated using new design values effective June 1, 2013. Not all of the possible Southern Pine grade/size combinations are produced. Check sources of supply for available grades and sizes, and for lumber longer than 20 feet; an asterisk (*) indicates a listed span has been limited to 26'-0" based on availability.

Each piece of lumber should be identified by the grade mark of an agency certified by the Board of Review of the American Lumber Standard Committee, and manufactured in accordance with *Product Standard PS 20* published by the U.S. Department of Commerce.

Typical Lumber Grade Marks



SFPA does not test lumber or establish design values. Accordingly, neither SFPA, nor its members, warrant that the design values on which the span tables are based are correct, and disclaim responsibility for injury or damage resulting from the use of such span tables. The conditions under which lumber is used in construction may vary widely, as does the quality of workmanship. Neither SFPA, nor its members, have knowledge of the quality of materials, workmanship or construction methods used on any construction project, and accordingly, do not warrant the technical data, design or performance of the lumber in completed structures.

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VISUALLY GRADED LUMBER

Table 1 Floor Joists

30 or 40 psf live load; 10 psf dead load; ℓ/360 deflection limit

Visual Grade			No. 1		No. 2		No. 3	
			Live Load					
			30	40	30	40	30	40
Size & Spacing	2x6	12	11-10	10-9	11-3	10-3	9-2	8-2
		16	10-9	9-9	10-3	9-4	7-11	7-1
		24	9-4	8-6	8-6	7-7	6-5	5-9
	2x8	12	15-7	14-2	14-11	13-6	11-6	10-3
		16	14-2	12-10	13-3	11-10	10-0	8-11
		24	12-4	11-3	10-10	9-8	8-2	7-3
	2x10	12	19-10	18-0	18-1	16-2	13-11	12-6
		16	18-0	16-1	15-8	14-0	12-1	10-10
		24	14-8	13-1	12-10	11-5	9-10	8-10
	2x12	12	24-2	21-11	21-4	19-1	16-6	14-9
		16	21-4	19-1	18-6	16-6	14-4	12-10
		24	17-5	15-7	15-1	13-6	11-8	10-5

Table 2 Ceiling Joists – Drywall ceiling

10 psf live load; 5 psf dead load; ℓ/240 deflection limit
20 psf live load; 10 psf dead load; ℓ/240 deflection limit

Visual Grade			No. 1		No. 2		No. 3	
			Live Load					
			10	20	10	20	10	20
Size & Spacing	2x6	12	19-6	15-6	18-8	13-11	14-11	10-7
		16	17-8	14-0	16-11	12-0	12-11	9-2
		24	15-6	11-5	13-11	9-10	10-7	7-5
	2x8	12	25-8	20-5	24-7	17-7	18-9	13-3
		16	23-4	17-9	21-7	15-3	16-3	11-6
		24	20-5	14-6	17-7	12-6	13-3	9-5
	2x10	12	26-0*	23-11	26-0*	20-11	22-9	16-1
		16	26-0*	20-9	25-7	18-1	19-9	13-11
		24	23-11	16-11	20-11	14-9	16-1	11-5

Table 3 Rafters – Medium roofing: Drywall ceiling; Snow load

20, 30, or 40 psf live load; 15 psf dead load; ℓ/240 deflection limit
Load duration factor = 1.15 for snow loads

Visual Grade			No. 1			No. 2			No. 3		
			Live Load								
			20	30	40	20	30	40	20	30	40
Size & Spacing	2x6	12	15-6	13-6	12-3	13-10	12-2	11-0	10-6	9-3	8-4
		16	13-11	12-3	11-1	11-11	10-7	9-6	9-1	8-0	7-3
		24	11-4	10-0	9-1	9-9	8-7	7-9	7-5	6-6	5-11
	2x8	12	20-4	17-10	16-2	17-6	15-5	14-0	13-2	11-8	10-6
		16	17-7	15-6	14-1	15-2	13-4	12-1	11-5	10-1	9-1
		24	14-5	12-8	11-6	12-4	10-11	9-10	9-4	8-3	7-5
	2x10	12	23-9	21-0	19-0	20-9	18-4	16-7	16-0	14-1	12-9
		16	20-7	18-2	16-5	18-0	15-10	14-4	13-10	12-3	11-1
		24	16-10	14-10	13-5	14-8	12-11	11-9	11-4	10-0	9-0
	2x12	12	26-0*	24-11	22-6	24-5	21-7	19-6	18-11	16-8	15-1
		16	24-5	21-7	19-6	21-2	18-8	16-11	16-5	14-6	13-1
		24	20-0	17-7	15-11	17-3	15-3	13-9	13-5	11-10	10-8

Table 4 Rafters – Drywall or No Finished ceiling; Construction load

20 psf live load; 10 psf dead load; ℓ/240 or ℓ/180 deflection limit
Load duration factor = 1.25 for construction loads

Visual Grade			No. 1		No. 2		No. 3	
			Deflection Limit					
			240	180	240	180	240	180
Size & Spacing	2x6	12	15-6	17-0	14-9	15-7	11-9	11-9
		16	14-1	15-6	13-5	13-6	10-2	10-2
		24	12-3	12-9	11-0	11-0	8-4	8-4
	2x8	12	20-5	22-5	19-6	19-8	14-10	14-10
		16	18-6	19-10	17-1	17-1	12-10	12-10
		24	16-2	16-2	13-11	13-11	10-6	10-6
	2x10	12	26-0	26-0*	23-5	23-5	18-0	18-0
		16	23-2	23-2	20-3	20-3	15-7	15-7
		24	18-11	18-11	16-6	16-6	12-9	12-9

Table 5 Floor Joists

30 or 40 psf live load; 10 psf dead load; ℓ/360 deflection limit

MSR Grade			2400f-2.0E		1650f-1.5E		1500f-1.6E	
			Live Load					
			30	40	30	40	30	40
Size & Spacing	2x6	12	12-9	11-7	11-7	10-6	11-10	10-9
		16	11-7	10-6	10-6	9-6	10-9	9-9
		24	10-1	9-2	9-2	8-4	9-4	8-6
	2x8	12	16-9	15-3	15-3	13-10	15-7	14-2
		16	15-3	13-10	13-10	12-7	14-2	12-10
		24	13-4	12-1	12-1	11-0	12-4	11-3
	2x10	12	21-5	19-5	19-5	17-8	19-10	18-0
		16	19-5	17-8	17-8	16-0	18-0	16-5
		24	17-0	15-5	15-5	14-0	15-9	14-4
	2x12	12	26-0	23-7	23-7	21-6	24-2	21-11
		16	23-7	21-6	21-6	19-6	21-11	19-11
		24	20-8	18-9	18-9	17-0	19-2	17-5

Table 6 Ceiling Joists – Drywall ceiling

10 psf live load; 5 psf dead load; ℓ/240 deflection limit
20 psf live load; 10 psf dead load; ℓ/240 deflection limit

MSR Grade			2400f-2.0E		1650f-1.5E		1500f-1.6E	
			Live Load					
			10	20	10	20	10	20
Size & Spacing	2x6	12	21-0	16-8	19-1	15-2	19-6	15-6
		16	19-1	15-2	17-4	13-9	17-8	14-1
		24	16-8	13-3	15-2	12-0	15-6	12-0
	2x8	12	26-0*	21-11	25-2	19-11	25-8	20-5
		16	25-2	19-11	22-10	18-2	23-4	18-6
		24	21-11	17-5	19-11	15-10	20-5	15-10
	2x10	12	26-0*	26-0*	26-0*	25-5	26-0*	26-0
		16	26-0*	25-5	26-0*	23-2	26-0*	23-8
		24	26-0*	22-3	25-5	20-2	26-0	20-3

Table 7 Rafters – Medium roofing: Drywall ceiling; Snow load

20, 30, or 40 psf live load; 15 psf dead load; ℓ/240 deflection limit
Load duration factor = 1.15 for snow loads

MSR Grade			2400f-2.0E			1650f-1.5E			1500f-1.6E		
			Live Load								
			20	30	40	20	30	40	20	30	40
Size & Spacing	2x6	12	16-8	14-7	13-3	15-2	13-3	12-0	15-6	13-6	12-3
		16	15-2	13-3	12-0	13-9	12-0	10-11	14-1	12-3	11-2
		24	13-3	11-7	10-6	12-0	10-6	9-6	11-11	10-7	9-6
	2x8	12	21-11	19-2	17-5	19-11	17-5	15-10	20-5	17-10	16-2
		16	19-11	17-5	15-10	18-2	15-10	14-5	18-6	16-2	14-8
		24	17-5	15-3	13-10	15-10	13-10	12-7	15-9	13-11	12-7
	2x10	12	26-0*	24-6	22-3	25-5	22-3	20-2	26-0	22-9	20-8
		16	25-5	22-3	20-2	23-2	20-2	18-4	23-8	20-8	18-9
		24	22-3	19-5	17-8	20-2	17-8	16-0	20-1	17-9	16-0
	2x12	12	26-0*	26-0*	26-0*	26-0*	26-0*	24-7	26-0*	26-0*	25-1
		16	26-0*	26-0*	24-7	26-0*	24-7	22-4	26-0*	25-1	22-10
		24	26-0*	23-7	21-6	24-7	21-6	19-6	24-5	21-7	19-6

Table 8 Rafters – Drywall or No Finished ceiling; Construction load

20 psf live load; 10 psf dead load; ℓ/240 or ℓ/180 deflection limit
Load duration factor = 1.25 for construction loads

MSR Grade			2400f-2.0E		1650f-1.5E		1500f-1.6E	
			Deflection Limit					
			240	180	240	180	240	180
Size & Spacing	2x6	12	16-8	18-4	15-2	16-8	15-6	17-0
		16	15-2	16-8	13-9	15-2	14-1	15-6
		24	13-3	14-7	12-0	13-3	12-3	13-6
	2x8	12	21-11	24-2	19-11	21-11	20-5	22-5
		16	19-11	21-11	18-2	19-11	18-6	20-5
		24	17-5	19-2	15-10	17-5	16-2	17-9
	2x10	12	26-0*	26-0*	25-5	26-0*	26-0	26-0*
		16	25-5	26-0*	23-2	25-5	23-8	26-0
		24	22-3	24-6	20-2	22-3	20-8	22-8

Table 9 Floor Joists

30 or 40 psf live load; 10 psf dead load; ℓ/360 deflection limit

MEL Grade			M-14 (1800-1.7)		M-29 (1550-1.7)		M-12 (1600-1.6)	
			Live Load					
			30	40	30	40	30	40
Size & Spacing	2x6	12	12-0	10-11	12-0	10-11	11-10	10-9
		16	10-11	9-11	10-11	9-11	10-9	9-9
		24	9-7	8-8	9-7	8-8	9-4	8-6
	2x8	12	15-10	14-5	15-10	14-5	15-7	14-2
		16	14-5	13-1	14-5	13-1	14-2	12-10
		24	12-7	11-5	12-7	11-5	12-4	11-3
	2x10	12	20-3	18-5	20-3	18-5	19-10	18-0
		16	18-5	16-9	18-5	16-9	18-0	16-5
		24	16-1	14-7	16-1	14-7	15-9	14-4
	2x12	12	24-8	22-5	24-8	22-5	24-2	21-11
		16	22-5	20-4	22-5	20-4	21-11	19-11
		24	19-7	17-9	19-7	17-9	19-2	17-5

Table 10 Ceiling Joists – Drywall ceiling

10 psf live load; 5 psf dead load; ℓ/240 deflection limit
20 psf live load; 10 psf dead load; ℓ/240 deflection limit

MEL Grade			M-14 (1800-1.7)		M-29 (1550-1.7)		M-12 (1600-1.6)	
			Live Load					
			10	20	10	20	10	20
Size & Spacing	2x6	12	19-11	15-9	19-11	15-9	19-6	15-6
		16	18-1	14-4	18-1	14-4	17-8	14-1
		24	15-9	12-6	15-9	12-3	15-6	12-3
	2x8	12	26-0*	20-10	26-0*	20-10	25-8	20-5
		16	23-10	18-11	23-10	18-11	23-4	18-6
		24	20-10	16-6	20-10	16-2	20-5	16-2
	2x10	12	26-0*	26-0*	26-0*	26-0*	26-0*	26-0
		16	26-0*	24-1	26-0*	24-1	26-0*	23-8
		24	26-0*	21-1	26-0*	20-7	26-0	20-8

Table 11 Rafters – Medium roofing: Drywall ceiling; Snow load

20, 30, or 40 psf live load; 15 psf dead load; ℓ/240 deflection limit
Load duration factor = 1.15 for snow loads

MEL Grade			M-14 (1800-1.7)			M-29 (1550-1.7)			M-12 (1600-1.6)		
			Live Load								
			20	30	40	20	30	40	20	30	40
Size & Spacing	2x6	12	15-9	13-9	12-6	15-9	13-9	12-6	15-6	13-6	12-3
		16	14-4	12-6	11-5	14-4	12-6	11-5	14-1	12-3	11-2
		24	12-6	10-11	9-11	12-2	10-9	9-8	12-3	10-9	9-9
	2x8	12	20-10	18-2	16-6	20-10	18-2	16-6	20-5	17-10	16-2
		16	18-11	16-6	15-0	18-11	16-6	15-0	18-6	16-2	14-8
		24	16-6	14-5	13-1	16-0	14-2	12-9	16-2	14-2	12-10
	2x10	12	26-0*	23-2	21-1	26-0*	23-2	21-1	26-0	22-9	20-8
		16	24-1	21-1	19-2	24-1	21-1	19-2	23-8	20-8	18-9
		24	21-1	18-5	16-9	20-5	18-0	16-4	20-8	18-0	16-5
	2x12	12	26-0*	26-0*	25-7	26-0*	26-0*	25-7	26-0*	26-0*	25-1
		16	26-0*	25-7	23-3	26-0*	25-7	23-3	26-0*	25-1	22-10
		24	25-7	22-5	20-4	24-10	21-11	19-10	25-1	21-11	19-11

Table 12 Rafters – Drywall or No Finished ceiling; Construction load

20 psf live load; 10 psf dead load; ℓ/240 or ℓ/180 deflection limit
Load duration factor = 1.25 for construction loads

MEL Grade			M-14 (1800-1.7)		M-29 (1550-1.7)		M-12 (1600-1.6)	
			Deflection Limit					
			240	180	240	180	240	180
Size & Spacing	2x6	12	15-9	17-4	15-9	17-4	15-6	17-0
		16	14-4	15-9	14-4	15-9	14-1	15-6
		24	12-6	13-9	12-6	13-8	12-3	13-6
	2x8	12	20-10	22-11	20-10	22-11	20-5	22-5
		16	18-11	20-10	18-11	20-10	18-6	20-5
		24	16-6	18-2	16-6	18-0	16-2	17-10
	2x10	12	26-0*	26-0*	26-0*	26-0*	26-0	26-0*
		16	24-1	26-0*	24-1	26-0*	23-8	26-0
		24	21-1	23-2	21-1	23-0	20-8	22-9