

SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" – 4" Thick by 2" – 4" Wide Only ⁽¹⁾						
Dense Select Structural	2700	1900	175	660	2050	1.9
Select Structural	2350	1650	175	565	1900	1.8
Non Dense Select Structural	2050	1450	175	480	1800	1.6
No. 1 Dense	1650	1100	175	660	1750	1.8
No. 1	1500	1000	175	565	1650	1.6
No. 1 Non Dense	1300	875	175	480	1550	1.4
No. 2 Dense	1200	750	175	660	1500	1.6
No. 2	1100	675	175	565	1450	1.4
No. 2 Non Dense	1050	600	175	480	1450	1.3
No. 3 and Stud	650	400	175	565	850	1.3

Appendix A Table 2: Design Values for Southern Pine Dimension Lumber – 2" - 4" Thick & 2" - 4" Wide

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

See additional **Design Value Footnotes** page 276

SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" - 4" Thick - 5" - 6" Wide Only ⁽¹⁾						
Dense Select Structural	2400	1650	175	660	1900	1.9
Select Structural	2100	1450	175	565	1800	1.8
Non Dense Select Structural	1850	1300	175	480	1700	1.6
No. 1 Dense	1500	1000	175	660	1650	1.8
No. 1	1350	875	175	565	1550	1.6
No. 1 Non Dense	1200	775	175	480	1450	1.4
No. 2 Dense	1050	650	175	660	1450	1.6
No. 2	1000	600	175	565	1400	1.4
No. 2 Non Dense	950	525	175	480	1350	1.3
No. 3 and Stud	575	350	175	565	800	1.3

Appendix A Table 3: Design Values for Southern Pine Dimension Lumber – 2" - 4" Thick & 5" - 6" Wide

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

See additional **Design Value Footnotes** page 276

SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" - 4" Thick - 8" Wide Only ⁽¹⁾⁽²⁾						
Dense Select Structural	2200	1550	175	660	1850	1.9
Select Structural	1950	1350	175	565	1700	1.8
Non Dense Select Structural	1700	1200	175	480	1650	1.6
No. 1 Dense	1350	900	175	660	1600	1.8
No. 1	1250	800	175	565	1500	1.6
No. 1 Non Dense	1100	700	175	480	1400	1.4
No. 2 Dense	975	600	175	660	1400	1.6
No. 2	925	550	175	565	1350	1.4
No. 2 Non Dense	875	500	175	480	1300	1.3
No. 3 and Stud	525	325	175	565	775	1.3

Appendix A Table 4: Design Values for Southern Pine Dimension Lumber – 2" - 4" Thick & 8" Wide

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) For 4" thick material that is 8" or greater in width the F_b value may be multiplied by 1.1.

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SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" - 4" Thick - 10" Wide Only ⁽¹⁾⁽²⁾						
Dense Select Structural	1950	1300	175	660	1800	1.9
Select Structural	1700	1150	175	565	1650	1.8
Non Dense Select Structural	1500	1050	175	480	1600	1.6
No. 1 Dense	1200	800	175	660	1550	1.8
No. 1	1050	700	175	565	1450	1.6
No. 1 Non Dense	950	625	175	480	1400	1.4
No. 2 Dense	850	525	175	660	1350	1.6
No. 2	800	475	175	565	1300	1.4
No. 2 Non Dense	750	425	175	480	1250	1.3
No. 3 and Stud	475	275	175	565	750	1.3

Appendix A Table 5: Design Values for Southern Pine Dimension Lumber – 2" - 4" Thick & 10" Wide

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) For 4" thick material that is 8" or greater in width the F_b value may be multiplied by 1.1.

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SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" - 4" Thick - 12" Wide Only ^{(1) (2) (3)}						
Dense Select Structural	1800	1250	175	660	1750	1.9
Select Structural	1600	1100	175	565	1650	1.8
Non Dense Select Structural	1400	975	175	480	1550	1.6
No. 1 Dense	1100	750	175	660	1500	1.8
No. 1	1000	650	175	565	1400	1.6
No. 1 Non Dense	900	575	175	480	1350	1.4
No. 2 Dense	800	500	175	660	1300	1.6
No. 2	750	450	175	565	1250	1.4
No. 2 Non Dense	700	400	175	480	1250	1.3
No. 3 and Stud	450	250	175	565	725	1.3

Appendix A Table 6: Design Values for Southern Pine Dimension Lumber – 2" - 4" Thick & 12" Wide

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) For 4" thick material that is 8" or greater in width the F_b value may be multiplied by 1.1.

(3) For sizes wider than 12", use 90% of the F_b, F_t, and F_{c||} specified for the 12" width. Use 100% of the F_v, F_{c⊥}, and MOE specified for the 12" width. See additional **Design Value Footnotes** page 276

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SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{cL} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" - 4" Thick - 2" - 4" Wide ⁽¹⁾						
Construction	875	500	175	565	1600	1.4
Standard	475	275	175	565	1300	1.2
Utility ⁽²⁾	225	125	175	565	850	1.2

Appendix A Table 7: Design Values for Southern Pine Dimension Lumber (Light Framing) – 2" - 4" Thick

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) Utility design values apply to 4" widths only

See additional **Design Value Footnotes** page 276

SOUTHERN PINE TIMBERS						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 5" x 5" and Larger ⁽¹⁾						
Dense Select Structural	1750	1200	165	440	1100	1.6
Select Structural	1500	1000	165	375	950	1.5
No. 1 Dense	1550	1050	165	440	975	1.6
No. 1	1350	900	165	375	825	1.5
No. 2 Dense	975	650	165	440	625	1.3
No. 2	850	550	165	375	525	1.2

Appendix A Table 8: Design Values for Southern Pine Timbers – 5" x 5" and Larger

(1) Appropriate for wet or dry service conditions

See additional **Design Value Footnotes** page 276

SOUTHERN PINE DECKING			
Grade	Extreme Fiber in Bending "F _b "	Compression Perpendicular to Grain "F _{c⊥} "	Modulus of Elasticity (million psi)"E"
Applies to 2" - 4" Thick ⁽¹⁾ For flatwise use only			
Dense Standard Decking	2000	660	1.8
Select Decking	1400	565	1.6
Dense Select Decking	1650	660	1.6
Commercial Decking	1400	565	1.6
Dense Commercial Decking	1650	660	1.6
Applies to 2-1/2" to 4" Thickness ⁽²⁾ For flatwise use only			
Dense Standard Decking	1600	440	1.6
Select Decking	1150	375	1.4
Dense Select Decking	1350	440	1.4
Commercial Decking	1150	375	1.4
Dense Commercial Decking	1350	440	1.4

Appendix A Table 9: Design Values for Southern Pine Decking - 2" - 4" Thick, 2" and Wider

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) Applies to moisture contents over 19%

See additional **Design Value Footnotes** page 276

See Section **420.1** Recommended Spans for Radius Edge Decking and **430.1** Recommended Spans for Patio Decking

MIXED SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" - 4" Thick - 2" - 4" Wide Only ⁽¹⁾						
Select Structural	2050	1200	175	565	1800	1.6
No. 1	1450	875	175	565	1650	1.5
No. 2	1100	675	175	565	1450	1.4
No. 3 and Stud	650	400	175	565	850	1.2
Construction	875	500	175	565	1600	1.3
Standard	475	275	175	565	1300	1.2
Utility ⁽²⁾	225	125	175	565	850	1.1
Applies to 2" - 4" Thick - 5" - 6" Wide Only ⁽¹⁾						
Select Structural	1850	1100	175	565	1700	1.6
No. 1	1300	750	175	565	1550	1.5
No. 2	1000	600	175	565	1400	1.4
No. 3 and Stud	575	350	175	565	800	1.2

Appendix A Table 10: Design Values for Mixed Southern Pine (Virginia Pine and Pond Pine) Dimension Lumber – 2" - 4" Thick

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) Utility design values apply to 4" width only

See additional **Design Value Footnotes** page 276

MIXED SOUTHERN PINE DIMENSION LUMBER						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 2" – 4" Thick – 8" Wide Only ⁽¹⁾⁽²⁾						
Select Structural	1750	1000	175	565	1600	1.6
No. 1	1200	700	175	565	1450	1.5
No. 2	925	550	175	565	1350	1.4
No. 3 and Stud	525	325	175	565	775	1.2
Applies to 2" – 4" Thick – 10" Wide Only ⁽¹⁾⁽²⁾						
Select Structural	1500	875	175	565	1600	1.6
No. 1	1050	600	175	565	1450	1.5
No. 2	800	475	175	565	1300	1.4
No. 3 and Stud	475	275	175	565	750	1.2
Applies to 2" – 4" Thick – 12" Wide Only ⁽¹⁾⁽²⁾⁽³⁾						
Select Structural	1400	825	175	565	1550	1.6
No. 1	975	575	175	565	1400	1.5
No. 2	750	450	175	565	1250	1.4
No. 3 and Stud	450	250	175	565	725	1.2

Appendix A Table 11: Design Values for Mixed Southern Pine (Virginia Pine and Pond Pine) Dimension Lumber – 2" – 4" Thick

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

(2) For 4" thick material that is 8" or greater in width the F_b value may be multiplied by 1.1.

(3) For sizes wider than 12", use 90% of the F_b, F_t, and F_{c||} specified for the 12" width. Use 100% of the F_v, F_{c⊥}, and MOE specified for the 12" width. See additional **Design Value Footnotes** page 276

MIXED SOUTHERN PINE TIMBERS						
Grade	Extreme Fiber in Bending "F _b "	Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression Perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 5" x 5" and Larger ⁽¹⁾						
Select Structural	1500	1000	165	375	900	1.3
No. 1	1350	900	165	375	800	1.3
No. 2	850	550	165	375	525	1.0

Appendix A Table 12: Design Values for Mixed Southern Pine (Virginia Pine and Pond Pine) Timbers – 5" x 5" and Larger

(1) Appropriate for wet or dry service conditions

See additional **Design Value Footnotes** page 276

BALD CYPRESS BASE VALUES FOR DIMENSION LUMBER						
Grade	Extreme Fiber in Bending (psi) "F _b "	Tension Parallel to Grain (psi) "F _t "	Horizontal Shear (psi) "F _v "	Compression Perpendicular to Grain (psi) "F _{cL} "	Compression Parallel to Grain (psi) "F _c "	Modulus of Elasticity (million psi) "E"
Base Design Values ⁽¹⁾ – See Table 17 for Size Factors						
Select Structural	1200	650	160	615	1200	1.4
No. 1	1000	550	160	615	1050	1.4
No. 2	825	450	160	615	900	1.3
No. 3	475	250	160	615	525	1.2
Stud	650	350	160	615	575	1.2
Construction	925	500	160	615	1100	1.2
Standard	525	275	160	615	925	1.1
Utility	250	125	160	615	600	1.0

Appendix A Table 13: Base Design Values for Bald Cypress Dimension Lumber – 2" - 4" Thick – Use Size Factors in Table 15

(1) Applies to Kiln Dried or S-Dry, MC 15, MC 19

See additional **Design Value Footnotes** page 276

BALD CYPRESS TIMBERS						
Grade	Extreme Fiber in Bending (psi) "F _b "	Tension Parallel to Grain (psi) "F _t "	Horizontal Shear (psi) "F _v "	Compression Perpendicular to Grain (psi) "F _{c⊥} "	Compression Parallel to Grain (psi) "F _c "	Modulus of Elasticity (million psi) "E"
Applies to 5" x 5" and Larger ⁽¹⁾						
Select Structural	1150	750	200	615	1050	1.3
No. 1	1000	675	200	615	925	1.3
No. 2	625	425	175	615	600	1.0

Appendix A Table 14: Design Values for Bald Cypress Timbers – 5" x 5" and Larger – Size Factors from Table 15 Do Not Apply

(1) Appropriate for wet or dry service conditions

See additional **Design Value Footnotes** page 276

SIZE FACTOR TABLE ⁽¹⁾ (FOR USE WITH TABLE 13 Only)					
Grade	Width (depth)	"F _b "		"F _t "	"F _{cl} "
		Thickness (breadth)			
		2" & 3"	4"		
Select Structural, No. 1, No. 2, and No. 3	2", 3", & 4"	1.5	1.5	1.5	1.15
	5"	1.4	1.4	1.4	1.1
	6"	1.3	1.3	1.3	1.1
	8"	1.2	1.3	1.2	1.05
	10"	1.1	1.2	1.1	1.0
	12"	1.0	1.1	1.0	1.0
	14" & Wider	0.9	1.0	0.9	0.9
Stud	2", 3", & 4"	1.1	1.1	1.1	1.05
	5" & 6"	1.0	1.0	1.0	1.0
	8" & Wider	Use No. 3 grade design values and factors			
Construction & Standard	2", 3", & 4"	1.0	1.0	1.0	1.0
Utility	4"	1.0	1.0	1.0	1.0
	2" & 3"	0.4		0.4	0.6

Appendix A Table 15: Size Factors, C_F - To be used with Table 13 - Multiply the tabulated design value by the following size factors to obtain values for the indicated width.

(1) The base design values are for the characteristic size of 2"x12"x144" for SEL STR. No. 1, No. 2, and No. 3, 2"x6"x120" for Stud, and 2"x4"x144" for Construction, Standard, and Utility.

DESIGN VALUE FOOTNOTES

- (1) See Sections **163 - 164.4** for conditions applicable to seasoned lumber. In widths of 12" and less in lengths of 24' and less, seasoning is required for all lumber of 2" thickness and less. Seasoning must be specified if desired for other widths and lengths, or for thickness in excess of 2".
- (2) The allowable unit stresses and adjustments apply to lumber used under conditions continuously dry, as in most covered structures. Timber design values are appropriate for wet or dry service conditions.
- (3) Lumber 2 ½" - 4" nominal thickness above 19% moisture content (S - GRN) and lumber in service under wet conditions of use or where moisture content is at or above the fiber saturation point, as when continuously submerged, the recommended design values shall be multiplied by the following factors:

<i>Property</i>	<i>Factor</i>
$F_b \leq 1150 \text{ psi}$	1.0
$F_b > 1150 \text{ psi}$	0.85
F_t	1.0
F_v	0.93
$F_{c\perp}$	0.67
$F_{c\parallel} \leq 750 \text{ psi}$	1.0
$F_{c\parallel} > 750 \text{ psi}$	0.8
MOE	0.9

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- (4) Lumber chemically treated may require adjustments to the recommended design values. Reference should be made to the American Wood Protection Association Standards and the National Design Specifications of the American Wood Council.
- (5) Grade restrictions established under the SPIB Standard Grading Rules apply the entire length of the piece, and each piece therefore is suitable for use in continuous spans, over double spans or under concentrated loads without the necessity of regarding for special shear or other special stress requirements.
- (6) All stress rated grades under these rules are established on a basis that permits cutting graded members to shorter lengths without impairment of stress ratings in the shorter pieces.

(7) In construction where three or more load-carrying members such as joists, rafters, studs, or decking are contiguous or are spaced not more than 24 inches in frame construction and are joined by transverse floor, roof or other load distributing elements, an increase in bending stress (F_b) of 15% for members used in such systems is allowed as a design consideration, as approved in ASTM D1990.

(8) For flatwise use, the following adjustments apply to the F_b values. These adjustments are not applicable to the values listed in Appendix A Table 9: Design Values for Southern Pine Decking - 2" - 4" Thick, 2" and Wider

<i>Width</i>	<i>Nominal Thickness</i>	
	<i>2" & 3"</i>	<i>4"</i>
<i>4"</i>	<i>1.10</i>	<i>1.00</i>
<i>5"</i>	<i>1.10</i>	<i>1.05</i>
<i>6"</i>	<i>1.15</i>	<i>1.05</i>
<i>8"</i>	<i>1.15</i>	<i>1.05</i>
<i>10" & Wider</i>	<i>1.20</i>	<i>1.10</i>

(9) The allowable unit stresses for all stress rated grades under these rules are for normal loading conditions and apply in all cases other than those for which special exemptions are to be made. Where a member is to be fully loaded to a maximum design stress for many years, either continuously or cumulatively, 90% of those indicated herein should be used. The stresses may be modified on a similar basis for railroad bridges and other structures that involve unusual hazardous or severe service conditions.

(10) Compression perpendicular-to-grain values are design stresses for 0.04" deformation. For design stress at 0.02" deformation, use 74% of the corresponding tabulated values.

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