



June 2021

ADDENDUM
to the 2021 and previous versions of
DESIGN VALUES FOR JOISTS AND RAFTERS
(a supplement to Span Tables for Joists and Rafters)

<u>Page</u>	<u>Revision</u>
21	Add new design values for Non-North American Visually Graded Dimension Lumber per 2018 NDS Supplement Table 4F as shown on the following pages.

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER^{1,3}

These F_b values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, F_b values shall be reduced 13%.

Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
AUSTRIAN SPRUCE - Austria & The Czech Republic							
Select Structural	2x4	2,590	2,975	3,235	260	1,700,000	WCLIB
No. 1		1,725	1,985	2,155	260	1,600,000	
No. 2		1,595	1,835	1,995	260	1,500,000	
No. 3		905	1,040	1,130	260	1,300,000	
Stud		915	1,055	1,145	260	1,300,000	
Construction		1,210	1,390	1,510	260	1,400,000	
Standard		660	760	825	260	1,300,000	
Utility		315	365	395	260	1,200,000	
Select Structural		2x6	2,245	2,580	2,805	260	
No. 1	1,495		1,720	1,870	260	1,600,000	
No. 2	1,385		1,590	1,730	260	1,500,000	
No. 3	785		905	980	260	1,300,000	
Stud	835	960	1,040	260	1,300,000		
Select Structural	2x8	2,070	2,380	2,590	260	1,700,000	
No. 1		1,380	1,585	1,725	260	1,600,000	
No. 2		1,275	1,470	1,595	260	1,500,000	
No. 3	725	835	905	260	1,300,000		
Select Structural	2x10	1,900	2,180	2,370	260	1,700,000	
No. 1		1,265	1,455	1,580	260	1,600,000	
No. 2		1,170	1,345	1,465	260	1,500,000	
No. 3		665	765	830	260	1,300,000	
Select Structural	2x12	1,725	1,985	2,155	260	1,700,000	
No. 1		1,150	1,325	1,440	260	1,600,000	
No. 2		1,065	1,225	1,330	260	1,500,000	
No. 3		605	695	755	260	1,300,000	
DOUGLAS FIR - France & Germany							
Select Structural	2x4	2,590	2,975	3,235	540	1,900,000	WCLIB
No. 1		1,680	1,935	2,100	540	1,700,000	
No. 2		1,425	1,635	1,780	540	1,500,000	
No. 3		820	940	1,025	540	1,300,000	
Stud		820	945	1,030	540	1,300,000	
Construction		1,065	1,225	1,330	540	1,400,000	
Standard		605	695	755	540	1,300,000	
Utility		290	330	360	540	1,200,000	
Select Structural	2x6	2,245	2,580	2,805	540	1,900,000	
No. 1		1,460	1,675	1,820	540	1,700,000	
No. 2		1,235	1,420	1,540	540	1,500,000	
No. 3		710	815	890	540	1,300,000	
Stud	750	860	935	540	1,300,000		
Select Structural	2x8	2,070	2,380	2,590	540	1,900,000	
No. 1		1,345	1,545	1,680	540	1,700,000	
No. 2		1,140	1,310	1,425	540	1,500,000	
No. 3	655	755	820	540	1,300,000		
Select Structural	2x10	1,900	2,180	2,370	540	1,900,000	
No. 1		1,235	1,420	1,540	540	1,700,000	
No. 2		1,045	1,200	1,305	540	1,500,000	
No. 3		600	690	750	540	1,300,000	
Select Structural	2x12	1,725	1,985	2,155	540	1,900,000	
No. 1		1,120	1,290	1,400	540	1,700,000	
No. 2		950	1,090	1,185	540	1,500,000	
No. 3		545	630	685	540	1,300,000	

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER^{1,3}

These F_b values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, F_b values shall be reduced 13%.
 Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
DOUGLAS FIR/EUROPEAN LARCH - Austria, The Czech Republic, & Bavaria²							
Select Structural	2x4	2,185	2,515	2,730	440	1,800,000	WCLIB
No. 1		1,610	1,850	2,015	440	1,700,000	
No. 2		1,555	1,785	1,940	440	1,600,000	
No. 3		890	1,025	1,115	440	1,400,000	
Stud		920	1,060	1,150	440	1,400,000	
Construction		1,150	1,325	1,440	440	1,500,000	
Standard		660	760	825	440	1,300,000	
Utility		315	365	395	440	1,300,000	
MONTANE PINE - South Africa							
Select Structural	2x4	1,680	1,935	2,100	325	1,300,000	WCLIB
No. 1		1,120	1,290	1,400	325	1,100,000	
No. 2		1,035	1,190	1,295	325	1,000,000	
No. 3		605	695	755	325	900,000	
Stud		600	690	750	325	900,000	
Construction		775	895	970	325	900,000	
Standard		430	495	540	325	800,000	
Utility	200	230	250	325	800,000		
Select Structural	2x6	1,460	1,675	1,820	325	1,300,000	
No. 1		970	1,120	1,215	325	1,100,000	
No. 2		895	1,030	1,120	325	1,000,000	
No. 3		525	600	655	325	900,000	
Stud	545	630	685	325	900,000		
Select Structural	2x8	1,345	1,545	1,680	325	1,300,000	
No. 1		895	1,030	1,120	325	1,100,000	
No. 2		830	950	1,035	325	1,000,000	
No. 3		485	555	605	325	900,000	
Select Structural	2x10	1,235	1,420	1,540	325	1,300,000	
No. 1		820	945	1,030	325	1,100,000	
No. 2		760	875	950	325	1,000,000	
No. 3		445	510	555	325	900,000	
Select Structural	2x12	1,120	1,290	1,400	325	1,300,000	
No. 1		750	860	935	325	1,100,000	
No. 2		690	795	865	325	1,000,000	
No. 3		405	465	505	325	900,000	

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER^{1,3}

These F_b values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, F_b values shall be reduced 13%. Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
NORWAY SPRUCE - Estonia, Latvia, & Lithuania							
Select Structural	2x4	2,070	2,380	2,590	430	1,600,000	WCLIB
No. 1		1,465	1,685	1,835	430	1,400,000	
No. 2		1,380	1,585	1,725	430	1,300,000	
No. 3		775	895	970	430	1,100,000	
Stud		790	910	990	430	1,100,000	
Construction Standard		1,035	1,190	1,295	430	1,200,000	
Utility		575	660	720	430	1,100,000	
Select Structural	2x6	290	330	360	430	1,000,000	
Select Structural		1,795	2,065	2,245	430	1,600,000	
No. 1		1,270	1,460	1,590	430	1,400,000	
No. 2		1,195	1,375	1,495	430	1,300,000	
No. 3		675	775	840	430	1,100,000	
Stud	720	825	900	430	1,100,000		
Select Structural	2x8	1,655	1,905	2,070	430	1,600,000	
No. 1		1,175	1,350	1,465	430	1,400,000	
No. 2		1,105	1,270	1,380	430	1,300,000	
No. 3		620	715	775	430	1,100,000	
Select Structural	2x10	1,520	1,745	1,900	430	1,600,000	
No. 1		1,075	1,235	1,345	430	1,400,000	
No. 2		1,010	1,165	1,265	430	1,300,000	
No. 3		570	655	710	430	1,100,000	
Select Structural	2x12	1,380	1,585	1,725	430	1,600,000	
No. 1		980	1,125	1,220	430	1,400,000	
No. 2		920	1,060	1,150	430	1,300,000	
No. 3		520	595	645	430	1,100,000	
NORWAY SPRUCE - Finland							
Select Structural	2x4	2,330	2,680	2,910	220	1,500,000	
No. 1		1,425	1,635	1,780	220	1,400,000	
No. 2		1,080	1,240	1,350	220	1,200,000	
No. 3		645	745	810	220	1,100,000	
Stud		725	835	910	220	1,100,000	
Construction Standard		835	960	1,040	220	1,100,000	
Utility		460	530	575	220	1,000,000	
Utility		230	265	290	220	1,000,000	
Select Structural	2x6	2,020	2,320	2,525	220	1,500,000	
No. 1		1,235	1,420	1,540	220	1,400,000	
No. 2		935	1,075	1,170	220	1,200,000	
No. 3		560	645	700	220	1,100,000	
Stud		660	760	825	220	1,100,000	
Select Structural	2x8	1,865	2,140	2,330	220	1,500,000	
No. 1		1,140	1,310	1,425	220	1,400,000	
No. 2		865	990	1,080	220	1,200,000	
No. 3		520	595	645	220	1,100,000	
Select Structural	2x10	1,710	1,965	2,135	220	1,500,000	
No. 1		1,045	1,200	1,305	220	1,400,000	
No. 2		790	910	990	220	1,200,000	
No. 3		475	545	595	220	1,100,000	
Select Structural	2x12	1,555	1,785	1,940	220	1,500,000	
No. 1		950	1,090	1,185	220	1,400,000	
No. 2		720	825	900	220	1,200,000	
No. 3		430	495	540	220	1,100,000	

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 Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
NORWAY SPRUCE - Germany, NE France, & Switzerland							
Select Structural	2x4	2,070	2,380	2,590	355	1,600,000	WCLIB
No. 1		1,425	1,635	1,780	355	1,400,000	
No. 2		1,250	1,440	1,565	355	1,200,000	
No. 3		735	845	915	355	1,100,000	
Stud		725	835	910	355	1,100,000	
Construction		950	1,090	1,185	355	1,100,000	
Standard		545	630	685	355	1,000,000	
Utility		260	300	325	355	900,000	
Select Structural	2x6	1,795	2,065	2,245	355	1,600,000	
No. 1		1,235	1,420	1,540	355	1,400,000	
No. 2		1,085	1,245	1,355	355	1,200,000	
No. 3		635	730	795	355	1,100,000	
Stud	660	760	825	355	1,100,000		
Select Structural	2x8	1,655	1,905	2,070	355	1,600,000	
No. 1		1,140	1,310	1,425	355	1,400,000	
No. 2		1,000	1,150	1,250	355	1,200,000	
No. 3		585	675	735	355	1,100,000	
Select Structural	2x10	1,520	1,745	1,900	355	1,600,000	
No. 1		1,045	1,200	1,305	355	1,400,000	
No. 2		915	1,055	1,145	355	1,200,000	
No. 3		540	620	670	355	1,100,000	
Select Structural	2x12	1,380	1,585	1,725	355	1,600,000	
No. 1		950	1,090	1,185	355	1,400,000	
No. 2		835	960	1,040	355	1,200,000	
No. 3		490	560	610	355	1,100,000	
NORWAY SPRUCE - Norway							
Select Structural	2x4	2,675	3,075	3,340	360	1,800,000	WCLIB
No. 1		1,725	1,985	2,155	360	1,500,000	
No. 2		1,380	1,585	1,725	360	1,300,000	
No. 3		820	940	1,025	360	1,200,000	
Stud		790	910	990	360	1,200,000	
Construction		1,065	1,225	1,330	360	1,200,000	
Standard		605	695	755	360	1,100,000	
Utility		290	330	360	360	1,000,000	
Select Structural	2x6	2,315	2,665	2,895	360	1,800,000	
No. 1		1,495	1,720	1,870	360	1,500,000	
No. 2		1,195	1,375	1,495	360	1,300,000	
No. 3		710	815	890	360	1,200,000	
Stud	720	825	900	360	1,200,000		
Select Structural	2x8	2,140	2,460	2,675	360	1,800,000	
No. 1		1,380	1,585	1,725	360	1,500,000	
No. 2		1,105	1,270	1,380	360	1,300,000	
No. 3		655	755	820	360	1,200,000	
Select Structural	2x10	1,960	2,255	2,450	360	1,800,000	
No. 1		1,265	1,455	1,580	360	1,500,000	
No. 2		1,010	1,165	1,265	360	1,300,000	
No. 3		600	690	750	360	1,200,000	
Select Structural	2x12	1,785	2,050	2,230	360	1,800,000	
No. 1		1,150	1,325	1,440	360	1,500,000	
No. 2		920	1,060	1,150	360	1,300,000	
No. 3		545	630	685	360	1,200,000	

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Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
NORWAY SPRUCE - Romania & Ukraine							
Select Structural	2x4	2,155	2,480	2,695	275	1,500,000	WCLIB
No. 1		1,465	1,685	1,835	275	1,400,000	
No. 2		1,250	1,440	1,565	275	1,200,000	
No. 3		735	845	915	275	1,100,000	
Stud		725	835	910	275	1,100,000	
Construction Standard		980	1,125	1,220	275	1,100,000	
Standard		545	630	685	275	1,000,000	
Utility		260	300	325	275	1,000,000	
Select Structural	2x6	1,870	2,150	2,335	275	1,500,000	
No. 1		1,270	1,460	1,590	275	1,400,000	
No. 2		1,085	1,245	1,355	275	1,200,000	
No. 3		635	730	795	275	1,100,000	
Stud	660	760	825	275	1,100,000		
Select Structural	2x8	1,725	1,985	2,155	275	1,500,000	
No. 1		1,175	1,350	1,465	275	1,400,000	
No. 2		1,000	1,150	1,250	275	1,200,000	
No. 3		585	675	735	275	1,100,000	
Select Structural	2x10	1,580	1,820	1,975	275	1,500,000	
No. 1		1,075	1,235	1,345	275	1,400,000	
No. 2		915	1,055	1,145	275	1,200,000	
No. 3		540	620	670	275	1,100,000	
Select Structural	2x12	1,440	1,655	1,795	275	1,500,000	
No. 1		980	1,125	1,220	275	1,400,000	
No. 2		835	960	1,040	275	1,200,000	
No. 3		490	560	610	275	1,100,000	
NORWAY SPRUCE - Sweden							
Select Structural	2x4	2,155	2,480	2,695	285	1,600,000	
No. 1		1,425	1,635	1,780	285	1,400,000	
No. 2		1,165	1,340	1,455	285	1,200,000	
No. 3		690	795	865	285	1,100,000	
Stud		695	800	870	285	1,100,000	
Construction Standard		890	1,025	1,115	285	1,200,000	
Standard		490	560	610	285	1,100,000	
Utility		230	265	290	285	1,000,000	
Select Structural	2x6	1,870	2,150	2,335	285	1,600,000	
No. 1		1,235	1,420	1,540	285	1,400,000	
No. 2		1,010	1,160	1,260	285	1,200,000	
No. 3		600	690	750	285	1,100,000	
Stud	635	725	790	285	1,100,000		
Select Structural	2x8	1,725	1,985	2,155	285	1,600,000	
No. 1		1,140	1,310	1,425	285	1,400,000	
No. 2		930	1,070	1,165	285	1,200,000	
No. 3		550	635	690	285	1,100,000	
Select Structural	2x10	1,580	1,820	1,975	285	1,600,000	
No. 1		1,045	1,200	1,305	285	1,400,000	
No. 2		855	980	1,065	285	1,200,000	
No. 3		505	580	635	285	1,100,000	
Select Structural	2x12	1,440	1,655	1,795	285	1,600,000	
No. 1		950	1,090	1,185	285	1,400,000	
No. 2		775	895	970	285	1,200,000	
No. 3		460	530	575	285	1,100,000	

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Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
SCOTS PINE - Austria & The Czech Republic, Romania, & Ukraine							
Select Structural	2x4	2,245	2,580	2,805	270	1,700,000	WCLIB
No. 1		1,555	1,785	1,940	270	1,600,000	
No. 2		1,335	1,535	1,670	270	1,400,000	
No. 3		775	895	970	270	1,300,000	
Stud		760	875	950	270	1,300,000	
Construction Standard		1,005	1,155	1,260	270	1,300,000	
Utility		575	660	720	270	1,200,000	
Utility		260	300	325	270	1,100,000	
Select Structural	2x6	1,945	2,235	2,430	270	1,700,000	
No. 1		1,345	1,545	1,680	270	1,600,000	
No. 2		1,160	1,330	1,450	270	1,400,000	
No. 3		675	775	840	270	1,300,000	
Stud	690	795	865	270	1,300,000		
Select Structural	2x8	1,795	2,065	2,245	270	1,700,000	
No. 1		1,240	1,430	1,555	270	1,600,000	
No. 2		1,070	1,230	1,335	270	1,400,000	
No. 3		620	715	775	270	1,300,000	
Select Structural	2x10	1,645	1,890	2,055	270	1,700,000	
No. 1		1,140	1,310	1,425	270	1,600,000	
No. 2		980	1,125	1,225	270	1,400,000	
No. 3		570	655	710	270	1,300,000	
Select Structural	2x12	1,495	1,720	1,870	270	1,700,000	
No. 1		1,035	1,190	1,295	270	1,600,000	
No. 2		890	1,025	1,115	270	1,400,000	
No. 3		520	595	645	270	1,300,000	
SCOTS PINE - Estonia, Latvia, & Lithuania							
Select Structural	2x4	1,985	2,280	2,480	430	1,500,000	WCLIB
No. 1		1,380	1,585	1,725	430	1,400,000	
No. 2		1,295	1,490	1,615	430	1,200,000	
No. 3		735	845	915	430	1,100,000	
Stud		725	835	910	430	1,100,000	
Construction Standard		980	1,125	1,220	430	1,100,000	
Utility		545	630	685	430	1,000,000	
Utility		260	300	325	430	1,000,000	
Select Structural	2x6	1,720	1,975	2,150	430	1,500,000	
No. 1		1,195	1,375	1,495	430	1,400,000	
No. 2		1,120	1,290	1,400	430	1,200,000	
No. 3		635	730	795	430	1,100,000	
Stud	660	760	825	430	1,100,000		
Select Structural	2x8	1,585	1,825	1,985	430	1,500,000	
No. 1		1,105	1,270	1,380	430	1,400,000	
No. 2		1,035	1,190	1,295	430	1,200,000	
No. 3		585	675	735	430	1,100,000	
Select Structural	2x10	1,455	1,675	1,820	430	1,500,000	
No. 1		1,010	1,165	1,265	430	1,400,000	
No. 2		950	1,090	1,185	430	1,200,000	
No. 3		540	620	670	430	1,100,000	
Select Structural	2x12	1,325	1,520	1,655	430	1,500,000	
No. 1		920	1,060	1,150	430	1,400,000	
No. 2		865	990	1,080	430	1,200,000	
No. 3		490	560	610	430	1,100,000	

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER^{1,3}

These F_b values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, F_b values shall be reduced 13%. Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
SCOTS PINE - Finland							
Select Structural	2x4	2,245	2,580	2,805	210	1,500,000	WCLIB
No. 1		1,640	1,885	2,050	210	1,400,000	
No. 2		1,595	1,835	1,995	210	1,300,000	
No. 3		905	1,040	1,130	210	1,200,000	
Stud		915	1,055	1,145	210	1,200,000	
Construction Standard		1,210	1,390	1,510	210	1,200,000	
Utility		690	795	865	210	1,100,000	
Utility		315	365	395	210	1,000,000	
Select Structural	2x6	1,945	2,235	2,430	210	1,500,000	
No. 1		1,420	1,635	1,775	210	1,400,000	
No. 2		1,385	1,590	1,730	210	1,300,000	
No. 3		785	905	980	210	1,200,000	
Stud	835	960	1,040	210	1,200,000		
Select Structural	2x8	1,795	2,065	2,245	210	1,500,000	
No. 1		1,310	1,510	1,640	210	1,400,000	
No. 2		1,275	1,470	1,595	210	1,300,000	
No. 3		725	835	905	210	1,200,000	
Select Structural	2x10	1,645	1,890	2,055	210	1,500,000	
No. 1		1,200	1,380	1,500	210	1,400,000	
No. 2		1,170	1,345	1,465	210	1,300,000	
No. 3		665	765	830	210	1,200,000	
Select Structural	2x12	1,495	1,720	1,870	210	1,500,000	
No. 1		1,095	1,255	1,365	210	1,400,000	
No. 2		1,065	1,225	1,330	210	1,300,000	
No. 3		605	695	755	210	1,200,000	
SCOTS PINE - Germany⁴							
Select Structural	2x4	2,070	2,380	2,590	395	1,600,000	WCLIB
No. 1		1,380	1,585	1,725	395	1,400,000	
No. 2		1,210	1,390	1,510	395	1,100,000	
No. 3		690	795	865	395	1,000,000	
Stud		695	800	870	395	1,000,000	
Construction Standard		920	1,060	1,150	395	1,100,000	
Utility		520	595	645	395	1,000,000	
Utility		260	300	325	395	900,000	
Select Structural	2x6	1,795	2,065	2,245	395	1,600,000	
No. 1		1,195	1,375	1,495	395	1,400,000	
No. 2		1,045	1,205	1,310	395	1,100,000	
No. 3		600	690	750	395	1,000,000	
Stud	635	725	790	395	1,000,000		
Select Structural	2x8	1,655	1,905	2,070	395	1,600,000	
No. 1		1,105	1,270	1,380	395	1,400,000	
No. 2		965	1,110	1,210	395	1,100,000	
No. 3		550	635	690	395	1,000,000	
Select Structural	2x10	1,520	1,745	1,900	395	1,600,000	
No. 1		1,010	1,165	1,265	395	1,400,000	
No. 2		885	1,020	1,105	395	1,100,000	
No. 3		505	580	635	395	1,000,000	
Select Structural	2x12	1,380	1,585	1,725	395	1,600,000	
No. 1		920	1,060	1,150	395	1,400,000	
No. 2		805	925	1,005	395	1,100,000	
No. 3		460	530	575	395	1,000,000	

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER^{1,3}

These F_b values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, F_b values shall be reduced 13%.
Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
SCOTS PINE - Sweden							
Select Structural	2x4	2,330	2,680	2,910	410	1,700,000	WCLIB
No. 1		1,425	1,635	1,780	410	1,500,000	
No. 2		990	1,140	1,240	410	1,200,000	
No. 3		560	645	700	410	1,100,000	
Stud		570	655	710	410	1,100,000	
Construction Standard		750	860	935	410	1,200,000	
Standard		430	495	540	410	1,100,000	
Utility		200	230	250	410	1,000,000	
Select Structural	2x6	2,020	2,320	2,525	410	1,700,000	
No. 1		1,235	1,420	1,540	410	1,500,000	
No. 2		860	990	1,075	410	1,200,000	
No. 3		485	560	605	410	1,100,000	
Stud	520	595	645	410	1,100,000		
Select Structural	2x8	1,865	2,140	2,330	410	1,700,000	
No. 1		1,140	1,310	1,425	410	1,500,000	
No. 2		795	915	990	410	1,200,000	
No. 3		450	515	560	410	1,100,000	
Select Structural	2x10	1,710	1,965	2,135	410	1,700,000	
No. 1		1,045	1,200	1,305	410	1,500,000	
No. 2		725	835	910	410	1,200,000	
No. 3		410	475	515	410	1,100,000	
Select Structural	2x12	1,555	1,785	1,940	410	1,700,000	
No. 1		950	1,090	1,185	410	1,500,000	
No. 2		660	760	825	410	1,200,000	
No. 3		375	430	465	410	1,100,000	
SILVER FIR (<i>Abies alba</i>) - Germany, NE France, & Switzerland							
Select Structural	2x4	1,640	1,885	2,050	400	1,500,000	WCLIB
No. 1		1,250	1,440	1,565	400	1,400,000	
No. 2		1,250	1,440	1,565	400	1,300,000	
No. 3		735	845	915	400	1,100,000	
Stud		725	835	910	400	1,100,000	
Construction Standard		950	1,090	1,185	400	1,200,000	
Standard		545	630	685	400	1,100,000	
Utility		260	300	325	400	1,000,000	
Select Structural	2x6	1,420	1,635	1,775	400	1,500,000	
No. 1		1,085	1,245	1,355	400	1,400,000	
No. 2		1,085	1,245	1,355	400	1,300,000	
No. 3		635	730	795	400	1,100,000	
Stud	660	760	825	400	1,100,000		
Select Structural	2x8	1,310	1,510	1,640	400	1,500,000	
No. 1		1,000	1,150	1,250	400	1,400,000	
No. 2		1,000	1,150	1,250	400	1,300,000	
No. 3		585	675	735	400	1,100,000	
Select Structural	2x10	1,200	1,380	1,500	400	1,500,000	
No. 1		915	1,055	1,145	400	1,400,000	
No. 2		915	1,055	1,145	400	1,300,000	
No. 3		540	620	670	400	1,100,000	
Select Structural	2x12	1,095	1,255	1,365	400	1,500,000	
No. 1		835	960	1,040	400	1,400,000	
No. 2		835	960	1,040	400	1,300,000	
No. 3		490	560	610	400	1,100,000	

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER^{1,3}

These F_b values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, F_b values shall be reduced 13%.
 Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending, F_b			Compression perpendicular to grain, $F_{c\perp}$	Modulus of Elasticity, E	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading			
SOUTHERN PINE - Misiones Argentina							
Select Structural	2x4	1,900	2,180	2,370	440	1,200,000	SPIB
No. 1		1,335	1,535	1,670	440	1,100,000	
No. 2		1,250	1,440	1,565	440	1,100,000	
No. 3		735	845	915	440	900,000	
Stud		725	835	910	440	900,000	
Construction Standard		950	1,090	1,185	440	1,000,000	
Standard		545	630	685	440	900,000	
Utility		260	300	325	440	800,000	
Select Structural	2x6	1,645	1,890	2,055	440	1,200,000	
No. 1		1,160	1,330	1,450	440	1,100,000	
No. 2		1,085	1,245	1,355	440	1,100,000	
No. 3		635	730	795	440	900,000	
Stud	660	760	825	440	900,000		
Select Structural	2x8	1,520	1,745	1,900	440	1,200,000	
No. 1		1,070	1,230	1,335	440	1,100,000	
No. 2		1,000	1,150	1,250	440	1,100,000	
No. 3		585	675	735	440	900,000	
Select Structural	2x10	1,390	1,600	1,740	440	1,200,000	
No. 1		980	1,125	1,225	440	1,100,000	
No. 2		915	1,055	1,145	440	1,100,000	
No. 3		540	620	670	440	900,000	
Select Structural	2x12	1,265	1,455	1,580	440	1,200,000	
No. 1		890	1,025	1,115	440	1,100,000	
No. 2		835	960	1,040	440	1,100,000	
No. 3		490	560	610	440	900,000	
SOUTHERN PINE - Misiones Argentina, Free of Heart Center and Medium Grain Density							
Select Structural	2x4	2,935	3,370	3,665	710	1,500,000	SPIB
No. 1		1,985	2,280	2,480	710	1,500,000	
No. 2		1,725	1,985	2,155	710	1,500,000	
No. 3		990	1,140	1,240	710	1,400,000	
Stud		1,010	1,165	1,265	710	1,400,000	
Construction Standard		1,325	1,520	1,655	710	1,400,000	
Standard		750	860	935	710	1,300,000	
Utility		345	395	430	710	1,200,000	
Select Structural	2x6	2,540	2,925	3,175	710	1,500,000	
No. 1		1,720	1,975	2,150	710	1,500,000	
No. 2		1,495	1,720	1,870	710	1,500,000	
No. 3		860	990	1,075	710	1,400,000	
Stud	920	1,060	1,150	710	1,400,000		
Select Structural	2x8	2,345	2,700	2,935	710	1,500,000	
No. 1		1,585	1,825	1,985	710	1,500,000	
No. 2		1,380	1,585	1,725	710	1,500,000	
No. 3		795	915	990	710	1,400,000	
Select Structural	2x10	2,150	2,475	2,690	710	1,500,000	
No. 1		1,455	1,675	1,820	710	1,500,000	
No. 2		1,265	1,455	1,580	710	1,500,000	
No. 3		725	835	910	710	1,400,000	
Select Structural	2x12	1,955	2,250	2,445	710	1,500,000	
No. 1		1,325	1,520	1,655	710	1,500,000	
No. 2		1,150	1,325	1,440	710	1,500,000	
No. 3		660	760	825	710	1,400,000	

See *Span Tables for Joists and Rafters* for footnotes 1, 2, 3, and 4 to Table W-1.