

ADDENDUM
to the 2024 Edition of the
Design Values for Wood Construction
(a supplement to the *National Design Specification® (NDS®) for Wood Construction*)
(All print and electronic versions)

Due to changes in the ASTM D1990 standard related to how specific gravity (G) values are assigned for grouped species, the G value for Spruce-Pine-Fir (South) has been increased from 0.36 to 0.40. This will apply to the Spruce-Pine-Fir (South) G value in NDS Supplement Tables 4A, 4C Footnote 2, 4D, and 4E as well as to the G value for the following multi-species and country labels in Table 4G as shown below.

Table 4A Reference Design Values for Visually Graded Dimension Lumber (2" - 4" thick)^{1,2,3}

(All species except Southern Pine—see Table 4B) (Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4A ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity ⁴	Grading Rules Agency
		Bending	Tension parallel to grain	Shear parallel to grain	Compression perpendicular to grain	Compression parallel to grain	Modulus of Elasticity			
							E	E _{min}		
SPRUCE-PINE-FIR (SOUTH)		F _b	F _t	F _v	F _{c⊥}	F _c	E	E _{min}	G	
Select Structural	2" & wider	1,300	575	135	335	1,200	1,300,000	470,000	0.36 0.40	NELMA PLIB WWPA
No. 1		875	400	135	335	1,050	1,200,000	440,000		
No. 2		775	350	135	335	1,000	1,100,000	400,000		
No. 3		450	200	135	335	575	1,000,000	370,000		
Stud	2" & wider	600	275	135	335	625	1,000,000	370,000		
Construction	2" - 4" wide	875	400	135	335	1,200	1,000,000	370,000		
Standard		500	225	135	335	1,000	900,000	330,000		
Utility		225	100	135	335	675	900,000	330,000		

Table 4C Footnotes

2. SPECIFIC GRAVITY, G, SHEAR PARALLEL TO GRAIN, F_v, AND COMPRESSION PERPENDICULAR TO GRAIN, F_{c⊥}. Values for specific gravity, G, shear parallel to grain, F_v, and compression perpendicular to grain, F_{c⊥}, are provided below for MSR and MEL lumber. For species or species groups not shown below, the G, F_v, and F_{c⊥} values for visually graded lumber may be used. Higher G values may be claimed when (a) specifically assigned by the rules writing agency or (b) when qualified by test, quality controlled for G and provided for on the grade stamp. When a different G value is provided on the grade stamp, higher F_v and F_{c⊥} design values may be calculated in accordance with the grading rule requirements.

Species	Modulus of Elasticity E (x10 ⁶) psi	Specific Gravity G	Design values in pounds per square inch (psi)		Grading Rules Agency
			Shear parallel to grain F _v	Compression perpendicular to grain F _{c⊥}	
Spruce-Pine-Fir (S)	1.0 to 1.1	0.36 0.40	135	335	NELMA, PLIB, WWPA
	1.2 to 1.9	0.42	150	465	NELMA
	1.2 to 1.7	0.42	150	465	PLIB, WWPA
	1.8 to 1.9	0.46	160	555	
	2.0 and higher	0.50	175	645	NELMA, PLIB, WWPA

Table 4D Reference Design Values for Visually Graded Timbers (5" x 5" and larger)^{1,3}

(Tabulated design values are for normal load duration and dry service conditions, unless specified otherwise. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4D ADJUSTMENT FACTORS

Species and commercial Grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity ⁴	Grading Rules Agency
		Bending F _b	Tension parallel to grain F _t	Shear parallel to grain F _v	Compression perpendicular to grain F _{c⊥}	Compression parallel to grain F _c	Modulus of Elasticity			
							E	E _{min}		
SPRUCE-PINE-FIR (SOUTH)										
Select Structural	Beams and Stringers	1,050	625	125	335	675	1,200,000	440,000	0.36 0.40	NELMA PLIB WWPA
No.1		900	450	125	335	550	1,200,000	440,000		
No.2		575	300	125	335	375	1,000,000	370,000		
Select Structural	Posts and Timbers	1,000	675	125	335	700	1,200,000	440,000	0.36 0.40	NELMA PLIB WWPA
No.1		800	550	125	335	625	1,200,000	440,000		
No.2		475	325	125	335	425	1,000,000	370,000		

Table 4E Reference Design Values for Visually Graded Decking^{1,2}

(Tabulated design values are for normal load duration and dry service conditions, unless specified otherwise. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4E ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)					Specific Gravity ³	Grading Rules Agency
		Bending		Compression perpendicular to grain	Modulus of Elasticity			
		Single Member	Repetitive Member					
		F _b	(F _b)(C _r)		F _{c⊥}	E		
SPRUCE-PINE-FIR (SOUTH)								
Selected	2"-4" thick	1,150	1,350	335	1,400,000	510,000	0.36 0.40	NELMA
Commercial	4"-12"wide	950	1,100	335	1,200,000	440,000		WWPA

Changes to G values in Table 4G are shown below in red strike-out and underline:

DOUGLAS FIR, HEM-FIR & SPRUCE-PINE-FIR (SOUTH) from U.S.

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Modulus of Elasticity		Specific Gravity ⁴	Grade Stamping Agency		
			Bending	Tension parallel to grain	Shear parallel to grain	Compression perpendicular to grain	Compression parallel to grain								
			F _b	F _t	F _v	F _{c⊥}	F _c	E	E _{min}						
DOUGLAS FIR, HEM-FIR & SPRUCE-PINE-FIR (SOUTH) from U.S.														PLIB	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: DOUGLAS FIR-LARCH; HEM-FIR; SPRUCE-PINE-FIR (SOUTH)	Select Structural	2" & wider	1300	575	135	335	1200	1.3	0.47	0.36 0.40					
	No. 1		875	400	135	335	1050	1.2	0.44						
	No. 2		775	350	135	335	1000	1.1	0.40						
	No. 3		450	200	135	335	575	1	0.37						
	Stud	2" & wider	600	275	135	335	625	1	0.37						
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37						
	Standard		500	225	135	335	1000	0.9	0.33						
	Utility		225	100	135	335	675	0.9	0.33						

HEM-FIR, DOUGLAS FIR (NORTH), SPRUCE-PINE-FIR & SPRUCE-PINE-FIR(SOUTH) from NORTH AMERICA

HFIDF-N/SPF/SPF-S		HEM-FIR, DOUGLAS FIR (NORTH), SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA									TP	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR; DOUGLAS FIR-LARCH (NORTH); SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH)	Select Structural		1250	575	135	335	1200	1.3	0.47	0.36 0.40		
	No. 1	2" & wider	850	400	135	335	1050	1.2	0.44			
	No. 2	775	350	135	335	1000	1.1	0.40				
	No. 3	450	200	135	335	575	1	0.37				
	Stud	2" & wider	600	275	135	335	625	1	0.37			
	Construction	875	400	135	335	1200	1	0.37				
	Standard	2" - 4" wide	500	225	135	335	1000	0.9	0.33			
	Utility	225	100	135	335	675	0.9	0.33				

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)						Modulus of Elasticity		Specific Gravity ⁴ G	Grade Stamping Agency
			Bending	Tension parallel to grain	Shear parallel to grain	Compression perpendicular to grain	Compression parallel to grain					
			F _b	F _t	F _v	F _{c⊥}	F _c	E	E _{min}			
SPF/SPF-S			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA									TP
SPF/SPF(S)			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA									PLIB
SPF ⁵ /SPF			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA									WWPA
SPF/SPF-S			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA									NLGA
S-P-F/SPFs			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA									NLGA
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH)	Select Structural		1250	575	135	335	1200	1.3	0.47	-0.36- 0.40		
	No. 1	2" & wider	875	400	135	335	1050	1.2	0.44			
	No. 2		775	350	135	335	1000	1.1	0.40			
	No. 3		450	200	135	335	575	1	0.37			
	Stud	2" & wider	600	275	135	335	625	1	0.37			
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37			
	Standard		500	225	135	335	1000	0.9	0.33			
Utility		225	100	135	335	675	0.9	0.33				

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, ESTONIA, FINLAND, GERMANY⁵, LITHUANIA, OR SWEDEN, & SILVER FIR from GERMANY

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, ESTONIA, FINLAND, GERMANY ⁵ , LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY											TP
SPF/SPF-S AS/N SPR/SCOTPI/SFIR(AU/SE/ST/FIN/GER/LTH/SW)											
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY; SCOTS PINE from SWEDEN; SILVER FIR (<i>Abies alba</i>) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural		950	425	120	210	1100	1.3	0.47		
	No. 1	2" & wider	725	325	120	210	975	1.2	0.44		
	No. 2		625	275	120	210	875	1.1	0.40		
	No. 3		375	175	120	210	500	1	0.37		
	Stud	2" & wider	500	225	120	210	550	1	0.37	-0.36- 0.40	
	Construction		725	325	120	210	1100	1	0.37		
	Standard	2" - 4" wide	400	175	120	210	900	0.9	0.33		
	Utility		200	75	120	210	600	0.9	0.33		

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, FINLAND, GERMANY⁵, LITHUANIA, OR SWEDEN, & SILVER FIR from GERMANY

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)						Modulus of Elasticity		Specific Gravity ⁴ G	Grade Stamping Agency
			Bending	Tension parallel to grain	Shear parallel to grain	Compression perpendicular to grain	Compression parallel to grain					
			F _b	F _t	F _v	F _{c⊥}	F _c	E	E _{min}			
SPF/SPF-S AS/N SPR/SCOTPI/SFIR(AU/SE/ST/FIN/GER/SW)	SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, FINLAND, GERMANY ⁵ , LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY										TP	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY ⁵ ; SCOTS PINE from SWEDEN; SILVER FIR (<i>Abies alba</i>) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural		950	425	120	210	1100	1.3	0.47			
No. 1	2" & wider	725	325	120	210	975	1.2	0.44				
No. 2		625	275	120	210	875	1.1	0.40				
No. 3		375	175	120	210	500	1	0.37				
Stud	2" & wider	500	225	120	210	550	1	0.37		-0.36- 0.40		
Construction	2" - 4" wide	725	325	120	210	1100	1	0.37				
Standard		400	175	120	210	900	0.9	0.33				
Utility		200	75	120	210	600	0.9	0.33				

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from GERMANY, ROMANIA, SWEDEN, or UKRAINE, SCOTS PINE from AUSTRIA, GERMANY⁵, ROMANIA, SWEDEN, or UKRAINE, or SILVER FIR from GERMANY

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from GERMANY, ROMANIA, SWEDEN, or UKRAINE, SCOTS PINE from AUSTRIA, GERMANY ⁵ , ROMANIA, SWEDEN, or UKRAINE, or SILVER FIR from GERMANY										TP
SPF/SPF-S A/S/N SPR/SCOTPI/SFIR(I)AUS/GER/ROM/SWUKR	Select Structural		950	425	100	260	1100	1.3	0.47	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY ⁵ ; SCOTS PINE from SWEDEN; SILVER FIR (<i>Abies alba</i>) from GERMANY, NE FRANCE, & SWITZERLAND	No. 1	2" & wider	725	325	100	260	975	1.2	0.44	-0.36- 0.38
	No. 2		625	275	100	260	875	1.1	0.40	
	No. 3		375	175	100	260	500	1	0.37	
	Stud	2" & wider	500	225	100	260	550	1	0.37	
	Construction	2" - 4" wide	725	325	100	260	1100	1	0.37	
	Standard		400	175	100	260	900	0.9	0.33	
	Utility		200	75	100	260	600	0.9	0.33	

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, ESTONIA, FINLAND, GERMANY⁵, LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, ESTONIA, FINLAND, GERMANY ⁵ , LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY										TP
SPF/SPF-S A/S/N SPR/SCOTPI/SFIR(I)AUS/EST/FIN/GER/LTHROM/SWUKR	Select Structural		950	425	100	210	1100	1.3	0.47	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY ⁵ ; SCOTS PINE from SWEDEN; SILVER FIR (<i>Abies alba</i>) from GERMANY, NE FRANCE, & SWITZERLAND	No. 1	2" & wider	725	325	100	210	975	1.2	0.44	-0.36- 0.38
	No. 2		625	275	100	210	875	1.1	0.40	
	No. 3		375	175	100	210	500	1	0.37	
	Stud	2" & wider	500	225	100	210	550	1	0.37	
	Construction	2" - 4" wide	725	325	100	210	1100	1	0.37	
	Standard		400	175	100	210	900	0.9	0.33	
	Utility		200	75	100	210	600	0.9	0.33	

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (S) from NORTH AMERICA, & NORWAY SPRUCE (NORTH) from NORTH AMERICA

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (S) from NORTH AMERICA, & NORWAY SPRUCE (NORTH) from NORTH AMERICA										NLGA
S-P-FI SPF-S/N Spr(N)	Select Structural		950	575	135	335	1100	1.3	0.47	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (S); NORWAY SPRUCE (NORTH)	No. 1	2" & wider	650	400	135	335	900	1.2	0.44	-0.36- 0.40
	No. 2		650	350	135	335	900	1.1	0.40	
	No. 3		375	200	135	335	525	1	0.37	
	Stud	2" & wider	500	275	135	335	575	1	0.37	
	Construction	2" - 4" wide	700	400	135	335	1100	1	0.37	
	Standard		400	225	135	335	925	0.9	0.33	
	Utility		175	100	135	335	600	0.9	0.33	

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, & SCOTS PINE from GERMANY⁵

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, & SCOTS PINE from GERMANY ⁵										TP
SPF/SPF-S NSPR/SCOTPI()GER	Select Structural		1200	550	135	335	1200	1.3	0.47	
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY ⁵	No. 1	2" & wider	800	375	135	335	1050	1.2	0.44	-0.36- 0.40
	No. 2		700	325	135	335	950	1.1	0.40	
	No. 3		400	175	135	335	550	1	0.37	
	Stud	2" & wider	550	250	135	335	600	1	0.37	
	Construction	2" - 4" wide	800	375	135	335	1150	1	0.37	
	Standard		450	200	135	335	975	0.9	0.33	
	Utility		225	100	135	335	625	0.9	0.33	

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY
SPRUCE, SCOTS PINE from GERMANY⁵, ROMANIA, SWEDEN, & UKRAINE

SPF/SPF-S N SPR/SCOTP(I)GER/ROM/SW/UKR	SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, SCOTS PINE from GERMANY ⁵ , ROMANIA, SWEDEN, & UKRAINE										TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY ⁵ ; SCOTS PINE from SWEDEN	Select Structural		1200	550	100	270	1200	1.3	0.47	-0.36- 0.40	
	No. 1	2" & wider	800	375	100	270	1000	1.2	0.44		
	No. 2		625	275	100	270	875	1.1	0.40		
	No. 3		375	175	100	270	500	1	0.37		
	Stud	2" & wider	500	225	100	270	550	1	0.37		
	Construction	2" - 4" wide	725	325	100	270	1100	1	0.37		
	Standard		400	175	100	270	900	0.9	0.33		
	Utility		200	75	100	270	600	0.9	0.33		

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

SPRUCE-PINE-FIR, SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY
SPRUCE, SCOTS PINE from GERMANY⁵ & SWEDEN

SPF/SPF-S N SPR/SCOTPI(GER/SW		SPRUCE-PINE-FIR, SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, SCOTS PINE from GERMANY ⁵ & SWEDEN									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); NORWAY SPRUCE from GERMANY ⁵ & SWEDEN; SCOTS PINE from GERMANY ⁵ & SWEDEN	Select Structural		1200	550	120	285	1200	1.3	0.47	-0.36- 0.40	
	No. 1	2" & wider	800	375	120	285	1000	1.2	0.44		
	No. 2		625	275	120	285	875	1.1	0.40		
	No. 3		375	175	120	285	500	1	0.37		
	Stud	2" & wider	500	225	120	285	550	1	0.37		
	Construction		725	325	120	285	1100	1	0.37		
	Standard	2" - 4" wide	400	175	120	285	900	0.9	0.33		
	Utility		200	75	120	285	600	0.9	0.33		

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

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(a supplement to the **National Design Specification® (NDS®) for Wood Construction**)
(All print and electronic versions)

Replace reference design values for Hem-Fir(N) in Table 4A, specific gravity for Hem-Fir(N) in Footnote 2 of Table 4C, and reference design values for HF/HF(N) HF/HF-N in Table 4G with those values as shown below in red underline:

Table 4A (Cont.) Reference Design Values for Visually Graded Dimension Lumber (2" - 4" thick)^{1,2,3}

(All species except Southern Pine — see Table 4B) (Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4A ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity ⁴	Grading Rules Agency
		Bending	Tension parallel to grain	Shear parallel to grain	Compression perpendicular to grain	Compression parallel to grain	Modulus of Elasticity			
							E	E _{min}		
HEM-FIR (NORTH)		F _b	F _t	F _v	F _{c⊥}	F _c	E	E _{min}	G	
Select Structural		1,200	750	145	405	1,650	1,600,000	580,000		
No. 1 & Btr	2" & wider	1,200	725	145	405	1,550	1,700,000	620,000		
No. 1/ No. 2		1,000	500	145	405	1,400	1,500,000	550,000		
No. 3		575	275	145	405	825	1,300,000	470,000		
Stud	2" & wider	775	375	145	405	900	1,300,000	470,000	0.44	NLGA
Construction		1,150	550	145	405	1,700	1,400,000	510,000		
Standard	2" - 4" wide	625	300	145	405	1,450	1,300,000	470,000		
Utility		300	150	145	405	950	1,200,000	440,000		

Table 4C Footnotes

2. **SPECIFIC GRAVITY, G, SHEAR PARALLEL TO GRAIN, F_v, AND COMPRESSION PERPENDICULAR TO GRAIN, F_{c⊥}.** Values for specific gravity, G, shear parallel to grain, F_v, and compression perpendicular to grain, F_{c⊥}, are provided below for MSR and MEL lumber. For species or species groups not shown below, the G, F_v, and F_{c⊥} values for visually graded lumber may be used. Higher G values may be claimed when (a) specifically assigned by the rules writing agency or (b) when qualified by test, quality controlled for G and provided for on the grade stamp. When a different G value is provided on the grade stamp, higher F_v and F_{c⊥} design values may be calculated in accordance with the grading rule requirements.

Species	Modulus of Elasticity E (x10 ⁶) psi	Specific Gravity G	Design values in pounds per square inch (psi)		Grading Rules Agency
			Shear parallel to grain	Compression perpendicular to grain	
			F _v	F _{c⊥}	
Hem-Fir (N)	1.0 and higher	0.44	145	405	NLGA

**Table 4G Reference Design Values for Multi-Species and Country Graded Visually
(Cont.) Graded Dimension Lumber (2"-4" thick)^{1,2,3}**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 5.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity ⁴ G	Grade Stamping Agency
			Bending F _b	Tension parallel to grain F _t	Shear parallel to grain F _v	Compression perpendicular to grain F _{c⊥}	Compression parallel to grain F _c	Modulus of Elasticity			
								E	E _{min}		
HF/HF(N)	HEM-FIR & HEM-FIR (NORTH) from NORTH AMERICA										PLIB, WWPA TP
HF/HF-N	HEM-FIR & HEM-FIR (NORTH) from NORTH AMERICA										
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR; HEM-FIR (NORTH)	Select Structural	2" & wider	1200	750	145	405	1500	1.6	0.58	0.43	
	No. 1 & Btr		1100	725	145	405	1350	1.5	0.55		
	No. 1		975	500	145	405	1350	1.5	0.55		
	No. 2		850	500	145	405	1300	1.3	0.47		
	No. 3		500	275	145	405	725	1.2	0.44		
	Stud	2" & wider	675	375	145	405	800	1.2	0.44		
	Construction	2" - 4" wide	975	550	145	405	1550	1.3	0.47		
	Standard		550	300	145	405	1300	1.2	0.44		
	Utility		250	150	145	405	850	1.1	0.40		

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ADDENDUM
to the 2024 Edition of the
Design Values for Wood Construction
(a supplement to the ***National Design Specification® (NDS®) for Wood Construction***)
(All print and electronic versions)

Modify Section 2.1 as follows:

2.1 List of Sawn Lumber Species Combinations

Species or Species Combination	Species That May Be Included in Combination	Grading Rules Agencies	Design Values Provided in Tables
<u>Red Alder</u>		WWPA	4A

Add the following species and commercial grades to Table 4A:

Table 4A Reference Design Values for Visually Graded Dimension Lumber (2" - 4" thick)^{1,2,3}

(All species except Southern Pine — see Table 4B) (Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4A ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity ^A	Grading Rules Agency
		Bending F _b	Tension parallel to grain F _t	Shear parallel to grain F _v	Compression perpendicular to grain F _{c⊥}	Compression parallel to grain F _c	Modulus of Elasticity			
							E	E _{min}		
RED ALDER										
Select Structural		1,100	650	140	395	1,050	1,400,000	510,000		
No. 1	2" & wider	800	475	140	395	825	1,300,000	470,000		
No. 2		775	450	140	395	650	1,300,000	470,000		
No. 3		450	250	140	395	375	1,100,000	400,000		
Stud	2" & wider	600	350	140	395	400	1,100,000	400,000	0.41	WWPA
Construction		875	500	140	395	875	1,200,000	440,000		
Standard	2" - 4" wide	450	275	140	395	675	1,100,000	400,000		
Utility			225	125	140	395	425	1,000,000	370,000	