

Table F7u.bend.1

F7

Unseasoned

GENERAL INFORMATION

$$(\phi M_x) = \phi k_1 k_4 k_6 k_9 [M_{Tx}]$$

$$(\phi M_y) = \phi k_1 k_4 k_6 k_9 [M_{Ty}]$$

$$(\phi V) = \phi k_1 k_4 k_6 [V_T]$$

Size	Area (mm ²)	major axis		minor axis		major axis			minor axis	shear
		$E I_{\text{average}}$	$E I_{5\%}$	$E I_{\text{average}}$	$E I_{5\%}$	$[M_{Tx}]$ ($k_{12}=1$)	L_{ay} (FLR)	$L_{a\phi}$ (FTR)	$[M_{Ty}]$	$[V_T]$
		(10 ⁹ Nmm ²)	(10 ⁹ Nmm ²)	(10 ⁹ Nmm ²)	(10 ⁹ Nmm ²)	(kNm)	(m)	(m)	(kNm)	(kN)
75x38	2520	8.60	4.30	2.03	1.02	0.605	1.07	any	0.294	3.53
100x38	3400	21.0	10.5	2.74	1.37	1.1	0.792	any	0.396	4.75
125x38	4270	41.8	20.9	3.44	1.72	1.74	0.63	any	0.498	5.98
150x38	5150	73.2	36.6	4.15	2.07	2.52	0.523	6.61	0.600	7.20
175x38	6020	117.	58.6	4.85	2.43	3.45	0.447	1.38	0.702	8.43
200x38	6900	176.	88.1	5.56	2.78	4.53	0.39	1.08	0.804	9.65
225x38	7770	252.	126.	6.27	3.13	5.75	0.346	0.96	0.907	10.9
250x38	8650	347.	174.	6.97	3.49	7.12	0.311	0.90	1.01	12.1
275x38	9520	464.	232.	7.68	3.84	8.63	0.283	0.86	1.11	13.3
300x38	10400	604.	302.	8.38	4.19	10.3	0.259	0.83	1.21	14.6
75x50	3380	11.5	5.77	4.92	2.46	0.812	1.92	any	0.530	4.74
100x50	4560	28.2	14.1	6.63	3.31	1.47	1.43	any	0.714	6.38
125x50	5730	56.2	28.1	8.34	4.17	2.33	1.14	any	0.898	8.03
150x50	6910	98.3	49.1	10.0	5.02	3.39	0.943	any	1.08	9.67
175x50	8080	157.	78.7	11.8	5.88	4.63	0.806	any	1.27	11.3
200x50	9260	237.	118.	13.5	6.73	6.08	0.704	10.90	1.45	13.0
225x50	10400	339.	169.	15.2	7.59	7.72	0.624	2.08	1.63	14.6
250x50	11600	466.	233.	16.9	8.44	9.56	0.561	1.60	1.82	16.3
275x50	12800	623.	311.	18.6	9.30	11.6	0.51	1.41	2.00	17.9
300x50	14000	811.	405.	20.3	10.1	13.8	0.467	1.30	2.19	19.5
75x75	5180	17.7	8.85	17.7	8.85	1.24	4.52	any	1.24	7.26
100x75	6980	43.3	21.6	23.8	11.9	2.26	3.35	any	1.68	9.78
125x75	8780	86.1	43.0	30.0	15.0	3.57	2.67	any	2.11	12.3
150x75	10600	151.	75.3	36.1	18.1	5.19	2.21	any	2.54	14.8
175x75	12400	241.	121.	42.3	21.1	7.1	1.89	any	2.97	17.3
200x75	14200	362.	181.	48.4	24.2	9.31	1.65	any	3.40	19.9
225x75	16000	519.	259.	54.6	27.3	11.8	1.47	any	3.84	22.4
250x75	17800	714.	357.	60.7	30.3	14.6	1.32	any	4.27	24.9
275x75	19600	954.	477.	66.8	33.4	17.8	1.2	any	4.70	27.4
300x75	21400	1240.	621.	73.0	36.5	21.2	1.1	any	5.13	29.9
100x100	9410	58.3	29.1	58.3	29.1	3.04	6.09	any	3.04	13.2
125x100	11800	116.	58.0	73.3	36.7	4.81	4.84	any	3.83	16.6
150x100	14300	203.	101.	88.3	44.2	6.99	4.02	any	4.61	20.0
175x100	16700	325.	162.	103.	51.7	9.57	3.43	any	5.39	23.4
200x100	19100	488.	244.	118.	59.2	12.5	3.00	any	6.18	26.8
225x100	21500	699.	349.	133.	66.7	15.9	2.66	any	6.96	30.1
250x100	24000	962.	481.	148.	74.2	19.7	2.39	any	7.75	33.5
275x100	26400	1290.	643.	163.	81.7	23.9	2.17	any	8.53	36.9
300x100	28800	1670.	836.	178.	89.2	28.5	1.99	any	9.31	40.3

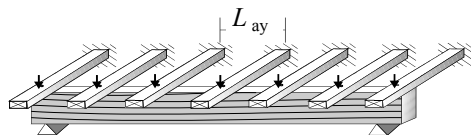
Notes:

1. Check local availability of sizes in the grade
2. Shrinkage of unseasoned timber should always be anticipated
3. Sections deeper than 250 mm and wider than 75 mm may have limited availability
4. Shrinkage of unseasoned timber may cause small gaps to open between sections nailed together to make a combined large width member
5. This material is often supplied as Douglas Fir locally sawn from imported flitches, and visually graded.

Table F7u.bend.2

F7

Unseasoned



MAJOR AXIS BENDING

LATERAL RESTRAINT ON COMPRESSION EDGE AT L_{ay}

[M_{Tx}] Bending Capacity (kNm)

$$(\phi M_x) = \phi k_1 k_4 k_6 k_9 [M_{Tx}]$$

Size	Area (mm ²)	Max L_{ay} FLR (m)	for lat. restraint of compression edge @ L_{ay} (m)										
			0	0.34	0.45	0.6	0.9	1.2	2.4	3.6	4.8	6	7.2
75x38	2520	1.07	0.605	0.605	0.605	0.605	0.605	0.587	0.454	0.352	0.269	0.215	0.179
100x38	3400	0.792	1.10	1.10	1.10	1.10	1.06	0.971	0.691	0.483	0.362	0.290	0.242
125x38	4270	0.630	1.74	1.74	1.74	1.74	1.57	1.41	0.910	0.608	0.456	0.365	0.304
150x38	5150	0.523	2.52	2.52	2.52	2.43	2.13	1.87	1.10	0.732	0.549	0.439	0.366
175x38	6020	0.447	3.45	3.45	3.45	3.18	2.73	2.35	1.29	0.857	0.643	0.514	0.428
200x38	6900	0.390	4.53	4.53	4.36	3.98	3.35	2.82	1.47	0.981	0.736	0.589	0.491
225x38	7770	0.346	5.75	5.75	5.35	4.84	3.99	3.27	1.66	1.11	0.829	0.664	0.553
250x38	8650	0.311	7.12	6.96	6.40	5.73	4.62	3.69	1.85	1.23	0.923	0.738	0.615
275x38	9520	0.283	8.63	8.21	7.50	6.66	5.24	4.06	2.03	1.35	1.02	0.813	0.677
300x38	10400	0.259	10.3	9.54	8.65	7.60	5.84	4.44	2.22	1.48	1.11	0.888	0.740
75x50	3380	1.92	0.812	0.812	0.812	0.812	0.812	0.812	0.765	0.663	0.577	0.501	0.433
100x50	4560	1.43	1.47	1.47	1.47	1.47	1.47	1.47	1.26	1.04	0.860	0.702	0.585
125x50	5730	1.14	2.33	2.33	2.33	2.33	2.33	2.30	1.80	1.42	1.10	0.883	0.736
150x50	6910	0.943	3.39	3.39	3.39	3.39	3.39	3.17	2.38	1.77	1.33	1.06	0.887
175x50	8080	0.806	4.63	4.63	4.63	4.63	4.50	4.12	2.95	2.07	1.56	1.24	1.04
200x50	9260	0.704	6.08	6.08	6.08	6.08	5.68	5.15	3.51	2.38	1.78	1.43	1.19
225x50	10400	0.624	7.72	7.72	7.72	7.72	6.95	6.23	4.01	2.68	2.01	1.61	1.34
250x50	11600	0.561	9.56	9.56	9.56	9.40	8.28	7.35	4.47	2.98	2.23	1.79	1.49
275x50	12800	0.510	11.6	11.6	11.6	11.1	9.68	8.49	4.92	3.28	2.46	1.97	1.64
300x50	14000	0.467	13.8	13.8	13.8	12.9	11.1	9.65	5.37	3.58	2.69	2.15	1.79
75x75	5180	4.52	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.22	1.15	1.08
100x75	6980	3.35	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.22	2.04	1.88	1.73
125x75	8780	2.67	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.28	2.96	2.68	2.42
150x75	10600	2.21	5.19	5.19	5.19	5.19	5.19	5.19	5.08	4.47	3.96	3.51	3.10
175x75	12400	1.89	7.10	7.10	7.10	7.10	7.10	7.10	6.65	5.75	4.99	4.33	3.72
200x75	14200	1.65	9.31	9.31	9.31	9.31	9.31	9.31	8.36	7.09	6.03	5.09	4.27
225x75	16000	1.47	11.8	11.8	11.8	11.8	11.8	11.8	10.2	8.47	7.04	5.78	4.81
250x75	17800	1.32	14.6	14.6	14.6	14.6	14.6	14.6	12.1	9.86	7.99	6.43	5.36
275x75	19600	1.20	17.8	17.8	17.8	17.8	17.8	17.7	14.1	11.2	8.85	7.08	5.90
300x75	21400	1.10	21.2	21.2	21.2	21.2	21.2	20.7	16.1	12.6	9.66	7.73	6.44
100x100	9410	6.09	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	2.91
125x100	11800	4.84	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.54	4.28
150x100	14300	4.02	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.66	6.21	5.80
175x100	16700	3.43	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.45	8.69	8.02	7.42
200x100	19100	3.00	12.5	12.5	12.5	12.5	12.5	12.5	12.5	11.9	10.9	9.94	9.10
225x100	21500	2.66	15.9	15.9	15.9	15.9	15.9	15.9	15.9	14.6	13.2	11.9	10.8
250x100	24000	2.39	19.7	19.7	19.7	19.7	19.7	19.7	19.7	17.5	15.6	14.0	12.5
275x100	26400	2.17	23.9	23.9	23.9	23.9	23.9	23.9	23.3	20.5	18.1	16.0	14.1
300x100	28800	1.99	28.5	28.5	28.5	28.5	28.5	28.5	27.1	23.6	20.6	18.0	15.6

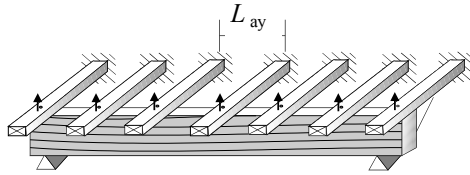
Notes:

1. Check local availability of sizes in the grade
2. Shrinkage of unseasoned timber should always be anticipated
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Table F7u.bend.3

F7

Unseasoned



MAJOR AXIS BENDING
LATERAL RESTRAINT ON TENSION EDGE AT L_{ay}

[M_{Tx}] Bending capacity (kNm)

$$(\phi M_x) = \phi k_1 k_4 k_6 k_9 [M_{Tx}]$$

Size	Area (mm ²)	for lateral restraint of tension edge @ L_{ay} (m)											
		0	0.34	0.45	0.6	0.9	1.2	1.8	2.4	3.6	4.8	6	7.2
75x38	2520	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605
100x38	3400	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.06	1.03	1.00
125x38	4270	1.74	1.74	1.74	1.74	1.74	1.74	1.68	1.61	1.50	1.42	1.35	1.29
150x38	5150	2.52	2.52	2.52	2.52	2.39	2.29	2.13	2.01	1.82	1.67	1.55	1.44
175x38	6020	3.25	3.25	3.25	3.13	2.92	2.75	2.49	2.29	1.98	1.74	1.56	1.42
200x38	6900	3.90	3.90	3.89	3.68	3.35	3.09	2.70	2.39	1.96	1.69	1.51	1.38
225x38	7770	4.48	4.48	4.43	4.12	3.64	3.26	2.70	2.34	1.91	1.65	1.48	1.35
250x38	8650	4.97	4.97	4.84	4.40	3.73	3.24	2.64	2.29	1.87	1.62	1.45	1.32
275x38	9520	5.33	5.33	5.07	4.49	3.67	3.18	2.59	2.25	1.83	1.59	1.42	1.30
300x38	10400	5.51	5.51	5.10	4.41	3.60	3.12	2.55	2.21	1.80	1.56	1.40	1.27
75x50	3380	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812
100x50	4560	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
125x50	5730	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.31
150x50	6910	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.31	3.17	3.06	2.97
175x50	8080	4.63	4.63	4.63	4.63	4.63	4.63	4.53	4.35	4.07	3.85	3.67	3.52
200x50	9260	6.08	6.08	6.08	6.08	6.01	5.78	5.43	5.15	4.73	4.40	4.13	3.89
225x50	10400	7.44	7.44	7.44	7.44	7.08	6.75	6.23	5.83	5.22	4.74	4.35	4.01
250x50	11600	8.63	8.63	8.63	8.63	8.07	7.61	6.89	6.33	5.48	4.82	4.31	3.93
275x50	12800	9.76	9.76	9.76	9.75	8.94	8.31	7.34	6.59	5.46	4.73	4.23	3.86
300x50	14000	10.8	10.8	10.8	10.7	9.64	8.81	7.54	6.57	5.36	4.64	4.15	3.79
75x75	5180	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
100x75	6980	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26
125x75	8780	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57
150x75	10600	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19
175x75	12400	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10
200x75	14200	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31
225x75	16000	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.5	11.2
250x75	17800	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.3	13.8	13.3	12.9
275x75	19600	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.3	16.3	15.6	14.9	14.4
300x75	21400	21.2	21.2	21.2	21.2	21.2	21.2	20.4	19.5	18.2	17.2	16.4	15.7
100x100	9410	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04
125x100	11800	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
150x100	14300	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99
175x100	16700	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57
200x100	19100	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
225x100	21500	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
250x100	24000	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7
275x100	26400	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9
300x100	28800	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.3

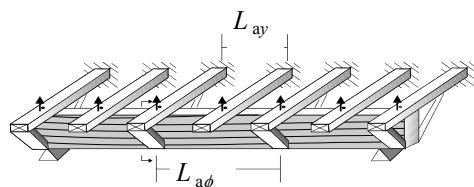
Notes:

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2. Shrinkage of unseasoned timber should always be anticipated
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Table F7u.bend.4

F7

Unseasoned



MAJOR AXIS BENDING

FLR ON TENSION EDGE PLUS TORSIONAL RESTRAINT AT $L_{a\phi}$

$$(\phi M_x) = \phi k_1 k_4 k_6 k_9 [M_{Tx}]$$

				[M_{Tx}] Bending capacity (kNm)									
Size	Area (mm ²)	Max L_{ay} FLR (m)	Max $L_{a\phi}$ FTR (m)	for FLR (tension edge) plus torsional restraint @ $L_{a\phi}$ (m)									
				0.6	0.9	1.2	2.4	3.6	4.8	6	7.2	12	none
75x38	2520	1.07	any	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605	0.605
100x38	3400	0.792	any	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
125x38	4270	0.630	any	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
150x38	5150	0.523	6.61	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52
175x38	6020	0.447	1.38	3.45	3.45	3.45	3.26	3.25	3.25	3.25	3.25	3.25	3.25
200x38	6900	0.390	1.08	4.53	4.53	4.43	3.97	3.90	3.90	3.90	3.90	3.90	3.90
225x38	7770	0.346	0.964	5.75	5.75	5.41	4.66	4.48	4.48	4.48	4.48	4.48	4.48
250x38	8650	0.311	0.900	7.12	7.12	6.47	5.32	4.98	4.97	4.97	4.97	4.97	4.97
275x38	9520	0.283	0.860	8.63	8.49	7.61	5.95	5.43	5.33	5.33	5.33	5.33	5.33
300x38	10400	0.259	0.834	10.3	9.99	8.84	6.53	5.76	5.51	5.51	5.51	5.51	5.51
75x50	3380	1.92	any	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812	0.812
100x50	4560	1.43	any	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
125x50	5730	1.14	any	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33
150x50	6910	0.943	any	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39
175x50	8080	0.806	any	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63
200x50	9260	0.704	10.9	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08
225x50	10400	0.624	2.08	7.72	7.72	7.72	7.61	7.44	7.44	7.44	7.44	7.44	7.44
250x50	11600	0.561	1.60	9.56	9.56	9.56	8.98	8.64	8.63	8.63	8.63	8.63	8.63
275x50	12800	0.510	1.41	11.6	11.6	11.6	10.4	9.86	9.76	9.76	9.76	9.76	9.76
300x50	14000	0.467	1.30	13.8	13.8	13.8	11.8	11.1	10.8	10.8	10.8	10.8	10.8
75x75	5180	4.52	any	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
100x75	6980	3.35	any	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26
125x75	8780	2.67	any	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57
150x75	10600	2.21	any	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.19
175x75	12400	1.89	any	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10
200x75	14200	1.65	any	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31
225x75	16000	1.47	any	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
250x75	17800	1.32	any	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
275x75	19600	1.20	any	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8
300x75	21400	1.10	any	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2
100x100	9410	6.09	any	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04	3.04
125x100	11800	4.84	any	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
150x100	14300	4.02	any	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99
175x100	16700	3.43	any	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57
200x100	19100	3.00	any	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
225x100	21500	2.66	any	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
250x100	24000	2.39	any	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7
275x100	26400	2.17	any	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.9
300x100	28800	1.99	any	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5

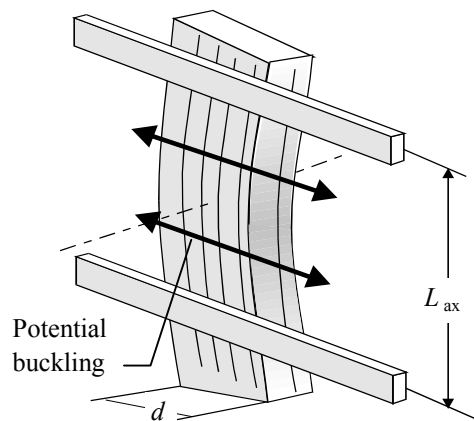
Notes:

1. Check local availability of sizes in the grade
2. Shrinkage of unseasoned timber should always be anticipated
3. Sections deeper than 250 mm and wider than 75 mm may have limited availability
4. Shrinkage of unseasoned timber may cause small gaps to open between sections nailed together to make a combined large width member
5. This material is often supplied as Douglas Fir locally sawn from imported flitches, and visually graded.

COMPRESSION

major

Table F7u.comp.1



F7 Unseasoned

MAJOR AXIS BUCKLING

$$(\phi N_{cx}) = \phi k_1 k_4 k_6 [N_{Tcx}]$$

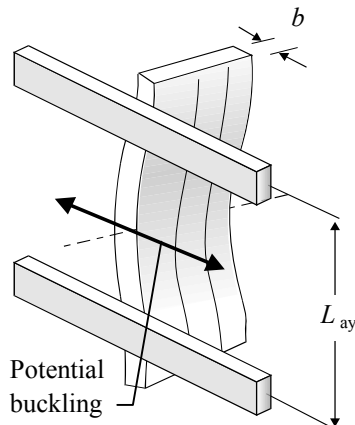
[N_{Tcx}] Compression capacity (kN)

Size	Area (mm ²)	E A _{avg} (10 ⁶ N)	E A _{5%} (10 ⁶ N)	for restraint against major axis buckling @ L _{ax}									
				0	0.34	0.45	0.6	0.9	1.2	2.4	3.6	4.8	6
75x38	2520	19.9	9.95	37.8	37.8	37.8	37.8	29.8	20.8	5.24	2.33	1.31	.838
100x38	3400	26.8	13.4	50.9	50.9	50.9	50.9	49.5	40.5	12.8	5.69	3.20	2.05
125x38	4270	33.7	16.9	64.1	64.1	64.1	64.1	64.1	60.2	25.5	11.3	6.37	4.08
150x38	5150	40.6	20.3	77.2	77.2	77.2	77.2	77.2	77.2	43.9	19.8	11.1	7.13
175x38	6020	47.6	23.8	90.3	90.3	90.3	90.3	90.3	90.3	63.6	31.7	17.8	11.4
200x38	6900	54.5	27.2	103.	103.	103.	103.	103.	103.	83.3	47.7	26.8	17.2
225x38	7770	61.4	30.7	117.	117.	117.	117.	117.	117.	103.	67.1	38.4	24.6
250x38	8650	68.3	34.1	130.	130.	130.	130.	130.	130.	123.	86.8	52.8	33.8
275x38	9520	75.2	37.6	143.	143.	143.	143.	143.	143.	142.	106.	70.6	45.2
300x38	10400	82.1	41.1	156.	156.	156.	156.	156.	156.	156.	126.	90.2	58.8
75x50	3380	26.7	13.4	50.8	50.8	50.8	50.8	40.0	27.9	7.03	3.12	1.76	1.12
100x50	4560	36.0	18.0	68.4	68.4	68.4	68.4	66.4	54.4	17.2	7.64	4.30	2.75
125x50	5730	45.3	22.6	86.0	86.0	86.0	86.0	86.0	80.8	34.2	15.2	8.55	5.47
150x50	6910	54.6	27.3	104.	104.	104.	104.	104.	104.	59.0	26.6	15.0	9.57
175x50	8080	63.9	31.9	121.	121.	121.	121.	121.	121.	85.4	42.6	24.0	15.3
200x50	9260	73.1	36.6	139.	139.	139.	139.	139.	139.	112.	64.0	36.0	23.0
225x50	10400	82.4	41.2	157.	157.	157.	157.	157.	157.	138.	90.1	51.5	33.0
250x50	11600	91.7	45.9	174.	174.	174.	174.	174.	174.	165.	117.	71.0	45.4
275x50	12800	101.	50.5	192.	192.	192.	192.	192.	192.	191.	143.	94.8	60.6
300x50	14000	110.	55.1	209.	209.	209.	209.	209.	209.	209.	169.	121.	79.0
75x75	5180	41.0	20.5	77.8	77.8	77.8	77.8	61.2	42.8	10.8	4.79	2.69	1.72
100x75	6980	55.2	27.6	105.	105.	105.	105.	102.	83.3	26.3	11.7	6.58	4.21
125x75	8780	69.4	34.7	132.	132.	132.	132.	132.	124.	52.4	23.3	13.1	8.38
150x75	10600	83.6	41.8	159.	159.	159.	159.	159.	159.	90.4	40.7	22.9	14.7
175x75	12400	97.8	48.9	186.	186.	186.	186.	186.	186.	131.	65.3	36.7	23.5
200x75	14200	112.	56.0	213.	213.	213.	213.	213.	213.	171.	98.0	55.2	35.3
225x75	16000	126.	63.1	240.	240.	240.	240.	240.	240.	212.	138.	78.9	50.5
250x75	17800	140.	70.2	267.	267.	267.	267.	267.	267.	252.	179.	109.	69.6
275x75	19600	155.	77.4	294.	294.	294.	294.	294.	294.	293.	219.	145.	92.9
300x75	21400	169.	84.5	321.	321.	321.	321.	321.	321.	321.	260.	186.	121.
100x100	9410	74.3	37.2	141.	141.	141.	141.	137.	112.	35.5	15.8	8.87	5.68
125x100	11800	93.5	46.7	178.	178.	178.	178.	178.	167.	70.6	31.4	17.6	11.3
150x100	14300	113.	56.3	214.	214.	214.	214.	214.	214.	122.	54.9	30.9	19.8
175x100	16700	132.	65.9	250.	250.	250.	250.	250.	250.	176.	87.9	49.5	31.6
200x100	19100	151.	75.5	287.	287.	287.	287.	287.	287.	231.	132.	74.3	47.6
225x100	21500	170.	85.1	323.	323.	323.	323.	323.	323.	285.	186.	106.	68.1
250x100	24000	189.	94.6	359.	359.	359.	359.	359.	359.	340.	241.	146.	93.7
275x100	26400	208.	104.	396.	396.	396.	396.	396.	396.	395.	295.	196.	125.
300x100	28800	228.	114.	432.	432.	432.	432.	432.	432.	432.	350.	250.	163.

Notes:

1. Check local availability of sizes in the grade
2. Shrinkage of unseasoned timber should always be anticipated
3. Sections deeper than 250 mm and wider than 75 mm may have limited availability
4. Shrinkage of unseasoned timber may cause small gaps to open between sections nailed together to make a combined large width member
5. This material is often supplied as Douglas Fir locally sawn from imported flitches, and visually graded.

Table F7u.comp.2



F7

Unseasoned

MINOR AXIS BUCKLING

$$(\phi N_{c_y}) = \phi k_1 k_4 k_6 [N_{T_{c_y}}]$$

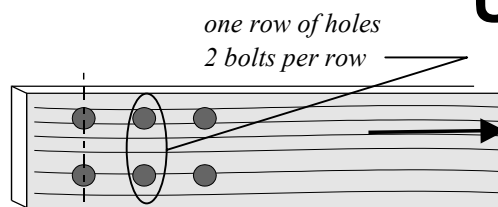
[N_{Tcy}] Compression Capacity (kN)

Size	Area (mm ²)	EA _{avg} (10 ⁶ N)	EA _{5%} (10 ⁶ N)	for restraint against minor axis buckling @ L _{ay}									
				0.0	0.3	0.45	0.6	0.9	1.2	1.5	1.8	2.4	3.0
75x38	2520	19.9	9.95	37.8	37.8	29.0	19.8	8.80	4.95	3.17	2.20	1.24	0.792
100x38	3400	26.8	13.4	50.9	50.9	39.1	26.6	11.9	6.67	4.27	2.96	1.67	1.07
125x38	4270	33.7	16.9	64.1	64.1	49.1	33.5	14.9	8.39	5.37	3.73	2.10	1.34
150x38	5150	40.6	20.3	77.2	77.2	59.2	40.4	18.0	10.1	6.47	4.49	2.53	1.62
175x38	6020	47.6	23.8	90.3	90.3	69.3	47.2	21.0	11.8	7.57	5.25	2.96	1.89
200x38	6900	54.5	27.2	103.	103.	79.3	54.1	24.1	13.5	8.67	6.02	3.39	2.17
225x38	7770	61.4	30.7	117.	117.	89.4	60.9	27.1	15.3	9.77	6.78	3.81	2.44
250x38	8650	68.3	34.1	130.	130.	99.5	67.8	30.2	17.0	10.9	7.55	4.24	2.72
275x38	9520	75.2	37.6	143.	143.	110.	74.7	33.2	18.7	12.0	8.31	4.67	2.99
300x38	10400	82.1	41.1	156.	156.	120.	81.5	36.3	20.4	13.1	9.07	5.10	3.27
75x50	3380	26.7	13.4	50.8	50.8	48.4	39.2	21.3	12.0	7.67	5.33	3.00	1.92
100x50	4560	36.0	18.0	68.4	68.4	65.3	52.8	28.7	16.1	10.3	7.18	4.04	2.58
125x50	5730	45.3	22.6	86.0	86.0	82.1	66.4	36.1	20.3	13.0	9.02	5.08	3.25
150x50	6910	54.6	27.3	104.	104.	98.9	80.0	43.5	24.5	15.7	10.9	6.12	3.91
175x50	8080	63.9	31.9	121.	121.	116.	93.7	50.9	28.6	18.3	12.7	7.16	4.58
200x50	9260	73.1	36.6	139.	139.	133.	107.	58.3	32.8	21.0	14.6	8.20	5.25
225x50	10400	82.4	41.2	157.	157.	149.	121.	65.7	36.9	23.6	16.4	9.24	5.91
250x50	11600	91.7	45.9	174.	174.	166.	134.	73.1	41.1	26.3	18.3	10.3	6.58
275x50	12800	101.	50.5	192.	192.	183.	148.	80.5	45.3	29.0	20.1	11.3	7.24
300x50	14000	110.	55.1	209.	209.	200.	162.	87.9	49.4	31.6	22.0	12.4	7.91
75x75	5180	41.0	20.5	77.8	77.8	77.8	77.8	61.2	42.8	27.6	19.1	10.8	6.89
100x75	6980	55.2	27.6	105.	105.	105.	105.	82.5	57.6	37.1	25.8	14.5	9.29
125x75	8780	69.4	34.7	132.	132.	132.	132.	104.	72.5	46.7	32.4	18.2	11.7
150x75	10600	83.6	41.8	159.	159.	159.	159.	125.	87.3	56.3	39.1	22.0	14.1
175x75	12400	97.8	48.9	186.	186.	186.	186.	146.	102.	65.9	45.7	25.7	16.5
200x75	14200	112.	56.0	213.	213.	213.	213.	168.	117.	75.4	52.4	29.5	18.9
225x75	16000	126.	63.1	240.	240.	240.	240.	189.	132.	85.0	59.0	33.2	21.3
250x75	17800	140.	70.2	267.	267.	267.	267.	210.	147.	94.6	65.7	36.9	23.6
275x75	19600	155.	77.4	294.	294.	294.	294.	231.	162.	104.	72.3	40.7	26.0
300x75	21400	169.	84.5	321.	321.	321.	321.	253.	176.	114.	79.0	44.4	28.4
100x100	9410	74.3	37.2	141.	141.	141.	141.	137.	112.	87.3	63.1	35.5	22.7
125x100	11800	93.5	46.7	178.	178.	178.	178.	172.	141.	110.	79.3	44.6	28.6
150x100	14300	113.	56.3	214.	214.	214.	214.	208.	170.	132.	95.6	53.8	34.4
175x100	16700	132.	65.9	250.	250.	250.	250.	243.	199.	155.	112.	62.9	40.3
200x100	19100	151.	75.5	287.	287.	287.	287.	278.	228.	177.	128.	72.1	46.1
225x100	21500	170.	85.1	323.	323.	323.	323.	314.	257.	200.	144.	81.2	52.0
250x100	24000	189.	94.6	359.	359.	359.	359.	349.	286.	222.	161.	90.3	57.8
275x100	26400	208.	104.	396.	396.	396.	396.	384.	315.	245.	177.	99.5	63.7
300x100	28800	228.	114.	432.	432.	432.	432.	420.	343.	267.	193.	109.	69.5

Notes:

1. Check local availability of sizes in the grade
2. Shrinkage of unseasoned timber should always be anticipated
3. Sections deeper than 250 mm and wider than 75 mm may have limited availability
4. Shrinkage of unseasoned timber may cause small gaps to open between sections nailed together to make a combined large width member
5. This material is often supplied as Douglas Fir locally sawn from imported flitches, and visually graded.

Table F7u.tens

F7**Unseasoned
Softwood**

$$(\phi N_t) = \phi k_1 k_4 k_6 [N_{Tt}]$$

[N_{Tt}] Tensile capacity - allowing for bolt holes (kN)

Size	Area (mm ²)	E A _{avg} (10 ⁶ N)	EA 5% (10 ⁶ N)	[14] Bolts capacity according to bolt holes (mm)																								
				M10 (11)			M10 (11)			M10 (11)			M12 (13.2)			M12 (13.2)			M12 (13.2)			M16 (17.6)			M16 (17.6)			M16 (17.6)
				No bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts	1 bolt	2 bolts	3 bolts
75x38	2520	19.9	9.95	25.2	21.4			20.6						19.0														
100x38	3400	26.8	13.4	34.0	30.1	26.3		29.3	24.7					27.8														
125x38	4270	33.7	16.9	42.7	38.9	35.0	31.2	38.1	33.5					36.5														
150x38	5150	40.6	20.3	51.5	47.6	43.8	39.9	46.8	42.2	37.6				45.3	39.1													
175x38	6020	47.6	23.8	58.8	55.1	51.3	47.6	54.3	49.8	45.3				52.8	46.8													
200x38	6900	54.5	27.2	65.9	62.2	58.5	54.8	61.5	57.1	52.6				60.0	54.1	48.2												
225x38	7770	61.4	30.7	72.8	69.2	65.6	62.0	68.4	64.1	59.8				67.0	61.2	55.5												
250x38	8650	68.3	34.1	79.5	76.0	72.5	68.9	75.3	71.0	66.8				73.9	68.2	62.5												
275x38	9520	75.2	37.6	86.2	82.7	79.2	75.7	82.0	77.8	73.6				80.6	75.0	69.5												
300x38	10400	82.1	41.1	92.7	89.3	85.9	82.4	88.6	84.5	80.4				87.2	81.8	76.3												
75x50	3380	26.7	13.4	33.8	28.7			27.6						25.6														
100x50	4560	36.0	18.0	45.6	40.4	35.3		39.4	33.2					37.3														
125x50	5730	45.3	22.6	57.3	52.2	47.0	41.8	51.1	44.9					49.1														
150x50	6910	54.6	27.3	69.1	63.9	58.8	53.6	62.9	56.7	50.5				60.8	52.5													
175x50	8080	63.9	31.9	79.0	74.0	68.9	63.9	72.9	66.9	60.8				70.9	62.8													
200x50	9260	73.1	36.6	88.5	83.5	78.6	73.7	82.5	76.6	70.7				80.6	72.7	64.8												
225x50	10400	82.4	41.2	97.7	92.9	88.0	83.2	91.9	86.1	80.3				90.0	82.2	74.5												
250x50	11600	91.7	45.9	107.	102.	97.3	92.5	101.	95.4	89.7				99.2	91.6	84.0												
275x50	12800	101.	50.5	116.	111.	106.	102.	110.	105.	98.9				108.	101.	93.3												
300x50	14000	110.	55.1	125.	120.	115.	111.	119.	113.	108.				117.	110.	102.												
75x75	5180	41.0	20.5	51.8	43.9			42.3						39.2														
100x75	6980	55.2	27.6	69.8	61.9	54.0		60.3	50.8					57.2														
125x75	8780	69.4	34.7	87.8	79.9	72.0	64.1	78.3	68.8					75.2														
150x75	10600	83.6	41.8	106.	97.9	90.0	82.1	96.3	86.8	77.3				93.2	80.5													
175x75	12400	97.8	48.9	121.	113.	106.	97.8	112.	102.	93.2				109.	96.3													
200x75	14200	112.	56.0	136.	128.	120.	113.	126.	117.	108.				123.	111.	99.2												
225x75	16000	126.	63.1	150.	142.	135.	127.	141.	132.	123.				138.	126.	114.												
250x75	17800	140.	70.2	164.	156.	149.	142.	155.	146.	137.				152.	140.	129.												
275x75	19600	155.	77.4	177.	170.	163.	156.	169.	160.	151.				166.	154.	143.												
300x75	21400	169.	84.5	191.	184.	177.	170.	182.	174.	165.				179.	168.	157.												
100x100	9410	74.3	37.2	94.1	83.4	72.8		81.3	68.5					77.0														
125x100	11800	93.5	46.7	118.	108.	97.0	86.3	106.	92.7					101.														
150x100	14300	113.	56.3	143.	132.	121.	111.	130.	117.	104.				126.	108.													
175x100	16700	132.	65.9	163.	153.	142.	132.	151.	138.	126.				146.	130.													
200x100	19100	151.	75.5	183.	172.	162.	152.	170.	158.	146.				166.	150.	134.												
225x100	21500	170.	85.1	202.	192.	182.	172.	190.	178.	166.				186.	170.	154.												
250x100	24000	189.	94.6	220.	211.	201.	191.	209.	197.	185.				205.	189.	173.												
275x100	26400	208.	104.	239.	229.	220.	210.	227.	216.	204.				223.	208.	193.												
300x100	28800	228.	114.	257.	248.	238.	228.	246.	234.	223.				242.	227.	211.												

Notes:

1. Check local availability of sizes in the grade
2. Shrinkage of unseasoned timber should always be anticipated
3. Sections deeper than 250 mm and wider than 75 mm may have limited availability
4. Shrinkage of unseasoned timber may cause small gaps to open between sections nailed together to make a combined large width member
5. Recommended minimum hole size shown in brackets under bolt designation
6. This material is often supplied as Douglas Fir locally sawn from imported flitches, and visually graded.