

## SECTION DIMENSIONS & PROPERTIES

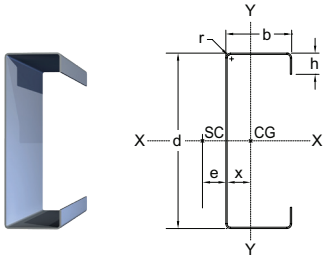
IMPERIAL

SECTION	DIMENSIONS					PROPERTIES									
	Depth of Section	Flange Width	Length of Lip	Thickness of Steel	Area of Section	Gross Moment of Inertia About X-X	Elastic Section Modulus About X-X	Radius of Gyration About X-X	Gross Moment of Inertia About Y-Y	Elastic Section Modulus About Y-Y	Radius of Gyration About Y-Y	Center of Gravity CG	Shear Center SC	St. Venant Torsion Constant	Warping Constant
	d (in)	b (in)	h (in)	t (in)	A (in <sup>2</sup> )	I <sub>x</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	r <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	S <sub>y</sub> (in <sup>3</sup> )	r <sub>y</sub> (in)	x (in)	e (in)	J (in <sup>4</sup> )	C <sub>w</sub> (in <sup>6</sup> )
45C16	4.5	2.25	0.75	0.060	0.59	1.92	0.85	1.80	0.43	0.55	0.86	0.79	1.10	7.05E-04	2.0
45C14	4.5	2.25	0.75	0.075	0.73	2.36	1.05	1.79	0.53	0.67	0.85	0.79	1.09	1.36E-03	2.5
45C13	4.5	2.25	0.75	0.090	0.87	2.79	1.24	1.79	0.62	0.78	0.84	0.79	1.07	2.34E-03	2.9
06C16	6	2.26	0.94	0.060	0.70	3.86	1.29	2.34	0.54	0.72	0.87	0.75	1.10	8.40E-04	4.5
06C14	6	2.26	0.94	0.075	0.88	4.76	1.59	2.33	0.65	0.88	0.86	0.75	1.08	1.63E-03	5.4
06C13	6	2.26	0.94	0.090	1.04	5.65	1.88	2.33	0.77	1.03	0.86	0.75	1.06	2.80E-03	6.3
06C12	6	2.26	0.94	0.105	1.21	6.50	2.17	2.32	0.88	1.17	0.85	0.75	1.05	4.41E-03	7.1
06C11	6	2.26	0.94	0.120	1.38	7.34	2.45	2.31	0.98	1.31	0.84	0.75	1.03	6.56E-03	7.9
06C10	6	2.26	0.94	0.135	1.54	8.14	2.71	2.30	1.08	1.44	0.84	0.75	1.01	9.27E-03	8.6
08C16	8	2.94	0.94	0.060	0.91	8.92	2.23	3.14	1.09	1.23	1.10	0.89	1.33	1.08E-03	14.6
08C14	8	2.94	0.94	0.075	1.13	11.03	2.76	3.13	1.34	1.51	1.09	0.89	1.31	2.10E-03	17.8
08C13	8	2.94	0.94	0.090	1.35	13.12	3.28	3.12	1.58	1.78	1.08	0.89	1.29	3.61E-03	20.9
08C12	8	2.94	0.94	0.105	1.56	15.15	3.79	3.11	1.81	2.04	1.08	0.89	1.28	5.70E-03	23.8
08C11	8	2.94	0.94	0.120	1.78	17.15	4.29	3.11	2.04	2.29	1.07	0.89	1.26	8.47E-03	26.6
08C10	8	2.94	0.94	0.135	1.99	19.09	4.77	3.10	2.25	2.53	1.06	0.89	1.24	1.20E-02	29.1
09C16	9	3.08	0.94	0.060	0.98	12.09	2.69	3.51	1.27	1.43	1.14	0.89	1.35	1.17E-03	20.9
09C14	9	3.08	0.94	0.075	1.22	14.97	3.33	3.50	1.56	1.76	1.13	0.89	1.33	2.27E-03	25.5
09C13	9	3.08	0.94	0.090	1.46	17.81	3.96	3.49	1.84	2.07	1.12	0.89	1.31	3.92E-03	29.9
09C12	9	3.08	0.94	0.105	1.70	20.58	4.57	3.48	2.11	2.38	1.11	0.89	1.30	6.18E-03	34.1
09C11	9	3.08	0.94	0.120	1.93	23.31	5.18	3.48	2.37	2.67	1.11	0.89	1.28	9.20E-03	38.1
09C10	9	3.08	0.94	0.135	2.16	25.97	5.77	3.47	2.62	2.95	1.10	0.89	1.26	1.30E-02	41.9
10C16	10	3.26	0.94	0.060	1.06	16.02	3.20	3.88	1.50	1.67	1.19	0.90	1.39	1.27E-03	29.9
10C14	10	3.26	0.94	0.075	1.32	19.84	3.97	3.87	1.84	2.05	1.18	0.90	1.37	2.46E-03	36.6
10C13	10	3.26	0.94	0.090	1.58	23.63	4.73	3.86	2.18	2.42	1.17	0.90	1.35	4.24E-03	43.0
10C12	10	3.26	0.94	0.105	1.84	27.32	5.46	3.86	2.50	2.77	1.17	0.90	1.34	6.70E-03	49.1
10C11	10	3.26	0.94	0.120	2.09	30.97	6.19	3.85	2.81	3.12	1.16	0.90	1.32	9.98E-03	54.9
10C10	10	3.26	0.94	0.135	2.34	34.53	6.91	3.84	3.11	3.45	1.15	0.90	1.30	1.41E-02	60.4

ExSteel roll forms a wide range of cee and zee sections for use in building applications or to replace hot rolled sections. Sizes range from 4 1/2 to 16 inches deep with flange widths from 2 to 3 1/2 inches and thicknesses from 16 ga. (0.06 in) to 10 ga. (0.135 in). An infinite choice of sizes between those listed are also available. This design table only includes standard section sizes that are typically manufactured by ExSteel.

1. Section properties are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.





## SECTION RESISTANCE TABLE

IMPERIAL

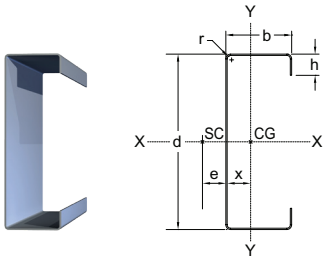
SECTION	LIMIT STATES DESIGN - 2004 NAS - CANADA							LIMIT STATES DESIGN - 2004 NAS - CANADA							
	M <sub>r</sub> ' (kip-ft) (FACTORED EFFECTIVE MOMENT RESISTANCE)							M <sub>r</sub> ' (kip-ft) (FACTORED EFFECTIVE MOMENT RESISTANCE)							
	Mass (lb/ft)	V <sub>r</sub> (kips)	C <sub>r</sub> ' (kips)	P <sub>r</sub> 4" (kips)	P <sub>r</sub> 8" (kips)	L <sub>u</sub> (ft)	M <sub>r</sub> <L <sub>u</sub> (kip-ft)	UNBRACED LENGTH							
								6'	8'	10'	12'	14'	16'	18'	20'
45C16	2.01	5.1	18.7	1.34	1.75	3.83	3.2	2.8	2.3	1.6	1.1	0.9	0.7	0.6	0.5
45C14	2.49	7.8	26.9	2.03	2.64	3.83	4.2	3.7	2.9	2.0	1.4	1.1	0.9	0.8	0.6
45C13	2.97	9.3	35.0	2.86	3.69	3.83	5.1	4.3	3.4	2.4	1.8	1.4	1.2	1.0	0.8
06C16	2.40	4.4	21.3	1.29	1.69	3.94	5.1	4.5	3.6	2.5	1.7	1.3	1.0	0.8	0.7
06C14	2.98	7.9	29.9	1.97	2.56	3.94	6.5	5.7	4.5	3.1	2.2	1.7	1.3	1.1	0.9
06C13	3.55	11.4	37.6	2.78	3.59	3.94	7.8	6.7	5.3	3.7	2.7	2.1	1.7	1.4	1.2
06C12	4.11	15.0	45.6	3.71	4.76	3.94	8.9	7.7	6.2	4.4	3.2	2.5	2.0	1.7	1.5
06C11	4.68	17.0	53.9	4.76	6.08	3.94	10.1	8.7	7.0	5.1	3.8	3.0	2.4	2.1	1.8
06C10	5.22	19.0	62.4	5.91	7.52	3.94	11.2	9.7	7.9	5.8	4.4	3.5	2.9	2.4	2.1
08C16	3.08	3.2	22.3	1.24	1.62	4.80	8.0	7.7	6.9	5.7	4.3	3.2	2.5	2.0	1.6
08C14	3.83	6.4	29.9	1.91	2.47	4.80	10.1	9.7	8.6	7.4	5.4	4.0	3.1	2.5	2.1
08C13	4.58	11.0	39.6	2.70	3.48	4.80	12.6	12.1	10.8	8.8	6.5	4.9	3.8	3.1	2.6
08C12	5.31	15.5	50.6	3.60	4.62	4.80	15.2	14.4	12.7	10.3	7.6	5.7	4.5	3.7	3.1
08C11	6.04	20.2	61.9	4.63	5.91	4.80	17.6	16.6	14.4	11.7	8.7	6.6	5.3	4.3	3.6
08C10	6.76	25.6	72.8	5.76	7.33	4.80	19.7	18.5	16.1	13.1	9.8	7.5	6.0	5.0	4.3
09C16	3.34	2.9	22.4	1.22	1.59	4.95	9.0	8.8	8.1	7.0	5.4	4.1	3.2	2.5	2.1
09C14	4.15	5.6	30.2	1.87	2.43	4.95	12.1	11.6	10.4	8.9	6.9	5.1	4.0	3.2	2.6
09C13	4.97	9.7	39.5	2.66	3.43	4.95	14.8	14.3	13.0	11.0	8.2	6.1	4.8	3.9	3.2
09C12	5.76	15.5	51.3	3.56	4.56	4.95	18.1	17.3	15.4	12.8	9.6	7.2	5.6	4.6	3.8
09C11	6.56	20.2	62.2	4.57	5.84	4.95	20.8	19.9	17.7	14.6	10.9	8.3	6.5	5.3	4.5
09C10	7.35	25.6	74.4	5.70	7.25	4.95	23.7	22.6	19.8	16.3	12.3	9.4	7.5	6.1	5.2
10C16	3.62	2.6	22.5	1.20	1.56	5.17	10.0	9.8	9.2	8.3	6.8	5.2	4.1	3.3	2.7
10C14	4.50	5.0	30.5	1.85	2.39	5.17	13.9	13.6	12.4	10.7	8.7	6.6	5.1	4.1	3.3
10C13	5.38	8.7	39.6	2.62	3.38	5.17	17.2	16.7	15.3	13.4	10.6	7.9	6.1	4.9	4.1
10C12	6.25	13.8	51.2	3.51	4.50	5.17	21.0	20.4	18.5	15.8	12.3	9.2	7.2	5.8	4.8
10C11	7.12	20.2	63.1	4.52	5.77	5.17	24.5	23.7	21.3	18.2	14.0	10.5	8.3	6.7	5.6
10C10	7.97	25.6	74.8	5.64	7.17	5.17	27.7	26.8	24.2	20.3	15.7	11.9	9.4	7.7	6.4

1. Loads are based on steel conforming to G40.21 or ASTM A1011/A1011M.
2. Member resistances are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.
3. Values have been calculated assuming no effect from cold work of forming.
4. Users of data contained in these tables assume all liability arising from such use.

F<sub>y</sub> = 55 ksi = minimum specified yield strength  
 L<sub>u</sub> = calculated maximum unbraced length to achieve fully braced member capacities  
 M<sub>r</sub>' = factored effective moment resistance for unbraced length less than or equal to L<sub>u</sub>  
 M<sub>r</sub>' = factored effective moment resistance based on unsupported length  
 C<sub>r</sub>' = factored compressive resistance for a fully braced member

V<sub>r</sub> = factored shear resistance  
 K<sub>x</sub> = K<sub>y</sub> = K<sub>t</sub> = 1.0  
 C<sub>u</sub> = 1.0  
 P<sub>r</sub> 4" = 4" bearing web crippling resistance  
 P<sub>r</sub> 8" = 8" bearing web crippling resistance  
 R = Average bend radius (all values calculated based on 3/16" bend radius)





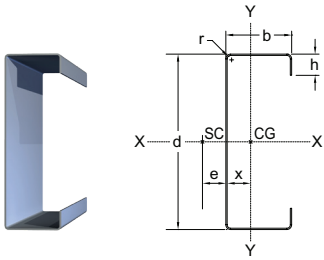
## SECTION DIMENSIONS & PROPERTIES

IMPERIAL

SECTION	DIMENSIONS					PROPERTIES									
	Depth of Section	Flange Width	Length of Lip	Thickness of Steel	Area of Section	Gross Moment of Inertia About X-X	Elastic Section Modulus About X-X	Radius of Gyration About X-X	Gross Moment of Inertia About Y-Y	Elastic Section Modulus About Y-Y	Radius of Gyration About Y-Y	Center of Gravity CG	Shear Center SC	St. Venant Torsion Constant	Warping Constant
	d (in)	b (in)	h (in)	t (in)	A (in <sup>2</sup> )	I <sub>x</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	r <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	S <sub>y</sub> (in <sup>3</sup> )	r <sub>y</sub> (in)	x (in)	e (in)	J (in <sup>4</sup> )	C <sub>w</sub> (in <sup>6</sup> )
12C14	12	3.38	0.94	0.075	1.49	31.18	5.20	4.57	2.12	2.49	1.19	0.85	1.34	2.77E-03	59.4
12C13	12	3.38	0.94	0.090	1.78	37.16	6.19	4.56	2.51	2.94	1.19	0.85	1.32	4.78E-03	69.9
12C12	12	3.38	0.94	0.105	2.07	43.01	7.17	4.56	2.88	3.37	1.18	0.85	1.31	7.56E-03	79.9
12C11	12	3.38	0.94	0.120	2.36	48.81	8.13	4.55	3.24	3.79	1.17	0.85	1.29	1.13E-02	89.6
12C10	12	3.38	0.94	0.135	2.64	54.47	9.08	4.54	3.59	4.19	1.16	0.85	1.27	1.59E-02	98.7
14C13	14	3.50	0.94	0.090	1.98	54.78	7.83	5.25	2.85	3.49	1.20	0.82	1.30	5.32E-03	107.1
14C12	14	3.50	0.94	0.105	2.31	63.45	9.06	5.24	3.27	4.00	1.19	0.82	1.28	8.41E-03	122.6
14C11	14	3.50	0.94	0.120	2.63	72.04	10.29	5.24	3.68	4.50	1.18	0.82	1.27	1.25E-02	137.6
14C10	14	3.50	0.94	0.135	2.95	80.46	11.50	5.23	4.08	4.98	1.18	0.82	1.25	1.78E-02	151.8
16C13	16	3.50	0.94	0.090	2.16	75.60	9.45	5.91	2.95	3.92	1.17	0.75	1.23	5.80E-03	144.8
16C12	16	3.50	0.94	0.105	2.52	87.60	10.95	5.90	3.38	4.49	1.16	0.75	1.22	9.18E-03	165.8
16C11	16	3.50	0.94	0.120	2.87	99.53	12.44	5.89	3.81	5.05	1.15	0.75	1.20	1.37E-02	186.1
16C10	16	3.50	0.94	0.135	3.22	111.21	13.90	5.88	4.22	5.58	1.15	0.76	1.18	1.94E-02	205.5

ExSteel roll forms a wide range of cee and zee sections for use in building applications or to replace hot rolled sections. Sizes range from 4 1/2 to 16 inches deep with flange widths from 2 to 3 1/2 inches and thicknesses from 16 ga. (0.06 in) to 10 ga. (0.135 in). An infinite choice of sizes between those listed are also available. This design table only includes standard section sizes that are typically manufactured by ExSteel.

1. Section properties are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.



## SECTION RESISTANCE TABLE

IMPERIAL

SECTION								LIMIT STATES DESIGN - 2004 NAS - CANADA							
								$M_r'$ (kip-ft) (FACTORED EFFECTIVE MOMENT RESISTANCE)							
	Mass (lb/ft)	$V_r$ (kips)	$C_r'$ (kips)	$P_r 4''$ (kips)	$P_r 8''$ (kips)	$L_u$ (ft)	$M_r < L_u$ (kip-ft)	UNBRACED LENGTH							
								6'	8'	10'	12'	14'	16'	18'	20'
12C14	5.07	4.1	30.8	1.79	2.32	5.27	16.5	16.2	15.2	13.8	11.5	8.9	6.9	5.5	4.5
12C13	6.06	7.2	40.1	2.55	3.29	5.27	22.1	21.7	19.9	17.5	14.2	10.6	8.2	6.6	5.4
12C12	7.05	11.4	51.4	3.43	4.40	5.27	27.1	26.4	24.2	20.8	16.6	12.3	9.6	7.7	6.3
12C11	8.03	17.1	64.4	4.42	5.65	5.27	32.0	31.1	27.9	24.0	18.8	14.1	11.0	8.8	7.3
12C10	8.99	24.4	76.1	5.52	7.02	5.27	36.0	35.0	31.6	27.1	21.1	15.8	12.4	10.0	8.3
14C13	6.75	6.1	40.5	2.49	3.21	5.38	25.5	25.2	23.7	21.9	18.2	13.9	10.7	8.5	7.0
14C12	7.84	9.7	51.6	3.35	4.30	5.38	33.4	33.0	30.4	26.6	21.4	16.1	12.4	9.9	8.2
14C11	8.94	14.6	64.8	4.33	5.53	5.38	40.0	39.2	35.4	30.5	24.5	18.3	14.2	11.4	9.4
14C10	10.02	20.8	77.4	5.42	6.89	5.38	45.4	44.3	39.9	34.6	27.4	20.4	15.9	12.8	10.6
16C13	7.36	5.3	40.6	2.43	3.14	5.31	27.3	26.8	24.8	22.4	19.1	15.0	11.9	9.7	8.1
16C12	8.55	8.5	51.8	3.28	4.21	5.31	34.3	33.8	31.5	28.2	23.4	18.0	14.3	11.6	9.5
16C11	9.75	12.7	65.1	4.25	5.43	5.31	42.5	41.8	38.2	33.5	27.4	21.0	16.6	13.3	10.9
16C10	10.93	18.1	77.9	5.32	6.76	5.31	49.9	48.7	44.5	39.3	31.3	23.9	18.6	14.9	12.3

1. Loads are based on steel conforming to G40.21 or ASTM A1011/A1011M.

2. Member resistances are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.

3. Values have been calculated assuming no effect from cold work of forming.

4. Users of data contained in these tables assume all liability arising from such use.

$F_y = 55$  ksi = minimum specified yield strength

$L_u^y$  = calculated maximum unbraced length to achieve fully braced member capacities

$M_r$  = factored effective moment resistance for unbraced length less than or equal to  $L_u$

$M_r'$  = factored effective moment resistance based on unsupported length

$C_r'$  = factored compressive resistance for a fully braced member

$V_r$  = factored shear resistance

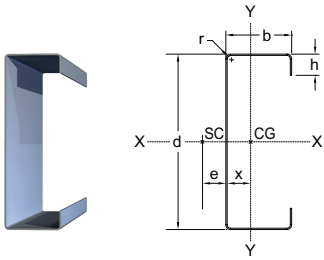
$K_x = K_y = K_t = 1.0$

$C_b = 1.0$

$P_r 4'' = 4''$  bearing web crippling resistance

$P_r 8'' = 8''$  bearing web crippling resistance

$R$  = Average bend radius (all values calculated based on 3/16" bend radius)



**SECTION DIMENSIONS & PROPERTIES**

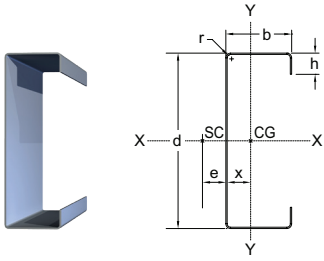
**METRIC**

SECTION	DIMENSIONS					PROPERTIES									
	Depth of Section	Flange Width	Length of Lip	Thickness of Steel	Area of Section	Gross Moment of Inertia About X-X	Elastic Section Modulus About X-X	Radius of Gyration About X-X	Gross Moment of Inertia About Y-Y	Elastic Section Modulus About Y-Y	Radius of Gyration About Y-Y	Center of Gravity CG	Shear Center SC	St. Venant Torsion Constant	Warping Constant
	d (mm)	b (mm)	h (mm)	t (mm)	A (mm <sup>2</sup> )	I <sub>x</sub> (10 <sup>6</sup> mm <sup>4</sup> )	S <sub>x</sub> (10 <sup>3</sup> mm <sup>3</sup> )	r <sub>x</sub> (mm)	I <sub>y</sub> (10 <sup>6</sup> mm <sup>4</sup> )	S <sub>y</sub> (10 <sup>3</sup> mm <sup>3</sup> )	r <sub>y</sub> (mm)	x (mm)	e (mm)	J (10 <sup>3</sup> mm <sup>4</sup> )	C <sub>w</sub> (10 <sup>9</sup> mm <sup>6</sup> )
45C16	114	57.2	19.1	1.52	381	0.80	14.0	45.7	0.180	8.95	21.7	20.1	28.1	0.293	0.55
45C14	114	57.2	19.1	1.90	473	0.98	17.2	45.5	0.220	10.92	21.6	20.1	27.6	0.568	0.66
45C13	114	57.2	19.1	2.28	564	1.16	20.3	45.4	0.258	12.81	21.4	20.1	27.2	0.976	0.77
06C16	152	57.4	23.9	1.52	455	1.61	21.1	59.4	0.223	11.76	22.1	18.9	27.9	0.350	1.20
06C14	152	57.4	23.9	1.90	565	1.98	26.0	59.3	0.272	14.37	22.0	18.9	27.5	0.678	1.45
06C13	152	57.4	23.9	2.28	674	2.35	30.8	59.1	0.320	16.87	21.8	18.9	27.0	1.166	1.69
06C12	152	57.4	23.9	2.66	781	2.71	35.5	58.9	0.365	19.24	21.6	19.0	26.6	1.837	1.91
06C11	152	57.4	23.9	3.04	887	3.05	40.1	58.7	0.408	21.51	21.4	19.0	26.1	2.729	2.12
06C10	152	57.4	23.9	3.42	991	3.39	44.5	58.5	0.448	23.64	21.3	19.0	25.7	3.857	2.31
08C16	203	74.7	23.9	1.52	584	3.71	36.5	79.7	0.455	20.18	27.9	22.6	33.8	0.449	3.93
08C14	203	74.7	23.9	1.90	727	4.59	45.2	79.5	0.559	24.76	27.7	22.6	33.3	0.872	4.79
08C13	203	74.7	23.9	2.28	868	5.46	53.7	79.3	0.659	29.20	27.6	22.6	32.9	1.502	5.61
08C12	203	74.7	23.9	2.66	1008	6.30	62.0	79.1	0.755	33.44	27.4	22.6	32.4	2.370	6.39
08C11	203	74.7	23.9	3.04	1146	7.14	70.2	78.9	0.848	37.54	27.2	22.6	32.0	3.526	7.13
08C10	203	74.7	23.9	3.42	1283	7.95	78.2	78.7	0.937	41.45	27.0	22.6	31.6	4.991	7.82
09C16	229	78.2	23.9	1.52	634	5.03	44.0	89.1	0.528	23.47	28.9	22.5	34.2	0.487	5.61
09C14	229	78.2	23.9	1.90	788	6.23	54.5	88.9	0.648	28.81	28.7	22.5	33.8	0.946	6.85
09C13	229	78.2	23.9	2.28	942	7.41	64.8	88.7	0.765	34.00	28.5	22.5	33.4	1.630	8.04
09C12	229	78.2	23.9	2.66	1094	8.56	74.9	88.5	0.877	38.95	28.3	22.5	32.9	2.574	9.17
09C11	229	78.2	23.9	3.04	1245	9.70	84.9	88.3	0.986	43.76	28.1	22.5	32.5	3.830	10.24
09C10	229	78.2	23.9	3.42	1394	10.81	94.6	88.1	1.090	48.34	28.0	22.5	32.0	5.423	11.26
10C16	254	82.8	23.9	1.52	686	6.67	52.5	98.6	0.624	27.33	30.2	22.9	35.2	0.528	8.02
10C14	254	82.8	23.9	1.90	854	8.26	65.0	98.4	0.768	33.58	30.0	22.9	34.8	1.024	9.82
10C13	254	82.8	23.9	2.28	1021	9.83	77.4	98.1	0.907	39.65	29.8	22.9	34.4	1.766	11.54
10C12	254	82.8	23.9	2.66	1186	11.37	89.5	97.9	1.040	45.46	29.6	22.9	33.9	2.790	13.17
10C11	254	82.8	23.9	3.04	1350	12.89	101.5	97.7	1.170	51.10	29.4	22.9	33.5	4.153	14.74
10C10	254	82.8	23.9	3.42	1512	14.37	113.2	97.5	1.294	56.50	29.3	22.9	33.0	5.882	16.23

ExSteel roll forms a wide range of cee and zee sections for use in building applications or to replace hot rolled sections. Sizes range from 114 to 406 mm inches deep with flange widths from 51 to 89 mm and thicknesses from 16 ga. (1.52mm) to 10 ga. (3.42mm). An infinite choice of sizes between those listed are also available. This design table only includes standard section sizes that are typically manufactured by ExSteel.

1. Section properties are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.





## SECTION RESISTANCE TABLE

METRIC

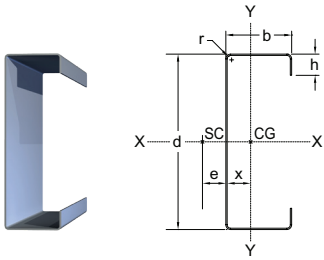
SECTION	LIMIT STATES DESIGN - 2004 NAS - CANADA							LIMIT STATES DESIGN - 2004 NAS - CANADA							
								$M_r'$ (kN-m) (FACTORED EFFECTIVE MOMENT RESISTANCE)							
	Mass (kg/m)	$V_r$ (kN)	$C_r'$ (kN)	$P_r$ 102mm (kN)	$P_r$ 203mm (kN)	$L_u$ (m)	$M_r < L_u$ (kN-m)	UNBRACED LENGTH							
								1.83m	2.44m	3.05m	3.66m	4.27m	4.88m	5.49m	6.1m
45C16	2.99	22.5	83	6.0	7.8	1.17	4.3	3.8	3.1	2.1	1.5	1.2	0.9	0.8	0.6
45C14	3.71	34.9	119	9.0	11.7	1.17	5.7	5.0	3.9	2.7	2.0	1.5	1.2	1.0	0.9
45C13	4.42	41.6	156	12.7	16.4	1.17	6.9	5.9	4.6	3.3	2.4	1.9	1.6	1.3	1.2
06C16	3.57	19.7	95	5.8	7.5	1.20	6.9	6.0	4.9	3.3	2.4	1.8	1.4	1.1	0.9
06C14	4.43	35.1	133	8.8	11.4	1.20	8.9	7.7	6.0	4.2	3.0	2.3	1.8	1.5	1.3
06C13	5.28	50.6	167	12.4	16.0	1.20	10.5	9.1	7.2	5.1	3.7	2.8	2.3	1.9	1.6
06C12	6.12	66.5	203	16.5	21.2	1.20	12.1	10.5	8.4	6.0	4.4	3.4	2.8	2.3	2.0
06C11	6.96	75.6	240	21.2	27.0	1.20	13.7	11.8	9.5	6.9	5.1	4.0	3.3	2.8	2.4
06C10	7.77	84.6	278	26.2	33.4	1.20	15.2	13.2	10.7	7.9	5.9	4.7	3.9	3.3	2.9
08C16	4.58	14.4	99	5.5	7.2	1.46	10.8	10.4	9.3	7.7	5.8	4.4	3.4	2.7	2.2
08C14	5.70	28.3	133	8.5	11.0	1.46	13.7	13.1	11.7	10.0	7.3	5.5	4.2	3.4	2.8
08C13	6.81	49.1	176	12.0	15.5	1.46	17.1	16.4	14.7	12.0	8.8	6.6	5.2	4.2	3.5
08C12	7.90	68.8	225	16.0	20.6	1.46	20.6	19.5	17.2	13.9	10.2	7.7	6.1	5.0	4.2
08C11	8.99	89.9	275	20.6	26.3	1.46	23.8	22.5	19.5	15.8	11.8	9.0	7.1	5.9	4.9
08C10	10.06	113.7	324	25.6	32.6	1.46	26.7	25.1	21.8	17.7	13.3	10.2	8.2	6.8	5.8
09C16	4.97	12.7	100	5.4	7.1	1.51	12.2	11.9	11.0	9.5	7.3	5.6	4.3	3.4	2.8
09C14	6.18	24.9	134	8.3	10.8	1.51	16.4	15.7	14.0	12.0	9.3	6.9	5.4	4.3	3.5
09C13	7.39	43.3	176	11.8	15.3	1.51	20.1	19.4	17.6	14.9	11.1	8.3	6.5	5.2	4.3
09C12	8.58	68.8	228	15.8	20.3	1.51	24.5	23.4	20.9	17.4	13.0	9.7	7.6	6.2	5.2
09C11	9.77	89.9	277	20.3	26.0	1.51	28.2	27.0	24.0	19.7	14.8	11.2	8.9	7.2	6.1
09C10	10.93	113.7	331	25.3	32.2	1.51	32.1	30.7	26.8	22.1	16.7	12.7	10.1	8.3	7.0
10C16	5.38	11.4	100	5.3	7.0	1.57	13.5	13.3	12.4	11.2	9.2	7.1	5.5	4.4	3.6
10C14	6.70	22.3	136	8.2	10.7	1.57	18.8	18.4	16.9	14.5	11.9	8.9	6.9	5.5	4.5
10C13	8.01	38.7	176	11.7	15.0	1.57	23.4	22.7	20.7	18.2	14.4	10.7	8.3	6.7	5.5
10C12	9.30	61.6	228	15.6	20.0	1.57	28.4	27.7	25.0	21.4	16.7	12.5	9.7	7.8	6.5
10C11	10.59	89.9	281	20.1	25.7	1.57	33.2	32.1	28.8	24.7	19.0	14.3	11.2	9.1	7.6
10C10	11.86	113.7	333	25.1	31.9	1.57	37.5	36.3	32.9	27.6	21.3	16.1	12.7	10.4	8.7

1. Loads are based on steel conforming to G40.21 or ASTM A1011/A1011M.
2. Member resistances are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.
3. Values have been calculated assuming no effect from cold work of forming.
4. Users of data contained in these tables assume all liability arising from such use.

$F_y$  = 379 MPa = minimum specified yield strength  
 $L_u$  = calculated maximum unbraced length to achieve fully braced member capacities  
 $M_u$  = factored effective moment resistance for unbraced length less than or equal to  $L_u$   
 $M_u'$  = factored effective moment resistance based on unsupported length  
 $C_r'$  = factored compressive resistance for a fully braced member

$V_r$  = factored shear resistance  
 $K_x = K_y = K_t = 1.0$   
 $C_b = 1.0$   
 $P_r$  102mm = 102mm bearing web crippling resistance  
 $P_r$  203mm = 203mm bearing web crippling resistance  
 $R$  = Average bend radius (all values calculated based on 4.8mm bend radius)





**SECTION DIMENSIONS & PROPERTIES**

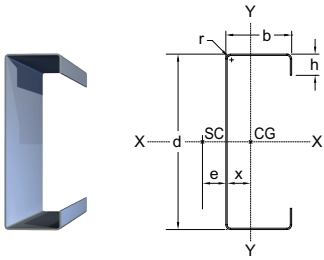
**METRIC**

SECTION	DIMENSIONS					PROPERTIES									
	Depth of Section	Flange Width	Length of Lip	Thickness of Steel	Area of Section	Gross Moment of Inertia About X-X	Elastic Section Modulus About X-X	Radius of Gyration About X-X	Gross Moment of Inertia About Y-Y	Elastic Section Modulus About Y-Y	Radius of Gyration About Y-Y	Center of Gravity CG	Shear Center SC	St. Venant Torsion Constant	Warping Constant
	d (mm)	b (mm)	h (mm)	t (mm)	A (mm <sup>2</sup> )	I <sub>x</sub> (10 <sup>6</sup> mm <sup>4</sup> )	S <sub>x</sub> (10 <sup>3</sup> mm <sup>3</sup> )	r <sub>x</sub> (mm)	I <sub>y</sub> (10 <sup>6</sup> mm <sup>4</sup> )	S <sub>y</sub> (10 <sup>3</sup> mm <sup>3</sup> )	r <sub>y</sub> (mm)	x (mm)	e (mm)	J (10 <sup>3</sup> mm <sup>4</sup> )	C <sub>w</sub> (10 <sup>9</sup> mm <sup>6</sup> )
12C14	305	85.9	23.9	1.90	962	12.98	85.2	116.2	0.884	40.83	30.3	21.7	34.0	1.154	15.94
12C13	305	85.9	23.9	2.28	1151	15.47	101.5	115.9	1.044	48.21	30.1	21.7	33.6	1.991	18.77
12C12	305	85.9	23.9	2.66	1337	17.90	117.5	115.7	1.198	55.29	29.9	21.7	33.2	3.145	21.46
12C11	305	85.9	23.9	3.04	1523	20.31	133.3	115.5	1.348	62.15	29.8	21.7	32.7	4.685	24.05
12C10	305	85.9	23.9	3.42	1706	22.67	148.8	115.3	1.492	68.72	29.6	21.7	32.3	6.638	26.51
14C13	356	88.9	23.9	2.28	1280	22.80	128.2	133.5	1.186	57.23	30.4	20.8	33.0	2.215	28.77
14C12	356	88.9	23.9	2.66	1488	26.41	148.5	133.2	1.361	65.63	30.3	20.8	32.6	3.501	32.93
14C11	356	88.9	23.9	3.04	1696	29.99	168.7	133.0	1.533	73.77	30.1	20.8	32.2	5.217	36.95
14C10	356	88.9	23.9	3.42	1901	33.49	188.4	132.7	1.697	81.59	29.9	20.8	31.8	7.395	40.77
16C13	406	88.9	23.9	2.28	1396	31.47	154.9	150.1	1.227	64.23	29.6	19.2	31.3	2.415	38.88
16C12	406	88.9	23.9	2.66	1623	36.46	179.5	149.9	1.407	73.61	29.5	19.2	30.9	3.819	44.52
16C11	406	88.9	23.9	3.04	1850	41.43	203.9	149.6	1.586	82.71	29.3	19.2	30.4	5.691	49.97
16C10	406	88.9	23.9	3.42	2074	46.29	227.8	149.4	1.756	91.39	29.1	19.2	30.0	8.070	55.18

ExSteel roll forms a wide range of cee and zee sections for use in building applications or to replace hot rolled sections. Sizes range from 114 to 406 mm inches deep with flange widths from 51 to 89 mm and thicknesses from 16 ga. (1.52mm) to 10 ga. (3.42mm). An infinite choice of sizes between those listed are also available. This design table only includes standard section sizes that are typically manufactured by ExSteel.

1. Section properties are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.





**SECTION RESISTANCE TABLE**

**METRIC**

SECTION								LIMIT STATES DESIGN - 2004 NAS - CANADA							
								$M_r'$ (kN-m) (FACTORED EFFECTIVE MOMENT RESISTANCE)							
	Mass (kg/m)	$V_r$ (kN)	$C_r'$ (kN)	$P_r$ 102mm (kN)	$P_r$ 203mm (kN)	$L_u$ (m)	$M_r < L_u$ (kN-m)	UNBRACED LENGTH							
								1.83m	2.44m	3.05m	3.66m	4.27m	4.88m	5.49m	6.1m
12C14	7.54	18.4	137	8.0	10.3	1.61	22.4	22.0	20.6	18.8	15.6	12.1	9.3	7.4	6.1
12C13	9.02	31.9	178	11.4	14.7	1.61	29.9	29.4	27.0	23.7	19.2	14.4	11.1	8.9	7.3
12C12	10.48	50.8	229	15.2	19.6	1.61	36.7	35.9	32.8	28.2	22.5	16.7	13.0	10.4	8.6
12C11	11.94	76.1	287	19.7	25.1	1.61	43.4	42.1	37.8	32.6	25.5	19.1	14.9	12.0	9.9
12C10	13.38	108.5	339	24.6	31.2	1.61	48.9	47.4	42.8	36.7	28.5	21.4	16.8	13.6	11.3
14C13	10.04	27.2	180	11.1	14.3	1.64	34.6	34.2	32.1	29.7	24.7	18.8	14.5	11.6	9.5
14C12	11.67	43.2	229	14.9	19.1	1.64	45.2	44.8	41.2	36.0	29.1	21.8	16.9	13.5	11.1
14C11	13.30	64.8	288	19.3	24.6	1.64	54.2	53.1	48.0	41.4	33.2	24.8	19.2	15.4	12.7
14C10	14.91	92.3	344	24.1	30.6	1.64	61.6	60.0	54.1	46.9	37.1	27.7	21.6	17.4	14.4
16C13	10.95	23.7	181	10.8	14.0	1.62	37.1	36.4	33.7	30.3	25.9	20.4	16.2	13.2	11.0
16C12	12.73	37.6	230	14.6	18.7	1.62	46.6	45.8	42.8	38.3	31.7	24.4	19.3	15.7	12.9
16C11	14.51	56.3	290	18.9	24.1	1.62	57.6	56.6	51.9	45.5	37.2	28.4	22.5	18.0	14.8
16C10	16.27	80.3	346	23.7	30.1	1.62	67.7	66.0	60.3	53.2	42.5	32.4	25.2	20.2	16.6

1. Loads are based on steel conforming to G40.21 or ASTM A1011/A1011M.
2. Member resistances are in accordance with 2004 NAS - Canada (LSD) for the Design of Cold-Formed Steel Structural Members.
3. Values have been calculated assuming no effect from cold work of forming.
4. Users of data contained in these tables assume all liability arising from such use.

$F_y$  = 379 MPa = minimum specified yield strength  
 $L_u^y$  = calculated maximum unbraced length to achieve fully braced member capacities  
 $M_r$  = factored effective moment resistance for unbraced length less than or equal to  $L_u$   
 $M_r'$  = factored effective moment resistance based on unsupported length  
 $C_r'$  = factored compressive resistance for a fully braced member

$V_r$  = factored shear resistance  
 $K_x = K_y = K_t = 1.0$   
 $C_b = 1.0$   
 $P_r$  102mm = 102mm bearing web crippling resistance  
 $P_r$  203mm = 203mm bearing web crippling resistance  
 $R$  = Average bend radius (all values calculated based on 4.8mm bend radius)

