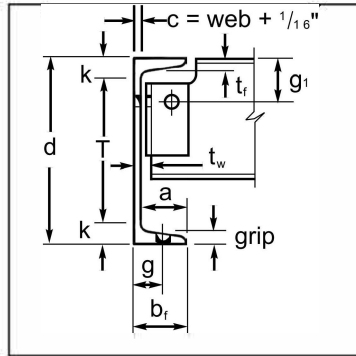
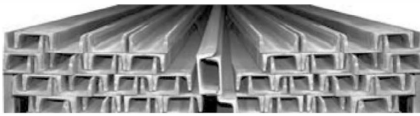


C SHAPES/STANDARD CHANNEL

STOCK LENGTHS: 20', 30', 40', 60' ASTMA-36



The AISC criteria that governs the method of determining the Approximate Dimensions for Detailing S, C and MC shapes is as follows:

d, depth of section, rounded to the nearest $\frac{1}{8}$ "

b_f, width of flange, rounded to the nearest $\frac{1}{8}$ "

t_f, average flange thickness, rounded to the nearest $\frac{1}{16}$ "

t_w, web thickness, rounded to the nearest $\frac{1}{16}$ "

t_w/2, one half the decimal thickness of the web, rounded to the nearest $\frac{1}{16}$ " (note that this derivation and rounding differs from that of W and HP shapes)

a, projection of the flange beyond the face of the web = $\frac{1}{2}$ " (decimal flange width minus decimal web thickness), rounded to the nearest $\frac{1}{8}$ "

T, clear distance on web between fillets, = (decimal depth of shape

minus ASTM A6 maximum under tolerance) minus 2 (decimal flange thickness at heel plus decimal fillet radius x tangent $\frac{1}{2}$ (90 - θ)), where θ is the flange slope, rounded down to the nearest $\frac{1}{8}$ "

k, distance from the outside of the flange to the fillet on the web, = $\frac{1}{2}$ (fractional depth of the shape minus fractional value of T), which will automatically be rounded up to the nearest $\frac{1}{16}$ " because of the rounding of T

Except for **k**, fractional dimensions such as "a" are derived by first using the theoretical decimal dimensions to calculate their value, then rounding the results to a fractional value. The rounding off of decimal dimensions to fractions can lead to an accumulation of differences when these fractions are added. For examples, S shapes fractional values of 2a + t_w may not equal their fractional value of b_f.

Designation	Weight per Foot	Depth of Section d	Flange		Web Thickness t_w	Half Web Thickness $\frac{t_w}{2}$	Distance					Grip	Max Flange Fastener	Usual Flange Gage g
			Width b_f	Thick-ness t_f			a	T	k	g₁	c			
C 3 X	4.1	3	1 $\frac{3}{8}$	1/4	3/16	1/16	1 $\frac{1}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{16}$	-	1/4	1/4	-	-
X	5	3	1 $\frac{1}{2}$	1/4	1/4	1/8	1 $\frac{1}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{16}$	-	5/16	1/4	-	-
X	6	3	1 $\frac{5}{8}$	1/4	3/8	3/16	1 $\frac{1}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{16}$	-	7/16	5/16	-	-
C 4 X	5.4	4	1 $\frac{5}{8}$	5/16	3/16	1/16	1 $\frac{3}{8}$	2 $\frac{5}{8}$	1 $\frac{1}{16}$	2	1/4	1/4	-	-
X	6.25	4	1 $\frac{11}{16}$	5/16	1/4	1/8	1 $\frac{3}{8}$	2 $\frac{5}{8}$	1 $\frac{1}{16}$	2	5/16	5/16	1/2	-
X	7.25	4	1 $\frac{3}{4}$	5/16	5/16	3/16	1 $\frac{3}{8}$	2 $\frac{5}{8}$	1 $\frac{1}{16}$	2	3/8	5/16	5/8	1
C 5 X	6.7	5	1 $\frac{3}{4}$	5/16	3/16	1/8	1 $\frac{1}{2}$	3 $\frac{1}{2}$	3/4	2 $\frac{1}{4}$	1/4	5/16	-	-
X	9	5	1 $\frac{7}{8}$	5/16	5/16	3/16	1 $\frac{1}{2}$	3 $\frac{1}{2}$	3/4	2 $\frac{1}{4}$	3/8	5/16	5/8	1 $\frac{1}{8}$
C 6 X	8.2	6	1 $\frac{7}{8}$	5/16	3/16	1/8	1 $\frac{3}{4}$	4 $\frac{3}{8}$	1 $\frac{3}{16}$	2 $\frac{1}{4}$	1/4	5/16	5/8	1 $\frac{1}{8}$
X	10.5	6	2	5/16	5/16	3/16	1 $\frac{3}{4}$	4 $\frac{3}{8}$	1 $\frac{3}{16}$	2 $\frac{1}{4}$	3/8	3/8	5/8	1 $\frac{1}{8}$
X	13	6	2 $\frac{1}{8}$	5/16	7/16	3/16	1 $\frac{3}{4}$	4 $\frac{3}{8}$	1 $\frac{3}{16}$	2 $\frac{1}{4}$	1/2	5/16	5/8	3 $\frac{3}{8}$
C 7 X	9.8	7	2 $\frac{1}{8}$	3/8	3/16	1/8	1 $\frac{7}{8}$	5 $\frac{1}{4}$	7/8	2 $\frac{1}{2}$	1/4	3/8	5/8	1 $\frac{1}{4}$
X	12.25	7	2 $\frac{1}{4}$	3/8	5/16	3/16	1 $\frac{7}{8}$	5 $\frac{1}{4}$	7/8	2 $\frac{1}{2}$	3/8	3/8	5/8	1 $\frac{1}{4}$
X	14.75	7	2 $\frac{1}{4}$	3/8	7/16	3/16	1 $\frac{7}{8}$	5 $\frac{1}{4}$	7/8	2 $\frac{1}{2}$	1/2	3/8	5/8	1 $\frac{1}{4}$
C 8 X	11.5	8	2 $\frac{1}{4}$	3/8	1/4	1/8	2	6 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{2}$	3/8	3/8	3/4	1 $\frac{3}{8}$
X	13.75	8	2 $\frac{3}{8}$	3/8	5/16	1/8	2	6 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{2}$	9/16	3/8	3/4	1 $\frac{3}{8}$
X	18.75	8	2 $\frac{1}{2}$	3/8	1/2	1/4	2	6 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{2}$	9/16	3/8	3/4	1 $\frac{1}{2}$
C 9 X	13.4	9	2 $\frac{3}{8}$	7/16	1/4	1/8	2 $\frac{1}{4}$	7 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{2}$	5/16	7/16	3/4	1 $\frac{3}{8}$
X	15	9	2 $\frac{1}{2}$	7/16	5/16	1/8	2 $\frac{1}{4}$	7 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{2}$	3/8	7/16	3/4	1 $\frac{3}{8}$
X	20	9	2 $\frac{5}{8}$	7/16	7/16	1/4	2 $\frac{1}{4}$	7 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{2}$	1/2	7/16	3/4	1 $\frac{1}{2}$
C 10 X	15.3	10	2 $\frac{5}{8}$	7/16	1/4	1/8	2 $\frac{3}{8}$	8	1	2 $\frac{1}{2}$	5/16	7/16	3/4	1 $\frac{1}{2}$
X	20	10	2 $\frac{3}{4}$	7/16	3/8	3/16	2 $\frac{3}{8}$	8	1	2 $\frac{1}{2}$	7/16	7/16	3/4	1 $\frac{1}{2}$
X	25	10	2 $\frac{7}{8}$	7/16	1/2	1/4	2 $\frac{3}{8}$	8	1	2 $\frac{1}{2}$	9/16	7/16	3/4	1 $\frac{3}{4}$
X	30	10	3	7/16	1 $\frac{1}{16}$	5/16	2 $\frac{3}{8}$	8	1	2 $\frac{1}{2}$	3/4	7/16	3/4	1 $\frac{3}{4}$
C 12 X	20.7	12	3	1/2	5/16	1/8	2 $\frac{5}{8}$	9 $\frac{3}{4}$	1 $\frac{1}{8}$	2 $\frac{1}{2}$	3/8	1/2	7/8	1 $\frac{3}{4}$
X	25	12	3	1/2	3/8	3/16	2 $\frac{5}{8}$	9 $\frac{3}{4}$	1 $\frac{1}{8}$	2 $\frac{1}{2}$	7/16	1/2	7/8	1 $\frac{3}{4}$
X	30	12	3 $\frac{1}{8}$	1/2	1/2	1/4	2 $\frac{5}{8}$	9 $\frac{3}{4}$	1 $\frac{1}{8}$	2 $\frac{1}{2}$	9/16	1/2	7/8	1 $\frac{3}{4}$
C 15 X	33.9	15	3 $\frac{3}{8}$	5/8	3/8	3/16	3	12 $\frac{1}{8}$	1 $\frac{7}{16}$	2 $\frac{3}{4}$	7/16	5/8	1	2
X	40	15	3 $\frac{1}{2}$	5/8	1/2	1/4	3	12 $\frac{1}{8}$	1 $\frac{7}{16}$	2 $\frac{3}{4}$	9/16	5/8	1	2
X	50	15	3 $\frac{3}{4}$	5/8	1 $\frac{1}{16}$	3/8	3	12 $\frac{1}{8}$	1 $\frac{7}{16}$	2 $\frac{3}{4}$	3/4	5/8	1	2 $\frac{1}{4}$

MC SHAPES/ JR. AND SHIP SHAPES

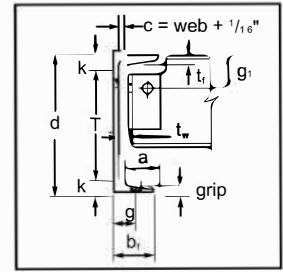
STOCK LENGTHS: 20' 30' 40' 60' ASTM A-36

APPROXIMATE DIMENSIONS FOR DETAILING

Designation	Weight per Foot	Depth of Section d	Flange		Web Thickness t _w	Half Web Thickness $\frac{t_w}{2}$	Distance					Grip	Max Flange Fastener	Usual Flange Gage g
			Width b _f	Thick-ness t _f			a	T	k	g ₁	c			
			in.	in.			in.	in.	in.	in.	in.			
MC 3 X	7.1	3	2	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{1}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$\frac{5}{8}$	-	$\frac{3}{8}$	-	-	-
MC 4 X	13.8	4	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	2	$2\frac{1}{4}$	$\frac{7}{8}$	2	$\frac{9}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{2}$
MC 6 X	12	6	$2\frac{1}{2}$	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{1}{8}$	$2\frac{1}{8}$	$4\frac{3}{8}$	$1\frac{3}{16}$	$2\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$1\frac{1}{2}$
MC 6 X	15.1	6	3	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{16}$	$2\frac{5}{8}$	$3\frac{7}{8}$	$1\frac{1}{16}$	$2\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{3}{4}$
MC 6 X	16.3	6	3	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	$2\frac{5}{8}$	$3\frac{7}{8}$	$1\frac{1}{16}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{3}{4}$
MC 6 X	15.3	6	$3\frac{1}{2}$	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{3}{16}$	$3\frac{1}{8}$	$4\frac{1}{4}$	$\frac{7}{8}$	$2\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{8}$	2
MC 6 X	18	6	$3\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	$3\frac{1}{8}$	$3\frac{7}{8}$	$1\frac{1}{16}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 7 X	19.1	7	$3\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	$3\frac{1}{8}$	$4\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 7 X	22.7	7	$3\frac{5}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$3\frac{1}{8}$	$4\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$\frac{9}{16}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 8 X	8.5	8	$1\frac{7}{8}$	$\frac{5}{16}$	$\frac{3}{16}$	$\frac{1}{16}$	$1\frac{3}{4}$	$6\frac{1}{2}$	$\frac{3}{4}$	$2\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{5}{8}$	$1\frac{1}{8}$
MC 8 X	18.7	8	3	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	$2\frac{5}{8}$	$5\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 8 X	20	8	3	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	$2\frac{5}{8}$	$5\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 8 X	21.4	8	$3\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	$3\frac{1}{8}$	$5\frac{5}{8}$	$1\frac{3}{16}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 8 X	22.8	8	$3\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$	$3\frac{1}{8}$	$5\frac{5}{8}$	$1\frac{3}{16}$	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{7}{8}$	2
MC 9 X	23.9	9	$3\frac{1}{2}$	$\frac{9}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	3	$6\frac{5}{8}$	$1\frac{3}{16}$	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC 9 X	25.4	9	$3\frac{1}{2}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{1}{4}$	3	$6\frac{5}{8}$	$1\frac{3}{16}$	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC10 X	6.5	10	$1\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	1	$9\frac{1}{8}$	$\frac{7}{16}$	$2\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	-	-
MC10 X	8.4	10	$1\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$1\frac{3}{8}$	$8\frac{5}{8}$	$1\frac{1}{16}$	$2\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	-	-
MC10 X	22	10	$3\frac{3}{8}$	$\frac{9}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	3	$7\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{3}{8}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC10 X	25	10	$3\frac{3}{8}$	$\frac{9}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	3	$7\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC10 X	28.5	10	4	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{3}{16}$	$3\frac{1}{2}$	$7\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC10 X	33.6	10	$4\frac{1}{8}$	$\frac{9}{16}$	$\frac{9}{16}$	$\frac{5}{16}$	$3\frac{1}{2}$	$7\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC10 X	41.1	10	$4\frac{3}{8}$	$\frac{9}{16}$	$1\frac{3}{16}$	$\frac{3}{8}$	$3\frac{1}{2}$	$7\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{7}{8}$	$\frac{9}{16}$	$\frac{7}{8}$	2
MC12 X	10.6	12	$1\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$1\frac{1}{4}$	$10\frac{5}{8}$	$1\frac{1}{16}$	$2\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	-	-
MC12 X	31	12	$3\frac{5}{8}$	$1\frac{1}{16}$	$\frac{7}{16}$	$\frac{3}{16}$	$3\frac{1}{4}$	$9\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{1}{4}$	$\frac{7}{16}$	$1\frac{1}{16}$	1	$2\frac{1}{2}$
MC12 X	35	12	$3\frac{3}{4}$	$1\frac{1}{16}$	$\frac{7}{16}$	$\frac{1}{4}$	$3\frac{1}{4}$	$9\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{16}$	1	$2\frac{1}{2}$
MC12 X	40	12	$3\frac{7}{8}$	$1\frac{1}{16}$	$\frac{9}{16}$	$\frac{5}{16}$	$3\frac{1}{4}$	$9\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{16}$	1	$2\frac{1}{2}$
MC12 X	45	12	4	$1\frac{1}{16}$	$1\frac{1}{16}$	$\frac{3}{8}$	$3\frac{1}{4}$	$9\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{16}$	1	$2\frac{1}{2}$
MC12 X	50	12	$4\frac{1}{8}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$\frac{7}{16}$	$3\frac{1}{4}$	$9\frac{3}{8}$	$1\frac{5}{16}$	$2\frac{1}{2}$	$\frac{7}{8}$	$1\frac{1}{16}$	1	$2\frac{1}{2}$

MC SHAPES (CONT.)

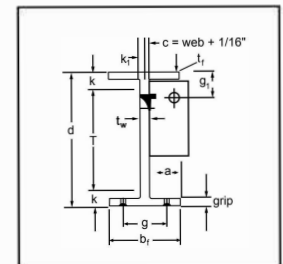
STOCK LENGTHS: 20', 30', 40', 60' ASTM A-36



APPROXIMATE DIMENSIONS FOR DETAILING

Designation	Weight per Foot	Depth of Section d	Flange		Web Thickness t _w	Half Web Thickness $\frac{t_w}{2}$	Distance					Grip	Max Flange Fastener	Usual Flange Gage g
			Width b _f	Thick-ness t _f			a	T	k	g ₁	c			
			in.	in.			in.	in.	in.	in.	in.			
MC13 X	31.8	13	4	5/8	3/8	3/16	3 5/8	10 1/4	1 3/8	2 3/4	7/16	9/16	1	2 1/2
MC13 X	35	13	4 1/8	5/8	7/16	1/4	3 5/8	10 1/4	1 3/8	2 3/4	1/2	9/16	1	2 1/2
MC13 X	40	13	4 1/8	5/8	9/16	1/4	3 5/8	10 1/4	1 3/8	2 3/4	5/8	9/16	1	2 1/2
MC13 X	50	13	4 3/8	5/8	1 3/16	3/8	3 5/8	10 1/4	1 3/8	2 3/4	7/8	5/8	1	2 1/2
MC18 X	42.7	18	4	5/8	7/16	1/4	3 1/2	15 1/4	1 3/8	2 1/2	1/2	5/8	1	2 1/2
MC18 X	45.8	18	4 1/8	5/8	1/2	1/4	3 1/2	15 1/4	1 3/8	2 1/2	7/16	5/8	1	2 1/2
MC18 X	51.9	18	4 1/8	5/8	5/8	5/16	3 1/2	15 1/4	1 3/8	2 1/2	1 1/16	5/8	1	2 1/2
MC18 X	58	18	4 1/4	5/8	1 1/16	3/8	3 1/2	15 1/4	1 3/8	2 1/2	3/4	5/8	1	2 1/2

APPROXIMATE DIMENSIONS FOR DETAILING



M SHAPES/MISC. AND JUNIORS

STOCK LENGTHS: 20', 30', 40', 60' ASTM A-36

APPROXIMATE DIMENSIONS FOR DETAILING

Designation	Weight per Foot	Depth of Section d	Flange		Web Thickness t _w	Half Web Thickness $\frac{t_w}{2}$	Distance					Grip	Max Flange Fastener	Usual Flange Gage g	
			Width b _f	Thick-ness t _f			a	T	k	k ₁	g ₁				c
			in.	in.			in.	in.	in.	in.	in.				in.
M 4 X	13	4	4	3/8	1/4	1/8	1 7/8	2 3/8	1 3/16	7/16	2	3/16	3/8	3/4	2 1/4
M 5 X	18.9	5	5	7/16	9/16	3/16	2 3/8	3 1/4	7/8	1/2	2 1/2	1/4	7/16	7/8	2 3/4
M 6 X	4.4	6	1 7/8	3/16	1/8	1/16	7/8	5 1/4	3/8	1/4	2	1/8	3/16	-	-
M 8 X	6.5	8	2 1/4	3/16	1/8	1/16	1 1/8	7	1/2	1/4	2	1/8	3/16	-	-
M10X	9	10	2 3/4	3/16	3/16	1/16	1 1/4	9	1/2	5/16	2	1/8	3/16	-	-
M12X	11.8	12	3 1/8	1/4	3/16	1/16	1 1/2	10 7/8	9/16	3/8	2 1/4	1/8	1/4	-	-