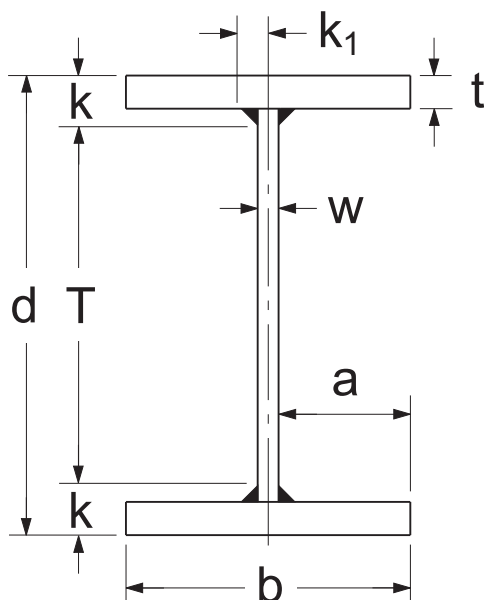


CISC Steel Design Series

Part 5 ***Welded Shapes - 1976 Series*** ***Properties and Dimensions***



Reprinted from the Handbook of Steel Construction, 2nd Edition

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CISC Steel Design Series SDS-5

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PART 5

WELDED SHAPES - 1976 SERIES - PROPERTIES AND DIMENSIONS

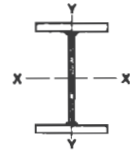
General

The tables of properties and dimensions of Welded Wide-Flange shapes on the following pages are reprinted from the Handbook of Steel Construction, 2nd Edition, 6th Revised Printing, 1976. The tables are provided in both imperial and metric (SI) units. They are intended mainly for designers involved in renovation projects.

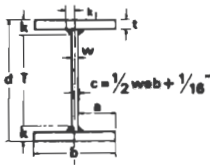
The welded shapes introduced in 1976 were the first to be produced by Algoma Steel Corporation in even metric units. They were initially produced to the requirements of CSA Standards G40.20/G40.21-1973 and designated as WWF(M). Subsequently, when CSA G40.20/G40.21-M1977 was published in metric units, the welded sections were produced to that standard and designated simply as WWF.

The previous entry in the Steel Design Series, Part 4, presented the properties and dimensions of WWF sections reprinted from the 10th Edition Handbook, 2010. Part 4 may be consulted for information on the manufacture, production and availability of WWF sections.

WELDED WIDE FLANGE SHAPES **WWF(M)47 — WWF(M)28** **PROPERTIES IN IMPERIAL UNITS**



Designation	Total Area	Area hw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
WWF(M)47											
X326	96.2	27.8	70.0	1.39	40200	1700	20.4	1860	2670	247	5.27
X270	79.6	28.3	71.3	1.85	32000	1350	20.1	1500	2000	185	5.01
X244	72.0	28.4	71.5	2.18	28000	1190	19.7	1320	1400	142	4.41
X203	59.7	28.5	71.9	3.05	21600	914	19.0	1040	642	81.5	3.28
X176	52.0	28.5	71.9	4.06	17400	737	18.3	861	271	45.9	2.28
WWF(M)43											
X307	90.5	22.1	72.9	1.27	32700	1510	19.0	1650	2670	247	5.43
X260	76.8	22.4	73.6	1.60	27000	1250	18.8	1360	1750	178	4.77
X225	66.2	22.7	74.6	2.00	22600	1040	18.5	1150	1400	142	4.60
X195	57.5	22.7	74.6	2.49	18700	864	18.0	965	718	91.2	3.53
X171	50.4	22.9	75.4	3.18	15700	725	17.7	817	564	71.6	3.35
X147	43.5	22.9	75.4	4.23	12600	582	17.0	672	238	40.3	2.34
WWF(M)39											
X300	88.3	20.0	65.7	1.15	26600	1350	17.4	1470	2670	247	5.50
X253	74.6	20.2	66.4	1.45	21900	1110	17.1	1220	1750	178	4.84
X217	64.0	20.5	67.4	1.81	18300	930	16.9	1020	1400	142	4.68
X188	55.4	20.5	67.4	2.27	15100	767	16.5	855	718	91.2	3.60
X163	48.2	20.7	68.3	2.89	12600	640	16.2	720	564	71.6	3.42
X134	39.6	20.7	68.6	4.23	9460	481	15.5	556	217	36.7	2.34
WWF(M)35											
X279	82.3	14.0	74.5	1.04	20800	1170	15.9	1270	2670	247	5.70
X233	68.6	14.2	75.5	1.31	17000	960	15.7	1040	1750	178	5.05
X197	57.9	14.4	76.7	1.63	14200	802	15.7	865	1400	142	4.92
X167	49.3	14.4	76.7	2.04	11600	655	15.3	716	718	91.2	3.82
X142	42.0	14.6	77.8	2.60	9580	541	15.1	594	564	71.6	3.66
X128	37.9	14.5	77.3	3.05	8290	468	14.8	522	271	45.9	2.67
X113	33.4	14.7	78.2	3.81	7030	397	14.5	446	217	36.7	2.55
WWF(M)31											
X223	65.7	11.3	73.0	1.16	13100	832	14.1	898	1750	178	5.16
X187	55.1	11.5	74.4	1.45	10900	692	14.1	744	1400	142	5.04
X157	46.4	11.5	74.4	1.81	8880	564	13.8	612	718	91.2	3.93
X133	39.2	11.7	75.6	2.31	7300	464	13.6	505	564	71.6	3.79
X109	32.3	11.7	75.6	3.08	5700	362	13.3	401	238	40.3	3.71
X103	30.5	11.8	76.0	3.39	5300	337	13.2	374	216	36.6	2.66
WWF(M)28											
X149	43.9	8.98	71.6	1.59	6580	478	12.2	516	718	91.2	4.04
X136	40.2	9.07	72.2	1.78	6000	435	12.2	470	641	81.4	3.99
X124	36.6	9.15	72.9	2.02	5400	392	12.1	423	564	71.6	3.93
X110	32.5	9.07	72.2	2.37	4630	336	11.9	367	270	45.7	2.88
X101	29.8	9.15	72.9	2.69	4180	303	11.8	332	238	40.3	2.83
X95	28.0	9.21	73.3	2.96	3880	282	11.8	309	216	36.6	2.78



WELDED WIDE FLANGE SHAPES

WWF(M)47 — WWF(M)28

DIMENSIONS IN IMPERIAL UNITS

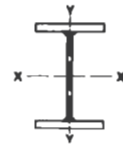
Designation‡	Depth d		Flange				Web Thickness w		Distance				
			Width b		Mean Thickness t				a	T	k	k ₁	c
	In.		In.		In.		In.		In.	In.	In.	In.	In.
WWF(M)47													
X326	47.24	47¼	21.65	21%	1.57	1⅞	.630	⅝	10½	43½	1⅞	⅝	⅜
X270	47.24	47¼	21.65	21%	1.18	1⅞	.630	⅝	10½	44¼	1⅞	⅝	⅜
X244	47.24	47¼	19.69	19%	1.10	1⅞	.630	⅝	9½	44%	1⅞	⅝	⅜
X203	47.24	47¼	15.75	15%	.984	1	.630	⅝	7½	44%	1⅞	⅝	⅜
X176	47.24	47¼	11.81	11%	.984	1	.630	⅝	5%	44%	1⅞	⅝	⅜
WWF(M)43													
X307	43.31	43¼	21.65	21%	1.57	1⅞	.551	⅞	10½	39½	1⅞	⅞	⅝
X260	43.31	43¼	19.69	19%	1.38	1⅞	.551	⅞	9%	40	1⅞	⅞	⅝
X225	43.31	43¼	19.69	19%	1.10	1⅞	.551	⅞	9%	40½	1⅞	⅞	⅝
X195	43.31	43¼	15.75	15%	1.10	1⅞	.551	⅞	7%	40½	1⅞	⅞	⅝
X171	43.31	43¼	15.75	15%	.866	⅞	.551	⅞	7%	41	1⅞	⅞	⅝
X147	43.31	43¼	11.81	11%	.866	⅞	.551	⅞	5%	41	1⅞	⅞	⅝
WWF(M)39													
X300	39.37	39%	21.65	21%	1.57	1⅞	.551	⅞	10½	35%	1⅞	⅞	⅝
X253	39.37	39%	19.69	19%	1.38	1⅞	.551	⅞	9%	36%	1⅞	⅞	⅝
X217	39.37	39%	19.69	19%	1.10	1⅞	.551	⅞	9%	36%	1⅞	⅞	⅝
X188	39.37	39%	15.75	15%	1.10	1⅞	.551	⅞	7%	36%	1⅞	⅞	⅝
X163	39.37	39%	15.75	15%	.866	⅞	.551	⅞	7%	37%	1⅞	⅞	⅝
X134	39.37	39%	11.81	11%	.787	1⅞	.551	⅞	5%	37¼	1⅞	⅞	⅝
WWF(M)35													
X279	35.43	35%	21.65	21%	1.57	1⅞	.433	⅞	10%	31%	1⅞	½	¼
X233	35.43	35%	19.69	19%	1.38	1⅞	.433	⅞	9%	32%	1⅞	½	¼
X197	35.43	35%	19.69	19%	1.10	1⅞	.433	⅞	9%	32%	1⅞	½	¼
X167	35.43	35%	15.75	15%	1.10	1⅞	.433	⅞	7%	32%	1⅞	½	¼
X142	35.43	35%	15.75	15%	.866	⅞	.433	⅞	7%	33%	1⅞	½	¼
X128	35.43	35%	11.81	11%	.984	1	.433	⅞	5%	32%	1⅞	½	¼
X113	35.43	35%	11.81	11%	.787	1⅞	.433	⅞	5%	33¼	1⅞	½	¼
WWF(M)31													
X223	31.50	31½	19.69	19%	1.38	1⅞	.394	⅞	9%	28%	1⅞	½	¼
X187	31.50	31½	19.69	19%	1.10	1⅞	.394	⅞	9%	28%	1⅞	½	¼
X157	31.50	31½	15.75	15%	1.10	1⅞	.394	⅞	7%	28%	1⅞	½	¼
X133	31.50	31½	15.75	15%	.866	⅞	.394	⅞	7%	29%	1⅞	½	¼
X109	31.50	31½	11.81	11%	.866	⅞	.394	⅞	5%	29%	1⅞	½	¼
X103	31.50	31½	11.81	11%	.787	1⅞	.394	⅞	5%	29%	1⅞	½	¼
WWF(M)28													
X149	27.56	27½	15.75	15%	1.10	1⅞	.354	⅞	7%	24%	1⅞	⅞	¼
X136	27.56	27½	15.75	15%	.984	1	.354	⅞	7%	25	1⅞	⅞	¼
X124	27.56	27½	15.75	15%	.866	⅞	.354	⅞	7%	25%	1⅞	⅞	¼
X110	27.56	27½	11.81	11%	.984	1	.354	⅞	5%	25	1⅞	⅞	¼
X101	27.56	27½	11.81	11%	.866	⅞	.354	⅞	5%	25%	1⅞	⅞	¼
X95	27.56	27½	11.81	11%	.787	1⅞	.354	⅞	5%	25%	1⅞	⅞	¼

‡The numerical term following the X is the nominal weight in pounds per foot.

WELDED WIDE FLANGE SHAPES

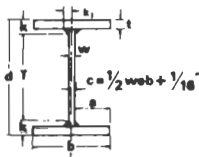
WWF(M)22 — WWF(M)14

PROPERTIES IN IMPERIAL UNITS



Designation	Total Area	Area hw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
WWF(M)22											
X484**	143	40.0	7.17	.423	10500	970	8.57	1160	4020	371	5.30
X416**	123	20.0	14.3	.423	10100	933	9.06	1070	4000	369	5.70
X338	99.5	14.0	22.5	.508	8680	802	9.34	901	3330	308	5.79
X282	83.1	14.6	23.5	.635	7330	677	9.39	752	2670	247	5.67
X146	43.0	8.70	46.4	1.27	4020	371	9.67	399	1330	123	5.56
WWF(M)20											
X437**	129	35.3	6.33	.423	7700	782	7.73	938	3020	307	4.84
X377**	111	17.7	12.7	.423	7370	749	8.15	872	3010	306	5.21
X306	90.2	12.4	20.0	.508	6380	648	8.41	735	2500	254	5.26
X256	75.3	13.0	21.0	.635	5410	550	8.48	615	2000	203	5.15
X230	67.9	13.3	21.5	.726	4890	497	8.49	553	1750	178	5.08
X205	60.5	13.6	22.0	.847	4350	442	8.48	489	1500	152	4.98
X185	54.6	11.0	27.8	.907	4050	411	8.61	451	1400	142	5.06
X170	50.1	11.2	28.1	1.02	3700	376	8.59	412	1250	127	5.00
X150	44.2	9.90	32.6	1.15	3300	335	8.64	365	1100	112	4.99
X132	39.0	7.84	41.8	1.27	3000	305	8.77	328	1000	102	5.06
WWF(M)18											
X337**	99.4	15.3	11.0	.423	5200	587	7.23	692	2190	247	4.69
X275	80.9	10.9	17.5	.508	4530	511	7.48	587	1830	207	4.76
X229	67.6	11.5	18.5	.635	3870	437	7.57	492	1460	165	4.65
X207	60.9	11.8	19.0	.726	3500	395	7.58	443	1280	145	4.58
X184	54.3	12.1	19.5	.847	3120	352	7.58	392	1100	124	4.50
X166	49.0	9.77	24.6	.907	2910	329	7.71	362	1020	115	4.56
X152	45.0	9.92	25.0	1.02	2660	300	7.69	331	913	103	4.50
X134	39.7	8.80	29.0	1.15	2380	269	7.74	294	803	90.7	4.50
X119	35.0	6.99	37.3	1.27	2160	244	7.86	264	730	82.4	4.57
WWF(M)16											
X298**	87.7	13.0	9.33	.423	3510	446	6.33	534	1540	196	4.19
X243	71.6	9.30	15.0	.508	3080	391	6.56	455	1280	163	4.23
X203	59.8	9.92	16.0	.635	2640	335	6.64	383	1030	131	4.15
X183	53.9	10.2	16.5	.726	2400	305	6.67	345	898	114	4.08
X163	48.1	10.5	17.0	.847	2150	273	6.69	306	769	97.7	4.00
X147	43.5	8.53	21.5	.907	2010	255	6.80	283	718	91.2	4.06
X135	39.9	8.68	21.9	1.02	1840	234	6.79	259	641	81.4	4.01
X119	35.2	7.73	25.4	1.15	1650	210	6.85	230	564	71.6	4.00
X105	31.1	6.14	32.7	1.27	1500	191	6.94	207	513	65.2	4.06
WWF(M)14											
X258**	76.1	10.7	7.67	.423	2230	324	5.41	396	1030	150	3.68
X211	62.3	7.75	12.5	.508	1980	287	5.64	339	859	125	3.71
X177	52.1	8.37	13.5	.635	1710	248	5.73	287	687	99.7	3.63
X159	47.0	8.68	14.0	.726	1560	226	5.76	259	601	87.2	3.58
X142	41.9	8.99	14.5	.847	1400	203	5.78	231	516	74.9	3.51
X128	37.9	7.29	18.4	.907	1310	190	5.88	214	481	69.8	3.56
X118	34.8	7.44	18.8	1.02	1210	176	5.90	196	429	62.3	3.51
X104	30.7	6.64	21.9	1.15	1080	157	5.93	174	378	54.9	3.51
X92	27.1	5.29	28.2	1.27	988	143	6.04	157	343	49.8	3.56

**Welding does not fully develop web strength for these sections.



WELDED WIDE FLANGE SHAPES **WWF(M)22 — WWF(M)14**

DIMENSIONS IN IMPERIAL UNITS

Designation†	Depth d		Flange				Web Thickness w		Distance				
			Width b		Mean Thickness t				a	T	k	k ₁	c
	In.		In.		In.		In.		In.	In.	In.	In.	In.
WWF(M)22													
X484	21.65	21%	21.65	21%	2.36	2%	2.36	2%	9%	16%	2%	1 1/16	1 1/4
X416	21.65	21%	21.65	21%	2.36	2%	1.18	1 3/16	10%	16%	2%	1	5/8
X338	21.65	21%	21.65	21%	1.97	1 1/16	.787	1 3/16	10%	16%	2%	1 3/16	7/16
X282	21.65	21%	21.65	21%	1.57	1 1/16	.787	1 3/16	10%	17%	1 15/16	1 3/16	7/16
X146	21.65	21%	21.65	21%	.787	1 3/16	.433	7/16	10%	19%	1 1/16	1/2	1/4
WWF(M)20													
X437	19.69	19%	19.69	19%	2.36	2%	2.36	2%	8%	14%	2%	1 1/16	1 1/4
X377	19.69	19%	19.69	19%	2.36	2%	1.18	1 3/16	9%	14%	2%	1	5/8
X306	19.69	19%	19.69	19%	1.97	1 1/16	.787	1 3/16	9%	14%	2%	1 3/16	7/16
X256	19.69	19%	19.69	19%	1.57	1 1/16	.787	1 3/16	9%	15%	1 15/16	1 3/16	7/16
X230	19.69	19%	19.69	19%	1.38	1%	.787	1 3/16	9%	16%	1%	1 3/16	7/16
X205	19.69	19%	19.69	19%	1.18	1 3/16	.787	1 3/16	9%	16 1/2	1 1/16	1 3/16	7/16
X185	19.69	19%	19.69	19%	1.10	1 1/8	.630	5/8	9%	16 3/4	1 1/16	5/8	3/8
X170	19.69	19%	19.69	19%	.984	1	.630	5/8	9 1/2	17	1 1/16	5/8	3/8
X150	19.69	19%	19.69	19%	.866	7/8	.551	9/16	9%	17 3/4	1 1/8	9/16	5/16
X132	19.69	19%	19.69	19%	.787	1 3/16	.433	7/16	9%	17 1/2	1 1/16	1/2	1/4
WWF(M)18													
X337	17.72	17%	17.72	17%	2.36	2%	1.18	1 3/16	8 1/2	12%	2%	1	5/8
X275	17.72	17%	17.72	17%	1.97	1 1/16	.787	1 3/16	8 1/2	13	2%	1 3/16	7/16
X229	17.72	17%	17.72	17%	1.57	1 1/16	.787	1 3/16	8 1/2	13 3/4	1 15/16	1 3/16	7/16
X207	17.72	17%	17.72	17%	1.38	1%	.787	1 3/16	8 1/2	14%	1%	1 3/16	7/16
X184	17.72	17%	17.72	17%	1.18	1 3/16	.787	1 3/16	8 1/2	14 1/2	1 1/16	1 3/16	7/16
X166	17.72	17%	17.72	17%	1.10	1 1/8	.630	5/8	8 1/2	14 3/4	1 1/16	5/8	3/8
X152	17.72	17%	17.72	17%	.984	1	.630	5/8	8 1/2	15%	1 1/16	5/8	3/8
X134	17.72	17%	17.72	17%	.866	7/8	.551	9/16	8%	15 1/2	1 1/8	9/16	5/16
X119	17.72	17%	17.72	17%	.787	1 3/16	.433	7/16	8%	15%	1 1/16	1/2	1/4
WWF(M)16													
X298	15.75	15%	15.75	15%	2.36	2%	1.18	1 3/16	7%	10%	2%	1	5/8
X243	15.75	15%	15.75	15%	1.97	1 1/16	.787	1 3/16	7 1/2	11	2%	1 3/16	7/16
X203	15.75	15%	15.75	15%	1.57	1 1/16	.787	1 3/16	7%	11 1/2	1 15/16	1 3/16	7/16
X183	15.75	15%	15.75	15%	1.38	1%	.787	1 3/16	7 1/2	12%	1%	1 3/16	7/16
X163	15.75	15%	15.75	15%	1.18	1 3/16	.787	1 3/16	7 1/2	12%	1 1/16	1 3/16	7/16
X147	15.75	15%	15.75	15%	1.10	1 1/8	.630	5/8	7 1/2	12 1/2	1 1/16	5/8	3/8
X135	15.75	15%	15.75	15%	.984	1	.630	5/8	7 1/2	13%	1 1/16	5/8	3/8
X119	15.75	15%	15.75	15%	.866	7/8	.551	9/16	7%	13 1/2	1 1/8	9/16	5/16
X105	15.75	15%	15.75	15%	.787	1 3/16	.433	7/16	7%	13%	1 1/16	1/2	1/4
WWF(M)14													
X258	13.78	13%	13.78	13%	2.36	2%	1.18	1 3/16	6%	8%	2%	1	5/8
X211	13.78	13%	13.78	13%	1.97	1 1/16	.787	1 3/16	6 1/2	9	2%	1 3/16	7/16
X177	13.78	13%	13.78	13%	1.57	1 1/16	.787	1 3/16	6 1/2	9 1/2	1 15/16	1 3/16	7/16
X159	13.78	13%	13.78	13%	1.38	1%	.787	1 3/16	6 1/2	10%	1%	1 3/16	7/16
X142	13.78	13%	13.78	13%	1.18	1 3/16	.787	1 3/16	6 1/2	10%	1 1/16	1 3/16	7/16
X128	13.78	13%	13.78	13%	1.19	1 1/8	.630	5/8	6%	10%	1 1/16	5/8	3/8
X118	13.78	13%	13.78	13%	.984	1	.630	5/8	6%	11%	1 1/16	5/8	3/8
X104	13.78	13%	13.78	13%	.866	7/8	.551	9/16	6%	11 1/2	1 1/8	9/16	5/16
X92	13.78	13%	13.78	13%	.787	1 3/16	.433	7/16	6%	11%	1 1/16	1/2	1/4

‡The numerical term following the X is the nominal weight in pounds per foot.

WELDED WIDE FLANGE SHAPES **WWF1200—WWF700** **PROPERTIES IN SI UNITS**

Designation†	Total Area	Area h _w	h/w	d/A _f	Axis X-X				Axis X-X		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
	mm ²	mm ²		mm ⁻¹	10 ⁶ mm ⁴	10 ³ mm ³	mm	10 ³ mm ³	10 ⁶ mm ⁴	10 ³ mm ³	mm
WWF1200											
X487	62 000	17 900	70.0	0.055	16 700	27 900	519	30 500	1 110	4 030	134
X403	51 400	18 200	71.3	0.073	13 300	22 200	509	24 500	832	3 030	127
X364	46 400	18 300	71.5	0.086	11 700	19 400	501	21 600	584	2 330	112
X302	38 500	18 400	71.9	0.120	8 970	15 000	483	17 000	267	1 340	83.3
X263	33 500	18 400	71.9	0.160	7 250	12 100	465	14 100	113	753	58.0
WWF1100											
X458	58 400	14 300	72.9	0.050	13 600	24 800	483	27 000	1 100	4 030	138
X388	49 500	14 400	73.6	0.063	11 200	20 400	476	22 400	729	2 920	121
X335	42 700	14 600	74.6	0.079	9 400	17 100	469	18 800	584	2 330	117
X291	37 100	14 600	74.6	0.098	7 790	14 200	458	15 800	299	1 490	89.7
X255	32 500	14 800	75.4	0.125	6 510	11 800	448	13 400	235	1 170	85.0
X220	28 100	14 800	75.4	0.167	5 240	9 520	432	11 000	99.2	662	59.4
WWF1000											
X447	57 000	12 900	65.7	0.045	11 100	22 100	441	24 100	1 110	4 030	140
X377	48 100	13 000	66.4	0.057	9 110	18 200	435	19 900	729	2 920	123
X324	41 300	13 200	67.4	0.071	7 620	15 200	429	16 700	584	2 330	119
X280	35 700	13 200	67.4	0.089	6 300	12 600	420	14 000	299	1 490	91.5
X244	31 100	13 400	68.3	0.114	5 250	10 500	411	11 800	235	1 170	86.9
X200	25 500	13 400	68.6	0.167	3 940	7 870	393	9 110	90.2	602	59.4
WWF900											
X417	53 100	9 020	74.5	0.041	8 660	19 300	404	20 800	1 110	4 030	145
X347	44 200	9 130	75.5	0.051	7 090	15 800	400	17 000	729	2 920	128
X293	37 400	9 280	76.7	0.064	5 890	13 100	397	14 200	583	2 330	125
X249	31 800	9 280	76.7	0.080	4 830	10 700	390	11 700	299	1 490	97.0
X213	27 100	9 420	77.8	0.102	3 990	8 860	383	9 730	235	1 170	93.0
X192	24 400	9 350	77.3	0.120	3 450	7 670	376	8 550	113	751	67.9
X169	21 600	9 460	78.2	0.150	2 920	6 500	368	7 310	90.1	601	64.7
WWF800											
X332	42 400	7 300	73.0	0.046	5 460	13 700	359	14 700	729	2 920	131
X279	35 500	7 440	74.4	0.057	4 530	11 300	357	12 200	583	2 330	128
X235	29 900	7 440	74.4	0.071	3 700	9 240	351	10 000	299	1 490	99.9
X198	25 300	7 560	75.6	0.091	3 040	7 590	347	8 280	235	1 170	96.4
X164	20 900	7 560	75.6	0.121	2 370	5 930	337	6 570	99.1	660	68.9
X154	19 700	7 600	76.0	0.133	2 210	5 510	335	6 130	90.1	600	67.6
WWF700											
X222	28 300	5 800	71.6	0.062	2 740	7 830	311	8 460	299	1 490	103
X203	25 900	5 850	72.2	0.070	2 500	7 130	310	7 700	267	1 330	101
X185	23 600	5 900	72.9	0.080	2 250	6 420	308	6 930	235	1 170	99.7
X164	20 900	5 850	72.2	0.093	1 930	5 500	303	6 010	133	750	73.3
X151	19 200	5 900	72.9	0.106	1 740	4 970	301	5 440	99.0	660	71.8
X141	18 000	5 940	73.3	0.117	1 610	4 610	299	5 060	90.0	600	70.6

WELDED WIDE FLANGE SHAPES

WWF1200—WWF700

DIMENSIONS IN SI UNITS

Designation‡	Depth d	Flange Width b	Flange Thickness t	Web Thickness w	Distances					Ordering Designation
					a	T	k	k ₁	c	
	mm	mm	mm	mm	mm	mm	mm	mm	mm	
WWF1200										WWF(M)47
X487	1 200	550	40	16	267	1 100	47.6	15.9	9.59	X326
X403	1 200	550	30	16	267	1 120	38.1	15.9	9.59	X270
X364	1 200	500	28	16	242	1 130	36.5	15.9	9.59	X244
X302	1 200	400	25	16	192	1 130	33.3	15.9	9.59	X203
X263	1 200	300	25	16	142	1 130	33.3	15.9	9.59	X176
WWF1100										WWF(M)43
X458	1 100	550	40	14	268	1 000	47.6	14.3	8.59	X307
X388	1 100	500	35	14	243	1 020	41.3	14.3	8.59	X260
X335	1 100	500	28	14	243	1 030	34.9	14.3	8.59	X225
X291	1 100	400	28	14	193	1 030	34.9	14.3	8.59	X195
X225	1 100	400	22	14	193	1 040	28.6	14.3	8.59	X171
X220	1 100	300	22	14	143	1 040	28.6	14.3	8.59	X147
WWF1000										WWF(M)39
X447	1 000	550	40	14	268	905	47.6	14.3	8.59	X300
X377	1 000	500	35	14	243	917	41.3	14.3	8.59	X253
X324	1 000	500	28	14	243	930	34.9	14.3	8.59	X217
X280	1 000	400	28	14	193	930	34.9	14.3	8.59	X188
X244	1 000	400	22	14	193	943	28.6	14.3	8.59	X163
X200	1 000	300	20	14	143	946	27.0	14.3	8.59	X134
WWF900										WWF(M)35
X417	900	550	40	11	270	805	47.6	12.7	7.09	X279
X347	900	500	35	11	245	817	41.3	12.7	7.09	X233
X293	900	500	28	11	245	830	34.9	12.7	7.09	X197
X249	900	400	28	11	195	830	34.9	12.7	7.09	X167
X213	900	400	22	11	195	843	28.6	12.7	7.09	X142
X192	900	300	25	11	145	837	31.8	12.7	7.09	X128
X169	900	300	20	11	145	846	27.0	12.7	7.09	X113
WWF800										WWF(M)31
X332	800	500	35	10	245	717	41.3	12.7	6.59	X223
X279	800	500	28	10	245	730	34.9	12.7	6.59	X187
X235	800	400	28	10	195	730	34.9	12.7	6.59	X157
X198	800	400	22	10	195	743	28.6	12.7	6.59	X133
X164	800	300	22	10	145	743	28.6	12.7	6.59	X109
X154	800	300	20	10	145	746	27.0	12.7	6.59	X103
WWF700										WWF(M)28
X222	700	400	28	9	196	630	34.9	11.1	6.09	X149
X203	700	400	25	9	196	637	31.8	11.1	6.09	X136
X185	700	400	22	9	196	643	28.6	11.1	6.09	X124
X164	700	300	25	9	146	637	31.8	11.1	6.09	X110
X151	700	300	22	9	146	643	28.6	11.1	6.09	X101
X141	700	300	20	9	146	646	27.0	11.1	6.09	X95

‡The numerical term following the X is the nominal mass in kg/m. This metric designation is not to be used until further notice. Instead use that shown at right of page.

6-15

WELDED WIDE FLANGE SHAPES **WWF550—WWF350** PROPERTIES IN SI UNITS

Designation†	Total Area	Area h/w	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
	mm ²	mm ²		mm ⁻¹	10 ⁶ mm ⁴	10 ³ mm ³	mm	10 ³ mm ³	10 ⁶ mm ⁴	10 ³ mm ³	mm
WWF550											
X721**	92 000	25 800	7.17	0.017	4 390	16 000	218	18 900	1 670	6 080	135
X620**	79 100	12 900	14.3	0.017	4 190	15 200	230	17 600	1 660	6 050	145
X503	64 200	9 000	22.5	0.020	3 610	13 100	237	14 800	1 390	5 040	147
X420	53 600	9 400	23.5	0.025	3 050	11 100	239	12 300	1 110	4 030	144
X217	27 700	5 610	46.4	0.050	1 670	6 090	246	6 540	555	2 020	141
WWF500											
X651**	83 000	22 800	6.33	0.017	3 200	12 800	196	15 400	1 260	5 030	123
X561**	71 600	11 400	12.7	0.017	3 070	12 300	207	14 300	1 250	5 000	132
X456	58 200	8 000	20.0	0.020	2 660	10 600	214	12 000	1 040	4 170	134
X381	48 600	8 400	21.0	0.025	2 250	9 010	215	10 100	834	3 330	131
X343	43 800	8 600	21.5	0.029	2 040	8 150	216	9 060	729	2 920	129
X306	39 000	8 800	22.0	0.033	1 810	7 240	215	8 010	625	2 500	127
X276	35 200	7 100	27.8	0.036	1 680	6 740	219	7 390	583	2 330	129
X254	32 300	7 200	28.1	0.040	1 540	6 160	218	6 750	521	2 080	127
X223	28 500	6 380	32.6	0.045	1 370	5 490	220	5 980	458	1 830	127
X197	25 200	5 060	41.8	0.050	1 250	4 990	223	5 380	417	1 670	129
WWF450											
X503**	64 100	9 900	11.0	0.017	2 160	9 620	184	11 300	912	4 050	119
X409	52 200	7 000	17.5	0.020	1 890	8 390	190	9 620	760	3 380	121
X342	43 600	7 400	18.5	0.025	1 610	7 150	192	8 060	608	2 700	118
X308	39 300	7 600	19.0	0.029	1 460	6 480	193	7 260	532	2 360	116
X274	35 000	7 800	19.5	0.033	1 300	5 770	193	6 420	456	2 030	114
X248	31 600	6 300	24.6	0.036	1 210	5 380	196	5 930	425	1 890	116
X228	29 000	6 400	25.0	0.040	1 110	4 920	195	5 420	380	1 690	114
X201	25 600	5 680	29.0	0.045	989	4 400	197	4 820	334	1 490	114
X177	22 600	4 510	37.3	0.050	900	4 000	200	4 330	304	1 350	116
WWF400											
X444**	56 600	8 400	9.33	0.017	1 460	7 300	161	8 750	641	3 200	106
X362	46 200	6 000	15.0	0.020	1 280	6 410	167	7 460	534	2 670	107
X303	38 600	6 400	16.0	0.025	1 100	5 500	169	6 280	427	2 130	105
X273	34 800	6 600	16.5	0.029	1 000	5 000	170	5 650	374	1 870	104
X243	31 000	6 800	17.0	0.033	894	4 470	170	5 010	320	1 600	102
X220	28 000	5 500	21.5	0.036	835	4 170	173	4 640	299	1 490	103
X202	25 700	5 600	21.9	0.040	765	3 830	172	4 240	267	1 330	102
X178	22 700	4 980	25.4	0.045	685	3 430	174	3 770	235	1 170	102
X157	20 100	3 960	32.7	0.050	624	3 120	176	3 390	213	1 070	103
WWF350											
X385**	49 100	6 900	7.67	0.017	929	5 310	138	6 490	429	2 450	93.5
X315	40 200	5 000	12.5	0.020	824	4 710	143	5 560	357	2 040	94.3
X263	33 600	5 400	13.5	0.025	713	4 070	146	4 700	286	1 630	92.3
X238	30 300	5 600	14.0	0.029	651	3 720	147	4 240	250	1 430	90.9
X212	27 000	5 800	14.5	0.033	584	3 340	147	3 790	215	1 230	89.1
X192	24 400	4 700	18.4	0.036	546	3 120	149	3 510	200	1 140	90.5
X176	22 400	4 800	18.8	0.040	502	2 870	150	3 210	179	1 020	89.3
X155	19 800	4 280	21.9	0.045	450	2 570	151	2 850	157	899	89.2
X137	17 500	3 410	28.2	0.050	411	2 350	153	2 570	143	817	90.4

**Welding does not fully develop web strength for these sections.

†This metric designation is not to be used until further notice.

Instead use that shown on page 6-12 or at right of 6-13M.

WELDED WIDE FLANGE SHAPES

WWF550—WWF350

DIMENSIONS IN SI UNITS

Designation†	Depth d	Flange Width b	Flange Thickness t	Web Thickness w	Distances					Ordering Designation
					a	T	k	k ₁	c	
	mm	mm	mm	mm	mm	mm	mm	mm	mm	
WWF550										WWF(M)22
X721	550	550	60	60	245	410	69.9	39.7	31.6	X484
X620	550	550	60	30	260	410	69.9	25.4	16.6	X416
X503	550	550	50	20	265	429	60.3	20.6	11.6	X338
X420	550	550	40	20	265	452	49.2	20.6	11.6	X282
X217	550	550	20	11	270	496	27.0	12.7	7.09	X146
WWF500										WWF(M)20
X651	500	500	60	60	220	360	69.9	39.7	31.6	X437
X561	500	500	60	30	235	360	69.9	25.4	16.6	X377
X456	500	500	50	20	240	379	60.3	20.6	11.6	X306
X381	500	500	40	20	240	402	49.2	20.6	11.6	X256
X343	500	500	35	20	240	411	44.5	20.6	11.6	X230
X306	500	500	30	20	240	421	39.7	20.6	11.6	X205
X276	500	500	28	16	242	427	36.5	15.9	9.59	X185
X254	500	500	25	16	242	433	33.3	15.9	9.59	X170
X223	500	500	22	14	243	443	28.6	14.3	8.59	X150
X197	500	500	20	11	245	446	27.0	12.7	7.09	X132
WWF450										WWF(M)18
X503	450	450	60	30	210	310	69.9	25.4	16.6	X337
X409	450	450	50	20	215	329	60.3	20.6	11.6	X275
X342	450	450	40	20	215	352	49.2	20.6	11.6	X229
X308	450	450	35	20	215	361	44.5	20.6	11.6	X207
X274	450	450	30	20	215	371	39.7	20.6	11.6	X184
X248	450	450	28	16	217	377	36.5	15.9	9.59	X166
X228	450	450	25	16	217	383	33.3	15.9	9.59	X152
X201	450	450	22	14	218	393	28.6	14.3	8.59	X134
X177	450	450	20	11	220	396	27.0	12.7	7.09	X119
WWF400										WWF(M)16
X444	400	400	60	30	185	260	69.9	25.4	16.6	X298
X362	400	400	50	20	190	279	60.3	20.6	11.6	X243
X303	400	400	40	20	190	302	49.2	20.6	11.6	X203
X273	400	400	35	20	190	311	44.5	20.6	11.6	X183
X243	400	400	30	20	190	321	39.7	20.6	11.6	X163
X220	400	400	28	16	192	327	36.5	15.9	9.59	X147
X202	400	400	25	16	192	333	33.3	15.9	9.59	X135
X178	400	400	22	14	193	343	28.6	14.3	8.59	X119
X157	400	400	20	11	195	346	27.0	12.7	7.09	X105
WWF350										WWF(M)14
X385	350	350	60	30	160	210	69.9	25.4	16.6	X258
X315	350	350	50	20	165	229	60.3	20.6	11.6	X211
X263	350	350	40	20	165	252	49.2	20.6	11.6	X177
X238	350	350	35	20	165	261	44.5	20.6	11.6	X159
X212	350	350	30	20	165	271	39.7	20.6	11.6	X142
X192	350	350	28	16	167	277	36.5	15.9	9.59	X128
X176	350	350	25	16	167	283	33.3	15.9	9.59	X118
X155	350	350	22	14	168	293	28.6	14.3	8.59	X104
X137	350	350	20	11	170	296	27.0	12.7	7.09	X92

†The numerical term following the X is the nominal mass in kg/m.

This metric designation is not to be used until further notice. Instead use that shown at right of page.

6-17