

# **Dimensions and Properties New W, HP and WT Shapes**

Including comparison data on existing profiles as published  
in the AISC Manual of Steel Construction, 7th Edition



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## FOREWORD

ASTM Standard A6-77b *Standard Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use*, published in November 1977, contains revisions to the standard profile series for W and HP shapes. The new series includes 187 W shapes and 15 HP shapes. A total of 111 W shapes and 9 HP shapes included in the previous series are also included in the new series; 81 W shapes included in the previous series have been dropped (see Table 1); 76 W shapes and 6 HP shapes have been added (see Table 2).

Most of the principal producers of structural shapes (see Table 3) will begin to roll the new series shapes about September 1, 1978. The exact date that a particular producer will begin production should be confirmed with that producer. It is important to note that when a mill begins to roll the new series shapes, the previous series shapes will no longer be available from that mill. Beginning immediately, therefore, the new series shapes, and their availability, should be considered in all structural designs involving W or HP members.

This booklet has been produced to assist both designers and steel fabricators during the transition period when the availability of either the new or previous series shapes may be uncertain. In this booklet, tables of "Properties for Designing" and "Dimensions for Detailing" for W shapes, HP shapes, and structural tees cut from W shapes include data for both the new and previous series profiles, with the previous series shapes shaded for easy identification and comparison. In addition, an "Allowable Stress Design Selection Table" is provided for the new series. Data for the previous series shapes can also be found in the *AISC Manual of Steel Construction*, 7th Edition.

It is recommended that the designer select and show on the contract plans, whenever possible, one shape from the new series and one shape from the previous series for each design application. The practice of making dual selections during the transition period will enable the fabricator and detailer to proceed with their work without delay, using whichever shape is readily available.

The selection of a substitute new series shape for a previous series shape, or vice versa, is the responsibility of the designer. Properties and dimensions related to strength and stiffness requirements, clearances, and elevations must be carefully considered for all substitute shapes.

The information on design properties and detailing dimensions for shapes presented in this publication has been prepared in accordance with recognized engineering principles and is for general information only. While it is believed to be accurate, this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability, and applicability by a licensed professional engineer, designer, or architect. The publication of the material contained herein is not intended as a representation or warranty on the part of American Iron and Steel Institute or the American Institute of Steel Construction, or of any other person named herein, that this information is suitable for any general or particular use or of freedom from infringement of any patent or patents. Anyone making use of this information assumes all liability arising from such use.

AISC acknowledges with thanks the contribution of the Committee of Structural Steel Producers of American Iron and Steel Institute which made possible the printing of this document.

W SHAPES NOT INCLUDED IN NEW SERIES<sup>a</sup>  
TABLE 1

W 33x240 x220 x200	W 24x120 x110 x100	W 18x114 x105 x96	W 14x314 x287 x264 x246	W 14x320 W 14x136 x127 x119	W 12x161 x133 x99 x92 x85	W 10x89 x72 x66
W 30x210 x190 x172	W 24x61 W 21x142 x127 x112	W 18x85 x77 x70 x64	W 14x237 x228 x219 x202	x111 x103 x95 x87	W 12x36 x31 x27	W 10x29 x25 x21
W 27x177 x160 x145	W 21x96 x82	W 18x45 W 16x96 x88	x184 x167 x158 x150 x142	W 14x84 x78	W 12x16.5	W 10x11.5 W 8x20 x17
W 24x160 x145 x130	W 21x55 W 21x49	W 16x78 x71 x64 x58				W 6x15.5 W 6x8.5 W 5x18.5

<sup>a</sup> At the time that a mill begins to roll the new series shapes, the shapes in this table will no longer be available from that mill.

NEW W AND HP SHAPES  
(NOT INCLUDED IN PREVIOUS SERIES)  
TABLE 2

W SHAPES						HP SHAPES
W 36x210	W 24x162 x146	W 18x119 x106	W 14x311 x283	W 12x336 x305	W 10x88 x68	HP 13x100 x87
W 33x241 x221 x201	x131 x117 x104	x97 x86 x76	x257 x233 x159 x145	x279 x252 x230 x210	W 10x30 x26 x22	x73 x60
W 30x211 x191 x173	W 24x62 W 21x147 x132 x122	W 18x71 x65	W 14x132 x120	W 12x170 x152	W 10x12	HP 12x84 x63
W 27x178 x161 x146	x111 x101 W 21x93 x83 W 21x57 x50	W 18x46 W 16x100 x89 x77 x67 W 16x57	x109 x99 x90 W 14x82 W 12x35 x30 x26 W 12x16	x136 x96 x87 W 12x35 x30 x26 W 12x16	W 8x21 x18 W 6x15 W 6x9 W 5x19	

PRINCIPAL PRODUCERS OF NEW SERIES W AND HP SHAPES  
TABLE 3

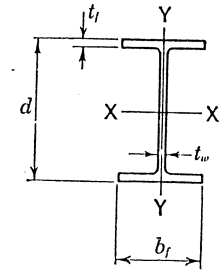
- |                                 |                                  |
|---------------------------------|----------------------------------|
| A. Armco Steel Corp.            | N. Northwestern Steel & Wire Co. |
| B. Bethlehem Steel Corp.        | U. United States Steel Corp.     |
| C. CF&I Steel Corp.             |                                  |
| I. Inland Steel Co.             |                                  |
| J. Jones & Laughlin Steel Corp. |                                  |

Section & Wt. per Ft.	Producer Code	Section & Wt. per Ft.	Producer Code
W 36—All	B, U	W 12x65-336	A, B <sup>1</sup> , I, U <sup>1</sup>
W 33—All	B, U	W 12x53-58	A, B, I, U
W 30—All	B, U	W 12x40-50	A, B, C, I, U
W 27—All	B, U	W 12x26-35	A, B, C, I, N, U
W 24x104-162	A, B, I, U	W 12x14-22	A, B, C, I, N, U
W 24x68-94	A, B, I, U	W 10x49-112	A, B, I, N <sup>2</sup> , U
W 24x55-62	A, B, I, U	W 10x33-45	A, B, C, I, N, U
W 21x101-147	A, B, I, U	W 10x22-30	A, B, C, I, N, U
W 21x62-93	A, B, I, U	W 10x12-19	A, B, C, I, N, U <sup>7</sup>
W 21x44-57	A, B, I, U	W 8x31-67	A, B, C, I, N <sup>3</sup> , U
W 18x76-119	A, B, I, U	W 8x24-28	A, B, C, I, N, U
W 18x50-71	A, B, I, N, U	W 8x18-21	A, B, C, I, N, U
W 18x35-46	A, B, I, N, U	W 8x10-15	A, B, C, I, N, U <sup>8</sup>
W 16x67-100	A, B, C, I, U	W 6x15-25	A, B, C, I, N, U
W 16x36-57	A, B, C <sup>6</sup> , I, N, U	W 6x9-16	A, B, I, J <sup>4</sup> , N, U <sup>9</sup>
W 16x26-31	A, B, C, I, N, U	W 5x16-19	A, B, I
W 14x145-730	B, U	W 4x13	A, B, N
W 14x90-132	B, U		
W 14x61-82	A, B, I, U	HP 14x73-117	B, U
W 14x43-53	A, B, C, I, U	HP 13x60-100	A, I
W 14x30-38	A, B, C, I, N, U	HP 12x53-84	A, B <sup>5</sup> , I, U <sup>5</sup>
W 14x22-26	A, B, C, I, N, U	HP 10x42-57	A, B, I, N, U
		HP 8x36	A, B, I, N, U

- <sup>1</sup> W 12x210-336 excluded
- <sup>2</sup> W 12x77-112 excluded
- <sup>3</sup> W 8x48-67 excluded
- <sup>4</sup> W 6x12 and W 6x16 excluded
- <sup>5</sup> HP 12x63 and HP 12x84 excluded
- <sup>6</sup> W 16x57 excluded
- <sup>7</sup> W 10x12 excluded
- <sup>8</sup> W 8x10 excluded
- <sup>9</sup> W 6x9 excluded

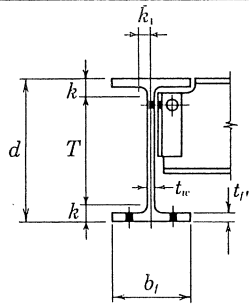
# I

## W SHAPES Properties for designing



Designation		Area <i>A</i>	Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	Elastic Properties						<i>r<sub>T</sub></i>	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i>	Plastic Modulus		
New Series	Previous Series			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	<i>F<sub>y</sub>'</i>	$\frac{d}{t_w}$	<i>F<sub>y</sub>'''</i>		<i>Z<sub>x</sub></i>	<i>Z<sub>y</sub></i>	
		<i>I</i>	<i>S</i>			<i>r</i>	<i>I</i>	<i>S</i>	<i>r</i>	Ksi	Ksi	In. <sup>4</sup>	In. <sup>3</sup>	In. <sup>3</sup>								
W 36x300	W 36x300	88.3	36.74	16.655	1.680	0.945	20300	1110	15.2	1300	156	3.83	4.39	1.31	5.0	—	38.9	43.7	64.2	1260	241	
		88.3	36.72	16.655	1.680	0.945	20300	1110	15.2	1300	156	3.83	4.46	1.31	4.96	—	38.9	43.7	64.2	1260	241	
	x280	x280	82.4	36.52	16.595	1.570	0.885	18900	1030	15.1	1200	144	3.81	4.37	1.40	5.3	—	41.3	38.8	52.6	1170	223
			82.4	36.50	16.595	1.570	0.885	18900	1030	15.1	1200	144	3.81	4.43	1.40	5.29	—	41.2	38.8	52.6	1170	223
	x260	x260	76.5	36.26	16.550	1.440	0.840	17300	953	15.0	1090	132	3.78	4.34	1.52	5.8	—	43.2	35.4	41.5	1080	204
			76.5	36.24	16.551	1.440	0.841	17300	952	15.0	1090	132	3.77	4.40	1.52	5.75	—	43.1	35.6	41.6	1080	204
	x245	x245	72.1	36.08	16.510	1.350	0.800	16100	895	15.0	1010	123	3.75	4.32	1.62	6.1	—	45.1	32.5	34.6	1010	190
			72.1	36.06	16.512	1.350	0.802	16100	894	15.0	1010	123	3.75	4.38	1.62	6.12	—	45.0	32.7	34.7	1010	190
x230	x230	67.6	35.90	16.470	1.260	0.760	15000	837	14.9	940	114	3.73	4.30	1.73	6.5	—	47.2	29.6	28.6	943	176	
		67.7	35.88	16.471	1.260	0.761	15000	837	14.9	940	114	3.73	4.36	1.73	6.54	—	47.1	29.7	28.6	943	176	
W 36x210	x194	W 36x194	61.8	36.69	12.180	1.360	0.830	13200	719	14.6	411	67.5	2.58	3.09	2.21	4.5	—	44.2	33.8	28.0	833	107
			57.0	36.49	12.115	1.260	0.765	12100	664	14.6	375	61.9	2.56	3.07	2.39	4.8	—	47.7	29.0	22.2	767	97.7
	x182	x182	57.2	36.48	12.117	1.260	0.770	12100	665	14.6	375	61.9	2.56	3.12	2.39	4.81	—	47.4	29.4	22.3	768	97.8
			53.6	36.32	12.072	1.180	0.725	11300	623	14.5	347	57.6	2.55	3.05	2.55	5.1	—	50.1	26.3	18.4	718	90.7
	x170	x170	50.0	36.17	12.030	1.100	0.680	10500	580	14.5	320	53.2	2.53	3.10	2.55	5.12	—	50.1	26.3	18.4	718	90.7
			50.0	36.16	12.027	1.100	0.680	10500	580	14.5	320	53.2	2.53	3.04	2.73	5.5	—	53.2	23.3	15.1	668	83.8
	x160	x160	47.0	36.01	12.000	1.020	0.650	9750	542	14.4	295	49.1	2.50	3.02	2.94	5.9	—	55.4	21.5	12.4	624	77.3
			47.1	36.00	12.000	1.020	0.653	9760	542	14.4	295	49.1	2.50	3.06	2.94	5.88	—	55.1	21.7	12.4	625	77.3
	x150	x150	44.2	35.85	11.975	0.940	0.625	9040	504	14.3	270	45.1	2.47	2.99	3.18	6.4	—	57.4	20.1	10.1	581	70.9
			44.2	35.84	11.972	0.940	0.625	9030	504	14.3	270	45.0	2.47	3.03	3.18	6.37	—	57.3	20.1	10.1	581	70.9
	x135	x135	39.7	35.55	11.950	0.790	0.600	7800	439	14.0	225	37.7	2.38	2.93	3.77	7.6	—	59.3	18.8	6.99	509	59.7
			39.8	35.55	11.945	0.794	0.598	7820	440	14.0	226	37.9	2.39	2.97	3.75	7.52	—	59.4	18.7	7.03	510	59.9
W 33x241	x221	W 33x240	70.9	34.18	15.860	1.400	0.830	14200	829	14.1	932	118	3.63	4.17	1.54	5.7	—	41.2	38.9	35.8	939	182
			70.6	33.50	15.865	1.400	0.830	13600	813	13.9	933	118	3.64	4.23	1.51	5.67	—	40.4	40.5	36.6	919	182
	x201	x220	65.0	33.93	15.805	1.275	0.775	12800	757	14.1	840	106	3.59	4.15	1.68	6.2	—	43.8	34.5	27.5	855	164
			64.8	33.25	15.810	1.275	0.775	12300	742	13.8	841	106	3.60	4.20	1.65	6.20	—	42.9	35.9	28.2	838	164
x201	x200	59.1	33.68	15.745	1.150	0.715	11500	684	14.0	749	95.2	3.56	4.12	1.86	6.9	—	47.1	29.8	20.5	772	147	
		58.9	33.00	15.750	1.150	0.715	11100	671	13.7	750	95.2	3.57	4.17	1.82	6.85	—	46.2	31.0	21.1	756	147	





## W SHAPES Dimensions for detailing

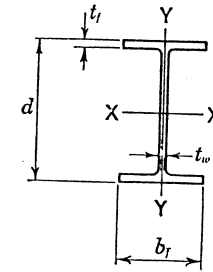


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 36x300		36 <sup>3</sup> / <sub>4</sub>	16 <sup>5</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>	1/2	31 <sup>1</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
	W 36x300	36 <sup>3</sup> / <sub>4</sub>	16 <sup>5</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>	1/2	31 <sup>1</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
	x280	36 <sup>1</sup> / <sub>2</sub>	16 <sup>5</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
	x280	36 <sup>1</sup> / <sub>2</sub>	16 <sup>5</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
	x260	36 <sup>1</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
	x260	36 <sup>1</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
	x245	36 <sup>1</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	
	x245	36	16 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	
x230		35 <sup>7</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	
	x230	35 <sup>7</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	
W 36x210		36 <sup>3</sup> / <sub>4</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	
	x194	36 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
	W 36x194	36 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x182	36 <sup>3</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x182	36 <sup>3</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x170	36 <sup>1</sup> / <sub>8</sub>	12	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2	1 <sup>3</sup> / <sub>16</sub>	
	x170	36 <sup>1</sup> / <sub>8</sub>	12	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	2	1 <sup>3</sup> / <sub>16</sub>	
	x160	36	12	1	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	
	x160	36	12	1	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x150	35 <sup>7</sup> / <sub>8</sub>	12	1 <sup>15</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	
x135		35 <sup>7</sup> / <sub>8</sub>	12	1 <sup>15</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	
	x135	35 <sup>1</sup> / <sub>2</sub>	12	1 <sup>13</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	
x135		35 <sup>1</sup> / <sub>2</sub>	12	1 <sup>13</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	
	x135	35 <sup>1</sup> / <sub>2</sub>	12	1 <sup>13</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	
W 33x241		34 <sup>1</sup> / <sub>8</sub>	15 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
	W 33x240	33 <sup>1</sup> / <sub>2</sub>	15 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	28 <sup>5</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	
	x221	33 <sup>7</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x220	33 <sup>1</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	2 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	
	x201		33 <sup>5</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>4</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
		x200	33	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>

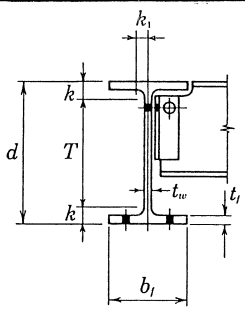
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## W SHAPES

### Properties for designing



Designation		Area $A$	Depth $d$	Flange		Web Thick- ness $t_w$	Elastic Properties						$r_T$	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant $J$	Plastic Modulus		
				Width $b_f$	Thick- ness $t_f$		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$ Ksi	$\frac{d}{t_w}$	$F_y'''$ Ksi		$Z_x$	$Z_y$	
New Series	Previous Series	In. <sup>2</sup>	In.	In.	In.	In.	$I$ In. <sup>4</sup>	$S$ In. <sup>3</sup>	$r$ In.	$I$ In. <sup>4</sup>	$S$ In. <sup>3</sup>	$r$ In.	In.									
W 33x152		44.7	33.49	11.565	1.055	0.635	8160	487	13.5	273	47.2	2.47	2.94	2.74	5.5	—	52.7	23.7	12.4	559	73.9	
	x141	44.8	33.50	11.565	1.055	0.635	8160	487	13.5	273	47.2	2.47	2.98	2.75	5.48	—	52.8	23.7	12.4	559	73.9	
		41.6	33.30	11.535	0.960	0.605	7450	448	13.4	246	42.7	2.43	2.92	3.01	6.0	—	55.0	21.8	9.70	514	66.9	
	x130	41.6	33.31	11.535	0.960	0.605	7460	448	13.4	246	42.7	2.43	2.96	3.01	6.01	—	55.1	21.8	9.70	514	66.9	
		38.3	33.09	11.510	0.855	0.580	6710	406	13.2	218	37.9	2.39	2.88	3.36	6.7	—	57.1	20.3	7.37	467	59.5	
	x118	38.3	33.10	11.510	0.855	0.580	6710	406	13.2	218	37.9	2.38	2.92	3.36	6.73	—	57.1	20.3	7.37	467	59.5	
	34.7	32.86	11.480	0.740	0.550	5900	359	13.0	187	32.6	2.32	2.84	3.87	7.8	—	59.7	18.5	5.30	415	51.3		
	34.8	32.86	11.484	0.738	0.554	5900	359	13.0	187	32.5	2.32	2.87	3.88	7.78	—	59.3	18.8	5.32	415	51.3		
W 30x211		62.0	30.94	15.105	1.315	0.775	10300	663	12.9	757	100	3.49	3.99	1.56	5.7	—	39.9	41.4	27.9	749	154	
	x191	61.9	30.38	15.105	1.315	0.775	9890	651	12.6	757	100	3.50	4.05	1.53	5.74	—	39.2	43.0	28.5	735	155	
		56.1	30.68	15.040	1.185	0.710	9170	598	12.8	673	89.5	3.46	3.97	1.72	6.4	—	43.2	35.4	20.6	673	138	
	x173	56.0	30.12	15.040	1.185	0.710	8850	587	12.6	673	89.5	3.47	4.01	1.69	6.35	—	42.4	36.7	21.2	661	138	
		50.8	30.44	14.985	1.065	0.655	8200	539	12.7	598	79.8	3.43	3.94	1.91	7.0	—	46.5	30.6	15.3	605	123	
	50.7	29.88	14.985	1.065	0.655	7910	530	12.5	598	79.8	3.43	3.98	1.87	7.04	—	45.6	31.7	15.7	594	123		
W 30x132		38.9	30.31	10.545	1.000	0.615	5770	380	12.2	196	37.2	2.25	2.68	2.87	5.3	—	49.3	27.2	9.72	437	58.4	
	x124	38.9	30.30	10.551	1.000	0.615	5760	380	12.2	196	37.2	2.25	2.72	2.87	5.28	—	49.3	27.2	9.72	437	58.5	
		36.5	30.17	10.515	0.930	0.585	5360	355	12.1	181	34.4	2.23	2.66	3.09	5.6	—	51.6	24.8	7.99	408	54.0	
	x116	36.5	30.16	10.521	0.930	0.585	5360	355	12.1	181	34.4	2.23	2.70	3.08	5.66	—	51.6	24.8	7.99	408	54.1	
		34.2	30.01	10.495	0.850	0.565	4930	329	12.0	164	31.3	2.19	2.64	3.36	6.2	—	53.1	23.4	6.43	378	49.2	
	x108	34.2	30.00	10.500	0.850	0.564	4930	329	12.0	164	31.3	2.19	2.68	3.36	6.18	—	53.2	23.3	6.43	378	49.3	
		31.7	29.83	10.475	0.760	0.545	4470	299	11.9	146	27.9	2.15	2.61	3.75	6.9	—	54.7	22.0	4.99	346	43.9	
	x99	31.8	29.82	10.484	0.760	0.548	4470	300	11.9	146	27.9	2.15	2.64	3.74	6.90	—	54.4	22.3	5.02	346	44.0	
		29.1	29.65	10.450	0.670	0.520	3990	269	11.7	128	24.5	2.10	2.57	4.23	7.8	—	57.0	20.3	3.77	312	38.6	
	29.1	29.64	10.458	0.670	0.522	4000	270	11.7	128	24.5	2.10	2.61	4.23	7.80	—	56.8	20.5	3.78	313	38.7		
W 27x178		52.3	27.81	14.085	1.190	0.725	6990	502	11.6	555	78.8	3.26	3.72	1.66	5.9	—	38.4	44.9	19.5	567	122	
	x161	52.2	27.31	14.090	1.190	0.725	6740	494	11.4	556	78.9	3.26	3.77	1.63	5.92	—	37.7	46.5	20.1	557	122	
		47.4	27.59	14.020	1.080	0.660	6280	455	11.5	497	70.9	3.24	3.70	1.82	6.5	—	41.8	37.8	14.7	512	109	
	x146	47.1	27.08	14.023	1.075	0.658	6030	446	11.3	495	70.6	3.24	3.75	1.80	6.52	—	41.2	39.0	14.9	501	109	
		42.9	27.38	13.965	0.975	0.605	5630	411	11.4	443	63.5	3.21	3.68	2.01	7.2	—	45.3	32.2	10.9	461	97.5	
	42.7	26.88	13.965	0.975	0.600	5430	404	11.3	443	63.5	3.22	3.72	1.97	7.16	—	44.8	32.9	11.2	453	97.6		



## W SHAPES Dimensions for detailing

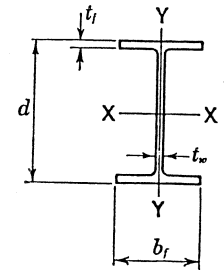


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 33x152		33 <sup>1</sup> / <sub>2</sub>	11 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	
	W 33x152	33 <sup>1</sup> / <sub>2</sub>	11 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	
	x141	33 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	5/8	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	
		x141	33 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	5/8	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>
	x130		33 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	7/8	9/16	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
		x130	33 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	7/8	9/16	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
x118		32 <sup>7</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	3/4	9/16	5/16	29 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	
		x118	32 <sup>7</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	3/4	9/16	1/4	29 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
W 30x211		31	15 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	3/4	3/8	26 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	
	W 30x210	30 <sup>3</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	3/4	3/8	25 <sup>3</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	
	x191	30 <sup>5</sup> / <sub>8</sub>	15	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	3/8	26 <sup>3</sup> / <sub>4</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	
		x190	30 <sup>1</sup> / <sub>8</sub>	15	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	3/8	25 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>16</sub>
	x173		30 <sup>1</sup> / <sub>2</sub>	15	1 <sup>1</sup> / <sub>16</sub>	5/8	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
	x172	29 <sup>7</sup> / <sub>8</sub>	15	1 <sup>1</sup> / <sub>16</sub>	5/8	5/16	25 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	
W 30x132		30 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>2</sub>	1	5/8	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	
	W 30x132	30 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>2</sub>	1	5/8	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	
	x124	30 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	9/16	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	1	
		x124	30 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	9/16	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	1
	x116		30	10 <sup>1</sup> / <sub>2</sub>	7/8	9/16	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1
		x116	30	10 <sup>1</sup> / <sub>2</sub>	7/8	9/16	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1
	x108		29 <sup>7</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub>	3/4	9/16	5/16	26 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1
		x108	29 <sup>7</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub>	3/4	9/16	1/4	26 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1
x99		29 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>16</sub>	1/2	1/4	26 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	1	
		x99	29 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>16</sub>	1/2	1/4	26 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	1
W 27x178		27 <sup>3</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	3/4	3/8	24	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	
	W 27x177	27 <sup>1</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	3/4	3/8	23	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	
	x161	27 <sup>5</sup> / <sub>8</sub>	14	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	3/8	24	1 <sup>13</sup> / <sub>16</sub>	1	
		x160	27 <sup>1</sup> / <sub>8</sub>	14	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5/16	23	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>
	x146		27 <sup>3</sup> / <sub>8</sub>	14	1	5/8	5/16	24	1 <sup>11</sup> / <sub>16</sub>	1
	x145	26 <sup>7</sup> / <sub>8</sub>	14	1	5/8	5/16	23	1 <sup>15</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	

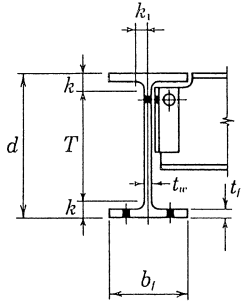


## W SHAPES

### Properties for designing



Designation		Area A	Depth d	Flange		Web Thick- ness $t_w$	Elastic Properties						$r_T$	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant J	Plastic Modulus	
				Width $b_f$	Thick- ness $t_f$		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$	$\frac{d}{t_w}$	$F_y'''$		$Z_x$	$Z_y$
New Series	Previous Series	In. <sup>2</sup>	In.	In.	In.	In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	In.		Ksi		Ksi	In. <sup>4</sup>	In. <sup>3</sup>	In. <sup>3</sup>	
W 27x114	W 27x114	33.5	27.29	10.070	0.930	0.570	4090	299	11.0	159	31.5	2.18	2.58	2.91	4	—	47.9	28.8	7.33	343	49.3
		33.6	27.28	10.070	0.932	0.570	4090	300	11.0	159	31.6	2.18	2.62	2.91	5.40	—	47.9	28.8	7.36	343	49.4
	x102	30.0	27.09	10.015	0.830	0.515	3620	267	11.0	139	27.8	2.15	2.56	3.26	6.0	—	52.6	23.9	5.29	305	43.4
		30.0	27.07	10.018	0.827	0.518	3610	267	11.0	139	27.7	2.15	2.59	3.27	6.06	—	52.3	24.2	5.27	305	43.3
	x94	27.7	26.92	9.990	0.745	0.490	3270	243	10.9	124	24.8	2.12	2.53	3.62	6.7	—	54.9	21.9	4.03	278	38.8
		27.7	26.91	9.990	0.747	0.490	3270	243	10.9	124	24.9	2.12	2.56	3.61	6.69	—	54.9	21.9	4.06	278	38.9
x84	24.8	26.71	9.960	0.640	0.460	2850	213	10.7	106	21.2	2.07	2.49	4.19	7.8	—	58.1	19.6	2.81	244	33.2	
	24.8	26.69	9.963	0.636	0.463	2830	212	10.7	105	21.1	2.06	2.52	4.21	7.83	—	57.6	19.9	2.79	244	33.0	
W 24x162	W 24x160	47.7	25.00	12.955	1.220	0.705	5170	414	10.4	443	68.4	3.05	3.45	1.58	5.3	—	35.5	52.5	18.5	468	105
		47.1	24.72	14.091	1.135	0.656	5120	414	10.4	530	75.2	3.35	3.82	1.55	6.21	—	37.7	46.5	16.5	465	115
	x146	43.0	24.74	12.900	1.090	0.650	4580	371	10.3	391	60.5	3.01	3.43	1.76	5.9	—	38.1	45.6	13.4	418	93.2
		42.7	24.49	14.043	1.020	0.608	4570	373	10.3	471	67.1	3.32	3.79	1.71	6.88	—	40.3	40.7	12.2	417	103
	x131	38.5	24.48	12.855	0.960	0.605	4020	329	10.2	340	53.0	2.97	3.40	1.98	6.7	—	40.5	40.3	9.50	370	81.5
		38.3	24.25	14.000	0.900	0.565	4020	332	10.2	412	58.9	3.28	3.76	1.92	7.78	—	42.9	35.9	8.67	370	90.2
	x120	35.4	24.31	12.088	0.930	0.556	3650	300	10.2	274	45.4	2.78	3.22	2.16	6.50	—	43.7	34.5	8.27	338	69.9
		34.4	24.26	12.800	0.850	0.550	3540	291	10.1	297	46.5	2.94	3.37	2.23	7.5	—	44.1	33.9	6.72	327	71.4
	x117	32.5	24.16	12.042	0.855	0.510	3330	276	10.1	249	41.4	2.77	3.20	2.35	7.04	—	47.4	29.4	6.45	309	63.6
		30.6	24.06	12.750	0.750	0.500	3100	258	10.1	259	40.7	2.91	3.35	2.52	8.5	58.5	48.1	28.5	4.72	289	62.4
	x104	29.5	24.00	12.000	0.775	0.468	3000	250	10.1	223	37.2	2.75	3.18	2.58	7.74	—	51.3	25.1	4.87	280	57.2
		W 24x94	W 24x94	27.7	24.31	9.065	0.875	0.515	2700	222	9.87	109	24.0	1.98	2.33	3.06	5.2	—	47.2	29.6	5.26
27.7	24.29			9.061	0.872	0.516	2690	221	9.86	108	23.9	1.98	2.37	3.07	5.20	—	47.1	29.8	5.23	253	37.4
x84	24.7		24.10	9.020	0.770	0.470	2370	196	9.79	94.4	20.9	1.95	2.31	3.47	5.9	—	51.3	25.1	3.70	224	32.6
	24.7		24.09	9.015	0.772	0.470	2370	197	9.79	94.5	21.0	1.95	2.34	3.46	5.84	—	51.3	25.1	3.72	224	32.7
x76	22.4		23.92	8.990	0.680	0.440	2100	176	9.69	82.5	18.4	1.92	2.29	3.91	6.6	—	54.4	22.3	2.68	200	28.6
	22.4		23.91	8.985	0.682	0.440	2100	176	9.69	82.6	18.4	1.92	2.32	3.90	6.59	—	54.3	22.4	2.70	201	28.7
x68	20.1	23.73	8.965	0.585	0.415	1830	154	9.55	70.4	15.7	1.87	2.26	4.52	7.7	—	57.2	20.2	1.87	177	24.5	
	20.0	23.71	8.961	0.582	0.416	1820	153	9.53	70.0	15.6	1.87	2.28	4.55	7.70	—	57.0	20.3	1.86	176	24.4	
W 24x62	W 24x61	18.2	23.74	7.040	0.590	0.430	1550	131	9.23	34.5	9.80	1.38	1.71	5.72	6.0	—	55.2	21.7	1.71	153	15.7
		18.0	23.72	7.023	0.591	0.419	1540	130	9.25	34.3	9.76	1.38	1.74	5.71	5.94	—	56.6	20.6	1.66	152	15.6
	x55	16.2	23.57	7.005	0.505	0.395	1350	114	9.11	29.1	8.30	1.34	1.68	6.66	6.9	—	59.7	18.5	1.18	134	13.3
		16.2	23.55	7.000	0.503	0.396	1340	114	9.10	28.9	8.25	1.34	1.70	6.69	6.96	—	59.5	18.7	1.18	134	13.3



## W SHAPES Dimensions for detailing

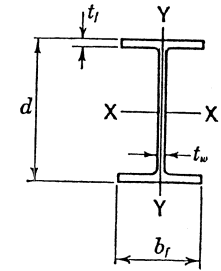


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance		
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 27x114  x102  x94  x84		27 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	24	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
	W 27x114	27 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	23 <sup>7</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x102	27 <sup>1</sup> / <sub>8</sub>	10	1 <sup>3</sup> / <sub>16</sub>	1/2	1/4	24	1 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x102	27 <sup>1</sup> / <sub>8</sub>	10	1 <sup>3</sup> / <sub>16</sub>	1/2	1/4	23 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
	x94	26 <sup>7</sup> / <sub>8</sub>	10	3/4	1/2	1/4	24	1 <sup>7</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x94	26 <sup>7</sup> / <sub>8</sub>	10	3/4	1/2	1/4	23 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>
W 24x162  x146  x131  x117  x104		25	13	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	3/8	21	2	1 <sup>1</sup> / <sub>16</sub>
	W 24x160	24 <sup>3</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5/8	5/16	20 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
	x146	24 <sup>3</sup> / <sub>4</sub>	12 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8	5/16	21	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
	x145	24 <sup>1</sup> / <sub>2</sub>	14	1	5/8	5/16	20 <sup>7</sup> / <sub>8</sub>	1 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
	x131	24 <sup>1</sup> / <sub>2</sub>	12 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	9/8	5/16	21	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>
	x130	24 <sup>1</sup> / <sub>4</sub>	14	7/8	9/16	5/16	20 <sup>7</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1
x117  x110  x104	x120	24 <sup>1</sup> / <sub>4</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	9/16	1/4	20 <sup>7</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1
	x110	24 <sup>1</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>4</sub>	7/8	9/16	5/16	21	1 <sup>5</sup> / <sub>8</sub>	1
	x110	24 <sup>1</sup> / <sub>8</sub>	12	7/8	1/2	1/4	20 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1
W 24x94  x84  x84  x76  x68		24	12 <sup>3</sup> / <sub>4</sub>	3/4	1/2	1/4	21	1 <sup>1</sup> / <sub>2</sub>	1
	x100	24	12	3/4	7/16	1/4	20 <sup>7</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	W 24x94	24 <sup>1</sup> / <sub>4</sub>	9 <sup>1</sup> / <sub>8</sub>	7/8	1/2	1/4	21	1 <sup>5</sup> / <sub>8</sub>	1
	W 24x94	24 <sup>1</sup> / <sub>4</sub>	9	7/8	1/2	1/4	21	1 <sup>5</sup> / <sub>8</sub>	1
	x84	24 <sup>1</sup> / <sub>8</sub>	9	3/4	1/2	1/4	21	1 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x84	24 <sup>1</sup> / <sub>8</sub>	9	3/4	1/2	1/4	21	1 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
x76  x76  x68	x76	23 <sup>7</sup> / <sub>8</sub>	9	1 <sup>1</sup> / <sub>16</sub>	7/16	1/4	21	1 <sup>7</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x76	23 <sup>7</sup> / <sub>8</sub>	9	1 <sup>1</sup> / <sub>16</sub>	7/16	1/4	21	1 <sup>7</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x68	23 <sup>3</sup> / <sub>4</sub>	9	9/16	7/16	1/4	21	1 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
W 24x62  x55  x55		23 <sup>3</sup> / <sub>4</sub>	7	9/16	7/16	1/4	21	1 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
	W 24x61	23 <sup>3</sup> / <sub>4</sub>	7	9/16	7/16	3/16	21	1 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
	x55	23 <sup>5</sup> / <sub>8</sub>	7	1/2	3/8	3/16	21	1 <sup>5</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x55	23 <sup>1</sup> / <sub>2</sub>	7	1/2	3/8	3/16	21	1 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>

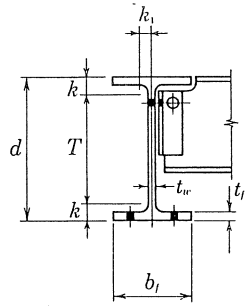


# I

## W SHAPES Properties for designing



Designation		Area $A$ In. <sup>2</sup>	Depth $d$ In.	Flange		Web Thick- ness $t_w$ In.	Elastic Properties						$r_T$ In.	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant $J$ In. <sup>4</sup>	Plastic Modulus			
New Series	Previous Series			Width $b_f$ In.	Thick- ness $t_f$ In.		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$ Ksi	$\frac{d}{t_w}$	$F_y''$ Ksi		$Z_x$ In. <sup>3</sup>	$Z_y$ In. <sup>3</sup>		
		$I$ In. <sup>4</sup>	$S$ In. <sup>3</sup>			$r$ In.	$I$ In. <sup>4</sup>	$S$ In. <sup>3</sup>	$r$ In.														
W 21x147	x132	W 21x142	43.2	22.06	12.510	1.150	0.720	3630	329	9.17	376	60.1	2.95	3.34	1.53	5.4	—	30.6	—	15.4	373	92.6	
			41.8	21.46	13.132	1.095	0.659	3410	317	9.03	414	63.0	3.15	3.58	1.49	6.00	—	32.6	62.3	13.8	357	96.7	
	x122	x127	38.8	21.83	12.440	1.035	0.650	3220	295	9.12	333	53.5	2.93	3.31	1.70	6.0	—	33.6	58.6	11.3	333	82.3	
			37.4	21.24	13.061	0.985	0.588	3020	284	8.99	366	56.1	3.13	3.55	1.65	6.63	—	36.1	50.6	10.0	318	85.8	
	x111	x112	35.9	21.68	12.390	0.960	0.600	2960	273	9.09	305	49.2	2.92	3.30	1.82	6.4	—	36.1	50.6	8.98	307	75.6	
			32.7	21.51	12.340	0.875	0.550	2670	250	8.92	317	48.8	3.10	3.52	1.87	7.51	—	39.8	41.6	6.87	278	74.6	
	x101		29.8	21.36	12.290	0.800	0.500	2420	227	9.02	248	40.3	2.89	3.27	2.17	7.1	—	39.1	43.2	6.83	279	68.2	
			28.3	21.14	9.038	0.935	0.575	2100	198	8.61	115	25.5	2.02	2.39	2.50	7.7	—	42.7	36.2	5.21	253	61.7	
	W 21x93	x83		27.3	21.62	8.420	0.930	0.580	2070	192	8.70	92.9	22.1	1.84	2.17	2.76	4.83	—	36.8	48.9	6.51	227	39.9
				24.3	21.43	8.355	0.835	0.515	1830	171	8.67	81.4	19.5	1.83	2.15	3.07	5.0	—	41.6	38.1	4.34	196	30.5
x73		x82	24.2	20.86	8.962	0.795	0.499	1760	169	8.53	95.6	21.3	1.99	2.35	2.93	5.64	—	41.8	37.8	4.09	192	33.2	
			21.5	21.24	8.295	0.740	0.455	1600	151	8.64	70.6	17.0	1.81	2.13	3.46	5.6	—	46.7	30.3	3.02	172	26.6	
x68		x73	21.5	21.24	8.295	0.740	0.455	1600	151	8.64	70.6	17.0	1.81	2.16	3.46	5.6	—	46.7	30.3	3.02	172	26.6	
			20.0	21.13	8.270	0.685	0.430	1480	140	8.60	64.7	15.7	1.80	2.12	3.73	6.0	—	49.1	27.4	2.45	160	24.4	
x62		x68	20.0	21.13	8.270	0.685	0.430	1480	140	8.60	64.7	15.7	1.80	2.15	3.73	6.04	—	49.1	27.4	2.45	160	24.4	
			18.3	20.99	8.240	0.615	0.400	1330	127	8.54	57.5	13.9	1.77	2.10	4.14	6.7	—	52.5	24.0	1.83	144	21.7	
x62			18.3	20.99	8.240	0.615	0.400	1330	127	8.54	57.5	13.9	1.77	2.13	4.14	6.70	—	52.5	24.0	1.83	144	21.7	
			16.7	21.06	6.555	0.650	0.405	1170	111	8.36	30.6	9.35	1.35	1.64	4.94	5.0	—	52.0	24.4	1.77	129	14.8	
W 21x57	x50	W 21x55	16.2	20.80	8.215	0.522	0.375	1140	110	8.40	48.3	11.8	1.73	2.10	4.85	7.87	—	55.5	21.5	1.24	126	18.4	
			14.7	20.83	6.530	0.535	0.380	984	94.5	8.18	24.9	7.64	1.30	1.60	5.96	6.1	—	54.8	22.0	1.14	110	12.2	
	x49	14.4	20.82	6.520	0.532	0.368	971	93.3	8.21	24.7	7.57	1.31	1.63	6.00	6.13	—	56.6	20.6	1.09	108	12.0		
x44		13.0	20.66	6.500	0.450	0.350	843	81.6	8.06	20.7	6.36	1.26	1.57	7.06	7.2	—	59.0	19.0	0.77	95.4	10.2		
		13.0	20.66	6.500	0.451	0.348	843	81.6	8.07	20.7	6.38	1.27	1.59	7.05	7.21	—	59.4	18.7	0.768	95.3	10.2		



## W SHAPES

### Dimensions for detailing

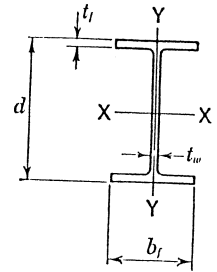


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 21x147		22	12 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{3}{4}$	$\frac{3}{8}$	18 $\frac{1}{4}$	1 $\frac{7}{8}$	1 $\frac{1}{16}$	
	x132	21 $\frac{1}{2}$	13 $\frac{1}{8}$	1 $\frac{1}{8}$	$\frac{11}{16}$	$\frac{5}{16}$	17 $\frac{3}{4}$	1 $\frac{7}{8}$	1	
		21 $\frac{7}{8}$	12 $\frac{1}{2}$	1 $\frac{1}{16}$	$\frac{5}{8}$	$\frac{5}{16}$	18 $\frac{1}{4}$	1 $\frac{13}{16}$	1	
	x127	21 $\frac{1}{4}$	13	1	$\frac{9}{16}$	$\frac{5}{16}$	17 $\frac{3}{4}$	1 $\frac{3}{4}$	1	
	x122	21 $\frac{5}{8}$	12 $\frac{3}{8}$	$\frac{15}{16}$	$\frac{5}{8}$	$\frac{9}{16}$	18 $\frac{1}{4}$	1 $\frac{1}{16}$	1	
		21	13	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	17 $\frac{3}{4}$	1 $\frac{5}{8}$	$\frac{15}{16}$	
	x111	21 $\frac{1}{2}$	12 $\frac{3}{8}$	$\frac{7}{8}$	$\frac{9}{16}$	$\frac{5}{16}$	18 $\frac{1}{4}$	1 $\frac{5}{8}$	$\frac{15}{16}$	
	x101	21 $\frac{3}{8}$	12 $\frac{1}{4}$	$\frac{13}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	18 $\frac{1}{4}$	1 $\frac{9}{16}$	$\frac{15}{16}$	
		W 21x96	21 $\frac{1}{8}$	9	$\frac{15}{16}$	$\frac{9}{16}$	$\frac{5}{16}$	17 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{15}{16}$
	W 21x93		21 $\frac{5}{8}$	8 $\frac{3}{8}$	$\frac{15}{16}$	$\frac{9}{16}$	$\frac{5}{16}$	18 $\frac{1}{4}$	1 $\frac{11}{16}$	1
x83		21 $\frac{3}{8}$	8 $\frac{3}{8}$	$\frac{13}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	18 $\frac{1}{4}$	1 $\frac{9}{16}$	$\frac{15}{16}$	
	x82	20 $\frac{7}{8}$	9	$\frac{13}{16}$	$\frac{1}{2}$	$\frac{1}{4}$	17 $\frac{3}{4}$	1 $\frac{9}{16}$	$\frac{15}{16}$	
x73		21 $\frac{1}{4}$	8 $\frac{1}{4}$	$\frac{3}{4}$	$\frac{7}{16}$	$\frac{1}{4}$	18 $\frac{1}{4}$	1 $\frac{1}{2}$	$\frac{15}{16}$	
	x73	21 $\frac{1}{4}$	8 $\frac{1}{4}$	$\frac{3}{4}$	$\frac{7}{16}$	$\frac{1}{4}$	18 $\frac{1}{2}$	1 $\frac{3}{8}$	$\frac{13}{16}$	
x68		21 $\frac{1}{8}$	8 $\frac{1}{4}$	$\frac{11}{16}$	$\frac{7}{16}$	$\frac{1}{4}$	18 $\frac{1}{4}$	1 $\frac{7}{16}$	$\frac{7}{8}$	
	x68	21 $\frac{1}{8}$	8 $\frac{1}{4}$	$\frac{11}{16}$	$\frac{7}{16}$	$\frac{3}{16}$	18 $\frac{1}{2}$	1 $\frac{5}{16}$	$\frac{13}{16}$	
x62		21	8 $\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{4}$	1 $\frac{3}{8}$	$\frac{7}{8}$	
	x62	21	8 $\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{4}$	
W 21x57		21	6 $\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{4}$	1 $\frac{3}{8}$	$\frac{7}{8}$	
	W 21x55	20 $\frac{3}{4}$	8 $\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{3}{4}$	
x50		20 $\frac{7}{8}$	6 $\frac{1}{2}$	$\frac{9}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{4}$	1 $\frac{5}{16}$	$\frac{7}{8}$	
	x49	20 $\frac{7}{8}$	6 $\frac{1}{2}$	$\frac{9}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{2}$	1 $\frac{3}{16}$	$\frac{3}{4}$	
x44		20 $\frac{5}{8}$	6 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{4}$	1 $\frac{3}{16}$	$\frac{7}{8}$	
	x44	20 $\frac{5}{8}$	6 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	18 $\frac{1}{2}$	1 $\frac{1}{16}$	$\frac{3}{4}$	



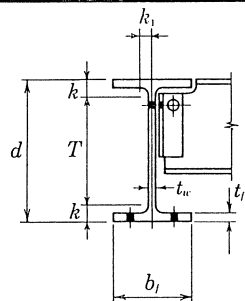
## W SHAPES

### Properties for designing



Designation		Area <i>A</i>	Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	Elastic Properties						<i>r<sub>T</sub></i>	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i>	Plastic Modulus			
New Series	Previous Series			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>		Axis X-X			Axis Y-Y					<i>b<sub>f</sub></i> <i>2t<sub>f</sub></i>	<i>F<sub>y'</sub></i> Ksi	$\frac{d}{t_w}$	<i>F<sub>y'''</sub></i> Ksi		<i>Z<sub>x</sub></i>	<i>Z<sub>y</sub></i>		
		<i>I</i>	<i>S</i>			<i>r</i>	<i>I</i>	<i>S</i>	<i>r</i>	ln. <sup>4</sup>	ln. <sup>3</sup>	ln. <sup>3</sup>											
W 18x119	W 18x114	35.1	18.97	11.265	1.060	0.655	2190	231	7.90	253	44.9	2.69	3.02	1.59	5.3	—	29.0	—	10.6	261	69.1		
		x106	33.5	18.48	11.833	0.991	0.595	2040	220	7.79	274	46.3	2.86	3.23	1.58	5.97	—	31.1	—	9.13	248	70.9	
		x97	x105	31.1	18.73	11.200	0.940	0.590	1910	204	7.84	220	39.4	2.66	3.00	1.78	6.0	—	31.7	—	7.48	230	60.5
			x96	30.9	18.32	11.792	0.911	0.554	1850	202	7.75	249	42.3	2.84	3.21	1.71	6.47	—	33.1	60.4	7.15	227	64.7
		x86	x85	28.5	18.59	11.145	0.870	0.535	1750	188	7.82	201	36.1	2.65	2.99	1.92	6.4	—	34.7	54.7	5.86	211	55.3
				x77	28.2	18.16	11.750	0.831	0.512	1680	185	7.70	225	38.3	2.82	3.19	1.86	7.07	—	35.5	52.5	5.48	206
		x76	x77	25.3	18.39	11.090	0.770	0.480	1530	166	7.77	175	31.6	2.63	2.97	2.15	7.2	—	38.3	45.0	4.10	186	48.4
				x76	25.0	18.32	8.838	0.911	0.526	1440	157	7.57	105	23.8	2.05	2.37	2.28	4.85	—	34.8	54.4	5.50	178
		W 18x71	W 18x70	22.7	18.16	8.787	0.831	0.475	1290	142	7.54	94.1	21.4	2.04	2.36	2.49	5.29	—	38.2	45.2	4.16	161	33.1
				x65	22.3	18.21	11.035	0.680	0.425	1330	146	7.73	152	27.6	2.61	2.95	2.43	8.1	64.2	42.8	36.0	2.83	163
x60	x64			20.8	18.47	7.635	0.810	0.495	1170	127	7.50	60.3	15.8	1.70	1.98	2.99	4.7	—	37.3	47.4	3.48	145	24.7
	x60			20.6	18.00	8.750	0.751	0.438	1160	129	7.50	84.0	19.2	2.02	2.34	2.74	5.83	—	41.1	39.1	3.13	145	29.6
x55	x55			19.1	18.35	7.590	0.750	0.450	1070	117	7.49	54.8	14.4	1.69	1.97	3.22	5.1	—	40.8	39.7	2.73	133	22.5
				x55	18.9	17.87	8.715	0.686	0.403	1050	118	7.46	75.8	17.4	2.00	2.32	2.99	6.35	—	44.3	33.6	2.41	132
x50	x50			17.6	18.24	7.555	0.695	0.415	984	108	7.47	50.1	13.3	1.69	1.96	3.47	5.4	—	44.0	34.2	2.17	123	20.6
				x50	17.7	18.25	7.558	0.695	0.416	986	108	7.47	50.1	13.3	1.68	1.99	3.47	5.44	—	43.9	34.3	2.17	123
x40	x40			16.2	18.11	7.530	0.630	0.390	890	98.3	7.41	44.9	11.9	1.67	1.95	3.82	6.0	—	46.4	30.6	1.66	112	18.5
				x40	16.2	18.12	7.532	0.630	0.390	891	98.4	7.42	45.0	11.9	1.67	1.98	3.82	5.98	—	46.5	30.6	1.66	112
x35	x35	14.7	17.99	7.495	0.570	0.355	800	88.9	7.38	40.1	10.7	1.65	1.94	4.21	6.6	—	50.7	25.7	1.24	101	16.6		
		x35	14.7	18.00	7.500	0.570	0.358	802	89.1	7.38	40.2	10.7	1.65	1.96	4.21	6.58	—	50.3	26.1	1.25	101	16.6	
W 18x46	W 18x45	13.5	18.06	6.060	0.605	0.360	712	78.8	7.25	22.5	7.43	1.29	1.54	4.93	5.0	—	50.2	26.2	1.22	90.7	11.7		
		x40	13.2	17.86	7.477	0.499	0.335	706	79.0	7.30	34.8	9.32	1.62	1.94	4.79	7.49	—	53.3	23.2	0.889	89.7	14.5	
		x40	11.8	17.90	6.015	0.525	0.315	612	68.4	7.21	19.1	6.35	1.27	1.52	5.67	5.7	—	56.8	20.5	0.81	78.4	9.95	
		x35	11.8	17.90	6.018	0.524	0.316	612	68.4	7.21	19.1	6.34	1.27	1.54	5.68	5.74	—	56.6	20.6	0.808	78.4	9.94	
x35	x35	10.3	17.70	6.000	0.425	0.300	510	57.6	7.04	15.3	5.12	1.22	1.49	6.94	7.1	—	59.0	19.0	0.50	66.5	8.06		
		x35	10.3	17.71	6.000	0.429	0.298	513	57.9	7.05	15.5	5.16	1.23	1.51	6.88	6.99	—	59.4	18.7	0.511	66.8	8.13	





## W SHAPES

### Dimensions for detailing

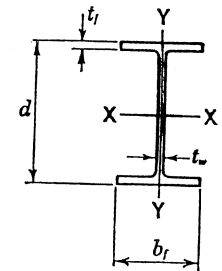


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 18x119		19	11 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8	5/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	
		W 18x114	18 <sup>1</sup> / <sub>2</sub>	11 <sup>7</sup> / <sub>8</sub>	1	5/8	5/16	15 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x106		18 <sup>3</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	9/16	5/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
		x105	18 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	9/16	1/4	15 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
	x97		18 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>8</sub>	7/8	9/16	5/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>9</sup> / <sub>16</sub>	7/8
		x96	18 <sup>1</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	1/2	1/4	15 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	7/8
	x86		18 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>8</sub>	3/4	1/2	1/4	15 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	7/8
		x85	18 <sup>3</sup> / <sub>8</sub>	8 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1/2	1/4	15 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	7/8
		x77	18 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	1/2	1/4	15 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	7/8
	x76		18 <sup>1</sup> / <sub>4</sub>	11	1 <sup>1</sup> / <sub>16</sub>	7/16	1/4	15 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
W 18x71		18 <sup>1</sup> / <sub>2</sub>	7 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	1/2	1/4	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	7/8	
		W 18x70	18	8 <sup>3</sup> / <sub>4</sub>	3/4	7/16	1/4	15 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	7/8
	x65		18 <sup>3</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	3/4	7/16	1/4	15 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	7/8
		x64	17 <sup>7</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	3/8	3/16	15 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
	x60		18 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>16</sub>	7/16	1/4	15 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
		x60	18 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>16</sub>	7/16	3/16	15 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
	x55		18 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	5/8	3/8	3/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
		x55	18 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	5/8	3/8	3/16	15 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5/8
	x50		18	7 <sup>1</sup> / <sub>2</sub>	9/16	3/8	3/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>
		x50	18	7 <sup>1</sup> / <sub>2</sub>	9/16	3/8	3/16	15 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8
W 18x46		18	6	5/8	3/8	3/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	
		W 18x45	17 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	1/2	5/16	3/16	15 <sup>7</sup> / <sub>8</sub>	1	5/8
	x40		17 <sup>7</sup> / <sub>8</sub>	6	1/2	5/16	3/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
		x40	17 <sup>7</sup> / <sub>8</sub>	6	1/2	5/16	3/16	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8
	x35		17 <sup>3</sup> / <sub>4</sub>	6	7/16	5/16	3/16	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>8</sub>	3/4
		x35	17 <sup>3</sup> / <sub>4</sub>	6	7/16	5/16	1/8	15 <sup>3</sup> / <sub>4</sub>	1	5/8

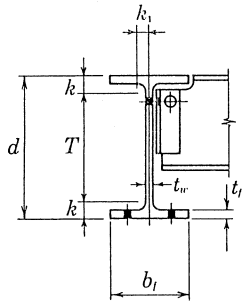


## W SHAPES

### Properties for designing



Designation		Area A	Depth d	Flange		Web Thick- ness $t_w$	Elastic Properties						$r_T$	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant J	Plastic Modulus	
				Width $b_f$	Thick- ness $t_f$		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$ Ksi	$\frac{d}{t_w}$	$F_y'''$ Ksi		$Z_x$	$Z_y$
In. <sup>2</sup>	In.	In.	In.			In.	I	S	r	I	S	r	In. <sup>4</sup>	In. <sup>3</sup>					In. <sup>3</sup>		
W 16x100		29.4	16.97	10.425	0.985	0.585	1490	175	7.10	186	35.7	2.52	2.81	1.65	5.3	—	29.0	—	7.73	198	54.9
	x89	28.2	16.32	11.533	0.875	0.535	1360	166	6.93	224	38.8	2.82	3.16	1.62	6.59	—	30.5	—	6.16	186	59.3
		26.2	16.75	10.365	0.875	0.525	1300	155	7.05	163	31.4	2.49	2.79	1.85	5.9	—	31.9	64.9	5.45	175	48.1
	x88	25.9	16.16	11.502	0.795	0.504	1220	151	6.87	202	35.1	2.79	3.14	1.77	7.23	—	32.1	64.2	4.72	169	53.6
	x78	23.0	16.32	8.586	0.875	0.529	1050	128	6.75	92.5	21.6	2.01	2.32	2.17	4.91	—	30.9	—	4.81	146	33.4
	x77	22.6	16.52	10.295	0.760	0.455	1110	134	7.00	138	26.9	2.47	2.77	2.11	6.8	—	36.3	50.1	3.57	150	41.1
	x71	20.9	16.16	8.543	0.795	0.486	941	116	6.71	82.8	19.4	1.99	2.30	2.38	5.37	—	33.3	59.7	3.65	132	30.0
	x67	19.7	16.33	10.235	0.665	0.395	954	117	6.96	119	23.2	2.46	2.75	2.40	7.7	—	41.3	38.6	2.39	130	35.5
	x64	18.8	16.00	8.500	0.715	0.443	836	104	6.66	73.3	17.3	1.97	2.28	2.63	5.94	—	36.1	50.6	2.65	118	26.6
	x58	17.1	15.86	8.464	0.645	0.407	748	94.4	6.62	65.3	15.4	1.96	2.26	2.91	6.56	—	39.0	43.5	1.98	106	23.8
W 16x57		16.8	16.43	7.120	0.715	0.430	758	92.2	6.72	43.1	12.1	1.60	1.86	3.23	5.0	—	38.2	45.2	2.22	105	18.9
	x50	14.7	16.26	7.070	0.630	0.380	659	81.0	6.68	37.2	10.5	1.59	1.84	3.65	5.6	—	42.8	36.1	1.52	92.0	16.3
		14.7	16.25	7.073	0.628	0.380	657	80.8	6.68	37.1	10.5	1.59	1.87	3.66	5.63	—	42.8	36.1	1.51	91.8	16.3
	x45	13.3	16.13	7.035	0.565	0.345	586	72.7	6.65	32.8	9.34	1.57	1.83	4.06	6.2	—	46.8	30.2	1.11	82.3	14.5
		13.3	16.12	7.039	0.563	0.346	584	72.5	6.64	32.8	9.32	1.57	1.85	4.07	6.25	—	46.6	30.4	1.11	82.1	14.4
	x40	11.8	16.01	6.995	0.505	0.305	518	64.7	6.63	28.9	8.25	1.57	1.82	4.53	6.9	—	52.5	24.0	0.79	72.9	12.7
		11.8	16.00	7.000	0.503	0.307	517	64.6	6.62	28.8	8.23	1.56	1.84	4.54	6.96	—	52.1	24.3	0.790	72.8	12.7
	x36	10.6	15.86	6.985	0.430	0.295	448	56.5	6.51	24.5	7.00	1.52	1.79	5.28	8.1	64.0	53.8	22.9	0.54	64.0	10.8
	10.6	15.85	6.992	0.428	0.299	447	56.5	6.50	24.4	6.99	1.52	1.81	5.30	8.17	63.3	53.0	23.5	0.545	64.0	10.8	
W 16x31		9.12	15.88	5.525	0.440	0.275	375	47.2	6.41	12.4	4.49	1.17	1.39	6.53	6.3	—	57.7	19.8	0.46	54.0	7.03
	x26	9.13	15.84	5.525	0.442	0.275	374	47.2	6.40	12.5	4.51	1.17	1.41	6.49	6.25	—	57.6	19.9	0.464	54.0	7.06
		7.68	15.69	5.500	0.345	0.250	301	38.4	6.26	9.59	3.49	1.12	1.36	8.27	8.0	—	62.8	16.8	0.26	44.2	5.48
	x26	7.67	15.65	5.500	0.345	0.250	300	38.3	6.25	9.59	3.49	1.12	1.38	8.25	7.97	—	62.6	16.9	0.261	44.0	5.48



## W SHAPES

### Dimensions for detailing

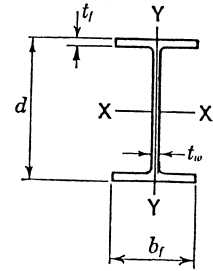


Designation		Depth $d$	Flange		Web Thick- ness $t_w$	$\frac{t_w}{2}$	Distance			
			Width $b_f$	Thick- ness $t_f$			$T$	$k$	$k_1$	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 16x100		17	10 <sup>3</sup> / <sub>8</sub>	1	9 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	13 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>	
	x89	W 16x96	16 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>
			16 <sup>3</sup> / <sub>4</sub>	10 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
		x88	16 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
		x78	16 <sup>3</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>
	x77		16 <sup>1</sup> / <sub>2</sub>	10 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
		x71	16 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	x67		16 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>
		x64	16	8 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
		x58	15 <sup>7</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>
W 16x57		16 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	
	x50		16 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	13 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>	
		W 16x50	16 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>
	x45		16 <sup>1</sup> / <sub>8</sub>	7	9 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>16</sub>
		x45	16 <sup>1</sup> / <sub>8</sub>	7	9 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>16</sub>
	x40		16	7	1 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>
		x40	16	7	1 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>
	x36		15 <sup>7</sup> / <sub>8</sub>	7	7 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>
	x36	15 <sup>7</sup> / <sub>8</sub>	7	7 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>16</sub>	
W 16x31		15 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	
		W 16x31	15 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>16</sub>
	x26		15 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	13 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>
		x26	15 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>8</sub>

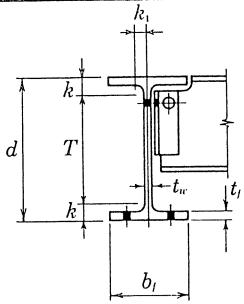


## W SHAPES

### Properties for designing



Designation		Area <i>A</i>	Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	Elastic Properties						<i>r<sub>T</sub></i>	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i>	Plastic Modulus	
New Series	Previous Series			<i>I</i>	<i>S</i>		<i>r</i>	<i>I</i>	<i>S</i>	<i>r</i>	Axis X-X				Axis Y-Y		$\frac{b_f}{2t_f}$	<i>F<sub>y</sub>'</i>		$\frac{d}{t_w}$	<i>F<sub>y</sub>'''</i>
		<i>I</i>	<i>S</i>			<i>I</i>					<i>S</i>	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>			in. <sup>4</sup>		
W 14x730		215	22.42	17.890	4.910	3.070	14300	1280	8.17	4720	527	4.69	4.99	0.25	1.8	—	7.3	—	1450	1660	8'
	W 14x730	215	22.44	17.889	4.910	3.069	14400	1280	8.18	4720	527	4.69	5.27	0.255	1.82	—	7.31	—	1450	1660	8'
x665		196	21.64	17.650	4.520	2.830	12400	1150	7.98	4170	472	4.62	4.92	0.27	1.9	—	7.6	—	1120	1480	730
	x665	196	21.67	17.646	4.522	2.826	12500	1150	7.99	4170	472	4.62	5.17	0.272	1.95	—	7.67	—	1120	1480	730
x605		178	20.92	17.415	4.160	2.595	10800	1040	7.80	3680	423	4.55	4.85	0.29	2.1	—	8.1	—	870	1320	6'
	x605	178	20.94	17.418	4.157	2.598	10900	1040	7.81	3680	423	4.55	5.08	0.289	2.10	—	8.06	—	869	1320	6'
x550		162	20.24	17.200	3.820	2.380	9430	931	7.63	3250	378	4.49	4.79	0.31	2.3	—	8.5	—	670	1180	583
	x550	162	20.26	17.206	3.818	2.386	9450	933	7.64	3260	378	4.49	5.00	0.308	2.25	—	8.49	—	670	1180	583
x500		147	19.60	17.010	3.500	2.190	8210	838	7.48	2880	339	4.43	4.73	0.33	2.4	—	8.9	—	514	1050	5'
	x500	147	19.63	17.008	3.501	2.188	8250	840	7.49	2880	339	4.43	4.92	0.330	2.43	—	8.97	—	514	1050	5'
x455		134	19.02	16.835	3.210	2.015	7190	756	7.33	2560	304	4.38	4.68	0.35	2.6	—	9.4	—	395	936	468
	x455	134	19.05	16.828	3.213	2.008	7220	758	7.35	2560	304	4.37	4.85	0.352	2.62	—	9.49	—	396	938	468



## W SHAPES

### Dimensions for detailing

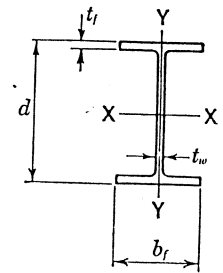


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance		
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 14x730		22 <sup>3</sup> / <sub>8</sub>	17 <sup>7</sup> / <sub>8</sub>	4 <sup>15</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	5 <sup>9</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>16</sub>
	W 14x730	22 <sup>1</sup> / <sub>2</sub>	17 <sup>7</sup> / <sub>8</sub>	4 <sup>15</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>
x665		21 <sup>5</sup> / <sub>8</sub>	17 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	2 <sup>13</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>
	x665	21 <sup>5</sup> / <sub>8</sub>	17 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	2 <sup>13</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>
x605		20 <sup>7</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	4 <sup>13</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>16</sub>
	x605	21	17 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	4 <sup>7</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>
x550		20 <sup>1</sup> / <sub>4</sub>	17 <sup>1</sup> / <sub>4</sub>	3 <sup>13</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	1 <sup>13</sup> / <sub>16</sub>
	x550	20 <sup>1</sup> / <sub>4</sub>	17 <sup>1</sup> / <sub>4</sub>	3 <sup>13</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	1 <sup>13</sup> / <sub>16</sub>
x500		19 <sup>5</sup> / <sub>8</sub>	17	3 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>
	x500	19 <sup>5</sup> / <sub>8</sub>	17	3 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>
x455		19	16 <sup>7</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	2	1	11 <sup>1</sup> / <sub>4</sub>	3 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
	x455	19	16 <sup>7</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	2	1	11 <sup>1</sup> / <sub>4</sub>	3 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>

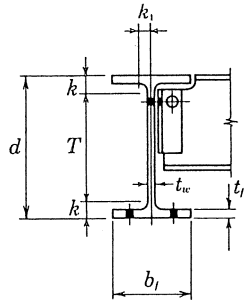


## W SHAPES

### Properties for designing



Designation		Area A	Depth d	Flange		Web Thick- ness $t_w$	Elastic Properties						$r_T$	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant J	Plastic Modulu	
				Width $b_f$	Thick- ness $t_f$		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$ Ksi	$\frac{d}{t_w}$	$F_y'''$ Ksi		$Z_x$ In. <sup>3</sup>	$Z_y$ In. <sup>3</sup>
In. <sup>2</sup>	In.	In.	In.			In.	I	S	r	I	S	r	In. <sup>4</sup>	In. <sup>3</sup>					In. <sup>3</sup>		
W 14x426		125	18.67	16.695	3.035	1.875	6600	707	7.26	2360	283	4.34	4.64	0.37	2.8	—	10.0	—	331	869	434
	W 14x426	125	18.69	16.695	3.033	1.875	6610	707	7.26	2360	283	4.34	4.81	0.369	2.75	—	9.97	—	330	869	434
x398		117	18.29	16.590	2.845	1.770	6000	656	7.16	2170	262	4.31	4.61	0.39	2.9	—	10.3	—	273	801	402
	x398	117	18.31	16.590	2.843	1.770	6010	657	7.17	2170	262	4.31	4.76	0.388	2.92	—	10.3	—	272	802	401
x370		109	17.92	16.475	2.660	1.655	5440	607	7.07	1990	241	4.27	4.57	0.41	3.1	—	10.8	—	222	736	370
	x370	109	17.94	16.475	2.658	1.655	5450	608	7.08	1990	241	4.27	4.72	0.410	3.10	—	10.8	—	222	737	370
x342		101	17.54	16.360	2.470	1.540	4900	559	6.98	1810	221	4.24	4.54	0.43	3.3	—	11.4	—	178	672	338
	x342	101	17.56	16.365	2.468	1.545	4910	559	6.99	1810	221	4.24	4.68	0.435	3.32	—	11.4	—	178	673	338
x311		92.3	17.19	16.235	2.283	1.415	4400	512	6.90	1630	201	4.20	4.63	0.464	3.56	—	12.1	—	140	611	307
	x287	91.4	17.12	16.230	2.260	1.410	4330	506	6.88	1610	199	4.20	4.50	0.47	3.6	—	12.1	—	136	603	304
x283		83.3	16.74	16.110	2.070	1.290	3840	459	6.79	1440	179	4.17	4.46	0.50	3.9	—	13.0	—	108	551	278
	x264	77.6	16.50	16.025	1.938	1.205	3530	427	6.74	1330	166	4.14	4.54	0.531	4.13	—	13.7	—	104	542	274
x257		75.6	16.38	15.995	1.890	1.175	3400	415	6.71	1290	161	4.13	4.43	0.54	4.2	—	13.9	—	79.1	487	246
	x246	72.3	16.25	15.945	1.813	1.125	3230	397	6.68	1230	154	4.12	4.51	0.562	4.40	—	14.4	—	69.7	464	235
x233		69.7	16.12	15.910	1.748	1.090	3080	382	6.65	1170	148	4.11	4.50	0.580	4.55	—	14.8	—	62.6	445	225
	x228	68.5	16.04	15.890	1.720	1.070	3010	375	6.63	1150	145	4.10	4.40	0.59	4.6	—	15.0	—	59.5	436	221
x211		64.4	15.87	15.825	1.623	1.005	2800	353	6.59	1070	136	4.08	4.47	0.618	4.70	—	15.3	—	56.2	427	216
	x219	64.4	15.87	15.825	1.623	1.005	2800	353	6.59	1070	136	4.08	4.47	0.618	4.88	—	15.8	—	49.9	408	207
x193		62.0	15.72	15.800	1.560	0.980	2660	338	6.55	1030	130	4.07	4.37	0.64	5.1	—	16.0	—	44.6	390	198
	x211	62.1	15.75	15.800	1.563	0.980	2670	339	6.56	1030	130	4.07	4.46	0.638	5.05	—	16.1	—	44.8	391	198
x176		59.4	15.63	15.750	1.503	0.930	2540	325	6.54	980	124	4.06	4.44	0.660	5.24	—	16.8	—	39.6	373	189
	x193	56.8	15.48	15.710	1.440	0.890	2400	310	6.50	931	119	4.05	4.35	0.68	5.4	—	17.4	—	34.8	355	180
x159		56.7	15.50	15.710	1.438	0.890	2400	310	6.51	930	118	4.05	4.42	0.686	5.46	—	17.4	—	34.7	355	180
	x184	54.1	15.38	15.660	1.378	0.840	2270	296	6.49	883	113	4.04	4.41	0.713	5.68	—	18.3	—	30.3	338	171
x145		51.8	15.22	15.650	1.310	0.830	2140	281	6.43	838	107	4.02	4.32	0.74	6.0	—	18.3	—	26.5	320	163
	x176	51.7	15.25	15.640	1.313	0.820	2150	282	6.45	838	107	4.02	4.39	0.743	5.96	—	18.6	—	26.5	321	163
x145		49.1	15.12	15.600	1.248	0.780	2020	267	6.42	790	101	4.01	4.38	0.777	6.25	—	19.4	—	22.8	303	154
	x167	46.7	14.98	15.565	1.190	0.745	1900	254	6.38	748	96.2	4.00	4.30	0.81	6.5	—	20.1	—	19.8	287	146
x145		46.5	15.00	15.550	1.188	0.730	1900	253	6.40	745	95.8	4.00	4.36	0.812	6.54	—	20.5	—	19.5	286	145
	x158	44.1	14.88	15.515	1.128	0.695	1790	240	6.37	703	90.6	3.99	4.35	0.850	6.88	—	21.4	—	16.7	270	137
x145		42.7	14.78	15.500	1.090	0.680	1710	232	6.33	677	87.3	3.98	4.28	0.88	7.1	—	21.7	—	15.2	260	133
	x142	41.8	14.75	15.500	1.063	0.680	1670	227	6.32	660	85.2	3.97	4.33	0.895	7.29	—	21.7	—	14.2	255	129



## W SHAPES

### Dimensions for detailing



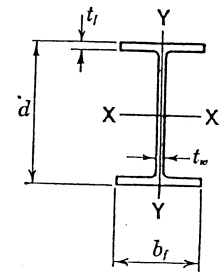
Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance		
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 14x426		18 <sup>5</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>11</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>16</sub>
	W 14x426	18 <sup>3</sup> / <sub>4</sub>	16 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>
x398		18 <sup>1</sup> / <sub>4</sub>	16 <sup>5</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>
	x398	18 <sup>1</sup> / <sub>4</sub>	16 <sup>5</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>
x370		17 <sup>7</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>2</sub>	2 <sup>11</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>
	x370	18	16 <sup>1</sup> / <sub>2</sub>	2 <sup>11</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>
x342		17 <sup>1</sup> / <sub>2</sub>	16 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>
	x342	17 <sup>1</sup> / <sub>2</sub>	16 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>
x311		17 <sup>1</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3	1 <sup>5</sup> / <sub>16</sub>
	x314	17 <sup>1</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	3	1 <sup>5</sup> / <sub>16</sub>
x283		17 <sup>1</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>15</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
	x287	16 <sup>3</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>
x257		16 <sup>3</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>
	x264	16 <sup>1</sup> / <sub>2</sub>	16	1 <sup>15</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>
x233		16 <sup>3</sup> / <sub>8</sub>	16	1 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
	x246	16 <sup>1</sup> / <sub>4</sub>	16	1 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>16</sub>
x211		16 <sup>1</sup> / <sub>8</sub>	15 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>7</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
	x237	16 <sup>1</sup> / <sub>8</sub>	15 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
x193		16	15 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
	x228	16	15 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>
x176		15 <sup>7</sup> / <sub>8</sub>	15 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1	1 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
	x219	15 <sup>7</sup> / <sub>8</sub>	15 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1	1 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
x159		15 <sup>3</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1	1 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>
	x211	15 <sup>3</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1	1 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>
x145		15 <sup>3</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>15</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
	x202	15 <sup>5</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>15</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
x142		15 <sup>1</sup> / <sub>2</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
	x193	15 <sup>1</sup> / <sub>2</sub>	15 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
x176		15 <sup>3</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
	x184	15 <sup>3</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
x159		15 <sup>1</sup> / <sub>4</sub>	15 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2	1 <sup>1</sup> / <sub>16</sub>
	x176	15 <sup>1</sup> / <sub>4</sub>	15 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2	1 <sup>1</sup> / <sub>16</sub>
x145		15 <sup>1</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>15</sup> / <sub>16</sub>	1
	x167	15 <sup>1</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>15</sup> / <sub>16</sub>	1
x145		15	15 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1
	x158	15	15 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1
x145		14 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>13</sup> / <sub>16</sub>	1
	x150	14 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>13</sup> / <sub>16</sub>	1
x145		14 <sup>3</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1
	x142	14 <sup>3</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1





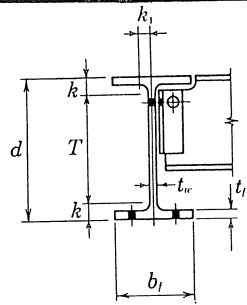
## W SHAPES

### Properties for designing



Designation		Area <i>A</i>	Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	Elastic Properties						<i>r<sub>T</sub></i>	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i>	Plastic Modulus		
New Series	Previous Series			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	<i>F<sub>y'</sub></i> Ksi	$\frac{d}{t_w}$	<i>F<sub>y'''</sub></i> Ksi		<i>Z<sub>x</sub></i>	<i>Z<sub>y</sub></i>	
		<i>I</i>	<i>S</i>			<i>r</i>	<i>I</i>	<i>S</i>	<i>r</i>	ln. <sup>4</sup>	ln. <sup>3</sup>	ln. <sup>3</sup>										
W 14x132	W 14x320	94.1	16.81	16.710	2.093	1.890	4140	493	6.63	1640	196	4.17	4.73	0.481	3.99	—	8.89	—	137	592	304	
	W 14x136	40.0	14.75	14.740	1.063	0.660	1590	216	6.31	568	77.0	3.77	4.12	0.941	6.93	—	22.3	—	13.5	243	117	
	x120	x127	38.8	14.66	14.725	1.030	0.645	1530	209	6.28	548	74.5	3.76	4.05	0.97	7.1	—	22.7	—	12.3	234	113
		x127	37.3	14.62	14.690	0.998	0.610	1480	202	6.29	528	71.8	3.76	4.10	0.997	7.1	—	24.0	—	11.1	226	109
		x119	35.3	14.48	14.670	0.940	0.590	1380	190	6.24	495	67.5	3.74	4.04	1.05	7.8	—	24.5	—	9.37	212	102
	x109	x111	35.0	14.50	14.650	0.938	0.570	1370	189	6.26	492	67.1	3.75	4.08	1.06	7.8	—	25.4	—	9.20	211	102
		x111	32.7	14.37	14.620	0.873	0.540	1270	176	6.23	455	62.2	3.73	4.07	1.13	8.37	60.3	26.6	—	7.48	196	94.3
		x103	32.0	14.32	14.605	0.860	0.525	1240	173	6.22	447	61.2	3.73	4.02	1.14	8.5	58.6	27.3	—	7.12	192	92.7
	x99	x103	30.3	14.25	14.575	0.813	0.495	1170	164	6.21	420	57.6	3.72	4.05	1.20	8.96	52.6	28.8	—	6.02	181	87.2
		x95	29.1	14.16	14.565	0.780	0.485	1110	157	6.17	402	55.2	3.71	4.00	1.25	9.3	48.5	29.2	—	5.37	173	83.6
x90	x95	27.9	14.12	14.545	0.748	0.465	1060	151	6.17	384	52.8	3.71	4.04	1.30	9.72	44.7	30.4	—	4.74	166	79.9	
	x87	26.5	14.02	14.520	0.710	0.440	999	143	6.14	362	49.9	3.70	3.99	1.36	10.2	40.4	31.9	—	4.06	157	75.6	
W 14x82	W 14x84	25.6	14.00	14.500	0.688	0.420	967	138	6.15	350	48.2	3.70	4.02	1.40	10.5	38.0	33.3	59.4	3.68	151	73.0	
	W 14x84	24.7	14.18	12.023	0.778	0.451	928	131	6.13	225	37.5	3.02	3.32	1.52	7.73	—	31.4	—	4.41	145	57.0	
	x78	x78	24.1	14.31	10.130	0.855	0.510	882	123	6.05	148	29.3	2.48	2.74	1.65	5.9	—	28.1	—	5.08	139	44.8
		x78	22.9	14.06	12.000	0.718	0.428	851	121	6.09	207	34.5	3.00	3.31	1.63	8.36	60.5	32.9	61.2	3.52	134	52.4
	x74	x74	21.8	14.17	10.070	0.785	0.450	796	112	6.04	134	26.6	2.48	2.72	1.79	6.4	—	31.5	—	3.88	126	40.6
		x74	21.8	14.19	10.072	0.783	0.450	797	112	6.05	133	26.5	2.48	2.76	1.80	6.43	—	31.5	—	3.86	126	40.5
	x68	x68	20.0	14.04	10.035	0.720	0.415	723	103	6.01	121	24.2	2.46	2.71	1.94	7.0	—	33.8	57.7	3.02	115	36.9
		x68	20.0	14.06	10.040	0.718	0.418	724	103	6.02	121	24.1	2.46	2.74	1.95	6.99	—	33.6	58.4	3.01	115	36.8
	x61	x61	17.9	13.89	9.995	0.645	0.375	640	92.2	5.98	107	21.5	2.45	2.70	2.15	7.8	—	37.0	48.1	2.20	102	32.8
		x61	17.9	13.91	10.000	0.643	0.378	641	92.2	5.98	107	21.5	2.45	2.73	2.16	7.78	—	36.8	48.8	2.19	102	32.7
W 14x53	W 14x53	15.6	13.92	8.060	0.660	0.370	541	77.8	5.89	57.7	14.3	1.92	2.15	2.62	6.1	—	37.6	46.7	1.94	87.1	22.0	
	x48	x48	15.6	13.94	8.062	0.658	0.370	542	77.8	5.90	57.5	14.3	1.92	2.18	2.63	6.13	—	37.7	46.5	1.93	87.1	21.9
		x48	14.1	13.79	8.030	0.595	0.340	485	70.3	5.85	51.4	12.8	1.91	2.13	2.89	6.8	—	40.6	40.2	1.46	78.4	19.6
	x43	x48	14.1	13.81	8.031	0.593	0.339	485	70.2	5.86	51.3	12.8	1.91	2.16	2.90	6.77	—	40.7	39.8	1.44	78.4	19.6
		x43	12.6	13.66	7.995	0.530	0.305	428	62.7	5.82	45.2	11.3	1.89	2.12	3.22	7.5	—	44.8	32.9	1.05	69.6	17.3
x43	12.6	13.68	8.000	0.528	0.308	429	62.7	5.82	45.1	11.3	1.89	2.14	3.24	7.58	—	44.4	33.5	1.05	69.7	17.3		





## W SHAPES

### Dimensions for detailing

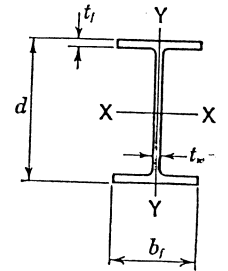


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 14x132	W 14x320	16 <sup>3</sup> / <sub>4</sub>	16 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	
	W 14x136	14 <sup>3</sup> / <sub>4</sub>	14 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	15 <sup>5</sup> / <sub>16</sub>	
	x120	x127	14 <sup>5</sup> / <sub>8</sub>	14 <sup>3</sup> / <sub>4</sub>	1	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	15 <sup>5</sup> / <sub>16</sub>
			14 <sup>5</sup> / <sub>8</sub>	14 <sup>3</sup> / <sub>4</sub>	1	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	15 <sup>5</sup> / <sub>16</sub>
			14 <sup>1</sup> / <sub>2</sub>	14 <sup>5</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>16</sub>
	x109	x111	14 <sup>1</sup> / <sub>2</sub>	14 <sup>5</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>16</sub>
			14 <sup>3</sup> / <sub>8</sub>	14 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
			14 <sup>3</sup> / <sub>8</sub>	14 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
	x99	x103	14 <sup>1</sup> / <sub>4</sub>	14 <sup>5</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>8</sub>
			14 <sup>1</sup> / <sub>8</sub>	14 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
			14 <sup>1</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
	x90	x95	14	14 <sup>1</sup> / <sub>2</sub>	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>
			14	14 <sup>1</sup> / <sub>2</sub>	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>
			14 <sup>1</sup> / <sub>8</sub>	14	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
W 14x82	W 14x84	14 <sup>1</sup> / <sub>8</sub>	12	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>	
	x78	14 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	11	1 <sup>5</sup> / <sub>8</sub>	1	
		14	12	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	
		14 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11	1 <sup>9</sup> / <sub>16</sub>	15 <sup>15</sup> / <sub>16</sub>	
	x74	x74	14 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>8</sub>
			14	10	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	11	1 <sup>1</sup> / <sub>2</sub>	15 <sup>15</sup> / <sub>16</sub>
			14	10	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>
x68	x68	14	10	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	11	1 <sup>7</sup> / <sub>16</sub>	15 <sup>15</sup> / <sub>16</sub>	
		13 <sup>7</sup> / <sub>8</sub>	10	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	13 <sup>13</sup> / <sub>16</sub>	
x61	x61	13 <sup>7</sup> / <sub>8</sub>	10	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	13 <sup>13</sup> / <sub>16</sub>	
		13 <sup>7</sup> / <sub>8</sub>	10	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	13 <sup>13</sup> / <sub>16</sub>	
W 14x53	13 <sup>7</sup> / <sub>8</sub>	8	11 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	11	1 <sup>7</sup> / <sub>16</sub>	15 <sup>15</sup> / <sub>16</sub>		
	W 14x53	14	8	11 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	
	x48	x48	13 <sup>3</sup> / <sub>4</sub>	8	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	11	1 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>
			13 <sup>3</sup> / <sub>4</sub>	8	9 <sup>9</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	13 <sup>13</sup> / <sub>16</sub>
	x43	x43	13 <sup>5</sup> / <sub>8</sub>	8	1 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	11	1 <sup>5</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
13 <sup>5</sup> / <sub>8</sub>			8	1 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	13 <sup>13</sup> / <sub>16</sub>	

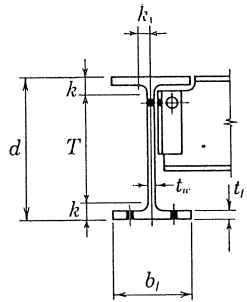


## W SHAPES

### Properties for designing



Designation		Area <i>A</i> In. <sup>2</sup>	Depth <i>d</i> In.	Flange		Web Thick- ness <i>t<sub>w</sub></i> In.	Elastic Properties						<i>r<sub>T</sub></i> In.	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i> In. <sup>4</sup>	Plastic Modulus	
New Series	Previous Series			<i>b<sub>f</sub></i> In.	Thick- ness <i>t<sub>f</sub></i> In.		Axis X-X			Axis Y-Y					<i>F<sub>y</sub>'</i> Ksi	$\frac{d}{t_w}$	<i>F<sub>y</sub>'''</i> Ksi	<i>Z<sub>x</sub></i> In. <sup>3</sup>		<i>Z<sub>y</sub></i> In. <sup>3</sup>	
		<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>			<i>r</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.												
W 14x38		11.2	14.10	6.770	0.515	0.310	385	54.6	5.88	26.7	7.88	1.55	1.77	4.04	6.6	—	45.5	31.9	0.80	61.5	12.1
	W 14x38	11.2	14.12	6.776	0.513	0.313	386	54.7	5.88	26.6	7.86	1.54	1.80	4.06	6.60	—	45.1	32.5	0.796	61.6	12.1
x34		10.0	13.98	6.745	0.455	0.285	340	48.6	5.83	23.3	6.91	1.53	1.76	4.56	7.4	—	49.1	27.5	0.57	54.6	10.6
	x34	10.0	14.00	6.750	0.453	0.287	340	48.6	5.83	23.3	6.89	1.52	1.78	4.58	7.45	—	48.8	27.8	0.567	54.6	10.6
x30		8.85	13.84	6.730	0.385	0.270	291	42.0	5.73	19.6	5.82	1.49	1.74	5.34	8.7	55.3	51.3	25.1	0.38	47.3	8.99
	x30	8.83	13.86	6.733	0.383	0.270	290	41.9	5.74	19.5	5.80	1.49	1.75	5.37	8.79	54.7	51.3	25.1	0.376	47.2	8.95
W 14x26		7.69	13.91	5.025	0.420	0.255	245	35.3	5.65	8.91	3.54	1.08	1.28	6.59	6.0	—	54.5	22.2	0.36	40.2	-5.54
	W 14x26	7.67	13.89	5.025	0.418	0.255	244	35.1	5.64	8.86	3.53	1.08	1.29	6.61	6.01	—	54.5	22.3	0.355	40.0	5.52
x22		6.49	13.74	5.000	0.335	0.230	199	29.0	5.54	7.00	2.80	1.04	1.25	8.20	7.5	—	59.7	18.5	0.21	33.2	4.39
	x22	6.49	13.72	5.000	0.335	0.230	198	28.9	5.53	7.00	2.80	1.04	1.26	8.19	7.46	—	59.7	18.6	0.208	33.1	4.39



## W SHAPES

### Dimensions for detailing

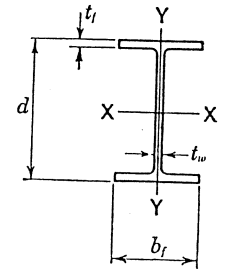


Designation		Depth $d$	Flange		Web Thick- ness $t_w$	$\frac{t_w}{2}$	Distance		
			Width $b_f$	Thick- ness $t_f$			$T$	$k$	$k_1$
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 14x38		14 $\frac{1}{8}$	6 $\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{16}$	12	1 $\frac{1}{16}$	$\frac{5}{8}$
	W 14x38	14 $\frac{1}{8}$	6 $\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{16}$	11 $\frac{7}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{16}$
	x34	14	6 $\frac{3}{4}$	$\frac{7}{16}$	$\frac{5}{16}$	$\frac{3}{16}$	12	1	$\frac{5}{8}$
	x34	14	6 $\frac{3}{4}$	$\frac{7}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	11 $\frac{7}{8}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$
x30		13 $\frac{7}{8}$	6 $\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	12	1 $\frac{5}{16}$	$\frac{5}{8}$
	x30	13 $\frac{7}{8}$	6 $\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	11 $\frac{7}{8}$	1	1 $\frac{1}{16}$
W 14x26		13 $\frac{7}{8}$	5	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	12	1 $\frac{5}{16}$	$\frac{9}{16}$
	W 14x26	13 $\frac{7}{8}$	5	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	11 $\frac{7}{8}$	1	1 $\frac{1}{16}$
	x22	13 $\frac{3}{4}$	5	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	12	$\frac{7}{8}$	$\frac{9}{16}$
	x22	13 $\frac{3}{4}$	5	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	11 $\frac{7}{8}$	1 $\frac{5}{16}$	$\frac{5}{8}$

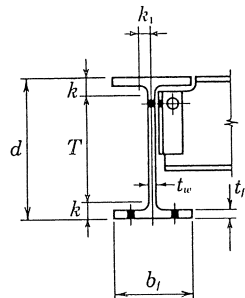


## W SHAPES

### Properties for designing



Designation		Area <i>A</i>	Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	Elastic Properties						<i>r<sub>r</sub></i>	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i>	Plastic Modulus	
New Series	Previous Series			<i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>		Axis X-X			Axis Y-Y					<i>F<sub>y</sub>'</i>	$\frac{d}{t_w}$	<i>F<sub>y</sub>'''</i>	<i>Z<sub>x</sub></i>		<i>Z<sub>y</sub></i>	
		<i>I</i>	<i>S</i>			<i>r</i>	<i>I</i>	<i>S</i>	<i>r</i>	Ksi	Ksi	In. <sup>4</sup>	In. <sup>3</sup>	In. <sup>3</sup>							
W 12x336		98.8	16.82	13.385	2.955	1.775	4060	483	6.41	1190	177	3.47	3.71	0.43	2.3	—	9.5	—	243	603	274
x305		89.6	16.32	13.235	2.705	1.625	3550	435	6.29	1050	159	3.42	3.67	0.46	2.4	—	10.0	—	185	537	244
x279		81.9	15.85	13.140	2.470	1.530	3110	393	6.16	937	143	3.38	3.64	0.49	2.7	—	10.4	—	143	481	220
x252		74.1	15.41	13.005	2.250	1.395	2720	353	6.06	828	127	3.34	3.59	0.53	2.9	—	11.0	—	108	428	196
x230		67.7	15.05	12.895	2.070	1.285	2420	321	5.97	742	115	3.31	3.56	0.56	3.1	—	11.7	—	83.8	386	177
x210		61.8	14.71	12.790	1.900	1.180	2140	292	5.89	664	104	3.28	3.53	0.61	3.4	—	12.5	—	64.7	348	159
x190		55.8	14.38	12.670	1.735	1.060	1890	263	5.82	589	93.0	3.25	3.50	0.65	3.6	—	13.6	—	48.8	311	143
	W 12x190	55.9	14.38	12.670	1.736	1.060	1890	263	5.82	590	93.1	3.25	3.59	0.654	3.65	—	13.6	—	48.9	311	143
x170		50.0	14.03	12.570	1.560	0.960	1650	235	5.74	517	82.3	3.22	3.47	0.72	4.0	—	14.6	—	35.6	275	126
	x161	47.4	13.88	12.515	1.486	0.905	1540	222	5.70	486	77.7	3.20	3.53	0.746	4.21	—	15.3	—	30.6	259	119
x152		44.7	13.71	12.480	1.400	0.870	1430	209	5.66	454	72.8	3.19	3.44	0.79	4.5	—	15.8	—	25.8	243	111
x136		39.9	13.41	12.400	1.250	0.790	1240	186	5.58	398	64.2	3.16	3.41	0.87	5.0	—	17.0	—	18.5	214	98.0
	x133	39.1	13.38	12.365	1.236	0.755	1220	183	5.59	390	63.1	3.16	3.47	0.875	5.00	—	17.7	—	17.6	210	96.2
x120		35.3	13.12	12.320	1.105	0.710	1070	163	5.51	345	56.0	3.13	3.38	0.96	5.6	—	18.5	—	12.9	186	85.4
	x120	35.3	13.12	12.320	1.106	0.710	1070	163	5.51	345	56.0	3.13	3.44	0.963	5.57	—	18.5	—	12.9	186	85.5
x106		31.2	12.89	12.220	0.990	0.610	933	145	5.47	301	49.3	3.11	3.36	1.07	6.2	—	21.1	—	9.13	164	75.1
	x106	31.2	12.88	12.230	0.986	0.620	931	145	5.46	301	49.2	3.11	3.41	1.07	6.20	—	20.8	—	9.10	164	74.9
x96		29.1	12.75	12.192	0.921	0.582	859	135	5.43	278	45.7	3.09	3.39	1.14	6.62	—	21.9	—	7.45	152	69.5
	x92	28.2	12.71	12.160	0.900	0.550	833	131	5.44	270	44.4	3.09	3.34	1.16	6.8	—	23.1	—	6.86	147	67.5
x87		27.1	12.62	12.155	0.856	0.545	789	125	5.40	256	42.2	3.08	3.38	1.21	7.10	—	23.2	—	6.01	140	64.2
	x85	25.6	12.53	12.125	0.810	0.515	740	118	5.38	241	39.7	3.07	3.32	1.28	7.5	—	24.3	—	5.10	132	60.4
x79		25.0	12.50	12.105	0.796	0.495	723	116	5.38	235	38.9	3.07	3.36	1.30	7.60	—	25.3	—	4.80	129	59.1
	x79	23.2	12.38	12.080	0.735	0.470	662	107	5.34	216	35.8	3.05	3.31	1.39	8.2	62.6	26.3	—	3.84	119	54.3
x72		23.2	12.38	12.080	0.736	0.470	663	107	5.34	216	35.8	3.05	3.34	1.39	8.21	62.7	26.3	—	3.85	119	54.4
	x72	21.1	12.25	12.040	0.670	0.430	597	97.4	5.31	195	32.4	3.04	3.29	1.52	9.0	52.3	28.5	—	2.93	108	49.2
x65		21.2	12.25	12.040	0.671	0.430	597	97.5	5.31	195	32.4	3.04	3.33	1.52	8.97	52.5	28.5	—	2.94	108	49.2
	x65	19.1	12.12	12.000	0.605	0.390	533	87.9	5.28	174	29.1	3.02	3.28	1.67	9.9	43.0	31.1	—	2.18	96.8	44.1
	x65	19.1	12.12	12.000	0.606	0.390	533	88.0	5.28	175	29.1	3.02	3.31	1.67	9.90	43.1	31.1	—	2.19	97.0	44.1
W 12x58		17.0	12.19	10.010	0.640	0.360	475	78.0	5.28	107	21.4	2.51	2.72	1.90	7.8	—	33.9	57.6	2.10	86.4	32.5
	W 12x58	17.1	12.19	10.014	0.641	0.359	476	78.1	5.28	107	21.4	2.51	2.75	1.90	7.81	—	34.0	57.3	2.10	86.5	32.6
x53		15.6	12.06	9.995	0.575	0.345	425	70.6	5.23	95.8	19.2	2.48	2.71	2.10	8.7	55.9	35.0	54.1	1.58	77.9	29.1
	x53	15.6	12.06	10.000	0.576	0.345	426	70.7	5.23	96.1	19.2	2.48	2.74	2.09	8.68	56.1	35.0	54.1	1.59	78.1	29.2



## W SHAPES

### Dimensions for detailing

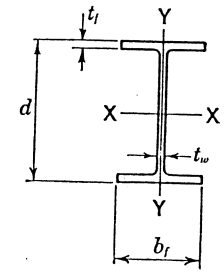


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 12x336 x305 x279 x252 x230 x210 x190  x170  x152 x136  x120  x106  x96  x87  x79  x72  x65		16 <sup>7</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>8</sub>	2 <sup>15</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	7/ <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	3 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
		16 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	3 <sup>7</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	
		15 <sup>7</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	3/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	
		15 <sup>3</sup> / <sub>8</sub>	13	2 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	
		15	12 <sup>7</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	
		14 <sup>3</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	5/ <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	
		14 <sup>3</sup> / <sub>8</sub>	12 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	9/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>7</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
		W 12x190	14 <sup>3</sup> / <sub>8</sub>	12 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1/2	9 <sup>1</sup> / <sub>2</sub>	2 <sup>7</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
			14	12 <sup>5</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1/2	9 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>
		x161	13 <sup>7</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	7/ <sub>8</sub>	7/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
			13 <sup>3</sup> / <sub>4</sub>	12 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	7/ <sub>8</sub>	7/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
			13 <sup>3</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	7/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	1
		x133	13 <sup>3</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3/ <sub>4</sub>	3/ <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>15</sup> / <sub>16</sub>	1
			13 <sup>1</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	3/ <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>13</sup> / <sub>16</sub>	1
		x120	13 <sup>1</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	3/ <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>13</sup> / <sub>16</sub>	1
			12 <sup>7</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>4</sub>	1	5/ <sub>8</sub>	5/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
		x106	12 <sup>7</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>4</sub>	1	5/ <sub>8</sub>	5/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
		x99	12 <sup>3</sup> / <sub>4</sub>	12 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	9/ <sub>16</sub>	5/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>
		x96	12 <sup>3</sup> / <sub>4</sub>	12 <sup>1</sup> / <sub>8</sub>	7/ <sub>8</sub>	9/ <sub>16</sub>	5/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>8</sub>	7/ <sub>8</sub>
			12 <sup>5</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	7/ <sub>8</sub>	9/ <sub>16</sub>	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>9</sup> / <sub>16</sub>	7/ <sub>8</sub>
		x87	12 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	1/2	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	7/ <sub>8</sub>
			12 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	1/2	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	7/ <sub>8</sub>
		x85	12 <sup>3</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	3/ <sub>4</sub>	1/2	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	7/ <sub>8</sub>
			12 <sup>3</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	3/ <sub>4</sub>	1/2	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	7/ <sub>8</sub>
		x79	12 <sup>3</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	3/ <sub>4</sub>	1/2	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>	7/ <sub>8</sub>
			12 <sup>1</sup> / <sub>4</sub>	12	1 <sup>1</sup> / <sub>16</sub>	7/ <sub>16</sub>	1/ <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	7/ <sub>8</sub>
	x72	12 <sup>1</sup> / <sub>4</sub>	12	1 <sup>1</sup> / <sub>16</sub>	7/ <sub>16</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	7/ <sub>8</sub>	
		12 <sup>1</sup> / <sub>8</sub>	12	5/ <sub>8</sub>	3/ <sub>8</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x65	12 <sup>1</sup> / <sub>8</sub>	12	5/ <sub>8</sub>	3/ <sub>8</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	
		12 <sup>1</sup> / <sub>4</sub>	10	5/ <sub>8</sub>	3/ <sub>8</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	
	W 12x58	12 <sup>1</sup> / <sub>4</sub>	10	5/ <sub>8</sub>	3/ <sub>8</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	
	x53	12	10	9/ <sub>16</sub>	3/ <sub>8</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	
		12	10	9/ <sub>16</sub>	3/ <sub>8</sub>	3/ <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	

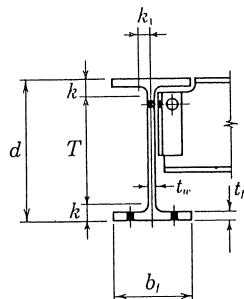


## W SHAPES

### Properties for designing



Designation		Area A	Depth d	Flange		Web Thick- ness $t_w$	Elastic Properties						$r_T$	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant J	Plastic Modulus	
				Width $b_f$	Thick- ness $t_f$		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$	$\frac{d}{t_w}$	$F_y'''$		$Z_x$	$Z_y$
New Series	Previous Series	In. <sup>2</sup>	In.	In.	In.	In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	In.		Ksi		Ksi	In. <sup>4</sup>	In. <sup>3</sup>	In. <sup>3</sup>	
W 12x50		14.7	12.19	8.080	0.640	0.370	394	64.7	5.18	56.3	13.9	1.96	2.17	2.36	6.3	—	32.9	60.9	1.78	72.4	21.4
	W 12x50	14.7	12.19	8.077	0.641	0.371	395	64.7	5.18	56.4	14.0	1.96	2.19	2.35	6.30	—	32.9	61.2	1.79	72.5	21.4
x45		13.2	12.06	8.045	0.575	0.335	350	58.1	5.15	50.0	12.4	1.94	2.15	2.61	7.0	—	36.0	51.0	1.31	64.7	19.0
	x45	13.2	12.06	8.042	0.576	0.336	351	58.2	5.15	50.0	12.4	1.94	2.18	2.60	6.98	—	35.9	51.3	1.32	64.8	19.0
x40		11.8	11.94	8.005	0.515	0.295	310	51.9	5.13	44.1	11.0	1.93	2.14	2.90	7.8	—	40.5	40.3	0.95	57.5	16.8
	x40	11.8	11.94	8.000	0.516	0.294	310	51.9	5.13	44.1	11.0	1.94	2.16	2.89	7.75	—	40.6	40.0	0.956	57.5	16.8
W 12x35	W 12x36	10.6	12.24	6.565	0.540	0.305	281	46.0	5.15	25.5	7.77	1.55	1.77	3.45	6.08	—	40.1	41.0	0.830	51.6	11.9
		10.3	12.50	6.560	0.520	0.300	285	45.6	5.25	24.5	7.47	1.54	1.74	3.66	6.3	—	41.7	38.0	0.74	51.2	11.5
x30	x31	9.13	12.09	6.525	0.465	0.265	239	39.5	5.12	21.6	6.61	1.54	1.75	3.98	7.02	—	45.6	31.7	0.536	44.1	10.1
		8.79	12.34	6.520	0.440	0.260	238	38.6	5.21	20.3	6.24	1.52	1.73	4.30	7.4	—	47.5	29.3	0.46	43.1	9.56
x26	x27	7.95	11.96	6.497	0.400	0.237	204	34.2	5.07	18.3	5.63	1.52	1.74	4.60	8.12	64.1	50.5	25.9	0.351	38.0	8.62
		7.65	12.22	6.490	0.380	0.230	204	33.4	5.17	17.3	5.34	1.51	1.72	4.96	8.5	57.9	53.1	23.4	0.30	37.2	8.17
W 12x22		6.48	12.31	4.030	0.425	0.260	156	25.4	4.91	4.66	2.31	0.848	1.02	7.19	4.7	—	47.3	29.5	0.29	29.3	3.66
	W 12x22	6.47	12.31	4.030	0.424	0.260	156	25.3	4.91	4.64	2.31	0.847	1.03	7.20	4.75	—	47.3	29.5	0.292	29.3	3.65
x19		5.57	12.16	4.005	0.350	0.235	130	21.3	4.82	3.76	1.88	0.822	1.00	8.67	5.7	—	51.7	24.7	0.18	24.7	2.98
	x19	5.59	12.16	4.007	0.349	0.237	130	21.3	4.82	3.76	1.88	0.820	1.01	8.70	5.74	—	51.3	25.1	0.181	24.7	2.98
x16	x16.5	4.87	12.00	4.000	0.269	0.230	105	17.6	4.65	2.88	1.44	0.770	0.975	11.2	7.43	—	52.2	24.3	0.112	20.6	2.32
		4.71	11.99	3.990	0.265	0.220	103	17.1	4.67	2.82	1.41	0.773	0.96	11.3	7.5	—	54.5	22.2	0.10	20.1	2.26
x14		4.16	11.91	3.970	0.225	0.200	88.6	14.9	4.62	2.36	1.19	0.753	0.95	13.3	8.8	54.3	59.6	18.6	0.07	17.4	1.90
	x14	4.12	11.91	3.968	0.224	0.198	88.0	14.8	4.62	2.34	1.18	0.754	0.957	13.4	8.86	53.9	60.2	18.3	0.069	17.3	1.89



## W SHAPES

### Dimensions for detailing

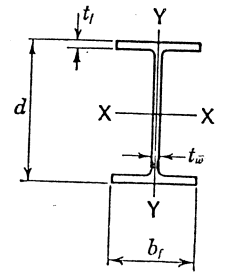


Designation		Depth $d$	Flange		Web Thick- ness $t_w$	$\frac{t_w}{2}$	Distance		
			Width $b_f$	Thick- ness $t_f$			$T$	$k$	$k_1$
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 12x50		12 $\frac{1}{4}$	8 $\frac{1}{8}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	9 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{3}{16}$
	W 12x50	12 $\frac{1}{4}$	8 $\frac{1}{8}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	9 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{3}{16}$
x45		12	8	$\frac{9}{16}$	$\frac{5}{16}$	$\frac{3}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{3}{16}$
	x45	12	8	$\frac{9}{16}$	$\frac{5}{16}$	$\frac{3}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{3}{16}$
x40		12	8	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{4}$
	x40	12	8	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{1}{8}$	9 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{3}{16}$
W 12x35	W 12x36	12 $\frac{1}{4}$	6 $\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	10 $\frac{1}{8}$	1 $\frac{1}{16}$	$\frac{5}{8}$
		12 $\frac{1}{2}$	6 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{16}$	10 $\frac{1}{2}$	1	$\frac{9}{16}$
x30	x31	12 $\frac{1}{8}$	6 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{8}$	1	$\frac{5}{8}$
		12 $\frac{3}{8}$	6 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{2}$	1 $\frac{5}{16}$	$\frac{1}{2}$
x26	x27	12	6 $\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{8}$	1 $\frac{5}{16}$	$\frac{9}{16}$
		12 $\frac{1}{4}$	6 $\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$
W 12x22		12 $\frac{1}{4}$	4	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$
	W 12x22	12 $\frac{1}{4}$	4	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{3}{8}$	1 $\frac{5}{16}$	$\frac{5}{8}$
x19		12 $\frac{1}{8}$	4	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{2}$	1 $\frac{3}{16}$	$\frac{1}{2}$
	x19	12 $\frac{1}{8}$	4	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{3}{8}$	$\frac{7}{8}$	$\frac{9}{16}$
x16	x16.5	12	4	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{3}{8}$	1 $\frac{3}{16}$	$\frac{9}{16}$
		12	4	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	10 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$
x14		11 $\frac{7}{8}$	4	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{8}$	10 $\frac{1}{2}$	1 $\frac{1}{16}$	$\frac{1}{2}$
	x14	11 $\frac{7}{8}$	4	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{8}$	10 $\frac{3}{8}$	$\frac{3}{4}$	$\frac{9}{16}$



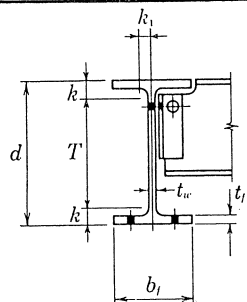
## W SHAPES

### Properties for designing



Designation		Area A In. <sup>2</sup>	Depth d In.	Flange		Web Thick- ness <i>t<sub>w</sub></i> In.	Elastic Properties						<i>r<sub>T</sub></i> In.	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant J In. <sup>4</sup>	Plastic Modulus		
New Series	Previous Series			Width <i>b<sub>f</sub></i> In.	Thick- ness <i>t<sub>f</sub></i> In.		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$ Ksi	$F_y'$ Ksi	$\frac{d}{t_w}$ Ksi	$F_y'''$ Ksi		<i>Z<sub>x</sub></i> In. <sup>3</sup>	<i>Z<sub>y</sub></i> In. <sup>3</sup>	
		<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>			<i>r</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.													
W 10x112	x100	W 10x112	32.9	11.36	10.415	1.250	0.755	716	126	4.66	236	45.3	2.68	2.88	0.87	4.2	—	15.0	—	15.1	147	69.2
			32.9	11.38	10.415	1.248	0.755	719	126	4.67	235	45.2	2.67	2.94	0.876	4.17	—	15.1	—	15.0	148	69.1
	x88	x100	29.4	11.10	10.340	1.120	0.680	623	112	4.60	207	40.0	2.65	2.85	0.96	4.6	—	16.3	—	10.9	130	61.0
		x89	29.4	11.12	10.345	1.118	0.685	625	112	4.61	207	39.9	2.65	2.91	0.961	4.63	—	16.2	—	10.8	130	61.0
	x77		26.2	10.88	10.275	0.998	0.615	542	99.7	4.55	181	35.2	2.63	2.88	1.06	5.15	—	17.7	—	7.74	114	53.6
		x77	25.9	10.84	10.265	0.990	0.605	534	98.5	4.54	179	34.8	2.63	2.83	1.07	5.2	—	17.9	—	7.53	113	53.1
	x68	x72	22.6	10.60	10.190	0.870	0.530	455	85.9	4.49	154	30.1	2.60	2.80	1.20	5.9	—	20.0	—	5.11	97.6	45.9
		x72	22.7	10.62	10.195	0.868	0.535	457	86.1	4.49	153	30.1	2.60	2.85	1.20	5.87	—	19.9	—	5.11	97.8	45.8
	x60	x66	21.2	10.50	10.170	0.808	0.510	421	80.1	4.46	142	27.9	2.59	2.84	1.28	6.29	—	20.6	—	4.17	90.6	42.4
		x66	20.0	10.40	10.130	0.770	0.470	394	75.7	4.44	134	26.4	2.59	2.79	1.33	6.6	—	22.1	—	3.56	85.3	40.1
	x54	x60	19.4	10.38	10.117	0.748	0.457	382	73.7	4.44	129	25.5	2.58	2.82	1.37	6.76	—	22.7	—	3.27	82.8	38.8
		x60	17.6	10.22	10.080	0.680	0.420	341	66.7	4.39	116	23.0	2.57	2.77	1.49	7.4	—	24.3	—	2.48	74.6	35.0
	x49	x54	17.7	10.25	10.075	0.683	0.415	344	67.1	4.41	116	23.1	2.57	2.80	1.49	7.4	—	24.3	—	2.49	75.0	35.1
		x54	15.8	10.09	10.030	0.615	0.370	303	60.0	4.37	103	20.6	2.56	2.75	1.64	8.1	63.5	27.3	—	1.82	66.6	31.3
x49	x49	15.9	10.12	10.028	0.618	0.368	306	60.4	4.39	104	20.7	2.56	2.78	1.63	8.11	64.2	27.5	—	1.84	67.1	31.4	
	x49	14.4	9.98	10.000	0.560	0.340	272	54.6	4.35	93.4	18.7	2.54	2.74	1.78	8.9	53.0	29.4	—	1.39	60.4	28.3	
W 10x45		14.4	10.00	10.000	0.558	0.340	273	54.6	4.35	93.0	18.6	2.54	2.77	1.79	8.96	52.6	29.4	—	1.38	60.3	28.2	
	x39	W 10x45	13.3	10.10	8.020	0.620	0.350	248	49.1	4.33	53.4	13.3	2.01	2.18	2.03	6.5	—	28.9	—	1.51	54.9	20.3
			13.2	10.12	8.022	0.618	0.350	249	49.1	4.33	53.2	13.3	2.00	2.21	2.04	6.49	—	28.9	—	1.50	54.9	20.2
	x33	x39	11.5	9.92	7.985	0.530	0.315	209	42.1	4.27	45.0	11.3	1.98	2.16	2.34	7.5	—	31.5	—	0.98	46.8	17.2
		x33	11.5	9.94	7.990	0.528	0.318	210	42.2	4.27	44.9	11.2	1.98	2.19	2.36	7.57	—	31.3	—	0.971	46.9	17.1
	x22	x33	9.71	9.73	7.960	0.435	0.290	170	35.0	4.19	36.6	9.20	1.94	2.14	2.81	9.1	50.5	33.6	58.7	0.580	38.8	14.0
x33		9.71	9.75	7.964	0.433	0.292	171	35.0	4.20	36.5	9.16	1.94	2.16	2.83	9.20	50.0	33.4	59.2	0.580	38.8	14.0	
W 10x30	x26	W 10x29	8.84	10.47	5.810	0.510	0.300	170	32.4	4.38	16.7	5.75	1.37	1.55	3.53	5.7	—	34.9	54.2	0.62	36.6	8.84
			8.54	10.22	5.799	0.500	0.289	158	30.8	4.30	16.3	5.61	1.38	1.57	3.52	5.80	—	35.4	52.8	0.579	34.7	8.62
	x22	x25	7.61	10.33	5.770	0.440	0.260	144	27.9	4.35	14.1	4.89	1.36	1.54	4.07	6.6	—	39.7	41.8	0.40	31.3	7.50
		x21	7.36	10.08	5.762	0.430	0.252	133	26.5	4.26	13.7	4.76	1.37	1.56	4.07	6.70	—	40.0	41.3	0.373	29.6	7.30
		x21	6.49	10.17	5.750	0.360	0.240	118	23.2	4.27	11.4	3.97	1.33	1.51	4.91	8.0	—	42.4	36.8	0.24	26.0	6.10
		6.20	9.90	5.750	0.340	0.240	107	21.5	4.15	10.8	3.75	1.32	1.53	5.06	8.46	59.1	41.3	38.8	0.210	24.1	5.77	





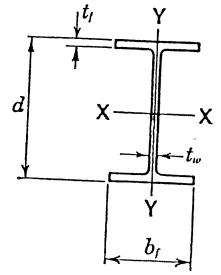
## W SHAPES Dimensions for detailing



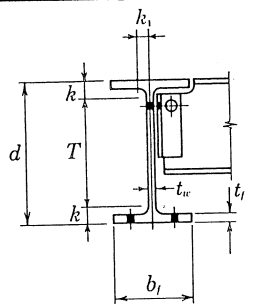
Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance			
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>	
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.	
W 10x112		11 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3/4	3/8	7 <sup>5</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	
	x100	W 10x112	11 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	3/4	3/8	7 <sup>3</sup> / <sub>4</sub>	1 <sup>13</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>
			11 <sup>1</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	11/16	3/8	7 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	7/8
		x100	11 <sup>1</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	11/16	5/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	7/8
		x89	10 <sup>7</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	1	5/8	5/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
	x88		10 <sup>7</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	1	5/8	5/16	7 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
	x77		10 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	7/8	1/2	1/4	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>16</sub>
		x77	10 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	7/8	9/16	1/4	7 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
		x72	10 <sup>1</sup> / <sub>2</sub>	10 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	1/2	1/4	7 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
	x68		10 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	3/4	1/2	1/4	7 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	3/4
		x66	10 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	3/4	7/16	1/4	7 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	3/4
	x60		10 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	11/16	7/16	1/4	7 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	3/4
		x60	10 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>8</sub>	11/16	7/16	3/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	3/4
	x54		10 <sup>1</sup> / <sub>8</sub>	10	5/8	3/8	3/16	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>
	x54	10 <sup>1</sup> / <sub>8</sub>	10	5/8	3/8	3/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	
x49		10	10	9/16	5/16	3/16	7 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	
	x49	10	10	9/16	5/16	3/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	
W 10x45		10 <sup>1</sup> / <sub>8</sub>	8	5/8	3/8	3/16	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	
		W 10x45	10 <sup>1</sup> / <sub>8</sub>	8	5/8	3/8	3/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
	x39		9 <sup>7</sup> / <sub>8</sub>	8	1/2	5/16	3/16	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
		x39	10	8	1/2	5/16	3/16	7 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
	x33		9 <sup>3</sup> / <sub>4</sub>	8	7/16	5/16	3/16	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
	x33	9 <sup>3</sup> / <sub>4</sub>	8	7/16	5/16	1/8	7 <sup>3</sup> / <sub>4</sub>	1	1 <sup>1</sup> / <sub>16</sub>	
W 10x30		10 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>4</sub>	1/2	5/16	3/16	8 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1/2	
		W 10x29	10 <sup>1</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>4</sub>	1/2	5/16	1/8	8 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	5/8
	x26		10 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	7/16	1/4	1/8	8 <sup>5</sup> / <sub>8</sub>	7/8	1/2
		x25	10 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	7/16	1/4	1/8	8 <sup>1</sup> / <sub>8</sub>	1	5/8
	x22		10 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	3/8	1/4	1/8	8 <sup>5</sup> / <sub>8</sub>	3/4	1/2
	x21	9 <sup>7</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	5/16	1/4	1/8	8 <sup>1</sup> / <sub>8</sub>	7/8	9/16	

# I

## W SHAPES Properties for designing



Designation		Area A In. <sup>2</sup>	Depth d In.	Flange		Web Thick- ness t <sub>w</sub> In.	Elastic Properties						r <sub>T</sub> In.	d A <sub>f</sub>	Compact Section Criteria				Torsional Constant J In. <sup>4</sup>	Plastic Modulus		
New Series	Previous Series			Width b <sub>f</sub> In.	Thick- ness t <sub>f</sub> In.		Axis X-X			Axis Y-Y					b <sub>f</sub> 2t <sub>f</sub>	F <sub>y</sub> ' Ksi	d t <sub>w</sub>	F <sub>y</sub> ''' Ksi		Z <sub>x</sub> In. <sup>3</sup>	Z <sub>y</sub> In. <sup>3</sup>	
		I In. <sup>4</sup>	S In. <sup>3</sup>			r In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.													
W 10x19	W 10x19	5.62	10.24	4.020	0.395	0.250	96.3	18.8	4.14	4.29	2.14	0.874	1.03	6.45	5.1	—	41.0	39.4	0.23	21.6	3.35	
		5.61	10.25	4.020	0.394	0.250	96.3	18.8	4.14	4.28	2.13	0.874	1.05	6.47	5.10	—	41.0	39.3	0.232	21.6	3.35	
	x17	x17	4.99	10.11	4.010	0.330	0.240	81.9	16.2	4.05	3.56	1.78	0.845	1.01	7.64	6.1	—	42.1	37.2	0.16	18.7	2.80
			4.99	10.12	4.010	0.329	0.240	81.9	16.2	4.05	3.55	1.77	0.844	1.03	7.67	6.09	—	42.2	37.1	0.155	18.6	2.80
	x15	x15	4.41	9.99	4.000	0.270	0.230	68.9	13.8	3.95	2.89	1.45	0.810	0.99	9.25	7.4	—	43.4	35.0	0.10	16.0	2.30
			4.41	10.00	4.000	0.269	0.230	68.9	13.8	3.95	2.88	1.44	0.809	1.00	9.29	7.43	—	43.5	34.9	0.104	16.0	2.29
x12	x11.5	3.54	9.87	3.960	0.210	0.190	53.8	10.9	3.90	2.18	1.10	0.785	0.96	11.9	9.4	47.5	51.9	24.5	0.05	12.6	1.74	
		3.39	9.87	3.950	0.204	0.180	52.0	10.5	3.92	2.10	1.06	0.787	0.975	12.2	9.68	45.1	54.8	22.0	0.049	12.2	1.68	
W 8x67	W 8x67	19.7	9.00	8.280	0.935	0.570	272	60.4	3.72	88.6	21.4	2.12	2.28	1.16	4.4	—	15.8	—	5.06	70.2	32.7	
		19.7	9.00	8.287	0.933	0.575	272	60.4	3.71	88.6	21.4	2.12	2.33	1.16	4.44	—	15.7	—	5.05	70.2	32.7	
	x58	x58	17.1	8.75	8.220	0.810	0.510	228	52.0	3.65	75.1	18.3	2.10	2.26	1.31	5.1	—	17.2	—	3.34	59.8	27.9
			17.1	8.75	8.222	0.808	0.510	227	52.0	3.65	74.9	18.2	2.10	2.31	1.32	5.09	—	17.2	—	3.32	59.7	27.8
	x48	x48	14.1	8.50	8.110	0.685	0.400	184	43.3	3.61	60.9	15.0	2.08	2.23	1.53	5.9	—	21.3	—	1.96	49.0	22.9
			14.1	8.50	8.117	0.683	0.405	184	43.2	3.61	60.9	15.0	2.08	2.27	1.53	5.94	—	21.0	—	1.96	49.0	22.8
	x40	x40	11.7	8.25	8.070	0.560	0.360	146	35.5	3.53	49.1	12.2	2.04	2.21	1.83	7.2	—	22.9	—	1.12	39.8	18.5
			11.8	8.25	8.077	0.558	0.365	146	35.5	3.53	49.0	12.1	2.04	2.24	1.83	7.24	—	22.6	—	1.12	39.8	18.5
	x35	x35	10.3	8.12	8.020	0.495	0.310	127	31.2	3.51	42.6	10.6	2.03	2.20	2.05	8.1	64.4	26.2	—	0.77	34.7	16.1
			10.3	8.12	8.027	0.493	0.315	126	31.1	3.50	42.5	10.6	2.03	2.22	2.05	8.14	63.7	25.8	—	0.768	34.7	16.1
	x31	x31	9.13	8.00	7.995	0.435	0.285	110	27.5	3.47	37.1	9.27	2.02	2.18	2.30	9.2	50.0	28.1	—	0.54	30.4	14.1
			9.12	8.00	8.000	0.433	0.288	110	27.4	3.47	37.0	9.24	2.01	2.21	2.31	9.24	49.5	27.8	—	0.534	30.4	14.0
W 8x28	W 8x28	8.25	8.06	6.535	0.465	0.285	98.0	24.3	3.45	21.7	6.63	1.62	1.77	2.65	7.0	—	28.3	—	0.54	27.2	10.1	
W 8x24		8.23	8.06	6.540	0.463	0.285	97.8	24.3	3.45	21.6	6.61	1.62	1.80	2.66	7.06	—	28.3	—	0.533	27.1	10.1	
W 8x24	x24	7.08	7.93	6.495	0.400	0.245	82.8	20.9	3.42	18.3	5.63	1.61	1.76	3.05	8.1	64.1	32.4	63.0	0.35	23.2	8.57	
		7.06	7.93	6.500	0.398	0.245	82.5	20.8	3.42	18.2	5.61	1.61	1.78	3.07	8.17	63.4	32.4	63.0	0.343	23.1	8.54	
W 8x21	W 8x20	6.16	8.28	5.270	0.400	0.250	75.3	18.2	3.49	9.77	3.71	1.26	1.41	3.93	6.6	—	33.1	60.2	0.28	20.4	5.69	
W 8x18		5.89	8.14	5.268	0.378	0.248	69.4	17.0	3.43	9.22	3.50	1.25	1.42	4.09	6.97	—	32.8	61.3	0.245	19.1	5.37	
	5.26	8.14	5.250	0.330	0.230	61.9	15.2	3.43	7.97	3.04	1.23	1.39	4.70	7.9	—	35.4	52.7	0.17	17.0	4.66		
	5.01	8.00	5.250	0.308	0.230	56.6	14.1	3.36	7.44	2.83	1.22	1.40	4.95	8.52	58.2	34.8	54.6	0.147	15.9	4.36		



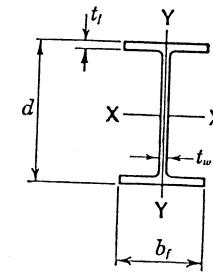
## W SHAPES Dimensions for detailing



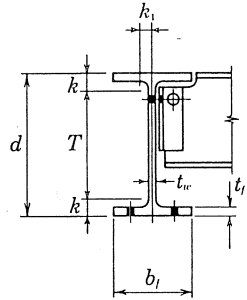
Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance		
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 10x19		10 <sup>1</sup> / <sub>4</sub>	4	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>
	W 10x19	10 <sup>1</sup> / <sub>4</sub>	4	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	x17	10 <sup>1</sup> / <sub>8</sub>	4	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>
	x17	10 <sup>1</sup> / <sub>8</sub>	4	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>
	x15	10	4	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>
	x15	10	4	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>
x12		9 <sup>7</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>
	x11.5	9 <sup>7</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	9 <sup>9</sup> / <sub>16</sub>
W 8x67		9	8 <sup>1</sup> / <sub>4</sub>	15 <sup>15</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	17 <sup>17</sup> / <sub>16</sub>	11 <sup>11</sup> / <sub>16</sub>
	W 8x67	9	8 <sup>1</sup> / <sub>4</sub>	15 <sup>15</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	17 <sup>17</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>
	x58	8 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	11 <sup>11</sup> / <sub>16</sub>
	x58	8 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	11 <sup>11</sup> / <sub>16</sub>
	x48	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>8</sub>	11 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	x48	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>8</sub>	11 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	x40	8 <sup>1</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	11 <sup>11</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	x40	8 <sup>1</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	11 <sup>11</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	x35	8 <sup>1</sup> / <sub>8</sub>	8	1 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	1	9 <sup>9</sup> / <sub>16</sub>
	x35	8 <sup>1</sup> / <sub>8</sub>	8	1 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	1	5 <sup>5</sup> / <sub>8</sub>
x31		8	8	7 <sup>7</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>
	x31	8	8	7 <sup>7</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
W 8x28		8	6 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>
	W 8x28	8	6 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	x24	7 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>
x24	7 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>	
W 8x21		8 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>
	W 8x20	8 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>
	x18	8 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>
	x17	8	5 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>



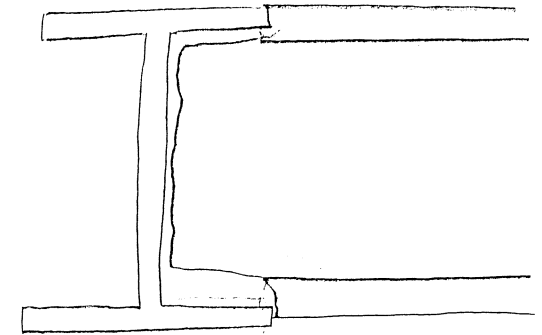
## W SHAPES Properties for designing



Designation		Area A In. <sup>2</sup>	Depth d In.	Flange		Web Thick- ness $t_w$ In.	Elastic Properties						$r_T$ In.	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant J In. <sup>4</sup>	Plastic Modulus	
New Series	Previous Series			Width $b_f$ In.	Thick- ness $t_f$ In.		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	$F_y'$ Ksi	$\frac{d}{t_w}$	$F_y'''$ Ksi		$Z_x$ In. <sup>3</sup>	$Z_y$ In. <sup>3</sup>
		I	S			r	I	S	r												
W 8x15		4.44	8.11	4.015	0.315	0.245	48.0	11.8	3.29	3.41	1.70	0.876	1.03	6.41	6.4	—	33.1	60.3	0.14	13.6	2.67
W 8x13	W 8x15	4.43	8.12	4.015	0.314	0.245	48.1	11.8	3.29	3.40	1.69	0.876	1.04	6.44	6.39	—	33.1	60.1	0.136	13.6	2.66
	x13	3.84	7.99	4.000	0.255	0.230	39.6	9.91	3.21	2.73	1.37	0.843	1.01	7.83	7.8	—	34.7	54.7	0.09	11.4	2.15
W 8x10		3.83	8.00	4.000	0.254	0.230	39.6	9.90	3.21	2.72	1.36	0.842	1.02	7.87	7.87	—	34.8	54.6	0.087	11.4	2.15
	x10	2.96	7.89	3.940	0.205	0.170	30.8	7.81	3.22	2.09	1.06	0.841	0.99	9.77	9.6	45.8	46.4	30.7	0.04	8.87	1.66
		2.96	7.90	3.940	0.204	0.170	30.8	7.80	3.23	2.08	1.06	0.839	1.00	9.83	9.66	45.3	46.5	30.6	0.042	8.86	1.65
W 6x25		7.34	6.38	6.080	0.455	0.320	53.4	16.7	2.70	17.1	5.61	1.52	1.66	2.31	6.7	—	19.9	—	0.46	18.9	8.56
	W 6x25	7.35	6.37	6.080	0.456	0.320	53.3	16.7	2.69	17.1	5.62	1.53	1.69	2.30	6.67	—	19.9	—	0.463	18.9	8.56
	x20	5.87	6.20	6.020	0.365	0.260	41.4	13.4	2.66	13.3	4.41	1.50	1.64	2.82	8.3	62.1	23.8	—	0.24	14.9	6.72
	x20	5.88	6.20	6.018	0.367	0.258	41.5	13.4	2.66	13.3	4.43	1.51	1.66	2.81	8.20	62.9	24.0	—	0.243	15.0	6.75
	x15.5	4.56	6.00	5.995	0.269	0.235	30.1	10.0	2.57	9.67	3.23	1.46	1.63	3.72	11.1	34.0	25.5	—	0.111	11.1	4.92
	x15	4.43	5.99	5.990	0.260	0.230	29.1	9.72	2.56	9.32	3.11	1.45	1.61	3.85	11.5	31.8	26.0	—	0.10	10.8	4.75
W 6x16		4.74	6.28	4.030	0.405	0.260	32.1	10.2	2.60	4.43	2.20	0.967	1.08	3.85	5.0	—	24.2	—	0.22	11.7	3.39
	W 6x16	4.72	6.25	4.030	0.404	0.260	31.7	10.2	2.59	4.42	2.19	0.967	1.10	3.84	4.99	—	24.0	—	0.222	11.6	3.38
	x12	3.55	6.03	4.000	0.280	0.230	22.1	7.31	2.49	2.99	1.50	0.918	1.05	5.38	7.1	—	26.2	—	0.09	8.30	2.32
	x12	3.54	6.00	4.000	0.279	0.230	21.7	7.25	2.48	2.98	1.49	0.918	1.07	5.38	7.17	—	26.1	—	0.090	8.23	2.31
	x9	2.68	5.90	3.940	0.215	0.170	16.4	5.56	2.47	2.20	1.11	0.905	1.03	6.96	9.2	50.3	34.7	54.8	0.04	6.23	1.72
	x8.5	2.51	5.83	3.940	0.194	0.170	14.8	5.08	2.43	1.98	1.01	0.889	1.04	7.63	10.2	41.0	34.3	56.2	0.033	5.71	1.55
W 5x19		5.54	5.15	5.030	0.430	0.270	26.2	10.2	2.17	9.13	3.63	1.28	1.38	2.38	5.9	—	19.1	—	0.31	11.6	5.53
	W 5x18.5	5.43	5.12	5.025	0.420	0.265	25.4	9.94	2.16	8.89	3.54	1.28	1.40	2.43	5.98	—	19.3	—	0.295	11.3	5.39
	x16	4.68	5.01	5.000	0.360	0.240	21.3	8.51	2.13	7.51	3.00	1.27	1.37	2.78	6.9	—	20.9	—	0.19	9.59	4.57
	x16	4.70	5.00	5.000	0.360	0.240	21.3	8.53	2.13	7.51	3.00	1.26	1.39	2.78	6.94	—	20.8	—	0.192	9.61	4.58
W 4x13		3.83	4.16	4.060	0.345	0.280	11.3	5.46	1.72	3.86	1.90	1.00	1.10	2.97	5.9	—	14.9	—	0.15	6.28	2.92
	W 4x13	3.82	4.16	4.060	0.345	0.280	11.3	5.45	1.72	3.76	1.85	0.991	1.11	2.97	5.88	—	14.9	—	0.154	6.27	2.88



## W SHAPES Dimensions for detailing

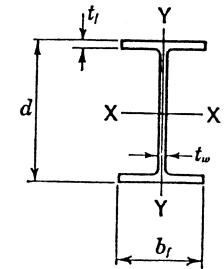


Designation		Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	$\frac{t_w}{2}$	Distance		
			Width <i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>			<i>T</i>	<i>k</i>	<i>k<sub>1</sub></i>
New Series	Previous Series	In.	In.	In.	In.	In.	In.	In.	In.
W 8x15  x13  x10		8 <sup>1</sup> / <sub>8</sub>	4	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>
	W 8x15	8 <sup>1</sup> / <sub>8</sub>	4	5 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>2</sub>	13 <sup>13</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>
	x13	8	4	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>
	x10	7 <sup>7</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>
	x10	7 <sup>7</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>2</sub>	11 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>
W 6x25  x20  x15		6 <sup>3</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	13 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>
	W 6x25	6 <sup>3</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	15 <sup>15</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>
	x20	6 <sup>1</sup> / <sub>4</sub>	6	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>
	x15.5	6 <sup>1</sup> / <sub>4</sub>	6	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>
	x15	6	6	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>
	x15	6	6	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>
W 6x16  x12  x9		6 <sup>1</sup> / <sub>4</sub>	4	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>
	W 6x16	6 <sup>1</sup> / <sub>4</sub>	4	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>8</sub>	9 <sup>9</sup> / <sub>16</sub>
	x12	6	4	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>
	x12	6	4	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>
	x9	5 <sup>7</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	9 <sup>9</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>
	x8.5	5 <sup>7</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	11 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>
W 5x19  x16		5 <sup>1</sup> / <sub>8</sub>	5	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	13 <sup>13</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>
	W 5x18.5	5 <sup>1</sup> / <sub>8</sub>	5	7 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	13 <sup>13</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>
	x16	5	5	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>
	x16	5	5	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>16</sub>
W 4x13		4 <sup>1</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	11 <sup>11</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>16</sub>
	W 4x13	4 <sup>1</sup> / <sub>8</sub>	4	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	13 <sup>13</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>

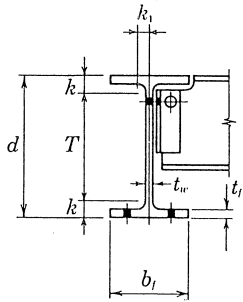


## HP SHAPES

### Properties for designing



Designation		Area <i>A</i>	Depth <i>d</i>	Flange		Web Thick- ness <i>t<sub>w</sub></i>	Elastic Properties						<i>r<sub>T</sub></i>	$\frac{d}{A_f}$	Compact Section Criteria				Torsional Constant <i>J</i>	Plastic Modulus		
New Series	Previous Series			<i>b<sub>f</sub></i>	Thick- ness <i>t<sub>f</sub></i>		Axis X-X			Axis Y-Y					$\frac{b_f}{2t_f}$	<i>F<sub>y</sub>'</i>	$\frac{d}{t_w}$	<i>F<sub>y</sub>'''</i>		<i>Z<sub>x</sub></i>	<i>Z<sub>y</sub></i>	
		<i>I</i>	<i>S</i>			<i>r</i>	<i>I</i>	<i>S</i>	<i>r</i>	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>					in. <sup>3</sup>			
HP 14x117	x102	HP 14x117	34.4	14.21	14.885	0.805	0.805	1220	172	5.96	443	59.5	3.59	4.00	1.19	9.3	49.4	17.7	—	8.02	194	91.4
		HP 14x117	34.4	14.23	14.885	0.805	0.805	1230	173	5.97	443	59.5	3.59	4.06	1.19	9.25	49.4	17.7	—	8.02	195	91.4
	x89	x102	30.0	14.01	14.785	0.705	0.705	1050	150	5.92	380	51.4	3.56	3.97	1.34	10.5	38.4	19.9	—	5.40	169	78.8
		x89	30.0	14.03	14.784	0.704	0.704	1050	150	5.93	380	51.3	3.56	4.02	1.35	10.5	38.3	19.9	—	5.38	169	78.6
	x73	x89	26.1	13.83	14.695	0.615	0.615	904	131	5.88	326	44.3	3.53	3.94	1.53	11.9	29.6	22.5	—	3.60	146	67.7
		x73	26.2	13.86	14.696	0.616	0.616	910	131	5.89	326	44.4	3.53	3.99	1.53	11.9	29.7	22.5	—	3.62	146	67.9
		x73	21.4	13.61	14.585	0.505	0.505	729	107	5.84	261	35.8	3.49	3.90	1.85	14.4	20.3	27.0	—	2.01	118	54.6
			21.5	13.64	14.586	0.506	0.506	734	108	5.85	262	35.9	3.49	3.94	1.85	14.4	20.3	27.0	—	2.03	119	54.8
HP 13x100	x73		29.4	13.15	13.205	0.765	0.765	886	135	5.49	294	44.5	3.16	3.54	1.30	8.6	56.7	17.2	—	6.25	153	68.6
		x87	25.5	12.95	13.105	0.665	0.665	755	117	5.45	250	38.1	3.13	3.51	1.49	9.9	43.5	19.5	—	4.12	131	58.5
		x73	21.6	12.75	13.005	0.565	0.565	630	98.8	5.40	207	31.9	3.10	3.47	1.74	11.5	31.9	22.6	—	2.54	110	48.8
		x60	17.5	12.54	12.900	0.460	0.460	503	80.3	5.36	165	25.5	3.07	3.43	2.11	14.0	21.5	27.3	—	1.39	89.0	39.0
HP 12x84	x74		24.6	12.28	12.295	0.685	0.685	650	106	5.14	213	34.6	2.94	3.29	1.46	9.0	52.5	17.9	—	4.24	120	53.2
		HP 12x74	21.8	12.13	12.215	0.610	0.605	569	93.8	5.11	186	30.4	2.92	3.26	1.63	10.0	42.1	20.0	—	2.98	105	46.6
	x63	HP 12x74	21.8	12.12	12.217	0.607	0.607	566	93.4	5.10	185	30.2	2.91	3.31	1.63	10.1	41.7	20.0	—	2.97	105	46.4
		x53	18.4	11.94	12.125	0.515	0.515	472	79.1	5.06	153	25.3	2.88	3.23	1.91	11.8	30.5	23.2	—	1.83	88.3	38.7
	x53	x53	15.5	11.78	12.045	0.435	0.435	393	66.8	5.03	127	21.1	2.86	3.20	2.25	13.8	22.0	27.1	—	1.12	74.0	32.2
			15.6	11.78	12.046	0.436	0.436	394	66.9	5.03	127	21.1	2.86	3.23	2.24	13.8	22.1	27.0	—	1.13	74.2	32.3
HP 10x57	x42	HP 10x57	16.8	9.99	10.225	0.565	0.565	294	58.8	4.18	101	19.7	2.45	2.74	1.73	9.1	51.6	17.7	—	1.97	66.5	30.3
		HP 10x57	16.8	10.01	10.224	0.564	0.564	295	58.8	4.19	101	19.7	2.45	2.78	1.74	9.06	51.4	17.7	—	1.96	66.5	30.3
	x42	x42	12.4	9.70	10.075	0.420	0.415	210	43.4	4.13	71.7	14.2	2.41	2.69	2.29	12.0	29.4	23.4	—	0.81	48.3	21.8
		x42	12.4	9.72	10.078	0.418	0.418	211	43.4	4.13	71.4	14.2	2.40	2.72	2.31	12.1	29.1	23.3	—	0.811	48.4	21.7
HP 8x36	HP 8x36		10.6	8.02	8.155	0.445	0.445	119	29.8	3.36	40.3	9.88	1.95	2.18	2.21	9.2	50.3	18.0	—	0.77	33.6	15.2
			10.6	8.03	8.158	0.446	0.446	120	29.9	3.36	40.4	9.91	1.95	2.22	2.21	9.15	50.5	18.0	—	0.776	33.8	15.2



## HP SHAPES

### Dimensions for detailing

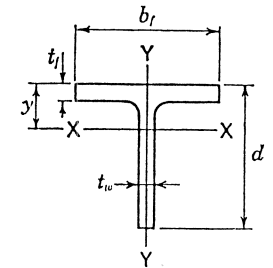


Designation		Depth $d$	Flange		Web Thickness $t_w$	$\frac{t_w}{2}$	Distance		
New Series	Previous Series		Width $b_f$	Thick- ness $t_f$			$T$	$k$	$k_1$
		In.	In.	In.	In.	In.	In.	In.	
HP 14x117		14 $\frac{1}{4}$	14 $\frac{7}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$	7 $\frac{1}{16}$	11 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{16}$
		HP 14x117	14 $\frac{1}{4}$	14 $\frac{7}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$	3 $\frac{3}{8}$	11 $\frac{1}{4}$	1 $\frac{1}{16}$
	x102		14	14 $\frac{3}{4}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	3 $\frac{3}{8}$	11 $\frac{1}{4}$	1
		x102	14	14 $\frac{3}{4}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	3 $\frac{3}{8}$	11 $\frac{1}{4}$	1
	x89		13 $\frac{7}{8}$	14 $\frac{3}{4}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{16}$	11 $\frac{1}{4}$	1 $\frac{5}{16}$
		x89	13 $\frac{7}{8}$	14 $\frac{3}{4}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{16}$	11 $\frac{1}{4}$	1 $\frac{5}{16}$
x73		13 $\frac{5}{8}$	14 $\frac{5}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	11 $\frac{1}{4}$	1 $\frac{3}{16}$	7 $\frac{7}{8}$
	x73	13 $\frac{5}{8}$	14 $\frac{5}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	11 $\frac{1}{4}$	1 $\frac{3}{16}$	7 $\frac{7}{8}$
HP 13x100		13 $\frac{1}{8}$	13 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{8}$	10 $\frac{1}{4}$	1 $\frac{7}{16}$	1
	x87		13	13 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	3 $\frac{3}{8}$	10 $\frac{1}{4}$	1 $\frac{5}{16}$
	x73		12 $\frac{3}{4}$	13	9 $\frac{9}{16}$	9 $\frac{9}{16}$	5 $\frac{5}{16}$	10 $\frac{1}{4}$	1 $\frac{5}{16}$
	x60		12 $\frac{1}{2}$	12 $\frac{7}{8}$	7 $\frac{7}{16}$	7 $\frac{7}{16}$	1 $\frac{1}{4}$	10 $\frac{1}{4}$	7 $\frac{7}{8}$
HP 12x84		12 $\frac{1}{4}$	12 $\frac{1}{4}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	3 $\frac{3}{8}$	9 $\frac{1}{2}$	1 $\frac{3}{8}$	1
	x74		12 $\frac{1}{8}$	12 $\frac{1}{4}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{16}$	9 $\frac{1}{2}$	1 $\frac{5}{16}$
		HP 12x74	12 $\frac{1}{8}$	12 $\frac{1}{4}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{16}$	9 $\frac{1}{2}$	1 $\frac{5}{16}$
	x63		12	12 $\frac{1}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	9 $\frac{1}{2}$	7 $\frac{7}{8}$
	x53		11 $\frac{3}{4}$	12	7 $\frac{7}{16}$	7 $\frac{7}{16}$	1 $\frac{1}{4}$	9 $\frac{1}{2}$	7 $\frac{7}{8}$
		x53	11 $\frac{3}{4}$	12	7 $\frac{7}{16}$	7 $\frac{7}{16}$	3 $\frac{3}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{8}$
HP 10x57		10	10 $\frac{1}{4}$	9 $\frac{9}{16}$	9 $\frac{9}{16}$	5 $\frac{5}{16}$	7 $\frac{5}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$
		HP 10x57	10	10 $\frac{1}{4}$	9 $\frac{9}{16}$	9 $\frac{9}{16}$	5 $\frac{5}{16}$	7 $\frac{3}{4}$	1 $\frac{1}{8}$
	x42		9 $\frac{3}{4}$	10 $\frac{1}{8}$	7 $\frac{7}{16}$	7 $\frac{7}{16}$	1 $\frac{1}{4}$	7 $\frac{5}{8}$	3 $\frac{3}{4}$
	x42	9 $\frac{3}{4}$	10 $\frac{1}{8}$	7 $\frac{7}{16}$	7 $\frac{7}{16}$	3 $\frac{3}{16}$	7 $\frac{3}{4}$	1	
HP 8x36		8	8 $\frac{1}{8}$	7 $\frac{7}{16}$	7 $\frac{7}{16}$	1 $\frac{1}{4}$	6 $\frac{1}{8}$	1 $\frac{5}{16}$	5 $\frac{5}{8}$
		HP 8x36	8	8 $\frac{1}{8}$	7 $\frac{7}{16}$	7 $\frac{7}{16}$	1 $\frac{1}{4}$	6 $\frac{1}{8}$	1 $\frac{5}{16}$





STRUCTURAL TEES  
Cut from W shapes  
Dimensions and  
properties for designing



Designation		Area	Depth of Tee $d$	Flange		Stem Thickness $t_w$	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y			
New Series	Previous Series			Width $b_f$	Thick-ness $t_f$			$I$	$S$	$r$	$y$	$I$	$S$	$r$	
		In. <sup>2</sup>	In.	In.	In.	In.		In. <sup>4</sup>	In. <sup>3</sup>	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	
WT 18x150		44.1	18.370	16.655	1.680	0.945	19.4	1230	86.1	5.27	4.13	648	77.8	3.83	
		WT 18x150	44.1	18.36	16.655	1.680	0.945	19.4	1220	86.0	5.27	4.13	648	77.8	3.83
	x140		41.2	18.260	16.595	1.570	0.885	20.6	1140	80.0	5.25	4.07	599	72.2	3.81
		x140	41.2	18.25	16.595	1.570	0.885	20.6	1130	80.0	5.25	4.06	599	72.2	3.81
	x130		38.2	18.130	16.550	1.440	0.840	21.6	1060	75.1	5.26	4.05	545	65.9	3.78
		x130	38.2	18.12	16.551	1.440	0.841	21.5	1060	75.1	5.26	4.05	545	65.9	3.77
	x122.5		36.0	18.040	16.510	1.350	0.800	22.6	995	71.0	5.26	4.03	507	61.4	3.75
		x122.5	36.1	18.03	16.512	1.350	0.802	22.5	995	71.1	5.25	4.03	507	61.4	3.75
	x115		33.8	17.950	16.470	1.260	0.760	23.6	934	67.0	5.25	4.01	470	57.1	3.73
		x115	33.8	17.94	16.471	1.260	0.761	23.6	933	67.0	5.25	4.00	470	57.1	3.73
WT 18x105		30.9	18.345	12.180	1.360	0.830	22.1	985	73.1	5.65	4.87	206	33.8	2.58	
	x97		28.5	18.245	12.115	1.260	0.765	23.8	901	67.0	5.62	4.80	187	30.9	2.56
		WT 18x97	28.6	18.24	12.117	1.260	0.770	23.7	905	67.4	5.63	4.81	188	31.0	2.56
	x91		26.8	18.165	12.075	1.180	0.725	25.1	845	63.1	5.62	4.77	174	28.8	2.55
		x91	26.8	18.16	12.072	1.180	0.725	25.0	845	63.1	5.61	4.77	174	28.8	2.55
	x85		25.0	18.085	12.030	1.100	0.680	26.6	786	58.9	5.61	4.73	160	26.6	2.53
		x85	25.0	18.08	12.027	1.100	0.680	26.6	786	58.8	5.60	4.73	160	26.6	2.53
	x80		23.5	18.005	12.000	1.020	0.650	27.7	740	55.8	5.61	4.74	147	24.6	2.50
		x80	23.6	18.00	12.000	1.020	0.653	27.6	742	56.0	5.61	4.75	147	24.6	2.50
	x75		22.1	17.925	11.975	0.940	0.625	28.7	698	53.1	5.62	4.78	135	22.5	2.47
		x75	22.1	17.92	11.972	0.940	0.625	28.7	698	53.1	5.62	4.78	135	22.5	2.47
	x67.5		19.9	17.775	11.950	0.790	0.600	29.6	636	49.7	5.66	4.96	113	18.9	2.38
		x67.5	19.9	17.78	11.945	0.794	0.598	29.7	636	49.5	5.65	4.94	113	18.9	2.39
WT 16.5x120.5		35.4	17.090	15.860	1.400	0.830	20.6	871	65.8	4.96	3.85	466	58.8	3.63	
		WT 16.5x120	35.3	16.75	15.865	1.400	0.830	20.2	823	63.2	4.83	3.73	467	58.8	3.64
	x110.5		32.5	16.965	15.805	1.275	0.775	21.9	799	60.8	4.96	3.81	420	53.2	3.59
		x110	32.4	16.63	15.810	1.275	0.775	21.5	755	58.4	4.83	3.70	421	53.2	3.60
	x100.5		29.5	16.840	15.745	1.150	0.715	23.6	725	55.5	4.95	3.78	375	47.6	3.56
	x100	29.4	16.50	15.750	1.150	0.715	23.1	685	53.3	4.82	3.66	375	47.6	3.57	

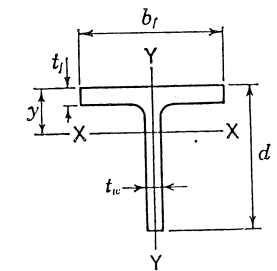




## STRUCTURAL TEES

### Cut from W shapes

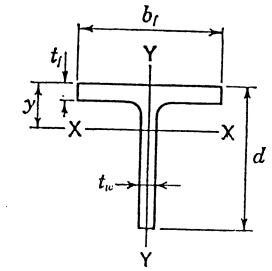
### Dimensions and properties for designing



Designation		Area	Depth of Tee <i>d</i>	Flange		Stem Thickness <i>t<sub>w</sub></i>	<i>d</i> / <i>t<sub>w</sub></i>	AXIS X-X				AXIS Y-Y			
				Width <i>b<sub>f</sub></i>	Thick-ness <i>t<sub>f</sub></i>			<i>I</i>	<i>S</i>	<i>r</i>	<i>y</i>	<i>I</i>	<i>S</i>	<i>r</i>	
New Series	Previous Series	In. <sup>2</sup>	In.	In.	In.	In.		In. <sup>4</sup>	In. <sup>3</sup>	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	
WT 16.5x76	WT 16.5x76	22.4	16.745	11.565	1.055	0.635	26.4	592	47.4	5.14	4.26	136	23.6	2.47	
		22.4	16.75	11.565	1.055	0.635	26.4	592	47.4	5.15	4.26	136	23.6	2.47	
		x70.5	20.8	16.650	11.535	0.960	0.605	27.5	552	44.7	5.15	4.29	123	21.3	2.43
		x70.5	20.8	16.66	11.535	0.960	0.605	27.5	552	44.7	5.16	4.29	123	21.3	2.43
		x65	19.2	16.545	11.510	0.855	0.580	28.5	513	42.1	5.18	4.36	109	18.9	2.39
		x65	19.2	16.55	11.510	0.855	0.580	28.5	514	42.2	5.18	4.37	109	18.9	2.38
x59	x59	17.3	16.430	11.480	0.740	0.550	29.9	469	39.2	5.20	4.47	93.6	16.3	2.32	
		x59	17.4	16.43	11.484	0.738	0.554	29.7	471	39.4	5.21	4.48	93.4	16.3	2.32
WT 15x105.5	WT 15x105	31.0	15.470	15.105	1.315	0.775	20.0	610	50.5	4.43	3.40	378	50.1	3.49	
		x95.5	30.9	15.19	15.105	1.315	0.775	19.6	579	48.7	4.33	3.31	378	50.1	3.50
		x95	28.1	15.340	15.040	1.185	0.710	21.6	549	45.7	4.42	3.35	336	44.7	3.46
		x95	28.0	15.06	15.040	1.185	0.710	21.2	521	44.1	4.31	3.25	336	44.7	3.47
		x86.5	25.4	15.220	14.985	1.065	0.655	23.2	497	41.7	4.42	3.31	299	39.9	3.43
x86	25.4	14.94	14.985	1.065	0.655	22.8	472	40.2	4.31	3.22	299	39.9	3.43		
WT 15x66	WT 15x66	19.4	15.155	10.545	1.000	0.615	24.6	421	37.4	4.66	3.90	98.0	18.6	2.25	
		x62	19.4	15.15	10.551	1.000	0.615	24.6	421	37.4	4.65	3.90	98.2	18.6	2.25
		x62	18.2	15.085	10.515	0.930	0.585	25.8	396	35.3	4.66	3.90	90.4	17.2	2.23
		x62	18.2	15.08	10.521	0.930	0.585	25.8	395	35.3	4.65	3.89	90.5	17.2	2.23
		x58	17.1	15.005	10.495	0.850	0.565	26.6	373	33.7	4.67	3.94	82.1	15.7	2.19
		x58	17.1	15.00	10.500	0.850	0.564	26.6	372	33.6	4.67	3.93	82.2	15.7	2.19
		x54	15.9	14.915	10.475	0.760	0.545	27.4	349	32.0	4.69	4.01	73.0	13.9	2.15
		x54	15.9	14.91	10.484	0.760	0.548	27.2	350	32.1	4.69	4.02	73.2	14.0	2.15
		x49.5	14.5	14.825	10.450	0.670	0.520	28.5	322	30.0	4.71	4.09	63.9	12.2	2.10
		x49.5	14.6	14.82	10.458	0.670	0.522	28.4	323	30.1	4.71	4.10	64.1	12.3	2.10
WT 13.5x89	WT 13.5x88.5	26.1	13.905	14.085	1.190	0.725	19.2	414	38.2	3.98	3.05	278	39.4	3.26	
		x80.5	26.1	13.66	14.090	1.190	0.725	18.8	393	36.8	3.88	2.97	278	39.4	3.26
		x80	23.7	13.795	14.020	1.080	0.660	20.9	372	34.4	3.96	2.99	248	35.4	3.24
		x80	23.6	13.54	14.023	1.075	0.658	20.6	352	33.1	3.87	2.90	247	35.3	3.24
		x73	21.5	13.690	13.965	0.975	0.605	22.6	336	31.2	3.95	2.95	222	31.7	3.21
		x72.5	21.4	13.44	13.965	0.975	0.600	22.4	317	29.9	3.85	2.85	222	31.7	3.22



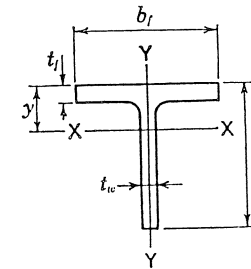
STRUCTURAL TEES  
Cut from W shapes  
Dimensions and  
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Designation		Area In. <sup>2</sup>	Depth of Tee d In.	Flange		Stem Thick- ness t <sub>w</sub> In.	d t <sub>w</sub>	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width b <sub>f</sub> In.	Thick- ness t <sub>f</sub> In.			I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	y In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.
WT 13.5x57		16.8	13.645	10.070	0.930	0.570	23.9	289	28.3	4.15	3.42	79.4	15.8	2.18
		16.8	13.64	10.070	0.932	0.570	23.9	289	28.3	4.15	3.41	79.5	15.8	2.18
	x51	15.0	13.545	10.015	0.830	0.515	26.3	258	25.3	4.14	3.37	69.6	13.9	2.15
		15.0	13.54	10.018	0.827	0.518	26.1	258	25.4	4.14	3.38	69.5	13.9	2.15
	x47	13.8	13.460	9.990	0.745	0.490	27.5	239	23.8	4.16	3.41	62.0	12.4	2.12
		13.8	13.46	9.990	0.747	0.490	27.5	239	23.8	4.15	3.41	62.2	12.5	2.12
x42		12.4	13.355	9.960	0.640	0.460	29.0	216	21.9	4.18	3.48	52.8	10.6	2.07
		12.4	13.35	9.963	0.636	0.463	28.8	216	22.0	4.18	3.50	52.5	10.5	2.06
WT 12x81		23.9	12.500	12.955	1.220	0.705	17.7	293	29.9	3.50	2.70	221	34.2	3.05
		23.6	12.36	14.091	1.135	0.656	18.8	272	27.6	3.40	2.50	265	37.6	3.35
	x73	21.5	12.370	12.900	1.090	0.650	19.0	264	27.2	3.50	2.66	195	30.3	3.01
		21.4	12.25	14.043	1.020	0.608	20.1	247	25.2	3.40	2.47	236	33.6	3.32
	x65.5	19.3	12.240	12.855	0.960	0.605	20.2	238	24.8	3.52	2.65	170	26.5	2.97
		19.2	12.13	14.000	0.900	0.565	21.5	223	23.1	3.41	2.46	206	29.4	3.28
	x58.5	17.7	12.16	12.088	0.930	0.556	21.9	215	22.5	3.49	2.62	137	22.7	2.78
		17.2	12.130	12.800	0.850	0.550	22.1	212	22.3	3.51	2.62	149	23.2	2.94
	x52	16.2	12.08	12.042	0.855	0.510	23.7	195	20.5	3.47	2.57	125	20.7	2.77
		15.3	12.030	12.750	0.750	0.500	24.1	189	20.0	3.51	2.59	130	20.3	2.91
		14.8	12.00	12.000	0.775	0.468	25.6	177	18.7	3.46	2.53	112	18.6	2.75
WT 12x47		13.8	12.155	9.065	0.875	0.515	23.6	186	20.3	3.67	2.99	54.5	12.0	1.98
		13.8	12.15	9.061	0.872	0.516	23.5	186	20.3	3.67	3.00	54.2	12.0	1.98
	x42	12.4	12.050	9.020	0.770	0.470	25.6	166	18.3	3.67	2.97	47.2	10.5	1.95
		12.4	12.05	9.015	0.772	0.470	25.6	166	18.3	3.66	2.97	47.2	10.5	1.95
	x38	11.2	11.960	8.990	0.680	0.440	27.2	151	16.9	3.68	3.00	41.3	9.18	1.92
		11.2	11.96	8.985	0.682	0.440	27.2	151	16.9	3.68	2.99	41.3	9.20	1.92
x34		10.0	11.865	8.965	0.585	0.415	28.6	137	15.6	3.70	3.06	35.2	7.85	1.87
		10.0	11.86	8.961	0.582	0.416	28.5	137	15.6	3.70	3.07	35.0	7.81	1.87
WT 12x31		9.11	11.870	7.040	0.590	0.430	27.6	131	15.6	3.79	3.46	17.2	4.90	1.38
		8.98	11.86	7.023	0.591	0.419	28.3	129	15.2	3.78	3.42	17.1	4.88	1.38
	x27.5	8.10	11.785	7.005	0.505	0.395	29.8	117	14.1	3.80	3.50	14.5	4.15	1.34
	8.09	11.78	7.000	0.503	0.396	29.7	116	14.1	3.79	3.50	14.4	4.13	1.34	



STRUCTURAL TEES  
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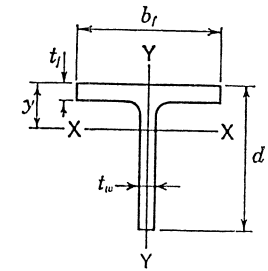
Designation		Area	Depth of Tee $d$	Flange		Stem Thickness $t_w$	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y				
				Width $b_f$	Thick-ness $t_f$			$I$	$S$	$r$	$y$	$I$	$S$	$r$		
New Series	Previous Series	In. <sup>2</sup>	In.	In.	In.	In.		In. <sup>4</sup>	In. <sup>3</sup>	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.		
WT 10.5x73.5	x66	21.6	11.030	12.510	1.150	0.720	15.3	204	23.7	3.08	2.39	188	30.0	2.95		
		WT-10.5x71	20.9	10.73	13.132	1.095	0.659	16.3	177	20.8	2.92	2.18	207	31.5	3.15	
	x61	19.4	10.915	12.440	1.035	0.650	16.8	181	21.1	3.06	2.33	166	26.7	2.93		
		x63.5	18.7	10.62	13.061	0.985	0.588	18.1	156	18.3	2.89	2.11	183	28.0	3.13	
	x55.5	17.9	10.840	12.390	0.960	0.600	18.1	166	19.3	3.04	2.28	152	24.6	2.92		
		x56	16.5	10.50	13.000	0.865	0.527	19.9	137	16.2	2.88	2.06	159	24.4	3.10	
	x50.5	16.3	10.755	12.340	0.875	0.550	19.6	150	17.5	3.03	2.23	137	22.2	2.90		
		14.9	10.680	12.290	0.800	0.500	21.4	135	15.8	3.01	2.18	124	20.2	2.89		
	WT 10.5x46.5	x41.5	WT 10.5x48	14.1	10.57	9.038	0.935	0.575	18.4	137	17.1	3.12	2.54	57.7	12.8	2.02
			13.7	10.810	8.420	0.930	0.580	18.6	144	17.9	3.25	2.74	46.4	11.0	1.84	
x36.5		12.2	10.715	8.355	0.835	0.515	20.8	127	15.7	3.22	2.66	40.7	9.75	1.83		
		x41	12.1	10.43	8.962	0.795	0.499	20.9	116	14.6	3.10	2.48	47.8	10.7	1.99	
x34		10.7	10.620	8.295	0.740	0.455	23.3	110	13.8	3.21	2.60	35.3	8.51	1.81		
		x36.5	10.7	10.62	8.295	0.740	0.455	23.3	110	13.8	3.21	2.60	35.3	8.51	1.81	
x31		10.0	10.565	8.270	0.685	0.430	24.6	103	12.9	3.20	2.59	32.4	7.83	1.80		
		x34	10.0	10.57	8.270	0.685	0.430	24.6	103	12.9	3.20	2.59	32.4	7.83	1.80	
x25		9.13	10.495	8.240	0.615	0.400	26.2	93.8	11.9	3.21	2.58	28.7	6.97	1.77		
		x31	9.13	10.50	8.240	0.615	0.400	26.2	93.8	11.9	3.21	2.58	28.7	6.97	1.77	
WT 10.5x28.5	x25	8.37	10.530	6.555	0.650	0.405	26.0	90.4	11.8	3.29	2.85	15.3	4.67	1.35		
		WT 10.5x27.5	8.10	10.40	8.215	0.522	0.375	27.7	84.4	10.9	3.23	2.64	24.2	5.88	1.73	
	x22	7.36	10.415	6.530	0.535	0.380	27.4	80.3	10.7	3.30	2.93	12.5	3.82	1.30		
		x24.5	7.21	10.41	6.520	0.532	0.368	28.3	78.3	10.4	3.29	2.90	12.3	3.78	1.31	
	x22	6.49	10.330	6.500	0.450	0.350	29.5	71.1	9.68	3.31	2.98	10.3	3.18	1.26		
x22		6.48	10.33	6.500	0.451	0.348	29.7	70.9	9.63	3.31	2.97	10.4	3.19	1.27		



# STRUCTURAL TEES

## Cut from W shapes

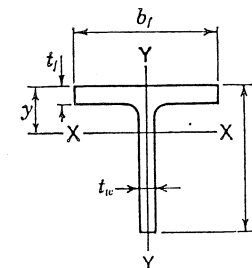
### Dimensions and properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee <i>d</i> In.	Flange		Stem Thickness <i>t<sub>w</sub></i> In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width <i>b<sub>f</sub></i> In.	Thick-ness <i>t<sub>f</sub></i> In.			<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.	<i>y</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.
WT 9x59.5		17.5	9.485	11.265	1.060	0.655	14.5	119	15.9	2.60	2.03	126	22.5	2.69
	WT 9x57	16.8	9.24	11.833	0.991	0.595	15.5	103	13.9	2.48	1.85	137	23.2	2.86
x53		15.6	9.365	11.200	0.940	0.590	15.9	104	14.1	2.59	1.97	110	19.7	2.66
	x52.5	15.4	9.16	11.792	0.911	0.554	16.5	94.0	12.8	2.47	1.82	125	21.1	2.84
x48.5		14.3	9.295	11.145	0.870	0.535	17.4	93.8	12.7	2.56	1.91	100	18.0	2.65
	x48	14.1	9.08	11.750	0.831	0.512	17.7	85.4	11.7	2.46	1.78	112	19.1	2.82
x43		12.7	9.195	11.090	0.770	0.480	19.2	82.4	11.2	2.55	1.86	87.6	15.8	2.63
	x42.5	12.5	9.16	8.838	0.911	0.526	17.4	84.4	11.9	2.60	2.05	52.5	11.9	2.05
x38		11.4	9.08	8.787	0.831	0.475	19.1	75.3	10.6	2.58	1.99	47.1	10.7	2.04
	x38.5	11.2	9.105	11.035	0.680	0.425	21.4	71.8	9.83	2.54	1.80	76.2	13.8	2.61
WT 9x35.5		10.4	9.235	7.635	0.810	0.495	18.7	78.2	11.2	2.74	2.26	30.1	7.89	1.70
	x35	10.3	9.00	8.750	0.751	0.438	20.5	68.2	9.68	2.57	1.96	42.0	9.60	2.02
x32.5		9.55	9.175	7.590	0.750	0.450	20.4	70.7	10.1	2.72	2.20	27.4	7.22	1.69
	x32	9.43	8.94	8.715	0.686	0.403	22.2	61.9	8.83	2.56	1.92	37.9	8.70	2.00
x30		8.82	9.120	7.555	0.695	0.415	22.0	64.7	9.29	2.71	2.16	25.0	6.63	1.69
	x30	8.83	9.13	7.558	0.695	0.416	21.9	64.9	9.32	2.71	2.16	25.1	6.63	1.68
x27.5		8.10	9.055	7.530	0.630	0.390	23.2	59.5	8.63	2.71	2.16	22.5	5.97	1.67
	x27.5	8.10	9.06	7.532	0.630	0.390	23.2	59.6	8.64	2.71	2.16	22.5	5.97	1.67
x25		7.33	8.995	7.495	0.570	0.355	25.3	53.5	7.79	2.70	2.12	20.0	5.35	1.65
	x25	7.36	9.00	7.500	0.570	0.358	25.1	54.0	7.86	2.71	2.13	20.1	5.35	1.65
WT 9x23		6.77	9.030	6.060	0.605	0.360	25.1	52.1	7.77	2.77	2.33	11.3	3.72	1.29
	WT 9x22.5	6.62	8.93	7.477	0.499	0.335	26.7	49.0	7.24	2.72	2.16	17.4	4.66	1.62
x20		5.88	8.950	6.015	0.525	0.315	28.4	44.8	6.73	2.76	2.29	9.55	3.17	1.27
	x20	5.88	8.95	6.018	0.524	0.316	28.3	44.9	6.75	2.76	2.29	9.54	3.17	1.27
x17.5		5.15	8.850	6.000	0.425	0.300	29.5	40.1	6.21	2.79	2.39	7.67	2.56	1.22
	x17.5	5.15	8.86	6.000	0.429	0.298	29.7	40.1	6.18	2.79	2.38	7.74	2.58	1.23



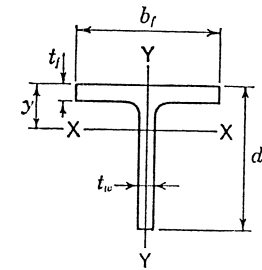
**STRUCTURAL TEES**  
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Designation		Area	Depth of Tee $d$	Flange		Stem Thickness $t_w$	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y			
				Width $b_f$	Thick-ness $t_f$			$I$	$S$	$r$	$y$	$I$	$S$	$r$	
New Series	Previous Series	In. <sup>2</sup>	In.	In.	In.	In.		In. <sup>4</sup>	In. <sup>3</sup>	In.	In.	In. <sup>4</sup>	In. <sup>3</sup>	In.	
WT 8x50	x44.5	14.7	8.485	10.425	0.985	0.585	14.5	76.8	11.4	2.28	1.76	93.1	17.9	2.52	
		WT 8x48	14.1	8.16	11.533	0.875	0.535	15.3	64.7	9.82	2.14	1.57	112	19.4	2.82
	x38.5	8x39	13.1	8.375	10.365	0.875	0.525	16.0	67.2	10.1	2.27	1.70	81.3	15.7	2.49
			x44	12.9	8.08	11.502	0.795	0.504	16.0	59.5	9.11	2.14	1.55	101	17.5
		x35.5	11.5	8.16	8.586	0.875	0.529	15.4	60.0	9.45	2.28	1.81	46.3	10.8	2.01
	x33.5	x29	11.3	8.260	10.295	0.760	0.455	18.2	56.9	8.59	2.24	1.63	69.2	13.4	2.47
			x32	10.5	8.08	8.543	0.795	0.486	16.6	54.1	8.57	2.27	1.77	41.4	9.69
		x29	9.84	8.165	10.235	0.665	0.395	20.7	48.6	7.36	2.22	1.56	59.5	11.6	2.46
	WT 8x28.5	x25	9.41	8.08	8.500	0.715	0.443	18.1	48.3	7.72	2.27	1.73	36.7	8.63	1.97
			8x25	8.53	7.93	8.464	0.645	0.407	19.5	43.6	7.01	2.26	1.71	32.6	7.71
x22.5		x20	8.38	8.215	7.120	0.715	0.430	19.1	48.7	7.77	2.41	1.94	21.6	6.06	1.60
			x25	7.37	8.130	7.070	0.630	0.380	21.4	42.3	6.78	2.40	1.89	18.6	5.26
		x20	7.36	8.13	7.073	0.628	0.380	21.4	42.2	6.77	2.40	1.89	18.6	5.25	1.59
x20		x18	6.63	8.065	7.035	0.565	0.345	23.4	37.8	6.10	2.39	1.86	16.4	4.67	1.57
			x22.5	6.63	8.06	7.039	0.563	0.346	23.3	37.8	6.10	2.39	1.86	16.4	4.66
		x18	5.89	8.005	6.995	0.505	0.305	26.2	33.1	5.35	2.37	1.81	14.4	4.12	1.57
x18		x15.5	5.89	8.00	7.000	0.503	0.307	26.1	33.2	5.38	2.37	1.82	14.4	4.11	1.56
			x18	5.28	7.930	6.985	0.430	0.295	26.9	30.6	5.05	2.41	1.88	12.2	3.50
	x18	5.30	7.93	6.992	0.428	0.299	26.5	30.8	5.11	2.41	1.89	12.2	3.49	1.52	
WT 8x15.5	x13	4.56	7.940	5.525	0.440	0.275	28.9	27.4	4.64	2.45	2.02	6.20	2.24	1.17	
		WT 8x15.5	4.57	7.92	5.53	0.442	0.275	28.8	27.3	4.62	2.44	2.01	6.23	2.25	1.17
	x13	3.84	7.845	5.500	0.345	0.250	31.4	23.5	4.09	2.47	2.09	4.80	1.74	1.12	
	x13	3.84	7.82	5.50	0.345	0.250	31.3	23.3	4.07	2.47	2.08	4.80	1.74	1.12	



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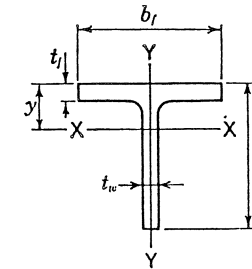
Designation		Area In. <sup>2</sup>	Depth of Tee <i>d</i> In.	Flange		Stem Thick- ness <i>t<sub>w</sub></i> In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width <i>b<sub>f</sub></i> In.	Thick- ness <i>t<sub>f</sub></i> In.			<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.	<i>y</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.
WT 7x365		107	11.210	17.890	4.910	3.070	3.6	739	95.4	2.62	3.47	2360	264	4.69
	WT 7x365	107.0	11.22	17.889	4.910	3.069	3.66	740	95.6	2.63	3.47	2360	264	4.69
x332.5		97.8	10.820	17.650	4.520	2.830	3.8	622	82.1	2.52	3.25	2080	236	4.62
	x332.5	97.8	10.84	17.646	4.522	2.826	3.83	623	82.2	2.52	3.25	2080	236	4.62
x302.5		88.9	10.460	17.415	4.160	2.595	4.0	524	70.6	2.43	3.05	1840	211	4.55
	x302.5	89.0	10.47	17.418	4.157	2.598	4.03	525	70.8	2.43	3.05	1840	211	4.55
x275		80.9	10.120	17.200	3.820	2.380	4.3	442	60.9	2.34	2.85	1630	189	4.49
	x275	80.9	10.13	17.206	3.818	2.386	4.25	444	61.1	2.34	2.86	1630	189	4.49
x250		73.5	9.800	17.010	3.500	2.190	4.5	375	52.7	2.26	2.67	1440	169	4.43
	x250	73.5	9.82	17.008	3.501	2.188	4.49	377	52.8	2.26	2.68	1440	169	4.43
x227.5		66.9	9.510	16.835	3.210	2.015	4.7	321	45.9	2.19	2.51	1280	152	4.38
	x227.5	66.9	9.53	16.828	3.213	2.008	4.74	322	45.9	2.19	2.51	1280	152	4.37

# T

## STRUCTURAL TEES

Cut from W shapes

Dimensions and properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee $d$ In.	Flange		Stem Thickness $t_w$ In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width $b_f$ In.	Thick-ness $t_f$ In.			$I$ In. <sup>4</sup>	$S$ In. <sup>3</sup>	$r$ In.	$y$ In.	$I$ In. <sup>4</sup>	$S$ In. <sup>3</sup>	$r$ In.
WT 7x213		62.6	9.335	16.695	3.035	1.875	5.0	287	41.4	2.14	2.40	1180	141	4.34
	WT 7x213	62.6	9.35	16.695	3.033	1.875	4.98	288	41.4	2.14	2.40	1180	141	4.34
x199		58.5	9.145	16.590	2.845	1.770	5.2	257	37.6	2.10	2.30	1090	131	4.31
	x199	58.5	9.16	16.590	2.843	1.770	5.17	258	37.7	2.10	2.30	1080	131	4.31
x185		54.4	8.960	16.475	2.660	1.655	5.4	229	33.9	2.05	2.19	994	121	4.27
	x185	54.4	8.97	16.475	2.658	1.655	5.42	230	34.0	2.06	2.19	993	121	4.27
x171		50.3	8.770	16.360	2.470	1.540	5.7	203	30.4	2.01	2.09	903	110	4.24
	x171	50.3	8.78	16.365	2.468	1.545	5.68	204	30.5	2.02	2.09	903	110	4.24
	x157	46.2	8.60	16.235	2.283	1.415	6.07	179	27.0	1.97	1.98	816	100	4.20
x155.5		45.7	8.560	16.230	2.260	1.410	6.1	176	26.7	1.96	1.97	807	99.4	4.20
	x143.5	42.2	8.41	16.130	2.093	1.310	6.42	157	24.1	1.93	1.87	733	90.9	4.17
x141.5		41.6	8.370	16.110	2.070	1.290	6.5	153	23.5	1.92	1.86	722	89.7	4.17
	x132	38.8	8.25	16.025	1.938	1.205	6.85	139	21.5	1.89	1.78	666	83.1	4.14
x128.5		37.8	8.190	15.995	1.890	1.175	7.0	133	20.7	1.88	1.75	645	80.7	4.13
	x123	36.2	8.13	15.945	1.813	1.125	7.22	126	19.6	1.86	1.71	613	76.9	4.12
	x118.5	34.8	8.06	15.910	1.748	1.090	7.39	120	18.7	1.85	1.67	587	73.8	4.11
x116.5		34.2	8.020	15.890	1.720	1.070	7.5	116	18.2	1.84	1.65	576	72.5	4.10
	x114	33.5	8.00	15.865	1.688	1.045	7.66	113	17.7	1.84	1.64	562	70.9	4.10
	x109.5	33.2	7.94	15.825	1.623	1.005	7.90	107	16.9	1.82	1.60	537	67.8	4.08
x105.5		31.0	7.860	15.800	1.560	0.980	8.0	102	16.2	1.81	1.57	513	65.0	4.07
	x105.5	31.0	7.88	15.800	1.563	0.980	8.04	102	16.2	1.82	1.57	514	65.1	4.07
	x101	29.7	7.82	15.750	1.503	0.930	8.40	95.8	15.2	1.80	1.53	490	62.2	4.06
x96.5		28.4	7.740	15.710	1.440	0.890	8.7	89.8	14.4	1.78	1.49	466	59.3	4.05
	x96.5	28.4	7.75	15.710	1.438	0.890	8.71	90.1	14.4	1.78	1.49	465	59.2	4.05
	x92	27.0	7.69	15.660	1.378	0.840	9.15	83.9	13.4	1.76	1.45	441	56.4	4.04
x88		25.9	7.610	15.650	1.310	0.830	9.2	80.5	13.0	1.76	1.43	419	53.5	4.02
	x88	25.9	7.63	15.640	1.313	0.820	9.30	80.2	12.9	1.76	1.42	419	53.6	4.02
	x83.5	24.5	7.56	15.600	1.248	0.780	9.69	75.0	12.2	1.75	1.39	395	50.7	4.01
x79.5		23.4	7.490	15.565	1.190	0.745	10.1	70.2	11.4	1.73	1.35	374	48.1	4.00
	x79	23.2	7.50	15.550	1.188	0.730	10.3	69.3	11.3	1.73	1.34	372	47.9	4.00
	x75	22.0	7.44	15.515	1.128	0.695	10.7	65.0	10.6	1.72	1.31	351	45.3	3.99
x72.5		21.3	7.390	15.500	1.090	0.680	10.9	62.5	10.2	1.71	1.29	338	43.7	3.98
	x71	20.9	7.38	15.500	1.063	0.680	10.8	62.1	10.2	1.72	1.29	330	42.6	3.97

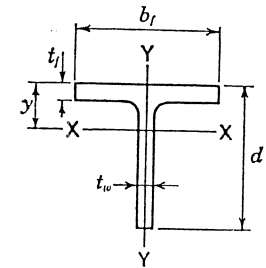




# STRUCTURAL TEES

## Cut from W shapes

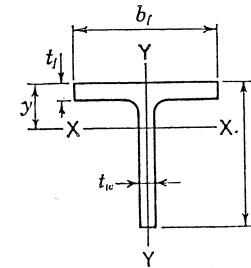
### Dimensions and properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee d In.	Flange		Stem Thickness t <sub>w</sub> In.	d/t <sub>w</sub>	AXIS X-X				AXIS Y-Y			
New Series	Previous Series			Width b <sub>f</sub> In.	Thick-ness t <sub>f</sub> In.			I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	y In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	
	<b>WT 7x160</b>	47.1	8.41	16.710	2.093	1.890	4.45	209	33.3	2.11	2.12	818	97.8	4.17	
WT 7x66	<b>WT 7x68</b>	20.0	7.38	14.740	1.063	0.660	11.2	60.1	9.89	1.73	1.31	284	38.5	3.77	
		19.4	7.330	14.725	1.030	0.645	11.4	57.8	9.57	1.73	1.29	274	37.2	3.76	
	x60	18.7	7.31	14.690	0.998	0.610	12.0	54.7	9.05	1.71	1.26	264	35.9	3.76	
		17.7	7.240	14.670	0.940	0.590	12.3	51.7	8.61	1.71	1.24	247	33.7	3.74	
		x59.5	17.5	7.25	14.650	0.938	0.570	12.7	50.4	8.36	1.70	1.22	246	33.6	3.75
		x55.5	16.3	7.19	14.620	0.873	0.540	13.3	46.9	7.82	1.69	1.19	227	31.1	3.73
	x54.5		16.0	7.160	14.605	0.860	0.525	13.6	45.3	7.56	1.68	1.17	223	30.6	3.73
		x51.5	15.1	7.13	14.575	0.813	0.495	14.4	42.4	7.10	1.67	1.15	210	28.8	3.72
	x49.5		14.6	7.080	14.565	0.780	0.485	14.6	40.9	6.88	1.67	1.14	201	27.6	3.71
		x47.5	14.0	7.06	14.545	0.748	0.465	15.2	39.1	6.58	1.67	1.12	192	26.4	3.71
x45		13.2	7.010	14.520	0.710	0.440	15.9	36.4	6.16	1.66	1.09	181	25.0	3.70	
	x43.5	12.8	7.00	14.500	0.688	0.420	16.7	34.9	5.88	1.65	1.08	175	24.1	3.70	
WT 7x41	<b>WT 7x42</b>	12.4	7.09	12.023	0.778	0.451	15.7	37.4	6.36	1.74	1.21	113	18.8	3.02	
		12.0	7.155	10.130	0.855	0.510	14.0	41.2	7.14	1.85	1.39	74.2	14.6	2.48	
x37	x39	11.5	7.03	12.000	0.718	0.428	16.4	34.8	5.96	1.74	1.19	103	17.2	3.00	
		10.9	7.085	10.070	0.785	0.450	15.7	36.0	6.25	1.82	1.32	66.9	13.3	2.48	
x34	x37	10.9	7.10	10.072	0.783	0.450	15.8	36.1	6.26	1.82	1.32	66.7	13.3	2.48	
		9.99	7.020	10.035	0.720	0.415	16.9	32.6	5.69	1.81	1.29	60.7	12.1	2.46	
x30.5	x34	10.0	7.03	10.040	0.718	0.418	16.8	33.0	5.75	1.82	1.29	60.6	12.1	2.46	
		8.96	6.945	9.995	0.645	0.375	18.5	28.9	5.07	1.80	1.25	53.7	10.7	2.45	
	x30.5	8.97	6.96	10.000	0.643	0.378	18.4	29.2	5.13	1.80	1.25	53.6	10.7	2.45	
WT 7x26.5	<b>WT 7x26.5</b>	7.81	6.960	8.060	0.660	0.370	18.8	27.6	4.94	1.88	1.38	28.8	7.16	1.92	
		7.79	6.97	8.062	0.658	0.370	18.8	27.7	4.96	1.88	1.38	28.8	7.14	1.92	
x24		7.07	6.895	8.030	0.595	0.340	20.3	24.9	4.48	1.87	1.35	25.7	6.40	1.91	
		7.06	6.91	8.031	0.593	0.339	20.4	24.9	4.49	1.88	1.35	25.6	6.38	1.91	
x21.5		6.31	6.830	7.995	0.530	0.305	22.4	21.9	3.98	1.86	1.31	22.6	5.65	1.89	
		6.32	6.84	8.000	0.528	0.308	22.2	22.2	4.02	1.87	1.33	22.6	5.64	1.89	



STRUCTURAL TEES  
Cut from W shapes  
Dimensions and  
properties for designing



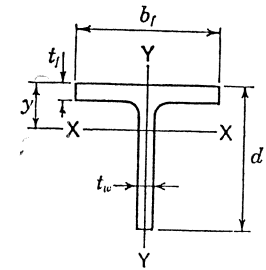
Designation		Area In. <sup>2</sup>	Depth of Tee <i>d</i> In.	Flange		Stem Thick- ness <i>t<sub>w</sub></i> In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width <i>b<sub>f</sub></i> In.	Thick- ness <i>t<sub>f</sub></i> In.			<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.	<i>y</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.
		WT 7x19		5.58	7.050	6.770	0.515							
WT 7x19	5.59		7.06	6.776	0.513	0.313	22.6	23.5	4.27	2.05	1.55	13.3	3.93	1.54
x17		5.00	6.990	6.745	0.455	0.285	24.5	20.9	3.83	2.04	1.53	11.7	3.45	1.53
	x17	5.01	7.00	6.750	0.453	0.287	24.4	21.1	3.87	2.05	1.54	11.6	3.44	1.52
x15		4.42	6.920	6.730	0.385	0.270	25.6	19.0	3.55	2.07	1.58	9.79	2.91	1.49
	x15	4.42	6.93	6.733	0.383	0.270	25.7	19.0	3.56	2.08	1.58	9.76	2.90	1.49
WT 7x13		3.85	6.955	5.025	0.420	0.255	27.3	17.3	3.31	2.12	1.72	4.45	1.77	1.08
	WT 7x13	3.83	6.95	5.025	0.418	0.255	27.2	17.2	3.30	2.12	1.72	4.43	1.76	1.08
x11		3.25	6.870	5.000	0.335	0.230	29.9	14.8	2.91	2.14	1.76	3.50	1.40	1.04
	x11	3.24	6.86	5.000	0.335	0.230	29.8	14.8	2.90	2.13	1.76	3.50	1.40	1.04



# STRUCTURAL TEES

## Cut from W shapes

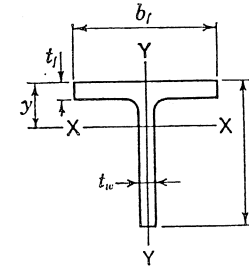
### Dimensions and properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee <i>d</i> In.	Flange		Stem Thickness <i>t<sub>w</sub></i> In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width <i>b<sub>f</sub></i> In.	Thick-ness <i>t<sub>f</sub></i> In.			<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.	<i>y</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.
WT 6x168		49.4	8.410	13.385	2.955	1.775	4.7	190	31.2	1.96	2.31	593	88.6	3.47
x152.5		44.8	8.160	13.235	2.705	1.625	5.0	162	27.0	1.90	2.16	525	79.3	3.42
x139.5		41.0	7.925	13.140	2.470	1.530	5.2	141	24.1	1.86	2.05	469	71.3	3.38
x126		37.0	7.705	13.005	2.250	1.395	5.5	121	20.9	1.81	1.92	414	63.6	3.34
x115		33.9	7.525	12.895	2.070	1.285	5.9	106	18.5	1.77	1.82	371	57.5	3.31
x105		30.9	7.355	12.790	1.900	1.180	6.2	92.1	16.4	1.73	1.72	332	51.9	3.28
x95		27.9	7.190	12.670	1.735	1.060	6.8	79.0	14.2	1.68	1.62	295	46.5	3.25
	<b>WT 6x95</b>	<b>27.9</b>	<b>7.19</b>	<b>12.670</b>	<b>1.736</b>	<b>1.060</b>	<b>6.78</b>	<b>79.0</b>	<b>14.2</b>	<b>1.68</b>	<b>1.62</b>	<b>295</b>	<b>46.5</b>	<b>3.25</b>
x85		25.0	7.015	12.570	1.560	0.960	7.3	67.8	12.3	1.65	1.52	259	41.2	3.22
	x80.5	23.7	6.94	12.515	1.486	0.905	7.67	62.6	11.5	1.63	1.47	243	38.9	3.20
x76		22.4	6.855	12.480	1.400	0.870	7.9	58.5	10.8	1.62	1.43	227	36.4	3.19
x68		20.0	6.705	12.400	1.250	0.790	8.5	50.6	9.46	1.59	1.35	199	32.1	3.16
	x66.5	19.6	6.69	12.365	1.236	0.755	8.86	48.4	9.04	1.57	1.33	195	31.5	3.16
x60		17.6	6.560	12.320	1.105	0.710	9.2	43.4	8.22	1.57	1.28	172	28.0	3.13
	x60	17.7	6.56	12.320	1.106	0.710	9.24	43.4	8.22	1.57	1.28	173	28.0	3.13
x53		15.6	6.445	12.220	0.990	0.610	10.6	36.3	6.91	1.53	1.19	151	24.7	3.11
	x53	15.6	6.44	12.230	0.986	0.620	10.4	36.7	7.01	1.53	1.20	150	24.6	3.11
	x49.5	14.6	6.38	12.192	0.921	0.582	11.0	33.8	6.48	1.52	1.16	139	22.8	3.09
x48		14.1	6.355	12.160	0.900	0.550	11.6	32.0	6.12	1.51	1.13	135	22.2	3.09
	x46	13.5	6.31	12.155	0.856	0.545	11.6	31.0	5.99	1.51	1.13	128	21.1	3.08
x43.5		12.8	6.265	12.125	0.810	0.515	12.2	28.9	5.60	1.50	1.10	120	19.9	3.07
	x42.5	12.5	6.25	12.105	0.796	0.495	12.6	27.8	5.38	1.49	1.08	118	19.5	3.07
x39.5		11.6	6.190	12.080	0.735	0.470	13.2	25.8	5.03	1.49	1.06	108	17.9	3.05
	x39.5	11.6	6.19	12.080	0.736	0.470	13.2	25.8	5.03	1.49	1.06	108	17.9	3.05
x36		10.6	6.125	12.040	0.670	0.430	14.2	23.2	4.54	1.48	1.02	97.5	16.2	3.04
	x36	10.6	6.13	12.040	0.671	0.430	14.2	23.2	4.54	1.48	1.02	97.6	16.2	3.04
x32.5		9.54	6.060	12.000	0.605	0.390	15.5	20.6	4.06	1.47	0.985	87.2	14.5	3.02
	x32.5	9.55	6.06	12.000	0.606	0.390	15.5	20.6	4.06	1.47	0.985	87.3	14.6	3.02
<b>WT 6x29</b>		<b>8.52</b>	<b>6.095</b>	<b>10.010</b>	<b>0.640</b>	<b>0.360</b>	<b>16.9</b>	<b>19.1</b>	<b>3.76</b>	<b>1.50</b>	<b>1.03</b>	<b>53.5</b>	<b>10.7</b>	<b>2.51</b>
	<b>WT 6x29</b>	<b>8.53</b>	<b>6.10</b>	<b>10.014</b>	<b>0.641</b>	<b>0.359</b>	<b>17.0</b>	<b>19.0</b>	<b>3.75</b>	<b>1.49</b>	<b>1.03</b>	<b>53.7</b>	<b>10.7</b>	<b>2.51</b>
x26.5		7.78	6.030	9.995	0.575	0.345	17.5	17.7	3.54	1.51	1.02	47.9	9.58	2.48
	x26.5	7.80	6.03	10.000	0.576	0.345	17.5	17.7	3.54	1.51	1.02	48.0	9.61	2.48



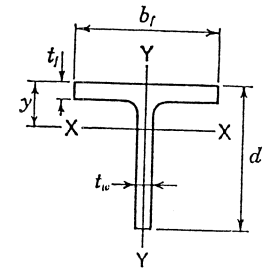
STRUCTURAL TEES  
Cut from W shapes  
Dimensions and  
properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee d In.	Flange		Stem Thick- ness t <sub>w</sub> In.	d t <sub>w</sub>	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width b <sub>f</sub> In.	Thick- ness t <sub>f</sub> In.			I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	y In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.
WT 6x25		7.34	6.095	8.080	0.640	0.370	16.5	18.7	3.79	1.60	1.17	28.2	6.97	1.96
	WT 6x25	7.36	6.10	8.077	0.641	0.371	16.4	18.7	3.80	1.60	1.17	28.2	6.98	1.96
x22.5		6.61	6.030	8.045	0.575	0.335	18.0	16.6	3.39	1.58	1.13	25.0	6.21	1.94
	x22.5	6.62	6.03	8.042	0.576	0.336	17.9	16.6	3.40	1.59	1.13	25.0	6.22	1.94
x20		5.89	5.970	8.005	0.515	0.295	20.2	14.4	2.95	1.57	1.08	22.0	5.51	1.93
	x20	5.89	5.97	8.000	0.516	0.294	20.3	14.4	2.94	1.56	1.08	22.0	5.51	1.94
WT 6x17.5		5.30	6.12	6.565	0.540	0.305	20.1	15.3	3.14	1.70	1.26	12.7	3.88	1.55
	WT 6x17.5	5.17	6.250	6.560	0.520	0.300	20.8	16.0	3.23	1.76	1.30	12.2	3.73	1.54
x15		4.57	6.05	6.525	0.465	0.265	22.8	13.0	2.69	1.69	1.22	10.8	3.30	1.54
	x15	4.40	6.170	6.520	0.440	0.260	23.7	13.5	2.75	1.75	1.27	10.2	3.12	1.52
x13		3.97	5.98	6.497	0.400	0.237	25.2	11.3	2.37	1.69	1.20	9.15	2.82	1.52
	x13	3.82	6.110	6.490	0.380	0.230	26.6	11.7	2.40	1.75	1.25	8.66	2.67	1.51
WT 6x11		3.24	6.155	4.030	0.425	0.260	23.7	11.7	2.59	1.90	1.63	2.33	1.16	0.848
	WT 6x11	3.24	6.16	4.030	0.424	0.260	23.7	11.7	2.59	1.90	1.63	2.32	1.15	0.847
x9.5		2.79	6.080	4.005	0.350	0.235	25.9	10.1	2.28	1.90	1.65	1.88	0.939	0.822
	x9.5	2.80	6.08	4.007	0.349	0.237	25.7	10.2	2.30	1.91	1.65	1.88	0.938	0.820
x8.25		2.43	6.00	4.000	0.269	0.230	26.1	9.03	2.13	1.93	1.76	1.44	0.721	0.770
	x8.25	2.36	5.995	3.990	0.265	0.220	27.3	8.70	2.04	1.92	1.74	1.41	0.706	0.773
x7		2.08	5.955	3.970	0.225	0.200	29.8	7.67	1.83	1.92	1.76	1.18	0.594	0.753
	x7	2.06	5.96	3.968	0.224	0.198	30.1	7.61	1.81	1.92	1.75	1.17	0.590	0.754



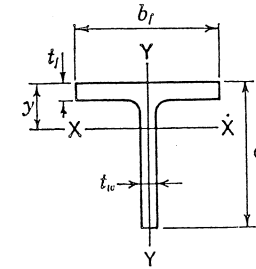
STRUCTURAL TEES  
Cut from W shapes  
Dimensions and  
properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee d In.	Flange		Stem Thick- ness t <sub>w</sub> In.	d / t <sub>w</sub>	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width b <sub>f</sub> In.	Thick- ness t <sub>f</sub> In.			I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	y In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.
WT 5x56	x50	16.5	5.680	10.415	1.250	0.755	7.5	28.6	6.40	1.32	1.21	118	22.6	2.68
		16.5	5.69	10.415	1.248	0.755	7.54	28.8	6.42	1.32	1.21	118	22.6	2.67
	x44	14.7	5.550	10.340	1.120	0.680	8.2	24.5	5.56	1.29	1.13	103	20.0	2.65
		14.7	5.56	10.345	1.118	0.685	8.12	24.8	5.62	1.30	1.14	103	20.0	2.65
	x38.5	13.1	5.44	10.275	0.998	0.615	8.85	21.3	4.88	1.28	1.07	90.3	17.6	2.63
		12.9	5.420	10.265	0.990	0.605	9.0	20.8	4.77	1.27	1.06	89.3	17.4	2.63
	x34	11.3	5.300	10.190	0.870	0.530	10.0	17.4	4.05	1.24	0.990	76.8	15.1	2.60
		11.3	5.31	10.195	0.868	0.535	9.93	17.7	4.10	1.25	0.996	76.7	15.1	2.60
	x30	10.6	5.25	10.170	0.808	0.510	10.3	16.4	3.83	1.24	0.971	70.9	13.9	2.59
		9.99	5.200	10.130	0.770	0.470	11.1	14.9	3.49	1.22	0.932	66.8	13.2	2.59
	x27	9.70	5.19	10.117	0.748	0.457	11.4	14.5	3.39	1.22	0.922	64.6	12.8	2.58
		8.82	5.110	10.080	0.680	0.420	12.2	12.9	3.04	1.21	0.884	58.1	11.5	2.57
	x24.5	8.83	5.13	10.075	0.683	0.415	12.3	12.8	3.03	1.21	0.882	58.2	11.6	2.57
		7.91	5.045	10.030	0.615	0.370	13.6	11.1	2.64	1.19	0.836	51.7	10.3	2.56
WT 5x22.5	7.94	5.06	10.028	0.618	0.368	13.8	11.2	2.64	1.19	0.836	52.0	10.4	2.56	
	7.21	4.990	10.000	0.560	0.340	14.7	10.0	2.39	1.18	0.807	46.7	9.34	2.54	
x19.5	7.20	5.00	10.000	0.558	0.340	14.7	10.1	2.40	1.18	0.809	46.5	9.30	2.54	
	6.63	5.050	8.020	0.620	0.350	14.4	10.2	2.47	1.24	0.907	26.7	6.65	2.01	
x16.5	6.62	5.06	8.022	0.618	0.350	14.5	10.3	2.48	1.25	0.910	26.6	6.63	2.00	
	5.73	4.960	7.985	0.530	0.315	15.7	8.84	2.16	1.24	0.876	22.5	5.64	1.98	
WT 5x15	5.74	4.97	7.990	0.528	0.318	15.6	8.96	2.19	1.25	0.883	22.5	5.62	1.98	
	4.85	4.865	7.960	0.435	0.290	16.8	7.71	1.93	1.26	0.869	18.3	4.60	1.94	
x13	4.85	4.88	7.964	0.433	0.292	16.7	7.80	1.95	1.27	0.875	18.2	4.58	1.94	
	4.42	5.235	5.810	0.510	0.300	17.5	9.28	2.24	1.45	1.10	8.35	2.87	1.37	
x11	4.27	5.11	5.799	0.500	0.289	17.7	8.39	2.07	1.40	1.05	8.14	2.81	1.38	
	3.81	5.165	5.770	0.440	0.260	19.9	7.86	1.91	1.44	1.06	7.05	2.44	1.36	
x10.5	3.68	5.04	5.762	0.430	0.252	20.0	7.13	1.77	1.39	1.01	6.86	2.38	1.37	
	3.24	5.085	5.750	0.360	0.240	21.2	6.88	1.72	1.46	1.07	5.71	1.99	1.33	
	3.10	4.95	5.750	0.340	0.240	20.6	6.32	1.62	1.43	1.06	5.39	1.88	1.32	



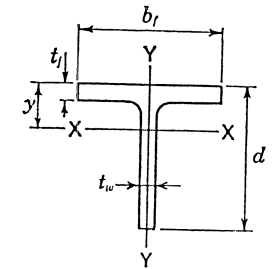
**STRUCTURAL TEES**  
Cut from W shapes  
Dimensions and  
properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee <i>d</i> In.	Flange		Stem Thick- ness <i>t<sub>w</sub></i> In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y		
New Series	Previous Series			Width <i>b<sub>f</sub></i> In.	Thick- ness <i>t<sub>f</sub></i> In.			<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.	<i>y</i> In.	<i>I</i> In. <sup>4</sup>	<i>S</i> In. <sup>3</sup>	<i>r</i> In.
WT 5x9.5		2.81	5.120	4.020	0.395	0.250	20.5	6.68	1.74	1.54	1.28	2.15	1.07	0.874
	WT 5x9.5	2.81	5.13	4.020	0.394	0.250	20.5	6.70	1.74	1.55	1.28	2.14	1.06	0.874
x8.5		2.50	5.055	4.010	0.330	0.240	21.1	6.06	1.62	1.56	1.32	1.78	0.888	0.845
	x8.5	2.49	5.06	4.010	0.329	0.240	21.1	6.07	1.62	1.56	1.32	1.77	0.885	0.844
x7.5		2.21	4.995	4.000	0.270	0.230	21.7	5.45	1.50	1.57	1.37	1.45	0.723	0.810
	x7.5	2.20	5.00	4.000	0.269	0.230	21.7	5.46	1.51	1.57	1.37	1.44	0.720	0.809
x6		1.77	4.935	3.960	0.210	0.190	26.0	4.35	1.22	1.57	1.36	1.09	0.551	0.785
	x5.75	1.70	4.94	3.950	0.204	0.180	27.4	4.16	1.16	1.57	1.34	1.05	0.532	0.787
WT 4x33.5		9.84	4.500	8.280	0.935	0.570	7.9	10.9	3.05	1.05	0.936	44.3	10.7	2.12
	WT 4x33.5	9.85	4.50	8.287	0.933	0.575	7.83	10.9	3.07	1.05	0.939	44.3	10.7	2.12
x29		8.55	4.375	8.220	0.810	0.510	8.6	9.12	2.61	1.03	0.874	37.5	9.13	2.10
	x29	8.53	4.38	8.222	0.808	0.510	8.58	9.12	2.61	1.03	0.874	37.5	9.12	2.10
x24		7.05	4.250	8.110	0.685	0.400	10.6	6.85	1.97	0.986	0.777	30.5	7.52	2.08
	x24	7.06	4.25	8.117	0.683	0.405	10.5	6.92	2.00	0.990	0.781	30.5	7.51	2.08
x20		5.87	4.125	8.070	0.560	0.360	11.5	5.73	1.69	0.988	0.735	24.5	6.08	2.04
	x20	5.88	4.13	8.077	0.558	0.365	11.3	5.80	1.71	0.993	0.740	24.5	6.07	2.04
x17.5		5.14	4.060	8.020	0.495	0.310	13.1	4.81	1.43	0.968	0.688	21.3	5.31	2.03
	x17.5	5.15	4.06	8.027	0.493	0.315	12.9	4.88	1.45	0.973	0.694	21.3	5.30	2.03
x15.5		4.56	4.000	7.995	0.435	0.285	14.0	4.28	1.28	0.968	0.668	18.5	4.64	2.02
	x15.5	4.56	4.00	8.000	0.433	0.288	13.9	4.31	1.30	0.973	0.672	18.5	4.62	2.01
WT 4x14		4.12	4.030	6.535	0.465	0.285	14.1	4.22	1.28	1.01	0.734	10.8	3.31	1.62
	WT 4x14	4.11	4.03	6.540	0.463	0.285	14.1	4.22	1.28	1.01	0.735	10.8	3.30	1.62
x12		3.54	3.965	6.495	0.400	0.245	16.2	3.53	1.08	0.999	0.695	9.14	2.81	1.61
	x12	3.53	3.97	6.500	0.398	0.245	16.2	3.53	1.08	1.00	0.695	9.12	2.80	1.61
WT 4x10.5		3.08	4.140	5.270	0.400	0.250	16.6	3.90	1.18	1.12	0.831	4.89	1.85	1.26
	WT 4x10	2.95	4.07	5.268	0.378	0.248	16.4	3.67	1.13	1.12	0.825	4.61	1.75	1.25
x9		2.63	4.070	5.250	0.330	0.230	17.7	3.41	1.05	1.14	0.834	3.98	1.52	1.23
	x8.5	2.50	4.00	5.250	0.308	0.230	17.4	3.21	1.02	1.13	0.835	3.72	1.42	1.22



STRUCTURAL TEES  
Cut from W shapes  
Dimensions and  
properties for designing



Designation		Area In. <sup>2</sup>	Depth of Tee d In.	Flange		Stem Thick- ness t <sub>w</sub> In.	$\frac{d}{t_w}$	AXIS X-X				AXIS Y-Y			
New Series	Previous Series			Width b <sub>f</sub> In.	Thick- ness t <sub>f</sub> In.			I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	y In.	I In. <sup>4</sup>	S In. <sup>3</sup>	r In.	
WT 4x7.5		2.22	4.055	4.015	0.315	0.245	16.6	3.28	1.07	1.22	0.998	1.70	0.849	0.876	
		WT 4x7.5	2.22	4.06	4.015	0.314	0.245	16.6	3.29	1.07	1.22	1.00	1.70	0.847	0.876
	x6.5		1.92	3.995	4.000	0.255	0.230	17.4	2.89	0.974	1.23	1.03	1.37	0.683	0.844
		x6.5	1.92	4.00	4.000	0.254	0.230	17.4	2.90	0.976	1.23	1.03	1.36	0.680	0.842
	x5		1.48	3.945	3.940	0.205	0.170	23.2	2.15	0.717	1.20	0.953	1.05	0.532	0.841
		x5	1.48	3.95	3.940	0.204	0.170	23.2	2.15	0.719	1.21	0.957	1.04	0.529	0.839
WT 3x12.5		3.67	3.190	6.080	0.455	0.320	10.0	2.29	0.886	0.789	0.610	8.53	2.81	1.52	
		WT 3x12.5	3.67	3.19	6.080	0.456	0.320	9.95	2.27	0.883	0.787	0.609	8.55	2.81	1.53
	x10		2.94	3.100	6.020	0.365	0.260	11.9	1.76	0.693	0.774	0.560	6.64	2.21	1.50
		x10	2.94	3.10	6.018	0.367	0.258	12.0	1.75	0.688	0.771	0.557	6.67	2.22	1.51
	x7.5		2.28	3.00	5.995	0.269	0.235	12.8	1.44	0.591	0.795	0.559	4.83	1.61	1.46
		x7.5	2.21	2.995	5.990	0.260	0.230	13.0	1.41	0.577	0.797	0.558	4.66	1.56	1.45
WT 3x8		2.37	3.140	4.030	0.405	0.260	12.1	1.69	0.685	0.844	0.677	2.21	1.10	0.967	
		WT 3x8	2.36	3.13	4.030	0.404	0.260	12.0	1.66	0.679	0.839	0.673	2.21	1.10	0.967
	x6		1.78	3.015	4.000	0.280	0.230	13.1	1.32	0.564	0.862	0.677	1.50	0.748	0.918
		x6	1.77	3.00	4.000	0.279	0.230	13.0	1.30	0.558	0.857	0.673	1.49	0.746	0.918
	x4.5		1.34	2.950	3.940	0.215	0.170	17.4	0.950	0.408	0.842	0.623	1.10	0.557	0.905
		x4.25	1.25	2.92	3.940	0.194	0.170	17.1	0.904	0.397	0.849	0.638	0.990	0.503	0.889
WT 2.5x9.5		2.77	2.575	5.030	0.430	0.270	9.5	1.01	0.485	0.605	0.487	4.56	1.82	1.28	
		WT 2.5x9.5	2.72	2.56	5.025	0.420	0.265	9.66	0.980	0.471	0.601	0.481	4.45	1.77	1.28
	x8		2.34	2.505	5.000	0.360	0.240	10.4	0.845	0.413	0.601	0.458	3.75	1.50	1.27
		x8	2.35	2.50	5.000	0.360	0.240	10.4	0.840	0.411	0.598	0.457	3.75	1.50	1.26
WT 2x6.5		1.91	2.080	4.060	0.345	0.280	7.4	0.526	0.321	0.524	0.440	1.93	0.950	1.00	
		WT 2x6.5	1.91	2.08	4.060	0.345	0.280	7.43	0.526	0.321	0.524	0.440	1.88	0.926	0.991



ALLOWABLE STRESS DESIGN SELECTION TABLES  
For shapes used as beams

# ALLOWABLE STRESS DESIGN SELECTION TABLE

For shapes used as beams (new series only)

$S_x$			$S_x$																			
$F_y = 50$ ksi			$S_x$	Shape	Depth $d$	$F_y'$	$F_y = 36$ ksi			$F_y = 50$ ksi			$S_x$	Shape	Depth $d$	$F_y'$	$F_y = 36$ ksi					
$L_c$	$L_u$	$M_R$					$L_c$	$L_u$	$M_R$	$L_c$	$L_u$	$M_R$					$L_c$	$L_u$	$M_R$	$L_c$	$L_u$	$M_R$
Ft.	Ft.	Kip-ft.					Ft.	Ft.	Kip-ft.	Ft.	Ft.	Kip-ft.					Ft.	Ft.	Kip-ft.	Ft.	Ft.	Kip-ft.
14.9	25.4	3053	1110	W 36x300	36 <sup>3</sup> / <sub>4</sub>	—	17.6	35.3	2220	8.9	9.8	822	299	W 30x108	29 <sup>7</sup> / <sub>8</sub>	—	11.1	12.3	598			
14.9	23.8	2833	1030	W 36x280	36 <sup>1</sup> / <sub>2</sub>	—	17.5	33.1	2060	9.0	11.5	822	299	W 27x114	27 <sup>3</sup> / <sub>4</sub>	—	10.6	15.9	598			
14.8	21.9	2621	953	W 36x260	36 <sup>1</sup> / <sub>4</sub>	—	17.5	30.5	1906	11.1	19.6	811	295	W 21x132	21 <sup>7</sup> / <sub>8</sub>	—	13.1	27.2	590			
14.8	20.6	2461	895	W 36x245	36 <sup>1</sup> / <sub>8</sub>	—	17.4	28.6	1790	11.5	14.9	800	291	W 24x117	24 <sup>1</sup> / <sub>4</sub>	—	13.5	20.8	582			
14.8	19.3	2302	837	W 36x230	35 <sup>7</sup> / <sub>8</sub>	—	17.4	26.8	1674	11.1	18.3	751	273	W 21x122	21 <sup>5</sup> / <sub>8</sub>	—	13.1	25.4	546			
14.2	21.6	2280	829	W 33x241	34 <sup>1</sup> / <sub>8</sub>	—	16.7	30.1	1658	7.9	9.7	740	269	W 30x 99	29 <sup>5</sup> / <sub>8</sub>	—	10.9	11.4	538			
14.2	19.8	2082	757	W 33x221	33 <sup>7</sup> / <sub>8</sub>	—	16.7	27.6	1514	9.0	10.2	734	267	W 27x102	27 <sup>1</sup> / <sub>8</sub>	—	10.6	14.2	534			
10.9	15.1	1977	719	W 36x210	36 <sup>3</sup> / <sub>4</sub>	—	12.9	20.9	1438	11.4	13.2	710	258	W 24x104	24	58.5	13.5	18.4	516			
14.1	17.9	1881	684	W 33x201	33 <sup>5</sup> / <sub>8</sub>	—	16.6	24.9	1368	11.1	16.8	685	249	W 21x111	21 <sup>1</sup> / <sub>2</sub>	—	13.0	23.3	498			
10.9	13.9	1826	664	W 36x194	36 <sup>1</sup> / <sub>2</sub>	—	12.8	19.4	1328	8.9	9.5	668	243	W 27x 94	26 <sup>7</sup> / <sub>8</sub>	—	10.5	12.8	486			
13.5	21.4	1823	663	W 30x211	31	—	15.9	29.7	1326	10.1	21.0	635	231	W 18x119	19	—	11.9	29.1	462			
10.8	13.1	1713	623	W 36x182	36 <sup>3</sup> / <sub>8</sub>	—	12.7	18.2	1246	11.0	15.4	624	227	W 21x101	21 <sup>3</sup> / <sub>8</sub>	—	13.0	21.3	454			
13.5	19.4	1645	598	W 30x191	30 <sup>5</sup> / <sub>8</sub>	—	15.9	26.9	1196	8.1	10.9	611	222	W 24x 94	24 <sup>1</sup> / <sub>4</sub>	—	9.6	15.1	444			
10.8	12.2	1595	580	W 36x170	36 <sup>1</sup> / <sub>8</sub>	—	12.7	17.0	1160	8.0	9.4	586	213	W 27x 84	26 <sup>3</sup> / <sub>4</sub>	—	10.5	11.0	426			
10.7	11.4	1491	542	W 36x160	36	—	12.7	15.7	1084	10.0	18.7	561	204	W 18x106	18 <sup>3</sup> / <sub>4</sub>	—	11.8	26.0	408			
13.4	17.5	1482	539	W 30x173	30 <sup>1</sup> / <sub>2</sub>	—	15.8	24.2	1078	8.1	9.6	539	196	W 24x 84	24 <sup>1</sup> / <sub>8</sub>	—	9.5	13.3	392			
10.5	11.3	1386	504	W 36x150	35 <sup>7</sup> / <sub>8</sub>	—	12.6	14.6	1008	7.5	12.1	528	192	W 21x 93	21 <sup>5</sup> / <sub>8</sub>	—	8.9	16.8	384			
12.6	20.1	1381	502	W 27x178	27 <sup>3</sup> / <sub>4</sub>	—	14.9	27.9	1004	13.1	31.7	523	190	W 14x120	14 <sup>1</sup> / <sub>2</sub>	—	15.5	44.1	380			
10.4	12.2	1339	487	W 33x152	33 <sup>1</sup> / <sub>2</sub>	—	12.2	16.9	974	10.0	17.4	517	188	W 18x 97	18 <sup>5</sup> / <sub>8</sub>	—	11.8	24.1	376			
12.6	18.3	1251	455	W 27x161	27 <sup>5</sup> / <sub>8</sub>	—	14.8	25.4	910	8.1	8.6	484	176	W 24x 76	23 <sup>7</sup> / <sub>8</sub>	—	9.5	11.8	352			
10.3	11.1	1232	448	W 33x141	33 <sup>1</sup> / <sub>4</sub>	—	12.2	15.4	896	9.3	20.2	481	175	W 16x100	17	—	11.0	28.1	350			
8.8	11.0	1207	439	W 36x135	35 <sup>1</sup> / <sub>2</sub>	—	12.3	13.0	878	13.1	29.2	476	173	W 14x109	14 <sup>3</sup> / <sub>8</sub>	58.6	15.4	40.6	346			
11.6	21.1	1139	414	W 24x162	25	—	13.7	29.3	828	7.5	10.9	470	171	W 21x 83	21 <sup>3</sup> / <sub>8</sub>	—	8.8	15.1	342			
12.5	16.6	1130	411	W 27x146	27 <sup>3</sup> / <sub>8</sub>	—	14.7	23.0	822	9.9	15.5	457	166	W 18x 86	18 <sup>3</sup> / <sub>8</sub>	—	11.7	21.5	332			
9.9	10.8	1117	406	W 33x130	33 <sup>1</sup> / <sub>8</sub>	—	12.1	13.8	812	13.0	26.7	431	157	W 14x 99	14 <sup>1</sup> / <sub>8</sub>	48.5	15.4	37.0	314			
9.4	11.6	1045	380	W 30x132	30 <sup>1</sup> / <sub>4</sub>	—	11.1	16.1	760	9.3	18.0	426	155	W 16x 89	16 <sup>3</sup> / <sub>4</sub>	—	10.9	25.0	310			
11.6	18.9	1020	371	W 24x146	24 <sup>3</sup> / <sub>4</sub>	—	13.6	26.3	742	7.4	8.5	424	154	W 24x 68	23 <sup>3</sup> / <sub>4</sub>	—	9.5	10.2	308			
8.6	10.7	987	359	W 33x118	32 <sup>7</sup> / <sub>8</sub>	—	12.0	12.6	718	7.4	9.6	415	151	W 21x 73	21 <sup>1</sup> / <sub>4</sub>	—	8.8	13.4	302			
9.4	10.8	976	355	W 30x124	30 <sup>1</sup> / <sub>8</sub>	—	11.1	15.0	710	9.9	13.7	402	146	W 18x 76	18 <sup>1</sup> / <sub>4</sub>	64.2	11.6	19.1	292			
9.4	9.9	905	329	W 30x116	30	—	11.1	13.8	658	13.0	24.5	385	143	W 14x 90	14	40.4	15.3	34.0	286			
11.5	16.8	905	329	W 24x131	24 <sup>1</sup> / <sub>2</sub>	—	13.6	23.4	658	7.4	8.9	385	140	W 21x 68	21 <sup>1</sup> / <sub>8</sub>	—	8.7	12.4	280			
11.2	21.8	905	329	W 21x147	22	—	13.2	30.3	658	9.2	15.8	369	134	W 16x 77	16 <sup>1</sup> / <sub>2</sub>	—	10.9	21.9	268			
										5.8	6.4	360	131	W 24x 62	23 <sup>3</sup> / <sub>4</sub>	—	7.4	8.1	262			
										7.4	8.1	349	127	W 21x 62	21	—	8.7	11.2	254			
										6.8	11.1	349	127	W 18x 71	18 <sup>1</sup> / <sub>2</sub>	—	8.1	15.5	254			
										9.1	20.2	338	123	W 14x 82	14 <sup>1</sup> / <sub>4</sub>	—	10.7	28.1	246			
										10.9	26.0	325	118	W 12x 87	12 <sup>1</sup> / <sub>2</sub>	—	12.8	36.2	236			
										6.8	10.4	322	117	W 18x 65	18 <sup>3</sup> / <sub>8</sub>	—	8.0	14.4	234			
										9.2	13.9	322	117	W 16x 67	16 <sup>3</sup> / <sub>8</sub>	—	10.8	19.3	234			

ALLOWABLE STRESS DESIGN SELECTION TABLE																			
For shapes used as beams (new series only)																			
$S_x$			$S_x$																
$F_y = 50 \text{ ksi}$			$S_x$	Shape	Depth $d$	$F_y'$	$F_y = 36 \text{ ksi}$			$F_y = 50 \text{ ksi}$			$S_x$	Shape	Depth $d$	$F_y'$	$F_y = 36 \text{ ksi}$		
$L_c$	$L_u$	$M_R$					$L_c$	$L_u$	$M_R$	$L_c$	$L_u$	$M_R$					$L_c$	$L_u$	$M_R$
Ft.	Ft.	Kip-ft.	In. <sup>3</sup>	In.	Ksi	Ft.	Ft.	Kip-ft.	Ft.	Ft.	Kip-ft.	In. <sup>3</sup>	In.	Ksi	Ft.	Ft.	Kip-ft.		
5.0	6.3	314	114	W 24x55	23 <sup>3</sup> / <sub>8</sub>	—	7.0	7.5	228	5.8	7.8	106	38.6	W 12x30	12 <sup>3</sup> / <sub>8</sub>	—	6.9	10.8	77
9.0	18.6	308	112	W 14x74	14 <sup>1</sup> / <sub>8</sub>	—	10.6	25.9	224	4.0	5.1	106	38.4	W 16x26	15 <sup>3</sup> / <sub>4</sub>	—	5.6	6.0	77
5.9	6.7	305	111	W 21x57	21	—	6.9	9.4	222	4.5	5.1	97	35.3	W 14x26	13 <sup>3</sup> / <sub>8</sub>	—	5.3	7.0	71
6.8	9.6	297	108	W 18x60	18 <sup>1</sup> / <sub>4</sub>	—	8.0	13.3	216	7.1	11.9	96	35.0	W 10x33	9 <sup>3</sup> / <sub>4</sub>	50.5	8.4	16.5	70
10.8	24.0	294	107	W 12x79	12 <sup>3</sup> / <sub>8</sub>	62.6	12.8	33.3	214	5.8	6.7	92	33.4	W 12x26	12 <sup>1</sup> / <sub>4</sub>	57.9	6.9	9.3	67
9.0	17.2	283	103	W 14x68	14	—	10.6	23.9	206	5.2	9.4	89	32.4	W 10x30	10 <sup>1</sup> / <sub>2</sub>	—	6.1	13.1	65
6.7	8.7	270	98.3	W 18x55	18 <sup>1</sup> / <sub>8</sub>	—	7.9	12.1	197	7.2	16.3	86	31.2	W 8x35	8 <sup>1</sup> / <sub>8</sub>	64.4	8.5	22.6	62
10.8	21.9	268	97.4	W 12x72	12 <sup>1</sup> / <sub>4</sub>	52.3	12.7	30.5	195	4.1	4.7	80	29.0	W 14x22	13 <sup>3</sup> / <sub>4</sub>	—	5.3	5.6	58
5.6	6.0	260	94.5	W 21x50	20 <sup>7</sup> / <sub>8</sub>	—	6.9	7.8	189	5.2	8.2	77	27.9	W 10x26	10 <sup>3</sup> / <sub>8</sub>	—	6.1	11.4	56
6.4	10.3	254	92.2	W 16x57	16 <sup>3</sup> / <sub>8</sub>	—	7.5	14.3	184	7.2	14.5	76	27.5	W 8x31	8	50.0	8.4	20.1	55
9.0	15.5	254	92.2	W 14x61	13 <sup>3</sup> / <sub>8</sub>	—	10.6	21.5	184	3.6	4.6	70	25.4	W 12x22	12 <sup>1</sup> / <sub>4</sub>	—	4.3	6.4	51
6.7	7.9	244	88.9	W 18x50	18	—	7.9	11.0	178	5.9	12.6	67	24.3	W 8x28	8	—	6.9	17.5	49
10.7	20.0	238	87.9	W 12x65	12 <sup>1</sup> / <sub>8</sub>	43.0	12.7	27.7	176	5.2	6.8	64	23.2	W 10x22	10 <sup>1</sup> / <sub>8</sub>	—	6.1	9.4	46
4.7	5.9	224	81.6	W 21x44	20 <sup>5</sup> / <sub>8</sub>	—	6.6	7.0	163	3.6	3.8	59	21.3	W 12x19	12 <sup>1</sup> / <sub>8</sub>	—	4.2	5.3	43
6.3	9.1	223	81.0	W 16x50	16 <sup>1</sup> / <sub>4</sub>	—	7.5	12.7	162	5.8	10.9	57	20.9	W 8x24	7 <sup>7</sup> / <sub>8</sub>	64.1	6.9	15.2	42
5.4	6.8	217	78.8	W 18x46	18	—	6.4	9.4	158	3.6	5.2	52	18.8	W 10x19	10 <sup>1</sup> / <sub>4</sub>	—	4.2	7.2	38
9.0	17.5	215	78.0	W 12x58	12 <sup>1</sup> / <sub>4</sub>	—	10.6	24.4	156	4.7	8.5	50	18.2	W 8x21	8 <sup>1</sup> / <sub>4</sub>	—	5.6	11.8	36
7.2	12.7	214	77.8	W 14x53	13 <sup>3</sup> / <sub>8</sub>	—	8.5	17.7	156	2.9	3.6	47	17.1	W 12x16	12	—	4.1	4.3	34
6.3	8.2	200	72.7	W 16x45	16 <sup>1</sup> / <sub>8</sub>	—	7.4	11.4	145	5.4	14.4	46	16.7	W 6x25	6 <sup>3</sup> / <sub>8</sub>	—	6.4	20.0	33
9.0	15.9	194	70.6	W 12x53	12	55.9	10.6	22.0	141	3.6	4.4	45	16.2	W 10x17	10 <sup>1</sup> / <sub>8</sub>	—	4.2	6.1	32
7.2	11.5	193	70.3	W 14x48	13 <sup>3</sup> / <sub>4</sub>	—	8.5	16.0	141	4.7	7.1	42	15.2	W 8x18	8 <sup>1</sup> / <sub>8</sub>	—	5.5	9.9	30
5.4	5.9	188	68.4	W 18x40	17 <sup>7</sup> / <sub>8</sub>	—	6.3	8.2	137	2.5	3.6	41	14.9	W 12x14	11 <sup>7</sup> / <sub>8</sub>	54.3	3.5	4.2	30
9.0	22.4	183	66.7	W 10x60	10 <sup>1</sup> / <sub>4</sub>	—	10.6	31.1	133	3.6	3.7	38	13.8	W 10x15	10	—	4.2	5.0	28
6.3	7.4	178	64.7	W 16x40	16	—	7.4	10.2	129	5.4	11.8	37	13.4	W 6x20	6 <sup>1</sup> / <sub>4</sub>	62.1	6.4	16.4	27
7.2	14.1	178	64.7	W 12x50	12 <sup>1</sup> / <sub>4</sub>	—	8.5	19.6	129	3.6	5.2	32	11.8	W 8x15	8 <sup>1</sup> / <sub>8</sub>	—	4.2	7.2	24
7.2	10.4	172	62.7	W 14x43	13 <sup>3</sup> / <sub>8</sub>	—	8.4	14.4	125	2.8	3.6	30	10.9	W 10x12	9 <sup>7</sup> / <sub>8</sub>	47.5	3.9	4.3	22
9.0	20.3	165	60.0	W 10x54	10 <sup>1</sup> / <sub>8</sub>	63.5	10.6	28.2	120	3.6	8.7	28	10.2	W 6x16	6 <sup>1</sup> / <sub>4</sub>	—	4.3	12.0	20
7.2	12.8	160	58.1	W 12x45	12	—	8.5	17.7	116	4.5	14.0	28	10.2	W 5x19	5 <sup>1</sup> / <sub>8</sub>	—	5.3	19.5	20
4.8	5.6	158	57.6	W 18x35	17 <sup>3</sup> / <sub>4</sub>	—	6.3	6.7	115	3.6	4.3	27	9.91	W 8x13	8	—	4.2	5.9	20
6.3	6.7	155	56.5	W 16x36	15 <sup>7</sup> / <sub>8</sub>	64.0	7.4	8.8	113	5.4	8.7	25	9.72	W 6x15	6	31.8	6.3	12.0	19
6.1	8.3	150	54.6	W 14x38	14 <sup>1</sup> / <sub>8</sub>	—	7.1	11.5	109	4.5	12.0	23	8.51	W 5x16	5	—	5.3	16.7	17
9.0	18.7	150	54.6	W 10x49	10	53.0	10.6	26.0	109	3.4	3.7	21	7.81	W 8x10	7 <sup>7</sup> / <sub>8</sub>	45.8	4.2	4.7	16
7.2	11.5	143	51.9	W 12x40	12	—	8.4	16.0	104	3.6	6.2	20	7.31	W 6x12	6	—	4.2	8.6	15
7.2	16.4	135	49.1	W 10x45	10 <sup>1</sup> / <sub>8</sub>	—	8.5	22.8	98	3.5	4.8	15	5.56	W 6x 9	5 <sup>7</sup> / <sub>8</sub>	50.3	4.2	6.7	11
6.0	7.3	134	48.6	W 14x34	14	—	7.1	10.2	97	3.6	11.2	15	5.46	W 4x13	4 <sup>1</sup> / <sub>8</sub>	—	4.3	15.6	11
4.9	5.2	130	47.2	W 16x31	15 <sup>7</sup> / <sub>8</sub>	—	5.8	7.1	94										
5.9	9.1	125	45.6	W 12x35	12 <sup>1</sup> / <sub>2</sub>	—	6.9	12.6	91										
7.2	14.2	116	42.1	W 10x39	9 <sup>7</sup> / <sub>8</sub>	—	8.4	19.8	84										
6.0	6.5	116	42.0	W 14x30	13 <sup>3</sup> / <sub>8</sub>	55.3	7.1	8.7	84										

$S_x$			ALLOWABLE STRESS DESIGN SELECTION TABLE																	$S_x$		
$F_y = 50 \text{ ksi}$			$S_x$	Shape	Depth $d$	$F_y'$	$F_y = 36 \text{ ksi}$			$F_y = 50 \text{ ksi}$			$S_x$	Shape	Depth $d$	$F_y'$	$F_y = 36 \text{ ksi}$					
$L_c$	$L_u$	$M_R$					$L_c$	$L_u$	$M_R$	$L_c$	$L_u$	$M_R$					$L_c$	$L_u$	$M_R$	$L_c$	$L_u$	$M_R$
Ft.	Ft.	Kip-ft.					Ft.	Ft.	Kip-ft.	Ft.	Ft.	Kip-ft.					Ft.	Ft.	Kip-ft.	Ft.	Ft.	Kip-ft.
5.0	6.3	314	114	W 24x55	23 <sup>5</sup> / <sub>8</sub>	—	7.0	7.5	228	5.8	7.8	106	38.6	W 12x30	12 <sup>3</sup> / <sub>8</sub>	—	6.9	10.8	77			
9.0	18.6	308	112	W 14x74	14 <sup>1</sup> / <sub>8</sub>	—	10.6	25.9	224													
5.9	6.7	305	111	W 21x57	21	—	6.9	9.4	222	4.0	5.1	106	38.4	W 16x26	15 <sup>3</sup> / <sub>4</sub>	—	5.6	6.0	77			
6.8	9.6	297	108	W 18x60	18 <sup>1</sup> / <sub>4</sub>	—	8.0	13.3	216													
10.8	24.0	294	107	W 12x79	12 <sup>3</sup> / <sub>8</sub>	62.6	12.8	33.3	214	4.5	5.1	97	35.3	W 14x26	13 <sup>7</sup> / <sub>8</sub>	—	5.3	7.0	71			
9.0	17.2	283	103	W 14x68	14	—	10.6	23.9	206	7.1	11.9	96	35.0	W 10x33	9 <sup>3</sup> / <sub>4</sub>	50.5	8.4	16.5	70			
6.7	8.7	270	98.3	W 18x55	18 <sup>1</sup> / <sub>8</sub>	—	7.9	12.1	197	5.8	6.7	92	33.4	W 12x26	12 <sup>1</sup> / <sub>4</sub>	57.9	6.9	9.3	67			
10.8	21.9	268	97.4	W 12x72	12 <sup>1</sup> / <sub>4</sub>	52.3	12.7	30.5	195	5.2	9.4	89	32.4	W 10x30	10 <sup>1</sup> / <sub>2</sub>	—	6.1	13.1	65			
5.6	6.0	260	94.5	W 21x50	20 <sup>7</sup> / <sub>8</sub>	—	6.9	7.8	189	7.2	16.3	86	31.2	W 8x35	8 <sup>1</sup> / <sub>8</sub>	64.4	8.5	22.6	62			
6.4	10.3	254	92.2	W 16x57	16 <sup>3</sup> / <sub>8</sub>	—	7.5	14.3	184	4.1	4.7	80	29.0	W 14x22	13 <sup>3</sup> / <sub>4</sub>	—	5.3	5.6	58			
9.0	15.5	254	92.2	W 14x61	13 <sup>7</sup> / <sub>8</sub>	—	10.6	21.5	184	5.2	8.2	77	27.9	W 10x26	10 <sup>3</sup> / <sub>8</sub>	—	6.1	11.4	56			
6.7	7.9	244	88.9	W 18x50	18	—	7.9	11.0	178	7.2	14.5	76	27.5	W 8x31	8	50.0	8.4	20.1	55			
10.7	20.0	238	87.9	W 12x65	12 <sup>1</sup> / <sub>8</sub>	43.0	12.7	27.7	176	3.6	4.6	70	25.4	W 12x22	12 <sup>1</sup> / <sub>4</sub>	—	4.3	6.4	51			
4.7	5.9	224	81.6	W 21x44	20 <sup>5</sup> / <sub>8</sub>	—	6.6	7.0	163	5.9	12.6	67	24.3	W 8x28	8	—	6.9	17.5	49			
6.3	9.1	223	81.0	W 16x50	16 <sup>1</sup> / <sub>4</sub>	—	7.5	12.7	162	5.2	6.8	64	23.2	W 10x22	10 <sup>1</sup> / <sub>8</sub>	—	6.1	9.4	46			
5.4	6.8	217	78.8	W 18x46	18	—	6.4	9.4	158													
9.0	17.5	215	78.0	W 12x58	12 <sup>1</sup> / <sub>4</sub>	—	10.6	24.4	156	3.6	3.8	59	21.3	W 12x19	12 <sup>1</sup> / <sub>8</sub>	—	4.2	5.3	43			
7.2	12.7	214	77.8	W 14x53	13 <sup>7</sup> / <sub>8</sub>	—	8.5	17.7	156	5.8	10.9	57	20.9	W 8x24	7 <sup>7</sup> / <sub>8</sub>	64.1	6.9	15.2	42			
6.3	8.2	200	72.7	W 16x45	16 <sup>1</sup> / <sub>8</sub>	—	7.4	11.4	145													
9.0	15.9	194	70.6	W 12x53	12	55.9	10.6	22.0	141	3.6	5.2	52	18.8	W 10x19	10 <sup>1</sup> / <sub>4</sub>	—	4.2	7.2	38			
7.2	11.5	193	70.3	W 14x48	13 <sup>3</sup> / <sub>4</sub>	—	8.5	16.0	141	4.7	8.5	50	18.2	W 8x21	8 <sup>1</sup> / <sub>4</sub>	—	5.6	11.8	36			
5.4	5.9	188	68.4	W 18x40	17 <sup>7</sup> / <sub>8</sub>	—	6.3	8.2	137	2.9	3.6	47	17.1	W 12x16	12	—	4.1	4.3	34			
9.0	22.4	183	66.7	W 10x60	10 <sup>1</sup> / <sub>4</sub>	—	10.6	31.1	133	5.4	14.4	46	16.7	W 6x25	6 <sup>3</sup> / <sub>8</sub>	—	6.4	20.0	33			
6.3	7.4	178	64.7	W 16x40	16	—	7.4	10.2	129	3.6	4.4	45	16.2	W 10x17	10 <sup>1</sup> / <sub>8</sub>	—	4.2	6.1	32			
7.2	14.1	178	64.7	W 12x50	12 <sup>1</sup> / <sub>4</sub>	—	8.5	19.6	129	4.7	7.1	42	15.2	W 8x18	8 <sup>1</sup> / <sub>8</sub>	—	5.5	9.9	30			
7.2	10.4	172	62.7	W 14x43	13 <sup>5</sup> / <sub>8</sub>	—	8.4	14.4	125	2.5	3.6	41	14.9	W 12x14	11 <sup>7</sup> / <sub>8</sub>	54.3	3.5	4.2	30			
9.0	20.3	165	60.0	W 10x54	10 <sup>1</sup> / <sub>8</sub>	63.5	10.6	28.2	120	3.6	3.7	38	13.8	W 10x15	10	—	4.2	5.0	28			
7.2	12.8	160	58.1	W 12x45	12	—	8.5	17.7	116	5.4	11.8	37	13.4	W 6x20	6 <sup>1</sup> / <sub>4</sub>	62.1	6.4	16.4	27			
4.8	5.6	158	57.6	W 18x35	17 <sup>3</sup> / <sub>4</sub>	—	6.3	6.7	115	3.6	5.2	32	11.8	W 8x15	8 <sup>1</sup> / <sub>8</sub>	—	4.2	7.2	24			
6.3	6.7	155	56.5	W 16x36	15 <sup>7</sup> / <sub>8</sub>	64.0	7.4	8.8	113	2.8	3.6	30	10.9	W 10x12	9 <sup>7</sup> / <sub>8</sub>	47.5	3.9	4.3	22			
6.1	8.3	150	54.6	W 14x38	14 <sup>1</sup> / <sub>8</sub>	—	7.1	11.5	109	3.6	8.7	28	10.2	W 6x16	6 <sup>1</sup> / <sub>4</sub>	—	4.3	12.0	20			
9.0	18.7	150	54.6	W 10x49	10	53.0	10.6	26.0	109	4.5	14.0	28	10.2	W 5x19	5 <sup>5</sup> / <sub>8</sub>	—	5.3	19.5	20			
7.2	11.5	143	51.9	W 12x40	12	—	8.4	16.0	104	3.6	4.3	27	9.91	W 8x13	8	—	4.2	5.9	20			
7.2	16.4	135	49.1	W 10x45	10 <sup>1</sup> / <sub>8</sub>	—	8.5	22.8	98	5.4	8.7	25	9.72	W 6x15	6	31.8	6.3	12.0	19			
6.0	7.3	134	48.6	W 14x34	14	—	7.1	10.2	97	4.5	12.0	23	8.51	W 5x16	5	—	5.3	16.7	17			
4.9	5.2	130	47.2	W 16x31	15 <sup>7</sup> / <sub>8</sub>	—	5.8	7.1	94	3.4	3.7	21	7.81	W 8x10	7 <sup>7</sup> / <sub>8</sub>	45.8	4.2	4.7	16			
5.9	9.1	125	45.6	W 12x35	12 <sup>1</sup> / <sub>2</sub>	—	6.9	12.6	91	3.6	6.2	20	7.31	W 6x12	6	—	4.2	8.6	15			
7.2	14.2	116	42.1	W 10x39	9 <sup>7</sup> / <sub>8</sub>	—	8.4	19.8	84	3.5	4.8	15	5.56	W 6x 9	5 <sup>7</sup> / <sub>8</sub>	50.3	4.2	6.7	11			
6.0	6.5	116	42.0	W 14x30	13 <sup>7</sup> / <sub>8</sub>	55.3	7.1	8.7	84	3.6	11.2	15	5.46	W 4x13	4 <sup>1</sup> / <sub>8</sub>	—	4.3	15.6	11			



