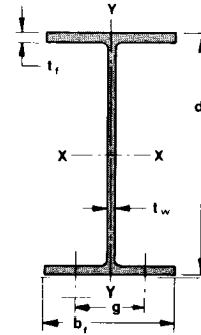


American Standard Shapes

WIDE FLANGE SHAPES (W SHAPES)



| Shape Designation Number | Depth of Section d in. | Weight per Foot lb. | Area of Section A in. ² | Web Thickness t _w in. | Flange Width b _f in. | Flange Thickness t _f in. | Area of Flange A _f in. ² | $\frac{d}{A_f}$ | Elastic Properties Axis X-X | | | Usual Flange Gage g in. |
|--------------------------------|------------------------------------|------------------------------|--|---|--|--|--|-----------------|--------------------------------|-----------------------|----------|-------------------------------------|
| | | | | | | | | | I in. ⁴ | S in. ³ | r in. | |
| W6x9 | 5.90 | 9.0 | 2.68 | 0.170 | 3.940 | 0.215 | 0.847 | 6.96 | 16.4 | 5.56 | 2.47 | 2 1/4 |
| W6x15 | 5.99 | 15.0 | 4.43 | 0.230 | 5.990 | 0.260 | 1.557 | 3.85 | 29.1 | 9.72 | 2.56 | 3 1/2 |
| W8x10 | 7.89 | 10.0 | 2.96 | 0.170 | 3.940 | 0.205 | 0.808 | 9.77 | 30.8 | 7.81 | 3.22 | 2 1/4 |
| W8x18 | 8.14 | 18.0 | 5.26 | 0.230 | 5.250 | 0.330 | 1.732 | 4.70 | 61.9 | 15.2 | 3.43 | 2 3/4 |
| W8x24 | 7.93 | 24.0 | 7.08 | 0.245 | 6.495 | 0.400 | 2.598 | 3.05 | 82.8 | 20.9 | 3.42 | 3 1/2 |
| W8x31 | 8.00 | 31.0 | 9.13 | 0.285 | 7.995 | 0.435 | 3.478 | 2.30 | 110 | 27.5 | 3.47 | 5 1/2 |
| W10x12 | 9.87 | 12.0 | 3.54 | 0.190 | 3.960 | 0.210 | 0.832 | 11.86 | 53.8 | 10.9 | 3.90 | 2 1/4 |
| W10x22 | 10.17 | 22.0 | 6.49 | 0.240 | 5.750 | 0.360 | 2.070 | 4.91 | 118.0 | 23.2 | 4.27 | 2 3/4 |
| W10x33 | 9.73 | 33.0 | 9.71 | 0.290 | 7.960 | 0.435 | 3.463 | 2.81 | 170.0 | 35.0 | 4.19 | 5 1/2 |
| W10x49 | 9.98 | 49.0 | 14.4 | 0.340 | 10.000 | 0.560 | 5.600 | 1.78 | 272.0 | 54.6 | 4.35 | 5 1/2 |
| W12x14 | 11.91 | 14.0 | 4.16 | 0.200 | 3.970 | 0.225 | 0.893 | 13.33 | 88.6 | 14.9 | 4.62 | 2 1/4 |
| W12x26 | 12.22 | 26.0 | 7.65 | 0.230 | 6.490 | 0.380 | 2.466 | 4.96 | 204 | 33.4 | 5.17 | 3 1/2 |
| W12x40 | 11.94 | 40.0 | 11.8 | 0.295 | 8.005 | 0.515 | 4.123 | 2.90 | 310 | 51.9 | 5.13 | 5 1/2 |
| W12x53 | 12.06 | 53.0 | 15.6 | 0.345 | 9.995 | 0.575 | 5.747 | 2.10 | 425.0 | 70.6 | 5.23 | 5 1/2 |
| W12x65 | 12.12 | 65.0 | 19.1 | 0.390 | 12.000 | 0.605 | 7.260 | 1.67 | 533 | 87.9 | 5.28 | 5 1/2 |
| W14x22 | 13.74 | 22.0 | 6.49 | 0.230 | 5.000 | 0.335 | 1.675 | 8.20 | 199 | 29.0 | 5.54 | 2 3/4 |
| W14x30 | 13.84 | 30.0 | 8.85 | 0.270 | 6.730 | 0.385 | 2.591 | 5.34 | 291 | 42.0 | 5.73 | 3 1/2 |
| W14x43 | 13.66 | 43.0 | 12.6 | 0.305 | 7.995 | 0.530 | 4.237 | 3.22 | 428 | 62.7 | 5.82 | 5 1/2 |
| W14x61 | 13.89 | 61.0 | 17.9 | 0.375 | 9.995 | 0.645 | 6.447 | 2.15 | 640 | 92.2 | 5.98 | 5 1/2 |
| W14x82 | 14.31 | 82.0 | 24.1 | 0.510 | 10.130 | 0.855 | 8.661 | 1.65 | 882 | 123.0 | 6.05 | 5 1/2 |
| W14x90 | 14.02 | 90.0 | 26.5 | 0.440 | 14.520 | 0.710 | 10.309 | 1.36 | 999 | 143.0 | 6.14 | 5 1/2 |
| W16x26 | 15.69 | 26.0 | 7.68 | 0.250 | 5.500 | 0.345 | 1.897 | 8.27 | 301 | 38.4 | 6.26 | 2 3/4 |
| W16x36 | 15.86 | 36.0 | 10.6 | 0.295 | 6.985 | 0.430 | 3.004 | 5.28 | 448 | 56.5 | 6.51 | 3 1/2 |
| W16x57 | 16.43 | 57.0 | 16.8 | 0.430 | 7.120 | 0.715 | 5.084 | 3.23 | 758 | 92.2 | 6.72 | 3 1/2 |
| W16x89 | 16.75 | 89.0 | 26.2 | 0.525 | 10.365 | 0.875 | 9.069 | 1.85 | 1300 | 155.0 | 7.05 | 5 1/2 |
| W18x35 | 17.70 | 35.0 | 10.3 | 0.300 | 6.000 | 0.425 | 2.550 | 6.94 | 510 | 57.6 | 7.04 | 3 1/2 |
| W18x46 | 18.06 | 46.0 | 13.5 | 0.360 | 6.060 | 0.605 | 3.666 | 4.93 | 712 | 78.8 | 7.25 | 3 1/2 |
| W18x65 | 18.35 | 65.0 | 19.1 | 0.450 | 7.590 | 0.750 | 5.692 | 3.22 | 1070 | 117.0 | 7.49 | 3 1/2 |
| W18x97 | 18.59 | 97.0 | 28.5 | 0.535 | 11.145 | 0.870 | 9.696 | 1.92 | 1750 | 188.0 | 7.82 | 5 1/2 |
| W21x44 | 20.66 | 44.0 | 13.0 | 0.350 | 6.500 | 0.450 | 2.925 | 7.06 | 843 | 81.6 | 8.06 | 3 1/2 |
| W21x57 | 21.06 | 57.0 | 16.7 | 0.405 | 6.555 | 0.650 | 4.261 | 4.94 | 1170 | 111 | 8.36 | 3 1/2 |
| W21x83 | 21.43 | 83.0 | 24.3 | 0.515 | 8.355 | 0.835 | 6.976 | 3.07 | 1830 | 171 | 8.67 | 5 1/2 |
| W21x111 | 21.51 | 111.0 | 32.7 | 0.550 | 12.340 | 0.875 | 10.798 | 1.99 | 2670 | 249 | 9.05 | 5 1/2 |
| W24x55 | 23.57 | 55.0 | 16.2 | 0.395 | 7.005 | 0.505 | 3.538 | 6.66 | 1350 | 114 | 9.11 | 3 1/2 |
| W24x68 | 23.73 | 68.0 | 20.1 | 0.415 | 8.965 | 0.585 | 5.245 | 4.52 | 1830 | 154 | 9.55 | 5 1/2 |
| W24x76 | 23.92 | 76.0 | 22.4 | 0.440 | 8.990 | 0.680 | 6.113 | 3.91 | 2100 | 176 | 9.69 | 5 1/2 |
| W24x104 | 24.06 | 104.0 | 30.6 | 0.500 | 12.750 | 0.750 | 9.562 | 2.52 | 3100 | 258 | 10.1 | 5 1/2 |
| W27x84 | 26.71 | 84.0 | 24.8 | 0.460 | 9.960 | 0.640 | 6.374 | 4.19 | 2850 | 213 | 10.7 | 5 1/2 |
| W27x94 | 26.92 | 94.0 | 27.7 | 0.490 | 9.990 | 0.745 | 7.443 | 3.62 | 3270 | 243 | 10.9 | 5 1/2 |
| W30x99 | 29.65 | 99.0 | 29.1 | 0.520 | 10.450 | 0.670 | 7.002 | 4.23 | 3990 | 269 | 11.7 | 5 1/2 |
| W30x108 | 29.83 | 108.0 | 31.7 | 0.545 | 10.475 | 0.760 | 7.961 | 3.75 | 4470 | 299 | 11.9 | 5 1/2 |
| W33x118 | 32.86 | 118.0 | 34.7 | 0.550 | 11.480 | 0.740 | 8.495 | 3.87 | 5900 | 359 | 13.0 | 5 1/2 |
| W36x135 | 35.55 | 135.0 | 39.7 | 0.600 | 11.950 | 0.790 | 9.440 | 3.77 | 7800 | 439 | 14.0 | 5 1/2 |
| W36x150 | 35.85 | 150.0 | 44.2 | 0.625 | 11.975 | 0.940 | 11.256 | 3.18 | 9040 | 504 | 14.3 | 5 1/2 |
| W36x230 | 35.90 | 230.0 | 67.6 | 0.760 | 16.470 | 1.260 | 20.752 | 1.73 | 15000 | 837 | 14.9 | 5 1/2 |

Lower flange loadings tabulated below are based on static load and do not consider service. Spacing between wheel centers must be equal to or greater than total flange width. All loading figures shown are in pounds.

| W Shape | Lower* Flange Loading | Span in feet | | Span in feet | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|-----------------------------|--------------|-------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|----|----|--|--|
| | | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 | | |
| 6x9 | 490 | 1996 D | 1357 D | 968 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 6x15 | 720 | 3547 D | 2416 D | 1726 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 8x10 | 450 | 2616 C | 1791 C | 1290 C | 961 C | 733 C | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 8x18 | 1,160 | 7632 D | 5243 D | 3794 D | 2845 D | 2188 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 8x24 | 1,705 | 10210 D | 7014 D | 5076 D | 3807 D | 2928 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 8x31 | 2,020 | 13570 D | 9325 D | 6751 D | 5066 D | 3899 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 10x12 | 470 | 3003 C | 2055 C | 1479 C | 1100 C | 837 C | 646 C | 501 C | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 10x22 | 1,380 | 13499 T | 10088 D | 7340 D | 5547 D | 4309 D | 3416 D | 2748 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 10x33 | 2,020 | 20366 T | 14524 D | 10564 D | 7979 D | 6194 D | 4905 D | 3941 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 10x49 | 3,345 | 31783 T | 23266 D | 16935 D | 12804 D | 9953 D | 7896 D | 6358 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 12x14 | 540 | 3654 C | 2502 C | 1802 C | 1343 C | 1023 C | 791 C | 615 C | 478 C | 369 C | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 12x26 | 1,540 | 19462 T | 15446 C | 11281 C | 8568 C | 6700 C | 5357 C | 4356 C | 3588 C | 2985 C | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 12x40 | 2,830 | 30244 T | 25130 T | 19439 D | 14751 D | 11521 D | 9197 D | 7464 D | 6134 D | 5088 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 12x53 | 3,525 | 41149 T | 34194 T | 26667 D | 20242 D | 15816 D | 12632 D | 10258 D | 8437 D | 7005 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 12x65 | 3,905 | 51237 T | 42578 T | 33456 D | 25400 D | 19852 D | 15860 D | 12885 D | 10603 D | 8809 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 14x22 | 1,200 | 11674 C | 8052 C | 5858 C | 4427 C | 3439 C | 2726 C | 2193 C | 1782 C | 1457 C | 1195 C | 979 C | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 14x30 | 1,580 | 24487 T | 18021 C | 13162 C | 9998 C | 7819 C | 6252 C | 5085 C | 4190 C | 3487 C | 2923 C | 2462 C | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 14x43 | 2,995 | 36565 T | 30392 T | 25970 D | 20488 D | 16044 D | 12850 D | 10473 D | 8652 D | 7223 D | 6078 D | 5144 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 14x61 | 4,440 | 53779 T | 44704 T | 38205 D | 30670 D | 24029 D | 19257 D | 15706 D | 12987 D | 10854 D | 9146 D | 7754 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 14x82 | 7,800 | 71742 T | 59635 T | 50963 D | 42288 D | 33138 D | 26564 D | 21673 D | 17929 D | 14992 D | 12641 D | 10724 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 14x90 | 5,375 | 83434 T | 69363 T | 59287 D | 47926 D | 37566 D | 30124 D | 24588 D | 20351 D | 17028 D | 14368 D | 12201 D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 16x26 | 1,270 | 15345 C | 10590 C | 7713 C | 5837 C | 4542 C | 3609 C | 2911 C | 2375 C | 1951 C | 1610 C | 1329 C | 1095 C | 897 C | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 16x36 | 1,970 | 32963 T | 24556 C | 17948 C | 13646 C | 10686 C | 8558 C | 6974 C | 5761 C | 4809 C | 4046 C | 3,423 C | 2907 C | 2474 C | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 16x57 | 5,450 | 53800 T | 44728 T | 38233 D | 33347 D | 28631 D | 22998 D | 18811 D | 15610 D | 13103 D | 11099 D | 9,469 D | 8,122 D | 6993 D | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 16x89 | 8,165 | 90478 T | 75235 T | 64322 D | 56115 D | 49201 D | 39552 D | 32383 D | 26904 D | 22615 D | 19189 D | 16404 D | 14104 D | 12179 D | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 18x35 | 1,925 | 27486 C | 18999 C | 13868 C | 10525 C | 8222 C | 6565 C | 5330 C | 4382 C | 3637 C | 3038 C | 2548 C | 2141 C | 1798 C | 1504 C | 1250 C | - | - | - | - | - | - | - | - | - | - | - | | |
| 18x46 | 3,905 | 45994 T | 36751 C | 26881 C | 20460 C | 16042 C | 12870 C | 10510 C | 8705 C | 7289 C | 6157 C | 5234 C | 4471 C | 3830 C | 3286 C | 2818 C | - | - | - | - | - | - | - | - | - | - | - | | |
| 18x65 | 6,000 | 68307 T | 56804 T | 48568 D | 42375 D | 36753 C | 29594 C | 24280 C | 20222 C | 17050 C | 14520 C | 12466 C | 10774 C | 9360 C | 8164 C | 7142 C | - | - | - | - | - | - | - | - | - | - | - | | |
| 18x97 | 8,070 | - | 91319 T | 78093 T | 68150 T | 60394 T | 53528 D | 43906 D | 36559 D | 30814 D | 26231 D | 22510 D | 19443 D | 16880 D | 14712 D | 12859 D | - | - | - | - | - | - | - | - | - | - | - | | |
| 21x44 | 2,160 | 38289 C | 26478 C | 19340 C | 14691 C | 11490 C | 9187 C | 7472 C | 6158 C | 5125 C | 4296 C | 3619 C | 3056 C | 2583 C | 2179 C | 1831 C | 1527 C | 1259 C | 1021 C | - | - | - | - | - | - | - | - | | |
| 21x57 | 4,505 | 64828 T | 51645 C | 37795 C | 28786 C | 22592 C | 18145 C | 14840 C | 12312 C | 10333 C | 8750 C | 7463 C | 6398 C | 5507 C | 4750 C | 4101 C | 3539 C | 3047 C | 2612 C | - | - | - | - | - | - | - | - | | |
| 21x83 | 7,435 | 99894 T | 83092 T | 71068 T | 62029 D | 54980 D | 45557 C | 37423 C | 31217 C | 26369 C | 22505 C | 19371 C | 16792 C | 14640 C | 12823 C | 11272 C | 9937 C | 8775 C | 7758 C | - | - | - | - | - | - | - | - | | |
| 21x111 | 8,165 | - | - | - | 90402 T | 80147 T | 71922 D | 65171 D | 56333 D | 47615 D | 40668 D | 35037 D | 30404 D | 26540 D | 23279 D | 20499 D | 18104 D | 16024 D | 14203 D | - | - | - | - | - | - | - | - | | |
| 24x55 | 2,720 | 56765 C | 39,281 C | 28717 C | 21841 C | 17110 C | 13710 C | 11180 C | 9243 C | 7723 C | 6505 C | 5513 C | 4690 C | 3999 C | 3411 C | 2905 C | 2465 C | 2078 C | 1736 C | 1430 C | 1155 C | 906 C | - | - | - | - | - | | |
| 24x68 | 3,650 | 89996 T | 74872 T | 57412 C | 43777 C | 34407 C | 27685 C | 22694 C | 18882 C | 15900 C | 13520 C | 11587 C | 9992 C | 8659 C | 7530 C | 6565 C | 5731 C | 5004 C | 4364 C | 3798 C | 3292 C | 2838 C | - | - | - | - | - | | |
| 24x76 | 4,930 | - | 85578 T | 73212 T | 57958 C | 45590 C | 36722 C | 30141 C | 25117 C | 21191 C | 18059 C | 15518 C | 13425 C | 11677 C | 10200 C | 8939 C | 7850 C | 6903 C | 6072 C | 5337 C | 4683 C | 4097 C | - | - | - | - | - | | |
| 24x104 | 6,000 | - | - | - | 93757 T | 83143 T | 74631 T | 67648 T | 58089 D | 49207 D | 42139 D | 36416 D | 31713 D | 27798 D | 24500 D | 21693 D | 19281 D | 17191 D | 15366 D | 13760 D | 12338 D | 11071 D | - | - | - | - | - | | |
| 27x84 | 4,370 | - | - | 85857 C | 65512 C | 51538 C | 41518 C | 34082 C | 28407 C | 23972 C | 20435 C | 17566 C | 15202 C | 13229 C | 11561 C | 10137 C | 8909 C | 7841 C | 6903 C | 6075 C | 5338 C | 4677 C | 4082 C | 3542 C | 3050 C | - | - | | |
| 27x94 | 5,920 | - | - | - | 86730 C | 68275 C | 55048 C | 45237 C | 37753 C | 31907 C | 27249 C | 23473 C | 20366 C | 17775 C | 15588 C | 13723 C | 12117 C | 10722 C | 9500 C | 8422 C | 7464 C | 6608 C | 5838 C | 5142 C | 4509 C | - | - | | |
| 30x99 | 4,790 | - | - | - | 81924 C | 64464 C | 51948 C | 42661 C | 35574 C | 30037 C | 25623 C | 22043 C | 19095 C | 16634 C | 14557 C | 12783 C | 11254 C | 9925 C | 8759 C | 7730 C | 6814 C | 5995 C | 5257 C | | | | | | |

* Recommended Lower Flange Loading per pair of wheels

Limits T = Tension C = Compression D = Vertical Defl. L = Lateral Defl.