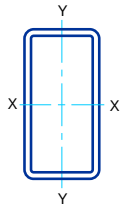
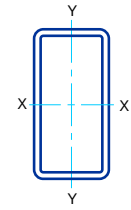



# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties

| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 30×24 | 0.5000 | ½ | 178.16 | 52.4 | 7110 | 474 | 555 | 11.7 | 5070 | 422 | 477 | 9.84 | 9170 |
| | 0.3750 | ⅜ | 134.67 | 39.6 | 5430 | 362 | 422 | 11.7 | 3870 | 323 | 363 | 9.89 | 6960 |
| | 0.3125 | 5/16 | 112.66 | 33.1 | 4570 | 305 | 354 | 11.7 | 3260 | 272 | 304 | 9.92 | 5830 |
| 28×24 | 0.5000 | ½ | 171.35 | 50.4 | 6050 | 432 | 503 | 11.0 | 4790 | 399 | 454 | 9.75 | 8280 |
| | 0.3750 | ⅜ | 129.56 | 38.1 | 4630 | 331 | 383 | 11.0 | 3660 | 305 | 345 | 9.81 | 6290 |
| | 0.3125 | 5/16 | 108.41 | 31.9 | 3890 | 278 | 321 | 11.1 | 3080 | 257 | 290 | 9.84 | 5270 |
| 26×24 | 0.5000 | ½ | 164.55 | 48.4 | 5100 | 392 | 454 | 10.3 | 4510 | 376 | 430 | 9.66 | 7410 |
| | 0.3750 | ⅜ | 124.46 | 36.6 | 3900 | 300 | 345 | 10.3 | 3460 | 288 | 327 | 9.72 | 5630 |
| | 0.3125 | 5/16 | 104.15 | 30.6 | 3280 | 253 | 290 | 10.4 | 2910 | 242 | 275 | 9.75 | 4720 |
| 24×22 | 0.5000 | ½ | 150.93 | 44.4 | 3960 | 330 | 383 | 9.45 | 3470 | 315 | 361 | 8.84 | 5740 |
| | 0.3750 | ⅜ | 114.25 | 33.6 | 3040 | 253 | 292 | 9.51 | 2660 | 242 | 275 | 8.90 | 4370 |
| | 0.3125 | 5/16 | 95.64 | 28.1 | 2560 | 213 | 245 | 9.54 | 2240 | 204 | 231 | 8.93 | 3660 |
| 22×20 | 0.5000 | ½ | 137.32 | 40.4 | 3010 | 273 | 318 | 8.63 | 2600 | 260 | 298 | 8.03 | 4350 |
| | 0.3750 | ⅜ | 104.04 | 30.6 | 2310 | 210 | 243 | 8.69 | 2000 | 200 | 228 | 8.09 | 3310 |
| | 0.3125 | 5/16 | 87.14 | 25.6 | 1950 | 177 | 204 | 8.72 | 1690 | 169 | 192 | 8.12 | 2780 |
| 20×18 | 0.5000 | ½ | 123.71 | 36.4 | 2220 | 222 | 259 | 7.81 | 1890 | 210 | 242 | 7.21 | 3190 |
| | 0.3750 | ⅜ | 93.83 | 27.6 | 1710 | 171 | 198 | 7.88 | 1460 | 162 | 185 | 7.27 | 2440 |
| | 0.3125 | 5/16 | 78.63 | 23.1 | 1440 | 144 | 167 | 7.91 | 1230 | 137 | 155 | 7.30 | 2050 |
| 20×12 | 0.5000 | ½ | 103.30 | 30.4 | 1650 | 165 | 201 | 7.37 | 750 | 125 | 141 | 4.97 | 1650 |
| | 0.3750 | ⅜ | 78.52 | 23.1 | 1280 | 128 | 154 | 7.45 | 583 | 97.2 | 109 | 5.03 | 1270 |
| | 0.3125 | 5/16 | 65.87 | 19.4 | 1080 | 108 | 130 | 7.47 | 495 | 82.5 | 91.8 | 5.06 | 1070 |
| 20×8 | 0.5000 | ½ | 89.68 | 26.4 | 1270 | 127 | 162 | 6.94 | 300 | 75.1 | 84.7 | 3.38 | 806 |
| | 0.3750 | ⅜ | 68.31 | 20.1 | 988 | 98.8 | 125 | 7.02 | 236 | 59.1 | 65.6 | 3.43 | 625 |
| | 0.3125 | 5/16 | 57.36 | 16.9 | 838 | 83.8 | 105 | 7.05 | 202 | 50.4 | 55.6 | 3.46 | 529 |
| 20×4 | 0.5000 | ½ | 76.07 | 22.4 | 889 | 88.9 | 123 | 6.31 | 61.6 | 30.8 | 36.0 | 1.66 | 205 |
| | 0.3750 | ⅜ | 58.10 | 17.1 | 699 | 69.9 | 95.3 | 6.40 | 50.3 | 25.1 | 28.5 | 1.72 | 165 |
| | 0.3125 | 5/16 | 48.86 | 14.4 | 596 | 59.6 | 80.8 | 6.44 | 43.7 | 21.8 | 24.3 | 1.74 | 143 |

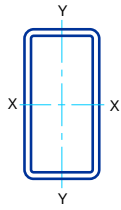
*Outside dimensions across flat sides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.

# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties




| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 18×12 | 0.5000 | 1/2 | 96.49 | 28.4 | 1280 | 142 | 172 | 6.71 | 684 | 114 | 130 | 4.91 | 1420 |
| | 0.3750 | 3/8 | 73.42 | 21.6 | 991 | 110 | 132 | 6.78 | 533 | 88.8 | 100 | 4.97 | 1090 |
| | 0.3125 | 5/16 | 61.62 | 18.1 | 840 | 93.3 | 111 | 6.81 | 452 | 75.3 | 84.5 | 5.00 | 920 |
| 18×6 | 0.5000 | 1/2 | 76.07 | 22.4 | 818 | 90.9 | 119 | 6.05 | 141 | 47.2 | 53.9 | 2.52 | 410 |
| | 0.3750 | 3/8 | 58.10 | 17.1 | 641 | 71.3 | 92.2 | 6.13 | 113 | 37.6 | 42.1 | 2.57 | 322 |
| | 0.3125 | 5/16 | 48.86 | 14.4 | 546 | 60.7 | 78.1 | 6.17 | 97.0 | 32.3 | 35.8 | 2.60 | 274 |
| | 0.2500 | 1/4 | 39.43 | 11.6 | 447 | 49.6 | 63.5 | 6.21 | 80.0 | 26.7 | 29.2 | 2.63 | 224 |
| 16×12 | 0.5000 | 1/2 | 89.68 | 26.4 | 962 | 120 | 144 | 6.04 | 618 | 103 | 118 | 4.84 | 1200 |
| | 0.3750 | 3/8 | 68.31 | 20.1 | 748 | 93.5 | 111 | 6.11 | 482 | 80.3 | 91.3 | 4.90 | 922 |
| | 0.3125 | 5/16 | 57.36 | 16.9 | 635 | 79.4 | 93.8 | 6.14 | 409 | 68.2 | 77.2 | 4.93 | 777 |
| 16×8 | 0.5000 | 1/2 | 76.07 | 22.4 | 722 | 90.2 | 113 | 5.68 | 244 | 61.0 | 69.7 | 3.30 | 599 |
| | 0.3750 | 3/8 | 58.10 | 17.1 | 565 | 70.6 | 87.6 | 5.75 | 193 | 48.2 | 54.2 | 3.36 | 465 |
| | 0.3125 | 5/16 | 48.86 | 14.4 | 481 | 60.1 | 74.2 | 5.79 | 165 | 41.2 | 45.9 | 3.39 | 394 |
| 16×4 | 0.5000 | 1/2 | 62.46 | 18.4 | 481 | 60.2 | 82.2 | 5.12 | 49.3 | 24.6 | 29.0 | 1.64 | 157 |
| | 0.3750 | 3/8 | 47.90 | 14.1 | 382 | 47.8 | 64.2 | 5.21 | 40.4 | 20.2 | 23.0 | 1.69 | 127 |
| | 0.3125 | 5/16 | 40.35 | 11.9 | 327 | 40.9 | 54.5 | 5.25 | 35.1 | 17.6 | 19.7 | 1.72 | 110 |
| 14×12 | 0.5000 | 1/2 | 82.88 | 24.4 | 699 | 99.9 | 119 | 5.36 | 552 | 91.9 | 107 | 4.76 | 983 |
| | 0.3750 | 3/8 | 63.21 | 18.6 | 546 | 78.0 | 91.7 | 5.42 | 431 | 71.9 | 82.6 | 4.82 | 757 |
| 14×10 | 0.5000 | 1/2 | 76.07 | 22.4 | 608 | 86.9 | 105 | 5.22 | 361 | 72.3 | 83.6 | 4.02 | 730 |
| | 0.3750 | 3/8 | 58.10 | 17.1 | 476 | 68.0 | 81.5 | 5.28 | 284 | 56.8 | 64.8 | 4.08 | 564 |
| | 0.3125 | 5/16 | 48.86 | 14.4 | 405 | 57.9 | 69.0 | 5.31 | 242 | 48.4 | 54.9 | 4.11 | 477 |
| 14×6 | 0.6250 | 5/8 | 76.33 | 22.4 | 504 | 72.0 | 94.0 | 4.74 | 130 | 43.3 | 51.2 | 2.41 | 352 |
| | 0.5000 | 1/2 | 62.46 | 18.4 | 426 | 60.8 | 78.3 | 4.82 | 111 | 37.1 | 42.9 | 2.46 | 296 |
| | 0.3750 | 3/8 | 47.90 | 14.1 | 337 | 48.1 | 61.1 | 4.89 | 89.1 | 29.7 | 33.6 | 2.52 | 233 |
| | 0.3125 | 5/16 | 40.35 | 11.9 | 288 | 41.2 | 51.9 | 4.93 | 76.7 | 25.6 | 28.7 | 2.54 | 199 |
| | 0.2500 | 1/4 | 32.63 | 9.59 | 237 | 33.8 | 42.3 | 4.97 | 63.4 | 21.1 | 23.4 | 2.57 | 162 |

*Outside dimensions across flat sides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.

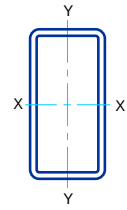



# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties

| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 14×4 | 0.6250 | 5/8 | 67.82 | 19.9 | 392 | 56.0 | 77.3 | 4.44 | 49.0 | 24.5 | 30.0 | 1.57 | 154 |
| | 0.5000 | 1/2 | 55.66 | 16.4 | 335 | 47.8 | 64.8 | 4.52 | 43.1 | 21.5 | 25.5 | 1.62 | 134 |
| | 0.3750 | 3/8 | 42.79 | 12.6 | 267 | 38.2 | 50.8 | 4.61 | 35.4 | 17.7 | 20.3 | 1.68 | 108 |
| | 0.3125 | 5/16 | 36.10 | 10.6 | 230 | 32.8 | 43.3 | 4.65 | 30.9 | 15.4 | 17.4 | 1.71 | 93.1 |
| | 0.2500 | 1/4 | 29.23 | 8.59 | 189 | 27.0 | 35.4 | 4.69 | 25.8 | 12.9 | 14.3 | 1.73 | 77.0 |
| | 0.1875 | 3/16 | 22.18 | 6.52 | 146 | 20.9 | 27.1 | 4.74 | 20.2 | 10.1 | 11.1 | 1.76 | 59.7 |
| 12×10 | 0.5000 | 1/2 | 69.27 | 20.4 | 419 | 69.9 | 83.9 | 4.54 | 316 | 63.3 | 74.1 | 3.94 | 581 |
| | 0.3750 | 3/8 | 53.00 | 15.6 | 330 | 55.0 | 65.2 | 4.60 | 249 | 49.8 | 57.6 | 4.00 | 450 |
| | 0.3125 | 5/16 | 44.60 | 13.1 | 281 | 46.9 | 55.2 | 4.63 | 213 | 42.6 | 48.8 | 4.03 | 381 |
| | 0.2500 | 1/4 | 36.03 | 10.6 | 230 | 38.4 | 44.9 | 4.66 | 174 | 34.9 | 39.7 | 4.06 | 309 |
| 12×8 | 0.6250 | 5/8 | 76.33 | 22.4 | 418 | 69.7 | 87.1 | 4.32 | 221 | 55.3 | 65.6 | 3.14 | 481 |
| | 0.5000 | 1/2 | 62.46 | 18.4 | 353 | 58.9 | 72.4 | 4.39 | 188 | 46.9 | 54.7 | 3.20 | 401 |
| | 0.3750 | 3/8 | 47.90 | 14.1 | 279 | 46.5 | 56.5 | 4.45 | 149 | 37.3 | 42.7 | 3.26 | 312 |
| | 0.3125 | 5/16 | 40.35 | 11.9 | 239 | 39.8 | 47.9 | 4.49 | 128 | 32.0 | 36.3 | 3.28 | 265 |
| | 0.2500 | 1/4 | 32.63 | 9.59 | 196 | 32.6 | 39.1 | 4.52 | 105 | 26.3 | 29.6 | 3.31 | 216 |
| | 0.1875 | 3/16 | 24.73 | 7.27 | 151 | 25.1 | 29.8 | 4.55 | 81.1 | 20.3 | 22.7 | 3.34 | 165 |
| 12×6 | 0.6250 | 5/8 | 67.82 | 19.9 | 337 | 56.2 | 72.9 | 4.11 | 112 | 37.2 | 44.5 | 2.37 | 286 |
| | 0.5000 | 1/2 | 55.66 | 16.4 | 287 | 47.8 | 60.9 | 4.19 | 96.0 | 32.0 | 37.4 | 2.42 | 241 |
| | 0.3750 | 3/8 | 42.79 | 12.6 | 228 | 38.1 | 47.7 | 4.26 | 77.2 | 25.7 | 29.4 | 2.48 | 190 |
| | 0.3125 | 5/16 | 36.10 | 10.6 | 196 | 32.6 | 40.6 | 4.30 | 66.6 | 22.2 | 25.1 | 2.51 | 162 |
| | 0.2500 | 1/4 | 29.23 | 8.59 | 161 | 26.9 | 33.2 | 4.33 | 55.2 | 18.4 | 20.6 | 2.53 | 132 |
| | 0.1875 | 3/16 | 22.18 | 6.52 | 124 | 20.7 | 25.4 | 4.37 | 42.8 | 14.3 | 15.8 | 2.56 | 101 |
| 12×4 | 0.6250 | 5/8 | 59.32 | 17.4 | 257 | 42.8 | 58.6 | 3.84 | 41.8 | 20.9 | 25.8 | 1.55 | 127 |
| | 0.5000 | 1/2 | 48.85 | 14.4 | 221 | 36.8 | 49.4 | 3.92 | 36.9 | 18.5 | 22.0 | 1.60 | 110 |
| | 0.3750 | 3/8 | 37.69 | 11.1 | 178 | 29.6 | 39.0 | 4.01 | 30.5 | 15.2 | 17.6 | 1.66 | 89.0 |
| | 0.3125 | 5/16 | 31.84 | 9.36 | 153 | 25.5 | 33.3 | 4.05 | 26.6 | 13.3 | 15.1 | 1.69 | 76.9 |
| | 0.2500 | 1/4 | 25.82 | 7.59 | 127 | 21.1 | 27.3 | 4.09 | 22.3 | 11.1 | 12.5 | 1.71 | 63.6 |
| | 0.1875 | 3/16 | 19.63 | 5.77 | 98.2 | 16.4 | 21.0 | 4.13 | 17.5 | 8.75 | 9.63 | 1.74 | 49.3 |
| 12×3 | 0.3125 | 5/16 | 29.72 | 8.73 | 132 | 22.0 | 29.7 | 3.89 | 13.8 | 9.19 | 10.6 | 1.26 | 43.6 |
| | 0.2500 | 1/4 | 24.12 | 7.09 | 109 | 18.2 | 24.4 | 3.93 | 11.7 | 7.79 | 8.80 | 1.28 | 36.5 |
| | 0.1875 | 3/16 | 18.35 | 5.39 | 85.1 | 14.2 | 18.8 | 3.97 | 9.28 | 6.19 | 6.84 | 1.31 | 28.7 |

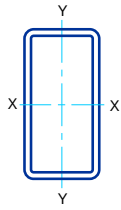
*Outside dimensions across flat sides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.

# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties




| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 12×2 | 0.2500 | 1/4 | 22.42 | 6.59 | 92.2 | 15.4 | 21.4 | 3.74 | 4.62 | 4.62 | 5.38 | 0.837 | 15.9 |
| | 0.1875 | 3/16 | 17.08 | 5.02 | 72.0 | 12.0 | 16.6 | 3.79 | 3.76 | 3.76 | 4.24 | 0.865 | 12.8 |
| 10×8 | 0.5000 | 1/2 | 55.66 | 16.4 | 226 | 45.2 | 55.1 | 3.72 | 160 | 39.9 | 47.2 | 3.12 | 306 |
| | 0.3750 | 3/8 | 42.79 | 12.6 | 180 | 35.9 | 43.1 | 3.78 | 127 | 31.8 | 37.0 | 3.18 | 239 |
| | 0.3125 | 5/16 | 36.10 | 10.6 | 154 | 30.8 | 36.7 | 3.81 | 109 | 27.3 | 31.5 | 3.21 | 203 |
| | 0.2500 | 1/4 | 29.23 | 8.59 | 127 | 25.4 | 30.0 | 3.84 | 90.2 | 22.5 | 25.8 | 3.24 | 166 |
| | 0.1875 | 3/16 | 22.18 | 6.52 | 97.9 | 19.6 | 23.0 | 3.87 | 69.7 | 17.4 | 19.7 | 3.27 | 127 |
| 10×6 | 0.5000 | 1/2 | 48.85 | 14.4 | 181 | 36.2 | 45.6 | 3.55 | 80.8 | 26.9 | 31.9 | 2.37 | 187 |
| | 0.3750 | 3/8 | 37.69 | 11.1 | 145 | 29.0 | 35.9 | 3.62 | 65.4 | 21.8 | 25.2 | 2.43 | 147 |
| | 0.3125 | 5/16 | 31.84 | 9.36 | 125 | 25.0 | 30.7 | 3.65 | 56.5 | 18.8 | 21.5 | 2.46 | 126 |
| | 0.2500 | 1/4 | 25.82 | 7.59 | 103 | 20.6 | 25.1 | 3.69 | 46.9 | 15.6 | 17.7 | 2.49 | 103 |
| | 0.1875 | 3/16 | 19.63 | 5.77 | 79.8 | 16.0 | 19.3 | 3.72 | 36.5 | 12.2 | 13.6 | 2.51 | 79.1 |
| 10×5 | 0.3750 | 3/8 | 35.13 | 10.3 | 128 | 25.5 | 32.3 | 3.51 | 42.9 | 17.1 | 19.9 | 2.04 | 107 |
| | 0.3125 | 5/16 | 29.72 | 8.73 | 110 | 22.0 | 27.6 | 3.55 | 37.2 | 14.9 | 17.0 | 2.07 | 91.5 |
| | 0.2500 | 1/4 | 24.12 | 7.09 | 91.2 | 18.2 | 22.7 | 3.59 | 31.1 | 12.4 | 14.0 | 2.09 | 75.2 |
| | 0.1875 | 3/16 | 18.35 | 5.39 | 70.8 | 14.2 | 17.4 | 3.62 | 24.3 | 9.71 | 10.8 | 2.12 | 58.0 |
| 10×4 | 0.5000 | 1/2 | 42.05 | 12.4 | 136 | 27.1 | 36.1 | 3.31 | 30.8 | 15.4 | 18.5 | 1.58 | 86.9 |
| | 0.3750 | 3/8 | 32.58 | 9.58 | 110 | 22.0 | 28.7 | 3.39 | 25.5 | 12.8 | 14.9 | 1.63 | 70.4 |
| | 0.3125 | 5/16 | 27.59 | 8.11 | 95.5 | 19.1 | 24.6 | 3.43 | 22.4 | 11.2 | 12.8 | 1.66 | 60.8 |
| | 0.2500 | 1/4 | 22.42 | 6.59 | 79.3 | 15.9 | 20.2 | 3.47 | 18.8 | 9.39 | 10.6 | 1.69 | 50.4 |
| | 0.1875 | 3/16 | 17.08 | 5.02 | 61.7 | 12.3 | 15.6 | 3.51 | 14.8 | 7.39 | 8.20 | 1.72 | 39.1 |
| 10×3 | 0.3750 | 3/8 | 30.0 | 8.83 | 92.8 | 18.6 | 25.1 | 3.24 | 13.0 | 8.66 | 10.3 | 1.21 | 39.8 |
| | 0.3125 | 5/16 | 25.5 | 7.48 | 80.8 | 16.2 | 21.6 | 3.29 | 11.5 | 7.68 | 8.92 | 1.24 | 34.9 |
| | 0.2500 | 1/4 | 20.72 | 6.09 | 67.4 | 13.5 | 17.8 | 3.33 | 9.79 | 6.53 | 7.42 | 1.27 | 29.3 |
| | 0.1875 | 3/16 | 15.80 | 4.64 | 52.7 | 10.5 | 13.8 | 3.37 | 7.80 | 5.20 | 5.79 | 1.30 | 23.0 |
| 10×2 | 0.3750 | 3/8 | 27.48 | 8.08 | 75.4 | 15.1 | 21.5 | 3.06 | 4.85 | 4.85 | 6.05 | 0.775 | 16.5 |
| | 0.3125 | 5/16 | 23.34 | 6.86 | 66.1 | 13.2 | 18.5 | 3.10 | 4.42 | 4.42 | 5.33 | 0.802 | 14.9 |
| | 0.2500 | 1/4 | 19.02 | 5.59 | 55.5 | 11.1 | 15.4 | 3.15 | 3.85 | 3.85 | 4.50 | 0.830 | 12.8 |
| | 0.1875 | 3/16 | 14.53 | 4.27 | 43.7 | 8.74 | 11.9 | 3.20 | 3.14 | 3.14 | 3.56 | 0.858 | 10.3 |

*Outside dimensions across flat sides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.

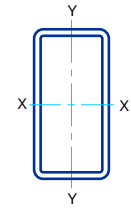



# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties

| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 8×6 | 0.5000 | 1/2 | 42.05 | 12.4 | 103 | 25.8 | 32.2 | 2.89 | 65.7 | 21.9 | 26.4 | 2.31 | 135 |
| | 0.3750 | 3/8 | 32.58 | 9.58 | 83.7 | 20.9 | 25.6 | 2.96 | 53.5 | 17.8 | 21.0 | 2.36 | 107 |
| | 0.3125 | 5/16 | 27.59 | 8.11 | 72.4 | 18.1 | 21.9 | 2.99 | 46.4 | 15.5 | 18.0 | 2.39 | 91.3 |
| | 0.2500 | 1/4 | 22.42 | 6.59 | 60.1 | 15.0 | 18.0 | 3.02 | 38.6 | 12.9 | 14.8 | 2.42 | 74.9 |
| | 0.1875 | 3/16 | 17.08 | 5.02 | 46.8 | 11.7 | 13.9 | 3.05 | 30.1 | 10.0 | 11.4 | 2.45 | 57.6 |
| 8×4 | 0.6250 | 5/8 | 42.30 | 12.4 | 85.1 | 21.3 | 28.8 | 2.62 | 27.4 | 13.7 | 17.3 | 1.49 | 73.2 |
| | 0.5000 | 1/2 | 35.24 | 10.4 | 75.1 | 18.8 | 24.7 | 2.69 | 24.6 | 12.3 | 15.0 | 1.54 | 64.1 |
| | 0.3750 | 3/8 | 27.48 | 8.08 | 61.9 | 15.5 | 19.9 | 2.77 | 20.6 | 10.3 | 12.2 | 1.60 | 52.2 |
| | 0.3125 | 5/16 | 23.34 | 6.86 | 53.9 | 13.5 | 17.1 | 2.80 | 18.1 | 9.05 | 10.5 | 1.62 | 45.2 |
| | 0.2500 | 1/4 | 19.02 | 5.59 | 45.1 | 11.3 | 14.1 | 2.84 | 15.3 | 7.63 | 8.72 | 1.65 | 37.5 |
| | 0.1875 | 3/16 | 14.53 | 4.27 | 35.3 | 8.83 | 11.0 | 2.88 | 12.0 | 6.02 | 6.77 | 1.68 | 29.1 |
| | 0.1250 | 1/8 | 9.86 | 2.90 | 24.6 | 6.14 | 7.53 | 2.91 | 8.45 | 4.23 | 4.67 | 1.71 | 20.0 |
| 8×3 | 0.5000 | 1/2 | 31.84 | 9.36 | 61.0 | 15.3 | 21.0 | 2.55 | 12.1 | 8.05 | 10.1 | 1.14 | 35.7 |
| | 0.3750 | 3/8 | 24.93 | 7.33 | 51.0 | 12.7 | 17.0 | 2.64 | 10.4 | 6.92 | 8.31 | 1.19 | 29.9 |
| | 0.3125 | 5/16 | 21.21 | 6.23 | 44.7 | 11.2 | 14.7 | 2.68 | 9.25 | 6.16 | 7.24 | 1.22 | 26.3 |
| | 0.2500 | 1/4 | 17.32 | 5.09 | 37.6 | 9.40 | 12.2 | 2.72 | 7.90 | 5.26 | 6.05 | 1.25 | 22.1 |
| | 0.1875 | 3/16 | 13.25 | 3.89 | 29.6 | 7.40 | 9.49 | 2.76 | 6.31 | 4.21 | 4.73 | 1.27 | 17.3 |
| | 0.1250 | 1/8 | 9.01 | 2.65 | 20.7 | 5.17 | 6.55 | 2.80 | 4.48 | 2.99 | 3.29 | 1.30 | 12.1 |
| 8×2 | 0.3750 | 3/8 | 22.37 | 6.58 | 40.1 | 10.0 | 14.2 | 2.47 | 3.85 | 3.85 | 4.83 | 0.765 | 12.6 |
| | 0.3125 | 5/16 | 19.08 | 5.61 | 35.5 | 8.87 | 12.3 | 2.51 | 3.52 | 3.52 | 4.28 | 0.792 | 11.4 |
| | 0.2500 | 1/4 | 15.62 | 4.59 | 30.1 | 7.52 | 10.3 | 2.56 | 3.08 | 3.08 | 3.63 | 0.819 | 9.84 |
| | 0.1875 | 3/16 | 11.97 | 3.52 | 23.9 | 5.97 | 8.02 | 2.60 | 2.52 | 2.52 | 2.88 | 0.847 | 7.94 |
| | 0.1250 | 1/8 | 8.16 | 2.40 | 16.8 | 4.20 | 5.56 | 2.65 | 1.83 | 1.83 | 2.03 | 0.875 | 5.66 |
| 7×5 | 0.5000 | 1/2 | 35.24 | 10.4 | 63.5 | 18.1 | 23.1 | 2.48 | 37.2 | 14.9 | 18.2 | 1.90 | 79.9 |
| | 0.3750 | 3/8 | 27.48 | 8.08 | 52.2 | 14.9 | 18.5 | 2.54 | 30.8 | 12.3 | 14.6 | 1.95 | 64.2 |
| | 0.3125 | 5/16 | 23.34 | 6.86 | 45.5 | 13.0 | 15.9 | 2.58 | 26.9 | 10.8 | 12.6 | 1.98 | 55.3 |
| | 0.2500 | 1/4 | 19.02 | 5.59 | 38.0 | 10.9 | 13.2 | 2.61 | 22.6 | 9.04 | 10.4 | 2.01 | 45.6 |
| | 0.1875 | 3/16 | 14.53 | 4.27 | 29.8 | 8.50 | 10.2 | 2.64 | 17.7 | 7.10 | 8.10 | 2.04 | 35.3 |
| | 0.1250 | 1/8 | 9.86 | 2.90 | 20.7 | 5.91 | 7.00 | 2.67 | 12.4 | 4.95 | 5.58 | 2.07 | 24.2 |
| 7×4 | 0.3750 | 3/8 | 24.93 | 7.33 | 44.0 | 12.6 | 16.0 | 2.45 | 18.1 | 9.06 | 10.8 | 1.57 | 43.3 |
| | 0.3125 | 5/16 | 21.21 | 6.23 | 38.5 | 11.0 | 13.8 | 2.49 | 16.0 | 7.98 | 9.36 | 1.60 | 37.5 |
| | 0.2500 | 1/4 | 17.32 | 5.09 | 32.3 | 9.23 | 11.5 | 2.52 | 13.5 | 6.75 | 7.78 | 1.63 | 31.2 |
| | 0.1875 | 3/16 | 13.25 | 3.89 | 25.4 | 7.26 | 8.91 | 2.55 | 10.7 | 5.34 | 6.06 | 1.66 | 24.2 |
| | 0.1250 | 1/8 | 9.01 | 2.65 | 17.7 | 5.07 | 6.15 | 2.59 | 7.51 | 3.76 | 4.19 | 1.68 | 16.7 |

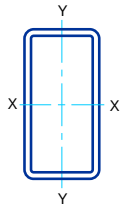
*Outside dimensions across flat sides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.

# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties




| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 7×3 | 0.3750 | 3/8 | 22.37 | 6.58 | 35.7 | 10.2 | 13.5 | 2.33 | 9.08 | 6.05 | 7.32 | 1.18 | 25.1 |
| | 0.3125 | 5/16 | 19.08 | 5.61 | 31.5 | 9.00 | 11.8 | 2.37 | 8.11 | 5.41 | 6.40 | 1.20 | 22.0 |
| | 0.2500 | 1/4 | 15.62 | 4.59 | 26.6 | 7.61 | 9.79 | 2.41 | 6.95 | 4.63 | 5.36 | 1.23 | 18.5 |
| | 0.1875 | 3/16 | 11.97 | 3.52 | 21.1 | 6.02 | 7.63 | 2.45 | 5.57 | 3.71 | 4.20 | 1.26 | 14.6 |
| | 0.1250 | 1/8 | 8.16 | 2.40 | 14.8 | 4.22 | 5.29 | 2.48 | 3.96 | 2.64 | 2.93 | 1.29 | 10.2 |
| 6×4 | 0.5000 | 1/2 | 28.43 | 8.36 | 35.3 | 11.8 | 15.4 | 2.06 | 18.4 | 9.21 | 11.5 | 1.48 | 42.1 |
| | 0.3750 | 3/8 | 22.37 | 6.58 | 29.7 | 9.90 | 12.5 | 2.13 | 15.6 | 7.82 | 9.44 | 1.54 | 34.6 |
| | 0.3125 | 5/16 | 19.08 | 5.61 | 26.2 | 8.72 | 10.9 | 2.16 | 13.8 | 6.92 | 8.21 | 1.57 | 30.1 |
| | 0.2500 | 1/4 | 15.62 | 4.59 | 22.1 | 7.36 | 9.06 | 2.19 | 11.7 | 5.87 | 6.84 | 1.60 | 25.0 |
| | 0.1875 | 3/16 | 11.97 | 3.52 | 17.4 | 5.81 | 7.06 | 2.23 | 9.32 | 4.66 | 5.34 | 1.63 | 19.5 |
| | 0.1250 | 1/8 | 8.16 | 2.40 | 12.2 | 4.08 | 4.88 | 2.26 | 6.57 | 3.29 | 3.71 | 1.66 | 13.5 |
| 6×3 | 0.5000 | 1/2 | 25.03 | 7.36 | 27.7 | 9.25 | 12.6 | 1.94 | 8.91 | 5.94 | 7.59 | 1.10 | 23.9 |
| | 0.3750 | 3/8 | 19.82 | 5.83 | 23.8 | 7.92 | 10.4 | 2.02 | 7.78 | 5.19 | 6.34 | 1.16 | 20.3 |
| | 0.3125 | 5/16 | 16.96 | 4.98 | 21.1 | 7.03 | 9.11 | 2.06 | 6.98 | 4.65 | 5.56 | 1.18 | 17.9 |
| | 0.2500 | 1/4 | 13.91 | 4.09 | 17.9 | 5.98 | 7.62 | 2.09 | 6.00 | 4.00 | 4.67 | 1.21 | 15.1 |
| | 0.1875 | 3/16 | 10.70 | 3.14 | 14.3 | 4.76 | 5.97 | 2.13 | 4.83 | 3.22 | 3.68 | 1.24 | 11.9 |
| | 0.1250 | 1/8 | 7.31 | 2.15 | 10.1 | 3.36 | 4.15 | 2.17 | 3.45 | 2.30 | 2.57 | 1.27 | 8.27 |
| 6×2 | 0.3750 | 3/8 | 17.27 | 5.08 | 17.8 | 5.94 | 8.33 | 1.87 | 2.84 | 2.84 | 3.61 | 0.748 | 8.72 |
| | 0.3125 | 5/16 | 14.83 | 4.36 | 16.0 | 5.34 | 7.33 | 1.92 | 2.62 | 2.62 | 3.22 | 0.775 | 7.94 |
| | 0.2500 | 1/4 | 12.21 | 3.59 | 13.8 | 4.60 | 6.18 | 1.96 | 2.31 | 2.31 | 2.75 | 0.802 | 6.88 |
| | 0.1875 | 3/16 | 9.42 | 2.77 | 11.1 | 3.70 | 4.88 | 2.00 | 1.90 | 1.90 | 2.20 | 0.829 | 5.56 |
| | 0.1250 | 1/8 | 6.46 | 1.90 | 7.92 | 2.64 | 3.42 | 2.04 | 1.39 | 1.39 | 1.56 | 0.857 | 3.98 |
| 5×4 | 0.3750 | 3/8 | 19.82 | 5.83 | 18.7 | 7.50 | 9.44 | 1.79 | 13.2 | 6.58 | 8.08 | 1.50 | 26.3 |
| | 0.3125 | 5/16 | 16.96 | 4.98 | 16.6 | 6.65 | 8.24 | 1.83 | 11.7 | 5.85 | 7.05 | 1.53 | 22.9 |
| | 0.2500 | 1/4 | 13.91 | 4.09 | 14.1 | 5.65 | 6.89 | 1.86 | 9.98 | 4.99 | 5.90 | 1.56 | 19.1 |
| | 0.1875 | 3/16 | 10.70 | 3.14 | 11.2 | 4.49 | 5.39 | 1.89 | 7.96 | 3.98 | 4.63 | 1.59 | 14.9 |
| 5×3 | 0.5000 | 1/2 | 21.63 | 6.36 | 16.9 | 6.75 | 9.20 | 1.63 | 7.33 | 4.88 | 6.34 | 1.07 | 18.2 |
| | 0.3750 | 3/8 | 17.27 | 5.08 | 14.7 | 5.89 | 7.71 | 1.70 | 6.48 | 4.32 | 5.35 | 1.13 | 15.6 |
| | 0.3125 | 5/16 | 14.83 | 4.36 | 13.2 | 5.27 | 6.77 | 1.74 | 5.85 | 3.90 | 4.72 | 1.16 | 13.8 |
| | 0.2500 | 1/4 | 12.21 | 3.59 | 11.3 | 4.52 | 5.70 | 1.77 | 5.05 | 3.37 | 3.98 | 1.19 | 11.7 |
| | 0.1875 | 3/16 | 9.42 | 2.77 | 9.06 | 3.62 | 4.49 | 1.81 | 4.08 | 2.72 | 3.15 | 1.21 | 9.21 |
| | 0.1250 | 1/8 | 6.46 | 1.90 | 6.44 | 2.58 | 3.14 | 1.84 | 2.93 | 1.95 | 2.21 | 1.24 | 6.44 |

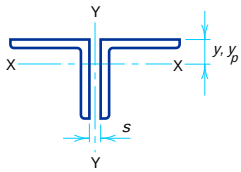
*Outside dimensions across flatsides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.




# STRUCTURAL TUBING
## Rectangular
## Dimensions and properties

| Dimensions | | | | Properties** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal* Size | Wall Thickness | | Weight per ft | Area | X-X Axis | | | | Y-Y Axis | | | | J |
| | | | | | *I* | *S* | *Z* | *r* | *I* | *S* | *Z* | *r* | |
| in. | in. | | lb | in.$^2$ | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ | in.$^3$ | in.$^3$ | in. | in.$^4$ |
| 5×2 | 0.3125 | 5/16 | 12.70 | 3.73 | 9.74 | 3.90 | 5.31 | 1.62 | 2.16 | 2.16 | 2.70 | 0.762 | 6.24 |
| | 0.2500 | 1/4 | 10.51 | 3.09 | 8.48 | 3.39 | 4.51 | 1.66 | 1.92 | 1.92 | 2.32 | 0.789 | 5.43 |
| | 0.1875 | 3/16 | 8.15 | 2.39 | 6.89 | 2.75 | 3.59 | 1.70 | 1.60 | 1.60 | 1.86 | 0.816 | 4.40 |
| | 0.1250 | 1/8 | 5.61 | 1.65 | 4.96 | 1.98 | 2.53 | 1.73 | 1.17 | 1.17 | 1.32 | 0.844 | 3.15 |
| 4×3 | 0.3125 | 5/16 | 12.70 | 3.73 | 7.45 | 3.72 | 4.75 | 1.41 | 4.71 | 3.14 | 3.88 | 1.12 | 9.89 |
| | 0.2500 | 1/4 | 10.51 | 3.09 | 6.45 | 3.23 | 4.03 | 1.45 | 4.10 | 2.74 | 3.30 | 1.15 | 8.41 |
| | 0.1875 | 3/16 | 8.15 | 2.39 | 5.23 | 2.62 | 3.20 | 1.48 | 3.34 | 2.23 | 2.62 | 1.18 | 6.67 |
| | 0.1250 | 1/8 | 5.61 | 1.65 | 3.76 | 1.88 | 2.25 | 1.51 | 2.41 | 1.61 | 1.85 | 1.21 | 4.68 |
| 4×2 | 0.3750 | 3/8 | 12.17 | 3.58 | 5.75 | 2.87 | 4.00 | 1.27 | 1.83 | 1.83 | 2.39 | 0.715 | 4.97 |
| | 0.3125 | 5/16 | 10.58 | 3.11 | 5.32 | 2.66 | 3.60 | 1.31 | 1.71 | 1.71 | 2.17 | 0.743 | 4.58 |
| | 0.2500 | 1/4 | 8.81 | 2.59 | 4.69 | 2.35 | 3.09 | 1.35 | 1.54 | 1.54 | 1.88 | 0.770 | 4.01 |
| | 0.1875 | 3/16 | 6.87 | 2.02 | 3.87 | 1.93 | 2.48 | 1.38 | 1.29 | 1.29 | 1.52 | 0.798 | 3.26 |
| | 0.1250 | 1/8 | 4.75 | 1.40 | 2.82 | 1.41 | 1.77 | 1.42 | 0.954 | 0.954 | 1.09 | 0.826 | 2.34 |
| 3×2 | 0.3125 | 5/16 | 8.45 | 2.48 | 2.44 | 1.63 | 2.20 | 0.992 | 1.26 | 1.26 | 1.64 | 0.714 | 2.97 |
| | 0.2500 | 1/4 | 7.11 | 2.09 | 2.21 | 1.47 | 1.92 | 1.03 | 1.15 | 1.15 | 1.44 | 0.742 | 2.63 |
| | 0.1875 | 3/16 | 5.59 | 1.64 | 1.86 | 1.24 | 1.57 | 1.06 | 0.977 | 0.977 | 1.18 | 0.771 | 2.16 |
| | 0.1250 | 1/8 | 3.90 | 1.15 | 1.38 | 0.920 | 1.13 | 1.10 | 0.733 | 0.733 | 0.855 | 0.800 | 1.57 |
| 2½×1½ | 0.2500 | 1/4 | 5.41 | 1.59 | 1.05 | 0.844 | 1.15 | 0.815 | 0.458 | 0.610 | 0.793 | 0.537 | 1.14 |
| | 0.1875 | 3/16 | 4.32 | 1.27 | 0.920 | 0.736 | 0.964 | 0.852 | 0.405 | 0.540 | 0.669 | 0.565 | 0.976 |

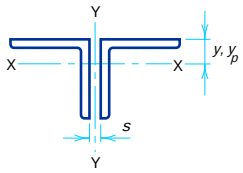
*Outside dimensions across flat sides.
**Properties are based upon a nominal outside corner radius equal to two times the wall thickness.




# DOUBLE ANGLES
## Two equal leg angles
## Properties of sections

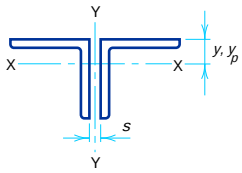
| Designation | Wt. per ft 2 Angles | Area of 2 Angles | Axis X-X | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *I* | *S* | *r* | *y* | *Z* | $y_p$ |
| | lb | $in.^2$ | $in.^4$ | $in.^3$ | in. | in. | $in.^3$ | in. |
| L8×8×1⅛ | 114 | 33.5 | 195 | 35.1 | 2.42 | 2.41 | 63.2 | 1.05 |
| 1 | 102 | 30.0 | 177 | 31.6 | 2.44 | 2.37 | 56.9 | 0.938 |
| ⅞ | 90.0 | 26.5 | 159 | 28.0 | 2.45 | 2.32 | 50.5 | 0.827 |
| ¾ | 77.8 | 22.9 | 139 | 24.4 | 2.47 | 2.28 | 43.9 | 0.715 |
| ⅝ | 65.4 | 19.2 | 118 | 20.6 | 2.49 | 2.23 | 37.1 | 0.601 |
| ½ | 52.8 | 15.5 | 97.3 | 16.7 | 2.50 | 2.19 | 30.1 | 0.484 |
| L6×6×1 | 74.8 | 22.0 | 70.9 | 17.1 | 1.80 | 1.86 | 30.9 | 0.917 |
| ⅞ | 66.2 | 19.5 | 63.8 | 15.3 | 1.81 | 1.82 | 27.5 | 0.811 |
| ¾ | 57.4 | 16.9 | 56.3 | 13.3 | 1.83 | 1.78 | 24.0 | 0.703 |
| ⅝ | 48.4 | 14.2 | 48.3 | 11.3 | 1.84 | 1.73 | 20.4 | 0.592 |
| ½ | 39.2 | 11.5 | 39.8 | 9.23 | 1.86 | 1.68 | 16.6 | 0.479 |
| ⅜ | 29.8 | 8.72 | 30.8 | 7.06 | 1.88 | 1.64 | 12.7 | 0.363 |
| L5×5×⅞ | 54.4 | 16.0 | 35.5 | 10.3 | 1.49 | 1.57 | 18.7 | 0.798 |
| ¾ | 47.2 | 13.9 | 31.5 | 9.06 | 1.51 | 1.52 | 16.3 | 0.694 |
| ½ | 32.4 | 9.50 | 22.5 | 6.31 | 1.54 | 1.43 | 11.4 | 0.475 |
| ⅜ | 24.6 | 7.22 | 17.5 | 4.84 | 1.56 | 1.39 | 8.72 | 0.361 |
| 5⁄16 | 20.6 | 6.05 | 14.8 | 4.08 | 1.57 | 1.37 | 7.35 | 0.303 |
| L4×4×¾ | 37.0 | 10.9 | 15.3 | 5.62 | 1.19 | 1.27 | 10.1 | 0.680 |
| ⅝ | 31.4 | 9.22 | 13.3 | 4.80 | 1.20 | 1.23 | 8.66 | 0.576 |
| ½ | 25.6 | 7.50 | 11.1 | 3.95 | 1.22 | 1.18 | 7.12 | 0.469 |
| ⅜ | 19.6 | 5.72 | 8.72 | 3.05 | 1.23 | 1.14 | 5.49 | 0.357 |
| 5⁄16 | 16.4 | 4.80 | 7.43 | 2.58 | 1.24 | 1.12 | 4.64 | 0.300 |
| ¼ | 13.2 | 3.88 | 6.08 | 2.09 | 1.25 | 1.09 | 3.77 | 0.242 |

# DOUBLE ANGLES
## Two equal leg angles
## Properties of sections




| Designation | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 0 | 3/8 | 3/4 | $Q_s$* Angles in Contact $F_y$ = 36 ksi | $F_y$ = 50 ksi | Angles Separated $F_y$ = 36 ksi | $F_y$ = 50 ksi |
|---|---|---|---|---|---|---|---|
| L8×8×1 1/8 | 3.42 | 3.55 | 3.69 | — | — | — | — |
| 1 | 3.40 | 3.53 | 3.67 | — | — | — | — |
| 7/8 | 3.38 | 3.51 | 3.64 | — | — | — | — |
| 3/4 | 3.36 | 3.49 | 3.62 | — | — | — | — |
| 5/8 | 3.34 | 3.47 | 3.60 | — | — | 0.997 | 0.935 |
| 1/2 | 3.32 | 3.45 | 3.58 | 0.995 | 0.921 | 0.911 | 0.834 |
| L6×6×1 | 2.59 | 2.73 | 2.87 | — | — | — | — |
| 7/8 | 2.57 | 2.70 | 2.85 | — | — | — | — |
| 3/4 | 2.55 | 2.68 | 2.82 | — | — | — | — |
| 5/8 | 2.53 | 2.66 | 2.80 | — | — | — | — |
| 1/2 | 2.51 | 2.64 | 2.78 | — | — | — | 0.961 |
| 3/8 | 2.49 | 2.62 | 2.75 | 0.995 | 0.921 | 0.911 | 0.834 |
| L5×5×7/8 | 2.16 | 2.30 | 2.45 | — | — | — | — |
| 3/4 | 2.14 | 2.28 | 2.42 | — | — | — | — |
| 1/2 | 2.10 | 2.24 | 2.38 | — | — | — | — |
| 3/8 | 2.09 | 2.22 | 2.35 | — | — | 0.982 | 0.919 |
| 5/16 | 2.08 | 2.21 | 2.34 | 0.995 | 0.921 | 0.911 | 0.834 |
| L4×4×3/4 | 1.74 | 1.88 | 2.03 | — | — | — | — |
| 5/8 | 1.72 | 1.86 | 2.00 | — | — | — | — |
| 1/2 | 1.70 | 1.83 | 1.98 | — | — | — | — |
| 3/8 | 1.68 | 1.81 | 1.95 | — | — | — | — |
| 5/16 | 1.67 | 1.80 | 1.94 | — | — | 0.997 | 0.935 |
| 1/4 | 1.66 | 1.79 | 1.93 | 0.995 | 0.921 | 0.911 | 0.834 |

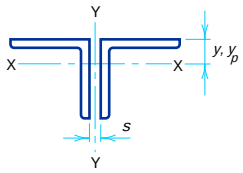
*Where no value of $Q_s$ is shown, the angles comply with LRFD Specification Section E2.




# DOUBLE ANGLES
## Two equal leg angles
## Properties of sections

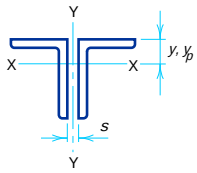
| Designation | Wt. per ft 2 Angles | Area of 2 Angles | Axis X-X | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *I* | *S* | *r* | *y* | *Z* | $y_p$ |
| | lb | $in.^2$ | $in.^4$ | $in.^3$ | in. | in. | $in.^3$ | in. |
| L3½×3½×⅜ | 17.0 | 4.97 | 5.73 | 2.30 | 1.07 | 1.01 | 4.15 | 0.355 |
| 5/16 | 14.4 | 4.18 | 4.90 | 1.95 | 1.08 | 0.990 | 3.52 | 0.299 |
| ¼ | 11.6 | 3.38 | 4.02 | 1.59 | 1.09 | 0.968 | 2.86 | 0.241 |
| L3×3×½ | 18.8 | 5.50 | 4.43 | 2.14 | 0.898 | 0.932 | 3.87 | 0.458 |
| ⅜ | 14.4 | 4.22 | 3.52 | 1.67 | 0.913 | 0.888 | 3.00 | 0.352 |
| 5/16 | 12.2 | 3.55 | 3.02 | 1.41 | 0.922 | 0.865 | 2.55 | 0.296 |
| ¼ | 9.80 | 2.88 | 2.49 | 1.15 | 0.930 | 0.842 | 2.08 | 0.240 |
| 3/16 | 7.42 | 2.18 | 1.92 | 0.882 | 0.939 | 0.820 | 1.59 | 0.182 |
| L2½×2½×⅜ | 11.8 | 3.47 | 1.97 | 1.13 | 0.753 | 0.762 | 2.04 | 0.347 |
| 5/16 | 10.0 | 2.93 | 1.70 | 0.964 | 0.761 | 0.740 | 1.74 | 0.293 |
| ¼ | 8.20 | 2.38 | 1.41 | 0.789 | 0.769 | 0.717 | 1.42 | 0.238 |
| 3/16 | 6.14 | 1.80 | 1.09 | 0.606 | 0.778 | 0.694 | 1.09 | 0.180 |
| L2×2×⅜ | 9.40 | 2.72 | 0.958 | 0.702 | 0.594 | 0.636 | 1.27 | 0.340 |
| 5/16 | 7.84 | 2.30 | 0.832 | 0.681 | 0.601 | 0.614 | 1.08 | 0.288 |
| ¼ | 6.38 | 1.88 | 0.695 | 0.494 | 0.609 | 0.592 | 0.890 | 0.234 |
| 3/16 | 4.88 | 1.43 | 0.545 | 0.381 | 0.617 | 0.569 | 0.686 | 0.179 |
| ⅛ | 3.30 | 0.960 | 0.380 | 0.261 | 0.626 | 0.546 | 0.471 | 0.121 |

# DOUBLE ANGLES
## Two equal leg angles
## Properties of sections




| Designation | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 0 | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 3/8 | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 3/4 | $Q_s$* Angles in Contact $F_y$ = 36 ksi | $Q_s$* Angles in Contact $F_y$ = 50 ksi | $Q_s$* Angles Separated $F_y$ = 36 ksi | $Q_s$* Angles Separated $F_y$ = 50 ksi |
|---|---|---|---|---|---|---|---|
| L3½×3½×3/8 | 1.48 | 1.61 | 1.75 | — | — | — | — |
| 5/16 | 1.47 | 1.60 | 1.74 | — | — | — | 0.986 |
| 1/4 | 1.46 | 1.59 | 1.73 | — | 0.982 | 0.965 | 0.897 |
| L3×3×½ | 1.29 | 1.43 | 1.59 | — | — | — | — |
| 3/8 | 1.27 | 1.41 | 1.56 | — | — | — | — |
| 5/16 | 1.26 | 1.40 | 1.55 | — | — | — | — |
| 1/4 | 1.26 | 1.39 | 1.53 | — | — | — | 0.961 |
| 3/16 | 1.25 | 1.38 | 1.52 | 0.995 | 0.921 | 0.911 | 0.834 |
| L2½×2½×3/8 | 1.07 | 1.21 | 1.36 | — | — | — | — |
| 5/16 | 1.06 | 1.20 | 1.35 | — | — | — | — |
| 1/4 | 1.05 | 1.19 | 1.34 | — | — | — | — |
| 3/16 | 1.04 | 1.18 | 1.32 | — | — | 0.982 | 0.919 |
| L2×2×3/8 | 0.870 | 1.01 | 1.17 | — | — | — | — |
| 5/16 | 0.859 | 1.00 | 1.16 | — | — | — | — |
| 1/4 | 0.849 | 0.989 | 1.14 | — | — | — | — |
| 3/16 | 0.840 | 0.977 | 1.13 | — | — | — | — |
| 1/8 | 0.831 | 0.965 | 1.11 | 0.995 | 0.921 | 0.911 | 0.834 |

*Where no value of $Q_s$ is shown, the angles comply with LRFD Specification Section E2.



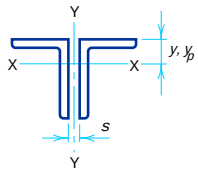

# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections

Long legs back to back

| Designation | Wt. per ft 2 Angles | Area of 2 Angles | Axis X-X | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *I* | *S* | *r* | *y* | *Z* | $y_p$ |
| | lb | $in.^2$ | $in.^4$ | $in.^3$ | in. | in. | $in.^3$ | in. |
| L8×6×1 | 88.4 | 26.0 | 161 | 30.2 | 2.49 | 2.65 | 54.5 | 1.50 |
| ¾ | 67.6 | 19.9 | 126 | 23.3 | 2.53 | 2.56 | 42.2 | 1.38 |
| ½ | 46.0 | 13.5 | 88.6 | 16.0 | 2.56 | 2.47 | 29.1 | 1.25 |
| L8×4×1 | 74.8 | 22.0 | 139 | 28.1 | 2.52 | 3.05 | 48.5 | 2.50 |
| ¾ | 57.4 | 16.9 | 109 | 21.8 | 2.55 | 2.95 | 37.7 | 2.38 |
| ½ | 39.2 | 11.5 | 77.0 | 15.0 | 2.59 | 2.86 | 26.1 | 2.25 |
| L7×4×¾ | 52.4 | 15.4 | 75.6 | 16.8 | 2.22 | 2.51 | 29.6 | 1.88 |
| ½ | 35.8 | 10.5 | 53.3 | 11.6 | 2.25 | 2.42 | 20.6 | 1.75 |
| ⅜ | 27.2 | 7.97 | 41.1 | 8.88 | 2.27 | 2.37 | 15.7 | 1.69 |
| L6×4×¾ | 47.2 | 13.9 | 49.0 | 12.5 | 1.88 | 2.08 | 22.3 | 1.38 |
| ⅝ | 40.0 | 11.7 | 42.1 | 10.6 | 1.90 | 2.03 | 19.0 | 1.31 |
| ½ | 32.4 | 9.50 | 34.8 | 8.67 | 1.91 | 1.99 | 15.6 | 1.25 |
| ⅜ | 24.6 | 7.22 | 26.9 | 6.64 | 1.93 | 1.94 | 11.9 | 1.19 |
| L6×3½×⅜ | 23.4 | 6.84 | 25.7 | 6.49 | 1.94 | 2.04 | 11.5 | 1.44 |
| 5/16 | 19.6 | 5.74 | 21.8 | 5.47 | 1.95 | 2.01 | 9.70 | 1.41 |
| L5×3½×¾ | 39.6 | 11.6 | 27.8 | 8.55 | 1.55 | 1.75 | 15.3 | 1.13 |
| ½ | 27.2 | 8.00 | 20.0 | 5.97 | 1.58 | 1.66 | 10.8 | 1.00 |
| ⅜ | 20.8 | 6.09 | 15.6 | 4.59 | 1.60 | 1.61 | 8.28 | 0.938 |
| 5/16 | 17.4 | 5.12 | 13.2 | 3.87 | 1.61 | 1.59 | 6.99 | 0.906 |
| L5×3×½ | 25.6 | 7.50 | 18.9 | 5.82 | 1.59 | 1.75 | 10.3 | 1.25 |
| ⅜ | 19.6 | 5.72 | 14.7 | 4.47 | 1.61 | 1.70 | 7.95 | 1.19 |
| 5/16 | 16.4 | 4.80 | 12.5 | 3.77 | 1.61 | 1.68 | 6.71 | 1.16 |
| ¼ | 13.2 | 3.88 | 10.2 | 3.06 | 1.62 | 1.66 | 5.45 | 1.13 |

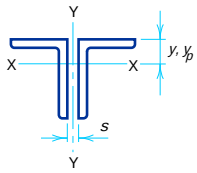
# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections

Long legs back to back




| Designation | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 0 | 3/8 | 3/4 | $Q_s$* Angles in Contact $F_y$ = 36 ksi | $F_y$ = 50 ksi | Angles Separated $F_y$ = 36 ksi | $F_y$ = 50 ksi |
|---|---|---|---|---|---|---|---|
| L8×6×1 | 2.39 | 2.52 | 2.66 | — | — | — | — |
| 3/4 | 2.35 | 2.48 | 2.62 | — | — | — | — |
| 1/2 | 2.32 | 2.44 | 2.57 | — | — | 0.911 | 0.834 |
| L8×4×1 | 1.47 | 1.61 | 1.75 | — | — | — | — |
| 3/4 | 1.42 | 1.55 | 1.69 | — | — | — | — |
| 1/2 | 1.38 | 1.51 | 1.64 | — | — | 0.911 | 0.834 |
| L7×4×3/4 | 1.48 | 1.62 | 1.76 | — | — | — | — |
| 1/2 | 1.44 | 1.57 | 1.71 | — | — | 0.965 | 0.897 |
| 3/8 | 1.43 | 1.55 | 1.68 | — | — | 0.839 | 0.750 |
| L6×4×3/4 | 1.55 | 1.69 | 1.83 | — | — | — | — |
| 5/8 | 1.53 | 1.67 | 1.81 | — | — | — | — |
| 1/2 | 1.51 | 1.64 | 1.78 | — | — | — | 0.961 |
| 3/8 | 1.5 | 1.62 | 1.76 | — | — | 0.911 | 0.834 |
| L6×3 1/2×3/8 | 1.26 | 1.39 | 1.53 | — | — | 0.911 | 0.834 |
| 5/16 | 1.26 | 1.38 | 1.51 | — | — | 0.825 | 0.733 |
| L5×3 1/2×3/4 | 1.40 | 1.53 | 1.68 | — | — | — | — |
| 1/2 | 1.35 | 1.49 | 1.63 | — | — | — | — |
| 3/8 | 1.34 | 1.46 | 1.60 | — | — | 0.982 | 0.919 |
| 5/16 | 1.33 | 1.45 | 1.59 | — | — | 0.911 | 0.834 |
| L5×3×1/2 | 1.12 | 1.25 | 1.40 | — | — | — | — |
| 3/8 | 1.10 | 1.23 | 1.37 | — | — | 0.982 | 0.919 |
| 5/16 | 1.09 | 1.22 | 1.36 | — | — | 0.911 | 0.834 |
| 1/4 | 1.08 | 1.21 | 1.34 | — | — | 0.804 | 0.708 |

*Where no value of $Q_s$ is shown the angles comply with LRFD Specification Section E2.

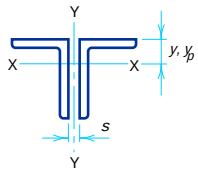



# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections
Long legs back to back

| Designation | Wt. per ft 2 Angles | Area of 2 Angles | Axis X-X | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *I* | *S* | *r* | *y* | *Z* | $y_p$ |
| | lb | $in.^2$ | $in.^4$ | $in.^3$ | in. | in. | $in.^3$ | in. |
| L4×3½×½ | 23.8 | 7.00 | 10.6 | 3.87 | 1.23 | 1.25 | 7.00 | 0.500 |
| ⅜ | 18.2 | 5.34 | 8.35 | 2.99 | 1.25 | 1.21 | 5.42 | 0.438 |
| 5/16 | 15.4 | 4.49 | 7.12 | 2.53 | 1.26 | 1.18 | 4.59 | 0.406 |
| ¼ | 12.4 | 3.63 | 5.83 | 2.05 | 1.27 | 1.16 | 3.73 | 0.375 |
| L4×3×½ | 22.2 | 6.50 | 10.1 | 3.78 | 1.25 | 1.33 | 6.81 | 0.750 |
| ⅜ | 17.0 | 4.97 | 7.93 | 2.92 | 1.26 | 1.28 | 5.28 | 0.688 |
| 5/16 | 14.4 | 4.18 | 6.76 | 2.47 | 1.27 | 1.26 | 4.47 | 0.656 |
| ¼ | 11.6 | 3.38 | 5.54 | 2.00 | 1.28 | 1.24 | 3.63 | 0.625 |
| L3½×3×⅜ | 15.8 | 4.59 | 5.45 | 2.25 | 1.09 | 1.08 | 4.08 | 0.438 |
| 5/16 | 13.2 | 3.87 | 4.66 | 1.91 | 1.10 | 1.06 | 3.46 | 0.406 |
| ¼ | 10.8 | 3.13 | 3.83 | 1.55 | 1.11 | 1.04 | 2.82 | 0.375 |
| L3½×2½×⅜ | 14.4 | 4.22 | 5.12 | 2.19 | 1.10 | 1.16 | 3.94 | 0.688 |
| ¼ | 9.80 | 2.88 | 3.60 | 1.51 | 1.12 | 1.11 | 2.73 | 0.625 |
| L3×2½×⅜ | 13.2 | 3.84 | 3.31 | 1.62 | 0.928 | 0.956 | 2.93 | 0.438 |
| ¼ | 9.00 | 2.63 | 2.35 | 1.12 | 0.945 | 0.911 | 2.04 | 0.375 |
| 5/16 | 6.77 | 1.99 | 1.81 | 0.859 | 0.954 | 0.888 | 1.56 | 0.344 |
| L3×2×⅜ | 11.8 | 3.47 | 3.06 | 1.56 | 0.940 | 1.04 | 2.79 | 0.688 |
| 5/16 | 10.0 | 2.93 | 2.63 | 1.33 | 0.948 | 1.02 | 2.38 | 0.656 |
| ¼ | 8.20 | 2.38 | 2.17 | 1.08 | 0.957 | 0.993 | 1.95 | 0.625 |
| 3/16 | 6.14 | 1.80 | 1.68 | 0.830 | 0.966 | 0.970 | 1.49 | 0.594 |
| L2½×2×⅜ | 10.6 | 3.09 | 1.82 | 1.09 | 0.768 | 0.831 | 1.97 | 0.438 |
| 5/16 | 9.00 | 2.62 | 1.58 | 0.932 | 0.776 | 0.809 | 1.69 | 0.406 |
| ¼ | 7.24 | 2.13 | 1.31 | 0.763 | 0.784 | 0.787 | 1.38 | 0.375 |
| 3/16 | 5.50 | 1.62 | 1.02 | 0.586 | 0.793 | 0.764 | 1.06 | 0.344 |

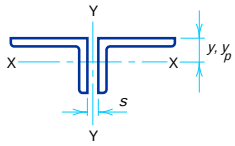
# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections

Long legs back to back




| Designation | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 0 | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 3/8 | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 3/4 | $Q_s$* Angles in Contact $F_y$ = 36 ksi | $Q_s$* Angles in Contact $F_y$ = 50 ksi | $Q_s$* Angles Separated $F_y$ = 36 ksi | $Q_s$* Angles Separated $F_y$ = 50 ksi |
|---|---|---|---|---|---|---|---|
| L4×3½×½ | 1.44 | 1.58 | 1.72 | — | — | — | — |
| 3/8 | 1.42 | 1.56 | 1.70 | — | — | — | — |
| 5/16 | 1.42 | 1.55 | 1.69 | — | — | 0.997 | 0.935 |
| 1/4 | 1.41 | 1.54 | 1.67 | — | 0.982 | 0.911 | 0.834 |
| L4×3×½ | 1.20 | 1.33 | 1.48 | — | — | — | — |
| 3/8 | 1.18 | 1.31 | 1.45 | — | — | — | — |
| 5/16 | 1.17 | 1.30 | 1.44 | — | — | 0.997 | 0.935 |
| 1/4 | 1.16 | 1.29 | 1.43 | — | — | 0.911 | 0.834 |
| L3½×3×3/8 | 1.22 | 1.36 | 1.50 | — | — | — | — |
| 5/16 | 1.21 | 1.35 | 1.49 | — | — | — | 0.986 |
| 1/4 | 1.20 | 1.33 | 1.48 | — | — | 0.965 | 0.897 |
| L3½×2½×3/8 | 0.976 | 1.11 | 1.26 | — | — | — | — |
| 1/4 | 0.958 | 1.09 | 1.23 | — | — | 0.965 | 0.897 |
| L3×2½×3/8 | 1.02 | 1.16 | 1.31 | — | — | — | — |
| 1/4 | 1.00 | 1.13 | 1.28 | — | — | — | 0.961 |
| 5/16 | 0.993 | 1.12 | 1.27 | — | — | 0.911 | 0.834 |
| L3×2×3/8 | 0.777 | 0.917 | 1.07 | — | — | — | — |
| 5/16 | 0.767 | 0.903 | 1.06 | — | — | — | — |
| 1/4 | 0.757 | 0.891 | 1.04 | — | — | — | 0.961 |
| 3/16 | 0.749 | 0.879 | 1.03 | — | — | 0.911 | 0.834 |
| L2½×2×3/8 | 0.819 | 0.961 | 1.12 | — | — | — | — |
| 5/16 | 0.809 | 0.948 | 1.10 | — | — | — | — |
| 1/4 | 0.799 | 0.935 | 1.09 | — | — | — | — |
| 3/16 | 0.790 | 0.923 | 1.07 | — | — | 0.982 | 0.919 |

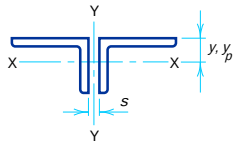
*Where no value of $Q_s$ is shown, the angles comply with LRFD Specification Section E2.




# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections
Short legs back to back

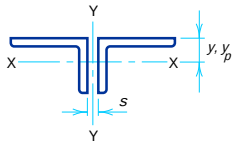
| Designation | Wt. per ft 2 Angles | Area of 2 Angles | Axis X-X | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *I* | *S* | *r* | *y* | *Z* | $y_p$ |
| | lb | $in.^2$ | $in.^4$ | $in.^3$ | in. | in. | $in.^3$ | in. |
| L8×6×1 | 88.4 | 26.0 | 77.6 | 17.8 | 1.73 | 1.65 | 32.4 | 0.813 |
| 3/4 | 67.6 | 19.9 | 61.4 | 13.8 | 1.76 | 1.56 | 24.9 | 0.621 |
| 1/2 | 46.0 | 13.5 | 43.4 | 9.58 | 1.79 | 1.47 | 17.0 | 0.422 |
| L8×4×1 | 74.8 | 22.0 | 23.3 | 7.88 | 1.03 | 1.05 | 15.4 | 0.688 |
| 3/4 | 57.4 | 16.9 | 18.7 | 6.14 | 1.05 | 0.953 | 11.6 | 0.527 |
| 1/2 | 39.2 | 11.5 | 13.5 | 4.29 | 1.08 | 0.859 | 7.80 | 0.359 |
| L7×4×3/4 | 52.4 | 15.4 | 18.1 | 6.05 | 1.09 | 1.01 | 11.3 | 0.549 |
| 1/2 | 35.8 | 10.5 | 13.1 | 4.23 | 1.11 | 0.917 | 7.66 | 0.375 |
| 3/8 | 27.2 | 7.97 | 10.2 | 3.26 | 1.13 | 0.870 | 5.80 | 0.285 |
| L6×4×3/4 | 47.2 | 13.9 | 17.4 | 5.94 | 1.12 | 1.08 | 10.9 | 0.578 |
| 5/8 | 40.0 | 11.7 | 15.0 | 5.07 | 1.13 | 1.03 | 9.24 | 0.488 |
| 1/2 | 32.4 | 9.50 | 12.5 | 4.16 | 1.15 | 0.987 | 7.50 | 0.396 |
| 3/8 | 24.6 | 7.22 | 9.81 | 3.21 | 1.17 | 0.941 | 5.71 | 0.301 |
| L6×3 1/2×3/8 | 23.4 | 6.84 | 6.68 | 2.46 | 0.988 | 0.787 | 4.41 | 0.285 |
| 5/16 | 19.6 | 5.74 | 5.70 | 2.08 | 0.996 | 0.763 | 3.70 | 0.239 |
| L5×3 1/2×3/4 | 39.6 | 11.6 | 11.1 | 4.43 | 0.977 | 0.996 | 8.20 | 0.581 |
| 1/2 | 27.2 | 8.00 | 8.10 | 3.12 | 1.01 | 0.906 | 5.65 | 0.400 |
| 3/8 | 20.8 | 6.09 | 6.37 | 2.41 | 1.02 | 0.861 | 4.32 | 0.305 |
| 5/16 | 17.4 | 5.12 | 5.44 | 2.04 | 1.03 | 0.838 | 3.63 | 0.256 |
| L5×3×1/2 | 25.6 | 7.50 | 5.16 | 2.29 | 0.829 | 0.750 | 4.22 | 0.375 |
| 3/8 | 19.6 | 5.72 | 4.08 | 1.78 | 0.845 | 0.704 | 3.21 | 0.286 |
| 5/16 | 16.4 | 4.80 | 3.49 | 1.51 | 0.853 | 0.681 | 2.69 | 0.240 |
| 1/4 | 13.2 | 3.88 | 2.88 | 1.23 | 0.861 | 0.657 | 2.17 | 0.194 |

# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections
Short legs back to back




| Designation | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 0 | 3/8 | 3/4 | $Q_s$* Angles in Contact $F_y$ = 36 ksi | $F_y$ = 50 ksi | Angles Separated $F_y$ = 36 ksi | $F_y$ = 50 ksi |
|---|---|---|---|---|---|---|---|
| L8×6×1 | 3.64 | 3.78 | 3.92 | — | — | — | — |
| 3/4 | 3.60 | 3.74 | 3.88 | — | — | — | — |
| 1/2 | 3.56 | 3.69 | 3.83 | 0.995 | 0.921 | 0.911 | 0.834 |
| L8×4×1 | 3.95 | 4.10 | 4.25 | — | — | — | — |
| 3/4 | 3.90 | 4.05 | 4.19 | — | — | — | — |
| 1/2 | 3.86 | 4.00 | 4.14 | 0.995 | 0.921 | 0.911 | 0.834 |
| L7×4×3/4 | 3.35 | 3.49 | 3.64 | — | — | — | |
| 1/2 | 3.30 | 3.44 | 3.59 | — | 0.982 | 0.965 | 0.897 |
| 3/8 | 3.28 | 3.42 | 3.56 | 0.926 | 0.838 | 0.839 | 0.750 |
| L6×4×3/4 | 2.80 | 2.94 | 3.09 | — | — | — | — |
| 5/8 | 2.78 | 2.92 | 3.06 | — | — | — | — |
| 1/2 | 2.76 | 2.90 | 3.04 | — | — | — | 0.961 |
| 3/8 | 2.74 | 2.87 | 3.02 | 0.995 | 0.921 | 0.911 | 0.834 |
| L6×3 1/2×3/8 | 2.81 | 2.95 | 3.09 | 0.995 | 0.921 | 0.911 | 0.834 |
| 5/16 | 2.80 | 2.94 | 3.08 | 0.912 | 0.822 | 0.825 | 0.733 |
| L5×3 1/2×3/4 | 2.33 | 2.48 | 2.63 | — | — | — | — |
| 1/2 | 2.29 | 2.43 | 2.57 | — | — | — | — |
| 3/8 | 2.27 | 2.41 | 2.55 | — | — | 0.982 | 0.919 |
| 5/16 | 2.26 | 2.39 | 2.54 | 0.995 | 0.921 | 0.911 | 0.834 |
| L5×3×1/2 | 2.36 | 2.50 | 2.65 | — | — | — | — |
| 3/8 | 2.34 | 2.48 | 2.63 | — | — | 0.982 | 0.919 |
| 5/16 | 2.33 | 2.47 | 2.61 | 0.995 | 0.921 | 0.911 | 0.834 |
| 1/4 | 2.32 | 2.46 | 2.60 | 0.891 | 0.797 | 0.804 | 0.708 |

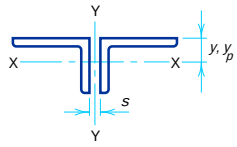
*Where no value of $Q_s$ is shown, the angles comply with LRFD Specification Section E2.




# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections
Short legs back to back

| Designation | Wt. per ft 2 Angles | Area of 2 Angles | Axis X-X | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *I* | *S* | *r* | *y* | *Z* | $y_p$ |
| | lb | $in.^2$ | $in.^4$ | $in.^3$ | in. | in. | $in.^3$ | in. |
| L4×3½×½ | 23.8 | 7.00 | 7.58 | 3.03 | 1.04 | 1.00 | 5.47 | 0.438 |
| ⅜ | 18.2 | 5.34 | 5.97 | 2.35 | 1.06 | 0.955 | 4.21 | 0.334 |
| 5/16 | 15.4 | 4.49 | 5.10 | 1.99 | 1.07 | 0.932 | 3.56 | 0.281 |
| ¼ | 12.4 | 3.63 | 4.19 | 1.62 | 1.07 | 0.909 | 2.89 | 0.227 |
| L4×3×½ | 22.2 | 6.50 | 4.85 | 2.23 | 0.864 | 0.827 | 4.06 | 0.406 |
| ⅜ | 17.0 | 4.97 | 3.84 | 1.73 | 0.879 | 0.782 | 3.11 | 0.311 |
| 5/16 | 14.4 | 4.18 | 3.29 | 1.47 | 0.887 | 0.759 | 2.63 | 0.261 |
| ¼ | 11.6 | 3.38 | 2.71 | 1.20 | 0.896 | 0.736 | 2.13 | 0.211 |
| L3½×3×⅜ | 15.8 | 4.59 | 3.69 | 1.70 | 0.897 | 0.830 | 3.06 | 0.328 |
| 5/16 | 13.2 | 3.87 | 3.17 | 1.44 | 0.905 | 0.808 | 2.59 | 0.276 |
| ¼ | 10.8 | 3.13 | 2.61 | 1.18 | 0.914 | 0.785 | 2.10 | 0.223 |
| L3½×2½×⅜ | 14.4 | 4.22 | 2.18 | 1.18 | 0.719 | 0.660 | 2.15 | 0.301 |
| ¼ | 9.80 | 2.88 | 1.55 | 0.824 | 0.735 | 0.614 | 1.47 | 0.205 |
| L3×2½×⅜ | 13.2 | 3.84 | 2.08 | 1.16 | 0.736 | 0.706 | 2.10 | 0.320 |
| ¼ | 9.00 | 2.63 | 1.49 | 0.808 | 0.753 | 0.661 | 1.45 | 0.219 |
| 3/16 | 6.77 | 1.99 | 1.15 | 0.620 | 0.761 | 0.638 | 1.11 | 0.166 |
| L3×2×⅜ | 11.8 | 3.47 | 1.09 | 0.743 | 0.559 | 0.539 | 1.37 | 0.289 |
| 5/16 | 10.0 | 2.93 | 0.941 | 0.634 | 0.567 | 0.516 | 1.16 | 0.244 |
| ¼ | 8.20 | 2.38 | 0.784 | 0.520 | 0.574 | 0.493 | 0.937 | 0.198 |
| 3/16 | 6.14 | 1.80 | 0.613 | 0.401 | 0.583 | 0.470 | 0.713 | 0.150 |
| L2½×2×⅜ | 10.6 | 3.09 | 1.03 | 0.725 | 0.577 | 0.581 | 1.32 | 0.309 |
| 5/16 | 9.00 | 2.62 | 0.893 | 0.620 | 0.584 | 0.559 | 1.12 | 0.262 |
| ¼ | 7.24 | 2.13 | 0.745 | 0.509 | 0.592 | 0.537 | 0.915 | 0.213 |
| 3/16 | 5.50 | 1.62 | 0.583 | 0.392 | 0.600 | 0.514 | 0.701 | 0.162 |

# DOUBLE ANGLES
## Two unequal leg angles
## Properties of sections
Short legs back to back




| Designation | Axis Y-Y Radii of Gyration Back to Back of Angles, in. 0 | 3/8 | 3/4 | $Q_s$* Angles in Contact $F_y$ = 36 ksi | $F_y$ = 50 ksi | Angles Separated $F_y$ = 36 ksi | $F_y$ = 50 ksi |
|---|---|---|---|---|---|---|---|
| L4×3½×½ | 1.76 | 1.89 | 2.04 | — | — | — | — |
| 3/8 | 1.74 | 1.87 | 2.01 | — | — | — | — |
| 5/16 | 1.73 | 1.86 | 2.00 | — | — | 0.997 | 0.935 |
| 1/4 | 1.72 | 1.85 | 1.99 | 0.995 | 0.921 | 0.911 | 0.834 |
| L4×3×½ | 1.82 | 1.96 | 2.11 | — | — | — | — |
| 3/8 | 1.80 | 1.94 | 2.08 | — | — | — | — |
| 5/16 | 1.79 | 1.93 | 2.07 | — | — | 0.997 | 0.935 |
| 1/4 | 1.78 | 1.92 | 2.06 | 0.995 | 0.921 | 0.911 | 0.834 |
| L3½×3×3/8 | 1.53 | 1.67 | 1.82 | — | — | — | — |
| 5/16 | 1.52 | 1.66 | 1.80 | — | — | — | 0.986 |
| 1/4 | 1.52 | 1.65 | 1.79 | — | 0.982 | 0.965 | 0.897 |
| L3½×2½×3/8 | 1.60 | 1.74 | 1.89 | — | — | — | — |
| 1/4 | 1.58 | 1.72 | 1.86 | — | 0.982 | 0.965 | 0.897 |
| L3×2½×3/8 | 1.33 | 1.47 | 1.62 | — | — | — | — |
| 1/4 | 1.31 | 1.45 | 1.60 | — | — | — | 0.961 |
| 3/16 | 1.30 | 1.44 | 1.58 | 0.995 | 0.921 | 0.911 | 0.834 |
| L3×2×3/8 | 1.40 | 1.55 | 1.70 | — | — | — | — |
| 5/16 | 1.39 | 1.53 | 1.68 | — | — | — | — |
| 1/4 | 1.38 | 1.52 | 1.67 | — | — | — | 0.961 |
| 3/16 | 1.37 | 1.51 | 1.66 | 0.995 | 0.921 | 0.911 | 0.834 |
| L2½×2×3/8 | 1.13 | 1.28 | 1.43 | — | — | — | — |
| 5/16 | 1.12 | 1.26 | 1.42 | — | — | — | — |
| 1/4 | 1.11 | 1.25 | 1.40 | — | — | — | — |
| 3/16 | 1.10 | 1.24 | 1.39 | — | — | 0.982 | 0.911 |

*Where no value of $Q_s$ is shown the angles comply with LRFD Specification Section E2.