

EN 10219-1 & 2 Cold Formed Welded Square Tubes

Nominal dimensions and sectional properties of square hollow sections

| Size (BXB) | | Wall Thickness (T) | | Mass per unit length | | Pieces/bdls | Size (BXB) | | Wall Thickness (T) | | Mass per unit length | | Pieces/bdls |
|---------------|---------|--------------------|------|----------------------|-------|-------------|---------------|-------------|--------------------|------|----------------------|-------|-------------|
| in | mm | in | mm | kg/m | lb/ft | | in | mm | in | mm | kg/m | lb/ft | |
| 1 3/5 x 1 3/5 | 40 x 40 | 0.059 | 1.50 | 1.77 | 1.188 | 81 | 2 1/3 x 2 1/3 | 60 x 60 | 0.177 | 4.50 | 7.43 | 4.995 | 25 |
| | | 0.071 | 1.80 | 2.09 | 1.407 | 81 | | | 0.197 | 5.00 | 8.13 | 5.464 | 25 |
| | | 0.079 | 2.00 | 2.31 | 1.552 | 81 | | | 0.236 | 6.00 | 9.45 | 6.351 | 20 |
| | | 0.098 | 2.50 | 2.82 | 1.895 | 64 | 2 1/2 x 2 1/2 | 63.5 x 63.5 | 0.059 | 1.50 | 2.87 | 1.929 | 49 |
| | | 0.118 | 3.00 | 3.30 | 2.218 | 64 | | | 0.079 | 2.00 | 3.78 | 2.540 | 49 |
| | | 0.157 | 4.00 | 4.20 | 2.823 | 49 | | | 0.118 | 3.00 | 5.52 | 3.710 | 36 |
| | | 0.196 | 5.00 | 5.00 | 3.360 | 49 | | | 0.157 | 4.00 | 7.15 | 4.805 | 25 |
| | | 0.236 | 6.00 | 5.70 | 3.831 | 36 | | | 0.197 | 5.00 | 8.68 | 5.833 | 25 |
| 2 x 2 | 50 x 50 | 0.059 | 1.50 | 2.24 | 1.504 | 64 | 2 5/9 x 2 5/9 | 65 x 65 | 0.236 | 6.00 | 10.11 | 6.794 | 20 |
| | | 0.079 | 2.00 | 2.93 | 1.969 | 49 | | | 0.059 | 1.50 | 2.95 | 1.983 | 49 |
| | | 0.098 | 2.50 | 3.60 | 2.419 | 49 | | | 0.079 | 2.00 | 3.88 | 2.608 | 49 |
| | | 0.118 | 3.00 | 4.25 | 2.856 | 49 | | | 0.118 | 3.00 | 5.66 | 3.804 | 36 |
| | | 0.157 | 4.00 | 5.45 | 3.663 | 36 | | | 0.157 | 4.00 | 7.34 | 4.933 | 25 |
| | | 0.197 | 5.00 | 6.56 | 4.409 | 36 | | | 0.197 | 5.00 | 8.91 | 5.988 | 25 |
| | | 0.236 | 6.00 | 7.56 | 5.081 | 25 | | | 0.236 | 6.00 | 10.39 | 6.983 | 20 |
| 2 1/3 x 2 1/3 | 60 x 60 | 0.059 | 1.50 | 2.71 | 1.821 | 49 | 3 x 3 | 75 x 75 | 0.059 | 1.50 | 3.42 | 2.298 | 36 |
| | | 0.079 | 2.00 | 3.56 | 2.392 | 49 | | | 0.079 | 2.00 | 4.50 | 3.026 | 36 |
| | | 0.098 | 2.50 | 4.39 | 2.950 | 36 | | | 0.098 | 2.50 | 5.56 | 3.739 | 36 |
| | | 0.118 | 3.00 | 5.19 | 3.488 | 36 | | | 0.118 | 3.00 | 6.60 | 4.435 | 36 |
| | | 0.157 | 4.00 | 6.71 | 4.509 | 25 | | | 0.157 | 4.00 | 8.59 | 5.776 | 25 |

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|-------------------------------------|---------|--------------------|--------|----------------------|--------|-------------|---|-----------|--------------------|-----------|----------------------|--------|-------------|--------|----|
| in | mm | in | mm | kg/m | lb/ft | | in | mm | in | mm | kg/m | lb/ft | | | |
| 3 x 3 | 75 x 75 | 0.177 | 4.50 | 9.55 | 6.419 | 25 | 3 ^{6/11} x 3 ^{6/11} | 90 x 90 | 0.079 | 2.00 | 5.45 | 3.663 | 36 | | |
| | | 0.197 | 5.00 | 10.50 | 7.056 | 20 | | | 0.098 | 2.50 | 6.74 | 4.530 | 36 | | |
| | | 0.236 | 6.00 | 12.30 | 8.266 | 20 | | | 0.118 | 3.00 | 8.01 | 5.383 | 36 | | |
| 3 ^{1/7} x 3 ^{1/7} | 80 x 80 | 0.079 | 2.00 | 4.82 | 3.237 | 36 | | | 4 x 4 | 100 x 100 | 0.157 | 4.00 | 10.50 | 7.056 | 25 |
| | | 0.098 | 2.50 | 5.96 | 4.003 | 36 | | | | | 0.197 | 5.00 | 12.80 | 8.602 | 20 |
| | | 0.118 | 3.00 | 7.07 | 4.751 | 25 | | | | | 0.236 | 6.00 | 15.10 | 10.148 | 16 |
| | | 0.157 | 4.00 | 9.22 | 6.196 | 25 | | | | | 0.315 | 8.00 | 18.90 | 12.702 | 12 |
| | | 0.177 | 4.50 | 10.26 | 6.894 | 25 | | | | | 0.079 | 2.00 | 6.07 | 4.081 | 25 |
| | | 0.197 | 5.00 | 11.30 | 7.594 | 20 | | | | | 0.098 | 2.50 | 7.53 | 5.058 | 25 |
| | | 0.236 | 6.00 | 13.20 | 8.871 | 16 | | | | | 0.118 | 3.00 | 8.96 | 6.022 | 20 |
| 3 ^{1/2} x 3 ^{1/2} | 89 x 89 | 0.315 | 8.00 | 16.40 | 11.022 | 12 | 4 ^{11/15} x 4 ^{11/15} | 120 x 120 | | | 0.157 | 4.00 | 11.70 | 7.863 | 20 |
| | | 0.354 | 9.00 | 17.90 | 12.030 | 12 | | | | | 0.177 | 4.50 | 13.08 | 8.793 | 16 |
| | | 0.079 | 2.00 | 5.38 | 3.616 | 25 | | | | | 0.197 | 5.00 | 14.40 | 9.677 | 16 |
| | | 0.098 | 2.50 | 6.66 | 4.476 | 25 | | | 0.217 | 5.50 | 15.71 | 10.556 | 12 | | |
| | | 0.118 | 3.00 | 7.92 | 5.323 | 25 | | | 0.236 | 6.00 | 17.00 | 11.425 | 12 | | |
| | | 0.157 | 4.00 | 10.35 | 6.956 | 20 | | | 0.315 | 8.00 | 21.40 | 14.382 | 9 | | |
| | | 0.197 | 5.00 | 12.68 | 8.522 | 16 | | | 0.354 | 9.00 | 23.53 | 15.813 | 9 | | |
| | | 0.236 | 6.00 | 14.91 | 10.020 | 16 | | | 0.394 | 10.00 | 25.60 | 17.204 | 9 | | |
| 0.315 | 8.00 | 18.62 | 12.513 | 12 | 0.472 | 12.00 | 28.31 | 19.026 | 8 | | | | | | |
| 0.354 | 9.00 | 20.43 | 13.730 | 12 | 0.098 | 2.50 | 9.10 | 6.116 | 20 | | | | | | |

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|---|-----------|--------------------|-------|----------------------|--------|-------------|---------------------------------------|-----------|--------------------|-------|----------------------|--------|-------------|
| in | mm | in | mm | kg/m | lb/ft | | in | mm | in | mm | kg/m | lb/ft | |
| 4 ^{11/15} x 4 ^{11/15} | 120 x 120 | 0.118 | 3.00 | 10.80 | 7.258 | 20 | 6 x 6 | 150 x 150 | 0.315 | 8.00 | 31.40 | 21.102 | 6 |
| | | 0.157 | 4.00 | 14.20 | 9.543 | 16 | | | 0.394 | 10.00 | 38.10 | 25.605 | 6 |
| | | 0.197 | 5.00 | 17.50 | 11.761 | 12 | | | 0.472 | 12.00 | 43.40 | 29.167 | 4 |
| | | 0.236 | 6.00 | 20.70 | 13.911 | 12 | | | 0.157 | 4.00 | 18.00 | 12.097 | 12 |
| | | 0.315 | 8.00 | 26.40 | 17.742 | 9 | | | 0.197 | 5.00 | 22.30 | 14.987 | 9 |
| | | 0.354 | 9.00 | 29.20 | 19.624 | 9 | | | 0.236 | 6.00 | 26.40 | 17.742 | 9 |
| | | 0.394 | 10.00 | 31.80 | 21.371 | 9 | | | 0.315 | 8.00 | 33.90 | 22.782 | 6 |
| | | 0.472 | 12.00 | 35.80 | 24.059 | 8 | | | 0.354 | 9.00 | 37.66 | 25.309 | 6 |
| 5 x 5 | 125 x 125 | 0.098 | 2.50 | 9.49 | 6.378 | 20 | 6 ^{3/10} x 6 ^{3/10} | 160 x 160 | 0.394 | 10.00 | 41.30 | 27.755 | 6 |
| | | 0.118 | 3.00 | 11.31 | 7.601 | 16 | | | 0.472 | 12.00 | 47.10 | 31.653 | 4 |
| | | 0.157 | 4.00 | 14.90 | 10.013 | 16 | | | 0.157 | 4.00 | 19.30 | 12.970 | 12 |
| | | 0.197 | 5.00 | 18.30 | 12.298 | 12 | | | 0.197 | 5.00 | 23.80 | 15.995 | 9 |
| | | 0.236 | 6.00 | 21.70 | 14.583 | 12 | | | 0.236 | 6.00 | 28.30 | 19.019 | 9 |
| | | 0.315 | 8.00 | 27.70 | 18.616 | 9 | | | 0.315 | 8.00 | 36.50 | 24.530 | 6 |
| | | 0.354 | 9.00 | 30.60 | 20.565 | 9 | | | 0.394 | 10.00 | 44.40 | 29.839 | 4 |
| | | 0.394 | 10.00 | 33.40 | 22.446 | 8 | | | 0.472 | 12.00 | 50.90 | 34.207 | 4 |
| 5 ^{12/23} x 5 ^{12/23} | 140 x 140 | 0.472 | 12.00 | 37.70 | 25.336 | 8 | 7 ^{3/32} x 7 ^{3/32} | 180 x 180 | 0.157 | 4.00 | 21.80 | 14.651 | 9 |
| | | 0.157 | 4.00 | 16.80 | 11.290 | 12 | | | 0.197 | 5.00 | 27.00 | 18.145 | 9 |
| | | 0.197 | 5.00 | 20.70 | 13.911 | 9 | | | 0.236 | 6.00 | 32.10 | 21.573 | 9 |
| | | 0.236 | 6.00 | 24.50 | 16.465 | 9 | | | 0.315 | 8.00 | 41.50 | 27.890 | 4 |

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|-------------|-----------|--------------------|-------|----------------------|--------|-------------|-------------|-----------|--------------------|-------|----------------------|--------|-------------|
| in | mm | in | mm | kg/m | lb/ft | | in | mm | in | mm | kg/m | lb/ft | |
| | | 0.394 | 10.00 | 50.70 | 34.073 | 4 | 8 x 8 | 200 x 200 | 0.472 | 12.00 | 66.00 | 44.355 | 2 |
| | | 0.472 | 12.00 | 58.50 | 39.315 | 4 | 10 x 10 | 250 x 250 | 0.157 | 4.00 | 30.57 | 20.544 | 4 |
| 8 x 8 | 200 x 200 | 0.157 | 4.00 | 24.30 | 16.331 | 6 | | | 0.197 | 5.00 | 38.00 | 25.538 | 4 |
| | | 0.197 | 5.00 | 30.10 | 20.228 | 6 | | | 0.236 | 6.00 | 45.20 | 30.376 | 4 |
| | | 0.236 | 6.00 | 35.80 | 24.059 | 4 | | | 0.315 | 8.00 | 59.10 | 39.718 | 4 |
| | | 0.315 | 8.00 | 46.50 | 31.250 | 4 | | | 0.394 | 10.00 | 72.70 | 48.858 | 2 |
| | | 0.394 | 10.00 | 57.00 | 38.306 | 4 | | | 0.472 | 12.00 | 84.80 | 56.989 | 2 |

TOLERANCES ON SHAPE AND MASS

THL PIPE

| Characteristic | Circular hollow sections | Square and Rectangular hollow sections | |
|---------------------------------|--|--|--------------------------|
| | | Side length (mm) | Tolerance |
| External dimensions (D,B & H) | ± 1%, with a minimum of ± 0.5 mm and a maximum of ± 10 mm | H, B < 100 | ± 1% with a min. ± 0.5mm |
| | | 100 ≤ H, B ≤ 200 | ± 0.8% |
| | | H,B > 200 | ± 0.6% |
| Thickness(T) | For D ≤ 406.4 mm, T ≤ 5.0mm ± 10% T > 5.0mm ± 0.5mm | T ≤ 5.0mm ± 10% T > 5.0mm ± 0.5mm | |
| Out of roundness(O) | 2% for hollow sections having a diameter to thickness ration not exceeding 100 | -- | |
| Concavity/Convexity | -- | Max. 0.8% with a minimum of 0.5mm | |
| Squareness of sides(∅) | -- | 90° ± 1° | |

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| Characteristic | Circular hollow sections | Square and Rectangular hollow sections | |
|-------------------------|---|---|-----------|
| | | Side length (mm) | Tolerance |
| External corner profile | -- | $T \leq 6.0\text{mm}$: 1.6T to 2.4T, $6.0 < T \leq 10.0\text{mm}$: 2.0T to 3.0T, $T > 10.0\text{mm}$: 2.4T to 3.6T | |
| Twist | | 2.0 mm plus 0.5mm/ m Length | |
| Straightness | 0.20% of total length and 3.0 mm over any 1m length | 0.15% of total length and 3.0 mm over any 1m length | |
| Mass per unit length | ± 6% on individual delivered length | | |
| Length | -0/+20mm | | |

CHEMICAL COMPOSITION:



| Grade | Chemical composition % max. | | | | | | |
|---------|-----------------------------|------|------|-------|-------|-------|------------------------|
| | C | Si | Mn | P | S | N | Carbon Equivalent(CEV) |
| S235JRH | 0.17 | -- | 1.40 | 0.040 | 0.040 | 0.009 | 0.35 |
| S275J0H | 0.20 | -- | 1.50 | 0.035 | 0.035 | 0.009 | 0.40 |
| S275J2H | 0.20 | -- | 1.50 | 0.030 | 0.030 | -- | 0.40 |
| S355J0H | 0.22 | 0.55 | 1.60 | 0.035 | 0.035 | 0.009 | 0.45 |
| S355J2H | 0.22 | 0.55 | 1.60 | 0.030 | 0.030 | -- | 0.45 |

Carbon Equivalent : Max. carbon equivalent shall be
 $CEV = C + (Mn / 6) + (Cr + Mo + V) / 5 + (Ni + Cu) / 15$

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MECHANICAL PROPERTIES:

| Grade | Min. Yield Strength R_{eh} (MPa) | Tensile Strength R_m (MPa) | | Minimum Elongation % | Min. Impact Energy(J) | | |
|---------|------------------------------------|------------------------------|----------|----------------------|-----------------------|-----|------|
| | | T < 3 mm | T ≥ 3 mm | | -20°C | 0°C | 20°C |
| S235JRH | 235 | 360-510 | 360-510 | 24 | -- | -- | 27 |
| S275J0H | 275 | 430-580 | 410-560 | 20 | -- | 27 | -- |
| S275J2H | | | | | 27 | -- | -- |
| S355J0H | 355 | 510-680 | 470-630 | 20 | -- | 27 | -- |
| S355J2H | | | | | 27 | -- | -- |

* For section sizes $D/T < 15$ (round) and $(B+H) / 2T < 12.5$ (square & rectangular) the minimum elongation is reduced by 2

Workmanship

: Free from overlap, lamination, tool/roll marks, pin holes, open seam & other harmful defect.

Packing

: Box Type

Marking

: Online stenciling as per the standard & customer requirement.