

STEEL GRADE COMPARISON & FACT SHEET

STEEL STANDARDS

ASTM A500-01A

CSA G40.21-98

| | | |
|---------------------|---|---|
| DESCRIPTION | Standard Specification for cold-formed welded and seamless carbon steel structural tubing in rounds and shapes. | General requirements for rolled or welded structural quality steel/structural quality steel. |
| INTENDED USE | Welded, riveted, or bolted construction of bridges and buildings, and for general structural purposes. | General specifications for plates, shapes, hollow sections, sheet, sheet piling cold-formed channels and bars used in construction. |

TECHNICAL INFORMATION

| SPECIFICATIONS | ROUND STRUCTURAL TUBING | |
|---------------------------|-------------------------|-------------------|
| STRENGTH LEVELS | Grade C | 50W |
| Yield Strength | 46,000 psi min. | 50,000 psi min. |
| Tensile Strength | 62,000 psi min. | 65,000-90,000 psi |
| Elongation % in 2" | 21 min.* | 22 min.* |

| TOLERANCES | Grade C | 50W |
|------------------|----------|-----------|
| O.D. Size | | |
| > 1.9-2.5 incl. | +/- .75% | +/- .020" |
| > 2.5-3.5 incl. | +/- .75% | +/- .030" |
| > 3.5-5.5 incl. | +/- .75% | +/- .040" |
| > 5.5 incl. | +/- .75% | +/- 1% |

| SPECIFICATIONS | SHAPED STRUCTURAL TUBING | |
|---------------------------|--------------------------|-------------------|
| STRENGTH LEVELS | Grade C | 50W |
| Yield Strength | 50,000 psi min. | 50,000 psi min. |
| Tensile Strength | 62,000 psi min. | 65,000-90,000 psi |
| Elongation % in 2" | 21 min.* | 22 min.* |

| TOLERANCES | Grade C | 50W |
|------------------|-----------|-----------|
| O.D. Size | | |
| ≤ 2.5 incl. | +/- .020" | +/- .020" |
| > 2.5-3.5 incl. | +/- .025" | +/- .030" |
| > 3.5-5.5 incl. | +/- .030" | +/- .040" |
| > 5.5 incl. | +/- 1% | +/- 1% |

NOTE: Tolerance includes allowance for convexity and concavity. For rectangular sections, the tolerance calculated for the larger flat dimension shall also apply to the smaller flat dimension. This tolerance shall be increased by 50% when applied to the smaller dimension for rectangular sections whose ratio of cross-sectional dimensions is between 1.5 and 3, and by 100% when this ratio exceeds 3.

| SPECIFICATIONS | SHAPED STRUCTURAL TUBING | | |
|---|--------------------------------------|--------------------------------------|---------------------------------|
| | Grade C | 50W | |
| TOLERANCES | | | |
| Wall Thickness (deviation from nominal) | +/- 10% | +10%/-5% | |
| Mass | N/A | +10%/-3.5% | |
| Straightness (maximum) | 1/8" x length (in feet) divided by 5 | 1/8" x length (in feet) divided by 5 | |
| Squareness | +/- 2° | +/- 2° | |
| Twist | | | |
| ≤ 1.5 incl. | .050" | .050" | |
| > 1.5-2.5 incl. | .062" | .062" | |
| > 2.5-4.0 incl. | .075" | .075" | |
| > 4.0-6.0 incl. | .087" | .087" | |
| > 6.0-8.0 incl. | .100" | .100" | |
| > 8.0 incl (max 3'). | .112" | .112" | |
| Corner Radii | | Perimeter ≤ 24" incl. | Perimeter > 24" incl. |
| ≤ .109 incl. | 3t | .218" | — |
| > .109-.134 incl. | 3t | .268" | — |
| > .134-.156 incl. | 3t | .312" | — |
| > .156-.188 incl. | 3t | .470" | — |
| > .188-.250 incl. | 3t | .625" | .750" |
| > .250-.313 incl. | 3t | .785" | .940" |
| > .313-.375 incl. | 3t | .938" | 1.125" |
| > .375-.500 incl. | 3t | 1.250" | 1.500" |
| > .500 incl. | 3t | — | 3t |
| CHEMISTRY LEVELS | Grade C | 50W | |
| Carbon | .23 max. | .23 max. | |
| Manganese | 1.35 max. | .50-1.50 | |
| Phosphorus | .035 max. | .040 max. | |
| Sulfur | .035 max. | .050 max. | |
| Silicon | N/A | .400 max.* | |
| Grain Refining Elements | N/A | .100 max.* | |

NOTE:

- 1) The above is provided for information purposes only as a general comparison of the specifications listed and in no way should be considered as a complete version of each specification. For more detailed information, the actual specification should be consulted.
- 2) *Other restrictions may apply. Please refer to complete specification for details.
- 3) Consult the Steel Tube Institute of North America publication "Recommended Methods to Check Dimensional Tolerances On HSS" for the industry recognized measurement methods.
- 4) The above comparison also applies to the metric version of the CSA Specification G40.21 350W.