

# ASTM A500 TUBE SPECIFICATIONS

## GENERAL CHARACTERISTICS

All structural tubing made is created in accordance with ASTM A500, Grades B and C, which specifies the mechanical and chemical properties. For the welded, riveted, or bolted construction of bridges and buildings as well as for general structural applications, cold-formed welded and seamless structural tubing made of carbon steel in round, square, rectangular, or unique shape is covered by this specification. With a specified wall thickness of 22 mm or less and a perimeter of no more than 2235 mm, [ASTM A500 tube](#) is available in both welded and seamless diameters. Heat treatment is required for grade D.

## ASTM A500 CHEMICAL COMPOSITION FOR TUBE:

Designation		%C	%Mn	%S	%P	%Cu
Grade A (Heat Analysis)	Min	--	--	--	--	0.20
	Max	0.26	1.35	0.035	0.035	--
Grade A (Product Analysis)	Min	--	--	--	--	0.18
	Max	0.30	1.40	0.045	0.045	--
Grade B (Heat Analysis)	Min	--	--	--	--	0.20
	Max	0.26	1.35	0.035	0.035	--
Grade B (Product Analysis)	Min	--	--	--	--	0.18
	Max	0.30	1.40	0.045	0.045	--
Grade C (Heat Analysis)	Min	--	--	--	--	0.20
	Max	0.23	1.35	0.035	0.035	--
Grade C (Product Analysis)	Min	--	--	--	--	0.18
	Max	0.27	1.40	0.045	0.045	--

## PERMISSIBLE VARIATIONS IN DIMENSIONS FOR SQUARE AND RECTANGULAR TUBING

Specified Outside Large Flat Dimension	Maximum twist in 3 ft.
Over 1-1/2" to 2-1/2"	0.062"
Over 2-1/2" to 4"	0.075"
Over 4" to 6"	0.087"
Over 6" to 8"	0.100"
Over 8"	0.112"

## MECHANICAL PROPERTIES OF ASTM A500 TUBE:

Mechanical properties (Square/Rectangular shape)	Grade	UTS (MPa)	YS (MPa)	%EL
ASTM A500	A	310	270	25
ASTM A500	B	400	315	23
ASTM A500	C	425	345	21

Mechanical properties (Round shape)	Grade	UTS (MPa)	YS (MPa)	%EL
ASTM A500	A	310	230	25
ASTM A500	B	400	290	23
ASTM A500	C	425	315	21

## ASTM A500 ROUND TUBES DIMENSIONAL TOLERANCES

- **Straightness (e):** 2.0 mm times of total length.
- **External Dimensions (D):**  $\pm 0.75\%$  for 50.0mm and above, and  $\pm 0.50\%$  for 48.3mm & smaller.
- **Wall Thickness (T):**  $\pm 10\%$  of the specified wall thickness.

## **ASTM A500 SHAPED TUBES DIMENSIONAL TOLERANCES**

- **Wall Thickness (T):**  $\pm 10\%$  of the specified wall thickness.
- **Concavity/convexity (x1/x2):** Included in the Flat Dimension Tolerances.
- **External Dimensions (B/H):**  $\pm 0.50\text{mm}$  for 65mm or under,  $\pm 0.60\text{mm}$  for 65- 90mm including,  $\pm 0.80\text{mm}$  for 90-140mm including  $\pm 1\%$  for over 140mm.
- **Squareness of side ( $\theta$ ):**  $90^\circ \pm 2^\circ$
- **Radius of corners (R):** Shall not exceed more than 3 times of Specified Wall Thickness.
- **Straightness (e):** 2.0 mm times of total length.

For more details visit: [ASTM A500 Tube Supplier](#)

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