

# ASTM A500 Grade A

## - ALLLAND Production Standards Overview



## Definition and Applications

### 1. Definition

ASTM A500 Grade A is a cold-formed welded and seamless carbon steel structural tubing specification widely used for construction and structural applications. It is manufactured according to ASTM A500/A500M and is available in round, square, and rectangular hollow sections (CHS, SHS, RHS).

With good weldability, dimensional accuracy, and reliable structural performance, ASTM A500 Grade A tubes are commonly used in building frames, bridges, machinery structures, and general fabrication projects.

### 2. ALLLAND ASTM A106 Grade C Steel Pipe Dimensions

| Item                  | Specification                                       |
|-----------------------|-----------------------------------------------------|
| Standard              | ASTM A106 / A106M                                   |
| Pipe Type             | Seamless Carbon Steel Pipe                          |
| Grade                 | Grade C                                             |
| Size Range            | NPS 1/8 – NPS 48 (DN 6 – DN 1200)                   |
| Outside Diameter      | 10.3 mm – 1219 mm                                   |
| Wall Thickness        | SCH 10 – SCH XXS (or customized)                    |
| Length                | 5.8 m, 6 m, 11.8 m, 12 m (custom lengths available) |
| Manufacturing Process | Hot Finished / Cold Drawn Seamless                  |

### 3. Application

ASTM A500 Grade A structural tubes are widely used in various structural and fabrication applications.

They are commonly applied in **building structures, steel frames, bridges, towers, and industrial equipment supports**.

Due to their excellent weldability and formability, they are suitable for **general construction and mechanical structural components**.

ASTM A500 Grade A provides a cost-effective solution for projects requiring reliable strength and dimensional accuracy.

## Critical Tolerances

| Parameter                                 | Tolerance Requirement                                                 |
|-------------------------------------------|-----------------------------------------------------------------------|
| Outside Dimension                         | ±1% of specified dimension                                            |
| Wall Thickness                            | ±10% of specified thickness                                           |
| Length                                    | According to purchaser requirements                                   |
| Straightness                              | Maximum deviation: 1/8 in. × total length (3.2 mm × length in meters) |
| Corner Radius (Square & Rectangular Tube) | Maximum 3 times wall thickness                                        |

## Chemical and Mechanical Properties

### 1. ASTM A500 Grade A Chemical Composition

| Element        | Maximum Value (%)         |
|----------------|---------------------------|
| Carbon (C)     | 0.26 max                  |
| Manganese (Mn) | 1.35 max                  |
| Phosphorus (P) | 0.035 max                 |
| Sulfur (S)     | 0.035 max                 |
| Copper (Cu)    | 0.20 min (when specified) |

### 2. ASTM A500 Grade A Mechanical Properties

| Property           | Requirement              |
|--------------------|--------------------------|
| Tensile Strength   | 45,000 psi (310 MPa) min |
| Yield Strength     | 33,000 psi (230 MPa) min |
| Elongation (2 in.) | 25% min                  |

## Dimension Specifications Table

### 1. Round Hollow Section (CHS)

| Outside Diameter (OD) | Wall Thickness (WT) | Weight (kg/m) |
|-----------------------|---------------------|---------------|
| 21.3 mm               | 2.77 mm             | 1.27          |
| 26.7 mm               | 2.87 mm             | 1.69          |
| 33.4 mm               | 3.38 mm             | 2.50          |
| 42.2 mm               | 3.56 mm             | 3.39          |

| Outside Diameter (OD) | Wall Thickness (WT) | Weight (kg/m) |
|-----------------------|---------------------|---------------|
| 48.3 mm               | 3.68 mm             | 4.05          |
| 60.3 mm               | 3.91 mm             | 5.44          |
| 73.0 mm               | 5.16 mm             | 8.63          |
| 88.9 mm               | 5.49 mm             | 11.29         |
| 101.6 mm              | 6.35 mm             | 15.09         |
| 114.3 mm              | 6.02 mm             | 16.07         |
| 127.0 mm              | 6.55 mm             | 19.10         |
| 139.7 mm              | 6.55 mm             | 21.12         |
| 168.3 mm              | 7.11 mm             | 28.26         |
| 193.7 mm              | 8.18 mm             | 37.28         |
| 219.1 mm              | 8.18 mm             | 42.55         |
| 244.5 mm              | 10.31 mm            | 60.30         |
| 273.0 mm              | 9.27 mm             | 60.31         |
| 323.9 mm              | 9.53 mm             | 73.59         |
| 355.6 mm              | 9.53 mm             | 81.14         |
| 406.4 mm              | 9.53 mm             | 93.18         |

## 2. Square Hollow Section (SHS)

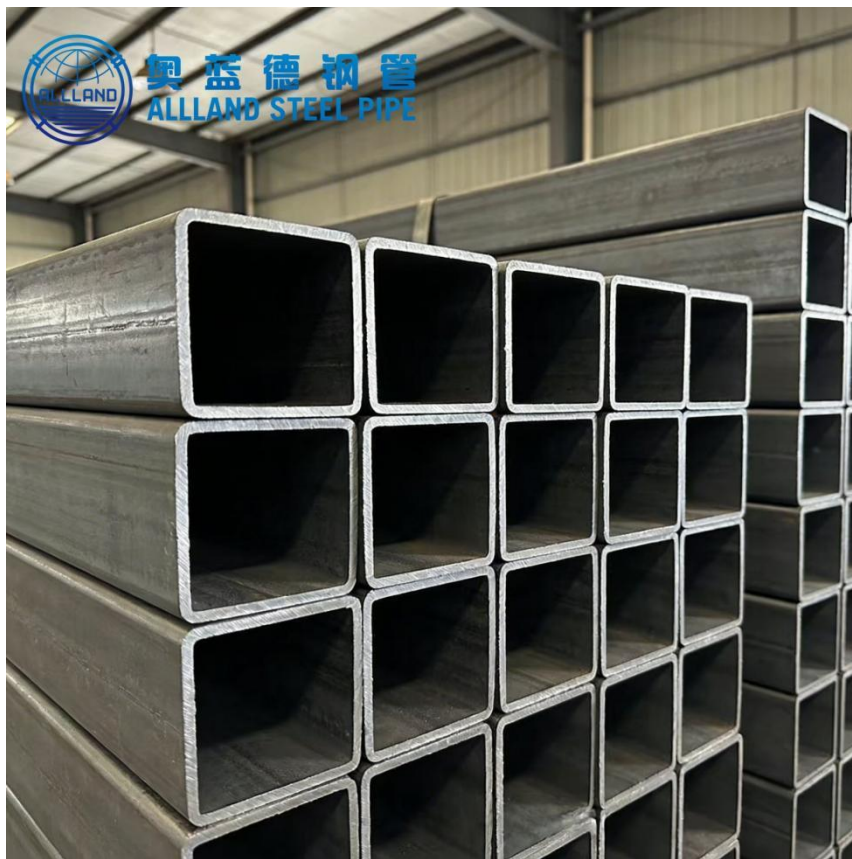
| Size (W × H) | Wall Thickness (WT) | Weight (kg/m) |
|--------------|---------------------|---------------|
| 25 × 25 mm   | 2.0 mm              | 1.49          |
| 30 × 30 mm   | 2.0 mm              | 1.80          |
| 40 × 40 mm   | 2.0 mm              | 2.42          |
| 40 × 40 mm   | 3.0 mm              | 3.48          |
| 50 × 50 mm   | 2.5 mm              | 3.70          |
| 50 × 50 mm   | 3.0 mm              | 4.39          |
| 60 × 60 mm   | 3.0 mm              | 5.09          |
| 75 × 75 mm   | 3.0 mm              | 6.45          |
| 75 × 75 mm   | 4.0 mm              | 8.39          |
| 80 × 80 mm   | 4.0 mm              | 9.05          |
| 100 × 100 mm | 3.0 mm              | 8.48          |
| 100 × 100 mm | 4.0 mm              | 11.08         |
| 100 × 100 mm | 5.0 mm              | 13.63         |
| 120 × 120 mm | 5.0 mm              | 16.54         |
| 150 × 150 mm | 5.0 mm              | 20.94         |
| 150 × 150 mm | 6.0 mm              | 24.98         |
| 200 × 200 mm | 6.0 mm              | 33.29         |
| 200 × 200 mm | 8.0 mm              | 43.86         |
| 250 × 250 mm | 8.0 mm              | 55.16         |
| 300 × 300 mm | 10.0 mm             | 89.54         |

## 3. Rectangular Hollow Section (RHS)

| Size (W × H) | Wall Thickness (WT) | Weight (kg/m) |
|--------------|---------------------|---------------|
| 40 × 20 mm   | 2.0 mm              | 1.80          |
| 50 × 25 mm   | 2.0 mm              | 2.20          |
| 60 × 40 mm   | 3.0 mm              | 4.24          |
| 75 × 50 mm   | 3.0 mm              | 5.66          |
| 80 × 40 mm   | 3.0 mm              | 5.09          |
| 100 × 50 mm  | 3.0 mm              | 6.84          |

| Size (W × H) | Wall Thickness (WT) | Weight (kg/m) |
|--------------|---------------------|---------------|
| 100 × 50 mm  | 4.0 mm              | 8.89          |
| 120 × 60 mm  | 4.0 mm              | 10.15         |
| 150 × 75 mm  | 4.0 mm              | 13.45         |
| 150 × 100 mm | 5.0 mm              | 18.46         |
| 200 × 100 mm | 5.0 mm              | 22.79         |
| 200 × 100 mm | 6.0 mm              | 27.11         |
| 250 × 150 mm | 6.0 mm              | 36.54         |
| 300 × 200 mm | 8.0 mm              | 60.00         |
| 350 × 250 mm | 10.0 mm             | 91.20         |
| 400 × 300 mm | 10.0 mm             | 108.00        |

## ALLLAND ASTM A500 Grade A Product Images



The image shows steel pipes actually produced by our company