# ASTM A500

**COLD-FORMED ERW STRUCTURAL AND MECHANICAL STEEL TUBING**

**SQUARES & RECTANGLES IN GRADES A and B**

## GENERAL INFORMATION ON MARUICHI ASTM A500 CARBON STEEL TUBING

### DESCRIPTIONS:
- Maruichi A500 tubing is available in two grades A and B:
  - **Grade A Tubing** .............. Pickled hot-rolled steel and/or cold-rolled steel ("semi-bright" steel).
  - **Grade B Tubing** .............. "black" hot-rolled steel with normal outside corner radii.

- Grade A tubing has square outside corner radii of less than three times the specified wall thickness.

### APPLICATIONS:
- Ordinary structural/mechanical uses as follows:
  - **Grade A Tubing** .............. appliance, furniture, leisure and playground equipment, ornamental and commercial structures, etc.
  - **Grade B Tubing** .............. structural columns and beams, heavy machinery framework, transportation equipment framework, farming and industrial equipment, guard and bridge railing, scaffolding, sign and advertisement posts, pallets and container frames, material handling equipment, stacking racks, etc.

- Special-purpose tubing, such as R.O.P.S. (roll over protective structure) tubing, may also be made available.

Contact us with details of your specific requirements.

### WELD AREA CONDITION:
- The tubing normally furnished "as-welded" without removal of inside flash.

### END FINISH:
- The tubing ends are square cut, with outside burr held to a minimum.

### IDENTIFICATION MARKING:
- **Grade A Tubing**:
  - Each length is not stenciled, but the following information is marked on a tag attached to each lift bundle:

  ![Image](image.png)

- **Grade B Tubing**:
  - Tubing with longest sides of 4 in. and smaller is not stenciled but identified with the following information marked on a tag attached to each lift bundle, while tubing with longest side over 4 in. is stenciled with the same information:

  ![Image](image.png)

### STANDARD PACKING:
- **Grade A Tubing** .............. steel banded.

- **Grade B Tubing** .............. In bare bundle, steel banded, or loose (in bulk).
  (For standardized number of lengths to be bundled into lift of a given size, please refer to the size tables in the following pages.)

### AVAILABLE SIZE:
- **Grade A Tubing**
  - Square: \[ 1/2" \times 1/2" \times 0.047" \text{ through } 2" \times 2" \times 0.120" \]
  - Rectangle: \[ 1" \times 1/2" \times 0.063" \text{ through } 1\frac{1}{2}" \times 3" \times 0.120" \]

- **Grade B Tubing**
  - Square: \[ 1-1/2" \times 1-1/2" \times 0.095" \text{ through } 10" \times 10" \times 0.500" \]
  - Rectangle: \[ 1" \times 2" \times 0.120" \text{ through } 12" \times 8" \times 0.500" \]

### STANDARD LENGTHS:
- Tubing sizes \[ 2" \times 2" \times 0.120" \text{ and smaller or } 2-1/2" \times 1-1/2" \times 0.120" \text{ and smaller} \]
  - Uniform mill lengths of 20ft. and 24ft.

- Tubing sizes \[ 1-1/2" \times 1-1/2" \times 0.095" \text{ through } 3" \times 3" \times 0.250" \text{ or } \]
  - Uniform mill lengths of 20ft., 24ft. and 40ft. (48ft. maximum)

- Tubing sizes \[ 4" \times 4" \times 0.120" \text{ through } 10" \times 10" \times 0.500" \text{ (12" x 8" x 0.500")} \]
  - Uniform mill lengths of 20ft., 40ft. and 48ft. (60ft. maximum)

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*Unless otherwise agreed, the option between "pickled hot-rolled steel" or "cold-rolled steel" to be used for any given size of your "semi-bright" tubing order is understood to be left to Maruichi.*
# ASTM A500
COLD-FORMED ERW STRUCTURAL AND MECHANICAL STEEL TUBING

## SQUARES & RECTANGLES IN GRADES A and B

### EXCERPTS FROM ASTM A500 SPECIFICATION

<table>
<thead>
<tr>
<th>Tolerances in outside dimensions</th>
<th>Largest Outside Dimension, across flats, in. (mm)</th>
<th>Tolerance, plus and minus, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-1/2 (63.5) and under</td>
<td>0.020 (0.51)</td>
</tr>
<tr>
<td></td>
<td>Over 2-1/2 to 3-1/2 (63.5 to 88.9), include</td>
<td>0.025 (0.64)</td>
</tr>
<tr>
<td></td>
<td>Over 3-1/2 to 5-1/2 (88.9 to 139.7), include</td>
<td>0.030 (0.76)</td>
</tr>
<tr>
<td></td>
<td>Over 5-1/2 (139.7)</td>
<td>1 percent</td>
</tr>
<tr>
<td>(Tolerance include allowance for convexity or concavity.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TOLERANCES IN WALL THICKNESS:

Plus and minus 10% of nominal thickness, exclusive of weld area.

### TOLERANCES IN LENGTH:

Plus 2 in. (50.8 mm) and minus zero on ordered lengths. (This is Maruichi’s private standard tolerance. If any closer tolerance is desired, please be sure to specify that in your inquiries or orders.)

### TOLERANCES IN STRAIGHTNESS:

1/8 in. x \[ \frac{\text{Total Length in ft}}{5} \]

### SQUARENESS OF SIDES:

Adjacent sides may deviate from 90° by plus and minus 2° max.

### CORNER RADII:

The radius of any outside corner shall not exceed three times the specified wall thickness.

### TOLERANCES IN TWIST:

<table>
<thead>
<tr>
<th>Specified Dimension of Longest Side</th>
<th>Maximum Twist in 3 ft, in.</th>
<th>Maximum Twist in 1 m, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2 (38.1) and under</td>
<td>0.060</td>
<td>1.39</td>
</tr>
<tr>
<td>Over 1-1/2 to 2-1/2 (38.1 to 63.5), include</td>
<td>0.062</td>
<td>1.72</td>
</tr>
<tr>
<td>Over 2-1/2 to 4 (63.5 to 101.6), include</td>
<td>0.075</td>
<td>2.09</td>
</tr>
<tr>
<td>Over 4 to 6 (101.6 to 152.4), include</td>
<td>0.087</td>
<td>2.42</td>
</tr>
<tr>
<td>Over 6 to 8 (152.4 to 203.2), include</td>
<td>0.100</td>
<td>2.78</td>
</tr>
<tr>
<td>Over 8 (203.2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CHEMICAL REQUIREMENTS (HEAT ANALYSIS):

<table>
<thead>
<tr>
<th></th>
<th>Grade A</th>
<th>Grade B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon, max., %</td>
<td>0.26</td>
<td>0.26</td>
</tr>
<tr>
<td>Manganese, max., %</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phosphorus, max., %</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>Sulfur, max., %</td>
<td>0.035</td>
<td>0.035</td>
</tr>
</tbody>
</table>

### MECHANICAL PROPERTIES:

<table>
<thead>
<tr>
<th></th>
<th>Grade A</th>
<th>Grade B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength, min., psi (MPa):</td>
<td>45,000 (310)</td>
<td>58,000 (400)</td>
</tr>
<tr>
<td>Yield point, min., psi (MPa):</td>
<td>39,000 (269)</td>
<td>46,000 (317)</td>
</tr>
<tr>
<td>Elongation:</td>
<td>As specified in A500 specification.</td>
<td></td>
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</tbody>
</table>