



## ASTM A513 Mechanical Tubing



**T**he mechanical tubing source - Leavitt can produce the shape, grade and finish that you desire.

Leavitt Tube Company produces round, square and rectangular ASTM A513 types 1 & 2 Mechanical Steel Tubing. You can order your tubular products in various grades of cold rolled bright, cold rolled commercial, aluminized, galvanized, zinc plated, chrome plated, or hot rolled surface finishes. We can produce customer orders quickly because of our flexible, large-scale mill operation. We also offer flash controlling where and when it is requested. So, for your mechanical tubing needs call the mechanical tubing source - Leavitt Tube Company.

Leavitt Tube Company produces mechanical tubing in rounds from .375 to 3.00 with wall thicknesses from 24 ga. (.022 ) to 8 ga. (.165 ); in squares from .500 to 2.500 with wall thicknesses from 22 ga. (.028 ) to 11 ga. (.120 ); and in rectangles from .5 x 1.0 to 2.0 x 3.0 , with wall thicknesses from 20 ga. (.035 ) to 11 ga. (.120 ). Larger sizes are also available by special order. Mechanical Tubing is just one of the many tubular products available from Leavitt Tube Company: The Tube People , where we're making high quality tubing for products used in homes, business and industry.



# ASTM A513 Mechanical Tubing

## Leavitt Tube Company The Mechanical Tubing Process

### Material

Prime hot rolled and cold rolled steel coils, purchased directly from mill sources are used by Leavitt Tube Company to manufacture Mechanical Tubing. When ordering steel, the limits on residual as well as primary elements are specified. This makes the steel superior for Mechanical Tube production.

### Slitting

Slitting of our mill coils is achieved using precision slitting equipment. Coils are selected from our on-hand steel inventory.

### Forming and Welding

The flat, slit coil is gradually and progressively formed into a round shape as it enters the welder. The steel edges are then joined by our welding process to produce high quality welded steel tubing.

### Sizing and Shaping

With our in-line continuous system, the welded tube moves through a cooling section and then a set of sizing rolls which cold work it to the ordered diameter. For square or rectangular tubing, the sizing section is equipped with special rolls which progressively form the round tube into the desired shape.

### End Finishing and Cutting

Tubes are cut to any practical length. Ends can be finished by dedimpling and/or deburring depending on size, gauge, and customer requirements.

### Quality Assurance

In addition to on-the-mill-inspection and testing, our tubing can be examined in one of our three Quality Assurance Labs to ensure that the finished tubing meets customer requirements.

## ASTM A513 TABLES

Tolerances, Outside Dimensions. Square & Rectangular Tubing*	
Widest Side, Inches	Tolerances, Inches
3/8 to 5/8 Incl.	Plus or Minus .004
Over 5/8 to 1-1/8	Plus or Minus .005
1-1/8 to 1-1/2	Plus or Minus .006
1-1/2 to 2	Plus or Minus .008

Convexity & Concavity Tolerances**	
Widest Side, Inches	Tolerances, Inches
2-1/2 & Under	Plus or Minus .010
Over 2-1/2 to 4	Plus or Minus .015

Twist Tolerances	
Largest Dimension, Inches	Tolerance in 3 Feet (Inches)
1/2 and Under	0.032
Over 1/2 to 1-1/2, Incl.	0.050
Over 1-1/2 to 2-1/2, Incl.	0.062
Over 2-1/2 to 4, Incl.	0.075

Corner Radii of Electric-Resistance-Welded Square and Rectangular Tubing		
Squares & Rectangles Made from Tubes of the Following Diameter Ranges, Inches	Wall Thicknesses in Bwg and Inches	Radius Tolerances, Inches
1/2 to 1-1/2 Incl.	22 (0.028)	1/32 to 1/16
1/2 to 2-1/2 Incl.	20 (0.035)	1/32 to 1/16
1/2 to 4 Incl.	18 (0.049)	3/64 to 5/64
1/4 to 4-1/8 Incl.	16 (0.065)	1/16 to 7/64
3/4 to 4-1/8 Incl.	14 (0.083)	5/64 to 1/8
1 to 4-1/8 Incl.	13 (0.095)	3/32 to 5/32
1-1/4 to 4 Incl.	12 (0.109)	1/8 to 13/64
1-1/4 to 4 Incl.	11 (0.120)	1/8 to 7/32

Wall Thickness Tolerance, Square & Rectangular Tubing ±10% of Nominal Wall Thickness
Straightness Tolerance Square & Rectangular Tubing Max. = 1/16" in 3'
Squareness of Sides Tolerance Max. = Wide Side (Inches) x .006"

Tolerance (Inch) for Squareness of Cut (Either End) When Specified for Round Tubing			
Length of Tube, Ft.	Outside Diameter, Inches		
	Under 1"	1" to 2" Incl.	Over 2" to 3" Incl.
Under 1	0.006	0.008	0.010
1 to 3 Incl.	0.008	0.010	0.015
Over 3 to 6 Incl.	0.010	0.015	0.020
Over 6 to 9 Incl.	0.015	0.020	0.025

Tolerances, Outside Diameter, Round Tubing*		
Outside Dimension O.D. Range Cold Rolled	Bwg Gauge	Flash in Tubing Tolerances Inches
3/8 to 5/8" Incl.	22-16	Plus or Minus .003
Over 5/8 to 1 1/8" Incl.	22-11	Plus or Minus .0035
Over 1 1/8 to 2" Incl.	22-10	Plus or Minus .005
Over 2 to 2 1/2" Incl.	20-10	Plus or Minus .006
Over 2 1/2 to 3" Incl.	20-10	Plus or Minus .008
<b>Hot Rolled</b>		
Over 3/4 to 1 1/8" Incl.	16-10	Plus or Minus .0035
Over 1 1/8 to 2" Incl.	16-7	Plus or Minus .005
Over 2 to 2 1/2" Incl.	16-8	Plus or Minus .006
Over 2 1/2 to 3" Incl.	16-9	Plus or Minus .008
Over 3 to 3 1/2" Incl.	16-4	Plus or Minus .009
Over 3 1/2 to 4" Incl.	14-4	Plus or Minus .010
Over 4 to 5 Incl.	14-4	Plus or Minus .020
Over 5	Inquire	

\*Measured at least 2" from cut end of tubing.

Cutting Tolerances Round & Shapes:	
Mill Punch Cut Length	Tolerances, Inches
1 to 3' Incl.	Plus or Minus 1/16
Over 3 to 12'	Plus or Minus 3/32
Over 12 to 20'	Plus or Minus 1/8
Over 20 to 30'	Plus or Minus 3/16
Over 30 to 40'	Plus or Minus 1/8
<b>Recut (Stationary)</b>	<b>Tol. Length, Inches</b>
Punch Cut or Haven Cut	to 3' Plus or Minus 1/32
	Over 3' to 8' Plus or Minus 1/16



\* Measured at corners at least 2" from cut end of tubing.

\*\* Measured in center of the flat sides, applies to size determined at the corners.

**Straightness Tolerance for Round Tubing** is 0.030" /3 ft. lengths for tubing up to 8.000" outside diameter.

**Ovality:** Where actual wall thickness is less than 3% of the O.D. add 50% to the O.D. tolerances shown on the left page.

Wall Thickness Tolerances for Cold Rolled Round Tubing							
Wall Thickness		Outside Diameter, Inches					
		<sup>3</sup> / <sub>8</sub> to <sup>7</sup> / <sub>8</sub> Incl.		Over <sup>7</sup> / <sub>8</sub> to <sup>1</sup> / <sub>2</sub> Incl.		Over <sup>1</sup> / <sub>2</sub> to 3 Incl.	
		Wall Thickness Tolerances, Inches					
In.	Bwg	Plus	Minus	Plus	Minus	Plus	Minus
0.022	24	0.001	0.005	0.001	0.005	-	-
0.028	22	0.001	0.005	0.001	0.005	-	-
0.035	20	0.002	0.005	0.001	0.005	0.001	0.005
0.049	18	0.003	0.006	0.002	0.006	0.002	0.006
0.065	16	0.005	0.007	0.004	0.007	0.004	0.007
0.083	14	0.006	0.007	0.005	0.007	0.004	0.007
0.095	13	-	-	0.005	0.007	0.004	0.007
0.109	12	-	-	0.006	0.008	0.005	0.008
0.120	11	-	-	0.007	0.008	0.006	0.008

Wall Thickness Tolerances for Hot Rolled Round Tubing							
Wall Thickness		Outside Diameter, Inches					
		<sup>3</sup> / <sub>4</sub> to 1 Incl.		Over 1 to <sup>1</sup> / <sub>2</sub> Incl.		Over <sup>1</sup> / <sub>2</sub> to 3 Incl.	
		Wall Thickness Tolerances, Inches					
In.	Bwg	Plus	Minus	Plus	Minus	Plus	Minus
0.065	16	0.005	0.009	0.004	0.010	0.003	0.011
0.072	15	0.005	0.009	0.004	0.010	0.003	0.011
0.083	14	0.006	0.010	0.005	0.011	0.004	0.012
0.095	13	0.006	0.010	0.005	0.011	0.004	0.012
0.109	12	0.006	0.010	0.005	0.011	0.004	0.012
0.120	11	-	-	0.005	0.011	0.004	0.012
0.134	10	-	-	0.005	0.011	0.004	0.012
0.148	9	-	-	0.006	0.012	0.005	0.013
0.165	8	-	-	0.006	0.012	0.005	0.013

Please inquire for heavier walls.

**Leavitt Tube Company ASTM A513 Mechanical Tubing — O.D. Sizes and wall thicknesses** **SQUARES**  
**RECTANGLES**

OUTSIDE DIAMETER			.028	.035	.049	.065	.072	.083	.095	.109	.120
Squares	Rectangles		22 Ga.	20 Ga.	18 Ga.	16 Ga.	15 Ga.	14 Ga.	13 Ga.	12 Ga.	11 Ga.
<sup>1</sup> / <sub>2</sub> x <sup>1</sup> / <sub>2</sub>	<sup>3</sup> / <sub>8</sub> x <sup>5</sup> / <sub>8</sub>		X	X	X	X					
<sup>5</sup> / <sub>8</sub> x <sup>5</sup> / <sub>8</sub>			X	X	X	X					
	<sup>1</sup> / <sub>2</sub> x <sup>7</sup> / <sub>8</sub>		X	X	X	X	X				
<sup>3</sup> / <sub>4</sub> x <sup>3</sup> / <sub>4</sub>	<sup>1</sup> / <sub>2</sub> x 1		X	X	X	X	X	X	X	X	X
<sup>13</sup> / <sub>16</sub> x <sup>13</sup> / <sub>16</sub>	<sup>5</sup> / <sub>8</sub> x 1		X	X	X	X	X	X			
<sup>7</sup> / <sub>8</sub> x <sup>7</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub> x 1		X	X	X	X	X	X			
	<sup>7</sup> / <sub>8</sub> x 1		X	X	X	X	X	X			
1 x 1	<sup>1</sup> / <sub>2</sub> x <sup>1</sup> / <sub>2</sub>		X	X	X	X	X	X	X	X	X
<sup>1</sup> / <sub>8</sub> x <sup>1</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub> x <sup>1</sup> / <sub>2</sub>	1 x <sup>1</sup> / <sub>4</sub>	X	X	X	X	X	X	X	X	X
<sup>1</sup> / <sub>4</sub> x <sup>1</sup> / <sub>4</sub>	1 x <sup>1</sup> / <sub>2</sub>			X	X	X	X	X	X	X	X
<sup>1</sup> / <sub>2</sub> x <sup>1</sup> / <sub>2</sub>	1 x 2	<sup>1</sup> / <sub>4</sub> x <sup>3</sup> / <sub>4</sub>		X	X	X	X	X	X	X	X
	<sup>1</sup> / <sub>4</sub> x 2			X	X	X	X	X	X	X	X
<sup>3</sup> / <sub>4</sub> x <sup>3</sup> / <sub>4</sub>	<sup>1</sup> / <sub>2</sub> x 2			X	X	X	X	X	X	X	X
<sup>1</sup> / <sub>8</sub> x <sup>1</sup> / <sub>8</sub>	<sup>1</sup> / <sub>4</sub> x <sup>2</sup> / <sub>2</sub>			X	X	X	X	X	X	X	X
2 x 2	1 x 3	<sup>1</sup> / <sub>2</sub> x <sup>2</sup> / <sub>2</sub>			X	X	X	X	X	X	X
<sup>2</sup> / <sub>2</sub> x <sup>2</sup> / <sub>2</sub>	2 x 3				X	X	X	X	X	X	X

This table is based on commonly used sizes. Other sizes are within Leavitt Tube Company's production capabilities. We invite your inquiry. Gauges with a blue "x" are available in cold rolled steels only.

**Leavitt Tube Company — More Facilities and Capabilities**

More production capacity ... our inventory of steel coil and tubular products ... tube cutting and precision end finishing ... our own interstate fleet of trucks ... railcar loading and unloading capabilities... huge in-plant shipping capacity ...

flash controlling ... on-line, real-time computerization ... a nationwide sales network ... and the industry's most modern metallurgical laboratories and quality control testing facilities to ensure that our mechanical tubing meets the ASTM A513 standards.

Leavitt Tube Company ASTM A513 Mechanical Tubing — O.D. Sizes and wall thicknesses

ROUND

Outside Diameter		.022	.028	.035	.042	.049	.065	.072	.083	.095	.109	.120	.134	.148	.165	.180									
Decimal	mm	24 Ga.	22 Ga.	20 Ga.	19 Ga.	18 Ga.	16 Ga.	15 Ga.	14 Ga.	13 Ga.	12 Ga.	11 Ga.	10 Ga.	9 Ga.	8 Ga.	7 Ga.									
.375	9.52	X	X	X	X	X	X		This table is based on commonly used sizes. Other sizes are within Leavitt Tube Company's production capabilities. We invite your inquiry.																
.406	10.16		X	X	X	X	X																		
.438	11.13		X	X	X	X	X																		
.500	12.70	X	X	X	X	X	X	X																	
.540	13.72		X	X	X	X	X																		
.562	14.27		X	X	X	X	X	X																	
.625	15.88	X	X	X	X	X	X	X	X	X															
.675	17.48		X	X	X	X	X	X	X																
.706	17.93		X	X	X	X	X	X	X																
.750	19.05	X	X	X	X	X	X	X	X	X	X	X													
.812	20.62		X	X	X	X	X	X	X	X															
.840	21.34		X	X	X	X	X	X	X	X	X														
.875	22.23		X	X	X	X	X	X	X	X	X	X													
.910	23.11		X	X	X	X	X	X	X																
.922	23.42		X	X	X	X	X	X	X																
.995	25.27		X	X	X	X	X	X	X	X	X	X													
1.000	25.40		X	X	X	X	X	X	X	X	X	X													
1.050	26.67		X	X	X	X	X	X	X	X	X	X													
1.062	26.97		X	X	X	X	X	X	X	X	X	X													
1.125	28.58		X	X	X	X	X	X	X	X	X	X													
1.250	31.75		X	X	X	X	X	X	X	X	X	X													
1.315	33.40		X	X	X	X	X	X	X	X	X	X													
1.375	34.93		X	X	X	X	X	X	X	X	X	X	X												
1.437	36.50		X	X	X	X	X	X	X	X	X	X	X												
1.500	38.10		X	X	X	X	X	X	X	X	X	X	X	X											
1.600	40.64		X	X	X	X	X	X	X	X	X	X	X												
1.625	41.28		X	X	X	X	X	X	X	X	X	X	X	X	X										
1.660	42.16			X	X	X	X	X	X	X	X	X	X	X	X	X									
1.690	42.93			X	X	X	X	X	X	X	X	X	X	X	X	X									
1.750	44.45			X	X	X	X	X	X	X	X	X	X	X	X	X									
1.875	47.63			X	X	X	X	X	X	X	X	X	X	X	X	X									
1.900	48.26			X	X	X	X	X	X	X	X	X	X	X	X	X									
2.000	50.80			X	X	X	X	X	X	X	X	X	X	X	X	X									
2.125	53.98			X	X	X	X	X	X	X	X	X													
2.218	56.33			X	X	X	X	X	X	X	X	X													
2.250	57.15			X	X	X	X	X	X	X	X	X	X	X	X	X									
2.375	60.33			X	X	X	X	X	X	X	X	X	X	X	X	X	X								
2.500	63.50			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
2.625	66.68			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
2.750	69.85			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
2.875	73.03			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
3.000	76.20			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							

Please inquire about our mechanical capability above 3 . Gauges with a blue x are available in cold rolled steels only.  
 Gauges with a red "x" are available in hot rolled steels only.



The Tube People

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