



Welded Tubes, Inc. Tolerance & Spec Sheet

High Quality, Tight Tolerance Tubing

Since our founding more than 50 years ago, Welded Tubes has been setting industry standards for tubing tolerances and quality. We produce tubing from a range of material grades for industrial and ornamental applications. Welded Tubes is ISO/TS 16949:2009 certified and a proven partner to OEMs in the automotive, appliance, health and fitness, industrial machinery, marine and furniture industries.

Welded Tube Benefits

- **Electric Resistance Welding (ERW)** - is a high productivity process yielding a clean weld, even stronger than the parent material
- **Strength** - cold forming gives our tubing a higher yield and tensile strength than the steel from which it is made
- **Less Processing** - the close dimensional tolerances of our tubing allows its use for mechanical parts with minimal downstream processing
- **Cost-Effective** - less processing than other types of mechanical tubing provides cost advantages for less-demanding applications
- **Wide Size Range** - our tubing is available in a broad range of OD and wall thickness dimensions
- **Variety of Shapes** - we offer round, square and rectangular shapes and a variety of special shapes to meet the your needs



The edges of the formed tube are high frequency electric-resistance welded, providing a smooth contour and maintaining tight tolerances

Standard Tolerances

Wall Thickness Tolerances 3/8" to 2-1/2" Diameter

Inches	BWG	+/- Range
.028	22	.026/.029
.035	20	.032/.035
.042	19	.040/.044
.049	18	.044/.049
.058	17	.055/.059
.065	16	.060/.065
.070	15	.065/.070
.083	14	.079/.085
.095	13	.095/.105
.109	12	.098/.113
.120	11	.120/.130

Length Tolerances

Type of Cut	Length (Inches)	+/- Inches
Griender	4-108	+/- .010
Griender	108-240	+/- .062
End Cond (22.5°)	4-108	+/- .010
Brehm (Vulcan)	5/8-60	+/- .015
Punch Cut	RML	+/- .500

Notes:

- (1) These tolerances may be much more restrictive than A513-00 TYPE2 specifications.
- (2) Any requests for tolerances that do not completely meet those established on these pages must be approved by Design Review.
- (3) Certain dimensional features are a function of the "As Welded" tube manufacturing process and as such are not inspected on a routine basis. Process inspection data showing compliance may or may not be available. Exact test data for compliance to yield, tensile and elongation requirements of the actual tube can be obtained by test at the customer's expense.
- (4) I.D. flash rolled to .005 max (see Round Tube Availability table)
- (5) I.D. flash removal (I.D. ranges from .826" to 2.265")

Selected Tolerances, Outside Dimensions of Square & Rectangle Tubing per ASTM, Table 13

Largest Nominal Outside Dimension	Wall	Outside Tolerance at All Sides at Corners
3/8" x 5/8"	.020 - .083	+/- .004
Over 5/8" - 1-1/8"	.022 - .156	+/- .005
Over 1-1/8" - 2.000"	.025 - .195	+/- .006

Selected Commercial Radii of Corner of Square & Rectangle as per ASTM, Table 14

Diameter (Round)	Wall Thickness		Radius Tolerance (Inches)
	Inches	BWG	
1/2 - 1-1/2	.028	22	1/32 - 1/16
1/2 - 2-1/2	.035	20	1/32 - 1/16
1/2 - 2-1/2	.049	18	3/64 - 5/64
1/2 - 2-1/2	.065	16	1/16 - 7/64
3/4 - 2-1/2	.083	14	5/64 - 1/8

Tighter Tolerances Available Upon Request

Selected Hardness Limits and Tensile Properties for Welded Tubing (ASTM A513), Table S 5.1

Grade	Yield Strength ksi (MPa) Min.	Ultimate Strength ksi (MPa) Min.	Elongation in 2" or 50mm, % Min.	RB Min.	RB Max.
1008	30 (207)	42 (290)	15	50	—
1020	38 (262)	52 (359)	12	62	—
340XF	49 (340)	64 (440)	22	—	—
420YF	61 (420)	75 (520)	16	—	—
550YF	80 (550)	94 (650)	12	—	—

Shape Sizes Available

(Other sizes & stainless steel available upon request)

Available
On Inquiry Only



Squares

Nominal Thickness (Inches)

	0.028	0.035	0.042	0.049	0.058	0.065	0.072	0.083	0.095	0.110	0.120
.393"											
3/8"											
1/2"											
5/8"											
3/4"											
13/16"											
7/8"											
1"											
1-1/8"											
1.181"											
1-1/4"											
1-1/2"											
2"											



Rectangles

Nominal Thickness (Inches)

	0.028	0.035	0.042	0.049	0.058	0.065	0.072	0.083	0.095	0.110	0.120
0.312" x 1-1/4"											
3/8" x 5/8"											
3/8" x 3/4"											
3/8" x 7/8"											
3/8" x 1"											
3/8" x 1-1/4"											
3/8" x 1-1/2"											
1/2" x 1"											
1/2" x 1-1/4"											
1/2" x 1-1/2"											
1/2" x 2"											
5/8" x 7/8"											
5/8" x 1"											
5/8" x 1-1/8"											
5/8" x 1-1/4"											
5/8" x 1-5/8"											
3/4" x 1"											
3/4" x 1-1/4"											
3/4" x 1-1/2"											
3/4" x 2"											
0.787" x 1.181"											
7/8" x 1-1/4"											
1" x 1-1/4"											
1" x 1-1/2"											
1" x 2"											



Flat Ovals

Nominal Thickness (Inches)

	0.028	0.035	0.042	0.049	0.058	0.065	0.072	0.083	0.095	0.110	0.120
0.394" x 0.984"											
0.410" x 1.261"											
0.633" x 1.250"											
0.500" x 2.250"											
0.875" x 2.220"											
0.313" x 2.750"											

Round Tube Availability

(Other sizes & stainless steel available upon request)

Available
On Inquiry Only



Rounds

OD Sizes

Nominal Thickness (Inches)

		0.028	0.035	0.042	0.049	0.058	0.065	0.072	0.083	0.095	0.110	0.120
0.375	3/8											
0.394	10mm											
0.438	7/16											
0.472	12mm											
0.500	12.7mm											
0.551	14mm											
0.563	9/16											
0.625	5/8											
0.688	7/16											
0.750	3/4											
0.813	13/16											
0.875	7/8											
0.885	22.5mm											
0.938	15/16											
1.000	25.4mm											
1.063	1-1/16											
1.063	27mm											
1.125	1-1/8											
1.179	30mm											
1.188	1-3/16											
1.250	1-1/4											
1.313	1-5/16											
1.375	1-3/8											
1.438	1-7/16											
1.500	1-1/2											
1.563	1-9/16											
1.625	1-5/8											
1.750	1-3/4											
2.000	2											
2.125	2-1/8											
2.250	2-1/4											
2.50	2-1/2											

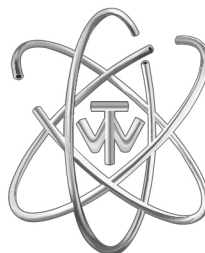
FLASH-IN

FLASH ROLLED .005" MAX

Also:	0.389	0.406	0.421	0.480	0.515	0.518	0.548	0.590	0.675	0.682	0.706	0.713
	0.746	0.788	0.816	0.822	0.834	0.840	0.860	0.867	0.910	0.922	0.984	1.022
	1.030	1.140	1.156	1.328	1.338	1.482	1.630	1.772	1.780	1.875	1.900	at most walls

NOTE: Additional mm sizes available
Special tolerances available on all rounds sizes
All contents subject to change without notice

ISO/TS 16949:2009



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