

Not For Production Use (For Reference Only)

ASTM A269-04 and UI

Specification for Welded Austenitic Stainless Steel Tubing for General Service

ASTM Chemical Requirements

Elements	304	304L	316	316L	321
	S30400	S30403	S31600	S31603	S32100
(C) Carbon, max	0.080	0.035	0.080	0.035	0.080
(Mn) Manganese, max	2.000	2.000	2.000	2.000	2.000
(P) Phosphorus, max	0.045	0.045	0.045	0.045	0.045
(S) Sulfur, max	0.030	0.030	0.030	0.030	0.030
(Si) Silicon	1.000	1.000	1.000	1.000	1.000
(Ni) Nickel	8.0-11.0	8.0-12.0	10.0-14.0	10.0-14.0	9.0-12.0
(Cr) Chromium	18.0-20.0	18.0-20.0	16.0-18.0	16.0-18.0	17.0-19.0
(Mo) Molybdenum	N/A	N/A	2.0-3.0	2.0-3.0	N/A
(Ti) Titanium	N/A	N/A	N/A	N/A	5xC - 0.070

Mechanical Testing Test

Test	ASTM	United
Flare	Not Required	Required
Flatten	Not Required	Required
Flange	Required	Required
Reverse Bend	Not Required	Required
Reverse Flatten	Required	Required
Eddy Current	Required*	Required
Hydrostatic	Required*	Not Required
Hardness, max	90 Rb	90 Rb
Pressure	Not Required	Required *

Heat Treatment

- The material will be heat treated by heating to 1900 F minimum and then quenching.

Surface Condition

- The tube surface will be free of scale by pickling or bright annealing (ASTM).

Stencil

- Man. Name or brand, spec number, and grade.

- Marked "welded", "NDE" if eddy current tested, "HT" and the anneal temp if <1900F.

*Air pressure test 30 psi tubes over 20' for HBA / 180 grit / ID Polish tubes

* ASTM required either an Eddy Current or a Hydrostatic test be performed.

Dimensional Requirements

Size	Outside Diameter		Squareness		Length**		Straightness		Weld Height		Wall***	
	ASTM	United	ASTM	United	ASTM	United	ASTM	United	ASTM	United	ASTM	United
1/2"	+/- .005	+/- .005	N/A	.010	-0 +1/8	-0 +1/8	.030/36"	.030/36"	.004	+ .006	+/- 10%	+/- 10%
3/4"	+/- .005	+/- .005	N/A	.010	-0 +1/8	-0 +1/8	.030/36"	.030/36"	.004	+ .006	+/- 10%	+/- 10%
1"	+/- .005	-.005 / .002	N/A	.015	-0 +1/8	-0 +1/8	.030/36"	.030/36"	.006	+ .006	+/- 10%	+/- 10%
1-1/2"	+/- .010	-.006/+ .002	N/A	.025	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.006	+ .006	+/- 10%	+/- 10%
2"	+/- .010	-.006/+ .002	N/A	.035	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.006	+ .006	+/- 10%	+/- 10%
2-1/2"	+/- .010	-.008/+ .002	N/A	.040	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.010	+ .010	+/- 10%	+/- 10%
3"	+/- .010	-.008/+ .003	N/A	.045	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.010	+ .010	+/- 10%	+/- 10%
3-1/2"	+/- .015	-.008/+ .003	N/A	.045	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.010	+ .010	+/- 10%	+/- 10%
4"	+/- .015	-.008/+ .003	N/A	.045	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.010	+ .010	+/- 10%	+/- 10%
4 1/2"	+/- .015	-.008/+ .003	N/A	.045	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.010	+ .010	+/- 10%	+/- 10%
6"	+/- .030	+/- .015	N/A	.045	-0 +3/16	-0 +3/16	.030/36"	.030/36"	.010	+ .010	+/- 10%	+/- 10%

** These tolerances apply to 24 ft. lengths or less. For lengths over 24 ft. add a tolerance of 1/8 in. for each 10 ft., or fraction thereof, up to a max of 1/2 in.

*** Applicable only when nominal wall is specified. When minimum wall is specified, the tolerance is -0 +18%.