



# Stainless Steel Pharmaceutical Tubing



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# ASME BPE Electropolished Stainless Steel Pharmaceutical Grade Tubing

Top Line Electropolished tubing sets the standard for service in applications requiring finishes to 15RA maximum. Available in sizes from 1/2" to 4" OD, this full finished stainless steel tubing is available from stock or direct from the mill in 20 foot lengths. All electropolished tubing is fully tested and marked per ASTM A450 requirements.

**MATERIALS:** Manufactured from 316L stainless steel produced to ASTM A270 Supplementary #2 Pharmaceutical Grade Tubing, other alloys available upon request.

CHEMICAL COMPOSITION	PERCENTAGE	316L	CHEMICAL COMPOSITION	PERCENTAGE	316L
ELEMENTS	SPEC.	TYPICAL	ELEMENTS	SPEC.	TYPICAL
(C) CARBON	0.035 max.	.020	(Si) SILICON	1.00	.50
(Mn) MANGANESE	2.00 max.	1.70	(Ni) NICKEL	10.0 - 15.0	10.2
(P) PHOSPHORUS	0.045	.029	(Cr) CHROMIUM	16.0 - 18.0	16.4
(S) SULFUR	.005 - .017 max.	.013	(Mo) MOLYBDENUM	2.0 - 3.0	2.10

## Dimensional Tolerances

OUTSIDE DIAMETER		GAUGE	OUTSIDE DIAMETER		LENGTH	WALL THICKNESS	
INCH	MILLIMETER		SPEC	TYPICAL		SPEC	TYPICAL
1/2"	12.70	16 (.065")	+0.005/-0.005	+0.003/-0	+2.00/-0	+/-10%	+/-3%
3/4"	19.05	16 (.065")	+0.005/-0.005	+0.003/-0	+2.00/-0	+/-10%	+/-3%
1"	25.40	16 (.065")	+0.005/-0.005	+0.003/-0	+2.00/-0	+/-10%	+/-3%
1 1/2"	38.10	16 (.065")	+0.008/-0.008	+0.002/-0.006	+2.00/-0	+/-10%	+/-3%
2"	50.80	16 (.065")	+0.008/-0.008	+0.002/-0.006	+2.00/-0	+/-10%	+/-3%
2 1/2"	63.50	16 (.065")	+0.010/-0.010	+0.002/-0.008	+2.00/-0	+/-10%	+/-3%
3"	76.20	16 (.065")	+0.010/-0.010	+0.002/-0.010	+2.00/-0	+/-10%	+/-3%
4"	101.60	14 (.083")	+0.015/-0.015	+0.002/-0.012	+2.00/-0	+/-10%	+/-3%

**FINISH:** Electropolished Tubing is standard with a 15RA max ID with bright annealed/mill OD (ASME BPE surface finish code SFT4). Mechanically polished OD to 32RA or 20RA available on application. The same product is available with a 10RA max. surface finish ID.

**ANNEALING:** All tubing is Bright Annealed to a minimum of 1900 degrees F (1040° C) and rapidly quenched.

**CLEANING:** All Top Line electropolished tubing is rinsed with low TOC de-ionized water. The tubing is then dry purged with 99.998% pure Nitrogen which is filtered to .003 micron at the point of use. The cleaning and packaging is done in a class 100 cleanroom.

**PACKAGING:** All Top Line electropolished tubing is packaged using protective 6 mil poly sleeving with air tight end caps. The tubing is then packaged in wood or Tri-Wall corrugated cartons for maximum protection during shipment.



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