

# Electropolished Stainless Steel Tubing

*High Purity Tubing for pharmaceutical, semiconductor, biotechnology, and other processes requiring finishes to 10  $\mu$ -in Ra ID maximum.*

## Summary:

Rath's True10™ tubing is manufactured to ASME BPE and ASTM A270 S2 standards, making it ideal for ultra high purity applications. By utilizing Rath's Micro-Weld™ technology and proprietary electropolishing process, ID surface anomalies are minimized, providing an ultra-smooth, corrosion resistant, chromium enriched surface where contaminants can't hide. Electropolished tubing is processed and packaged in a certified Class 100 Cleanroom (Fed 209E), a must for manufacturing clean tubing intended for use in today's ultra purity environments. Sizes available are 1/2" (12.7 mm) to 4" (101.6 mm) OD in stock 20 ft. (6.1 m) lengths.



## Materials

- 316L available from stock. 6-MOLY and other alloys available on request.
- See reverse side for complete specifications regarding materials and dimensional tolerances.

## Mechanical Tests

To ensure the highest surface quality in all of our sanitary tubing, Rath goes beyond the requirements of ASTM A269 and A270 by performing the full battery of ASTM bend and deformation tests required by ASME SA249 as well as additional deformation tests developed by Rath. The tests, combined with specific raw material requirements, eddy current testing at the tube mill, 100% bore-scoping prior to mechanical polish, and tighter OD and wall tolerances allow Rath to provide a more consistent superior quality product.

## Annealing

- Hydrogen bright annealed in line to 1900° F (1040° C) minimum and rapidly quenched.

## Cleaning

All Rath® True10™ Electropolished tubing utilizes a state of the art deionized water system that guarantees less than 50 ppb TOC with an average of 10 ppb and a resistivity up to 18 M $\Omega$ . Rath also utilizes 99.9999% pure Nitrogen which is filtered to 0.003  $\mu$ m at the point of use. Cleaning and packaging are performed in a certified Class 100 Cleanroom.

## Surface Finish

Surface finish is 10  $\mu$ -in Ra (0.25  $\mu$ m) ID maximum measured per ASME/ANSI B46.1 with the profilometer reading at 90 degrees to major polishing pattern. The OD finish is bright annealed with polishing available on request.

## Packaging

As a final step in maintaining clean standards, Rath tubing is packaged using protective 6 mil poly sleeving along with air tight plastic end caps over a polyamide patch. The tubing is then placed in wood boxes for maximum protection during shipment. Other packaging is available on customer request.

## Specification

**Tubing shall be Rath True10™ Electropolished 316L tubing. Surface finish is 10  $\mu$ -in Ra (0.25  $\mu$ m) ID maximum measured per ASME/ANSI B46.1 with the profilometer reading at 90 degrees to major polishing pattern.**

## Tubing Sizes

**1/2" to 4" OD**



ISO 9001  
REGISTERED



# Rath Manufacturing Company, Inc.

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## Chemical Composition

Elements	316L (wt%)
(C) Carbon, max	0.035
(Mn) Manganese, max	2.00
(P) Phosphorus, max	0.040
(S) Sulfur	0.005 - 0.017
(Si) Silicon, max	0.75
(Ni) Nickel	10.0 - 15.0
(Cr) Chromium	16.0 - 18.0
(Mo) Molybdenum	2.0 - 3.0



Rath's certified Class 100 Cleanroom is where electropolished tubing receives 100% inspection, final cleaning and packaging.

## Dimensional Tolerances

all dimensions in inches (mm)

Size OD	Nominal Wall	Outside Diameter	Length	Wall
1/2" (12.7)	0.065" (1.65)	+/-0.004" (0.10)	+1/8" (3.18) - 0	+/-10.0%
3/4" (19.1)	0.065" (1.65)	+/-0.004" (0.10)	+1/8" (3.18) - 0	+/-10.0%
1" (25.4)	0.065" (1.65)	+0.002" (0.05)/-0.008" (0.20)	+1/8" (3.18) - 0	+/-10.0%
1-1/2" (38.1)	0.065" (1.65)	+0.002" (0.05)/-0.008" (0.20)	+1/8" (3.18) - 0	+/-10.0%
2" (50.8)	0.065" (1.65)	+0.002" (0.05)/-0.011" (0.28)	+1/8" (3.18) - 0	+/-10.0%
2-1/2" (63.5)	0.065" (1.65)	+0.002" (0.05)/-0.011" (0.28)	+1/8" (3.18) - 0	+/-10.0%
3" (76.2)	0.065" (1.65)	+0.003" (0.08)/-0.012" (0.30)	+1/8" (3.18) - 0	+/-10.0%
4" (101.6)	0.083" (2.11)	+0.003" (0.08)/-0.015" (0.38)	+1/8" (3.18) - 0	+/-10.0%

*Take Full  
Advantage of Rath®  
Performance*

Rath's extensive manufacturing facility in Janesville, Wisconsin can deliver superior tube and pipe quality along with the service performance needed by Rath's customers. We offer prompt quotations, tight production controls for best possible delivery, plus complete in-house testing and finishing for an extra measure of value. Rely on Rath® technology and the experience of our entire team to meet customers application requirements.



Stainless, Duplex & Nickel Alloy  
Tubing & Pipe

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