



Swagelok Alabama | Central & South Florida | West Tennessee



Make the Connection

Swagelok® Tubing

Setting the standard for quality and superior performance

Reliable, High-Performing, Corrosion Resistant
The higher chemical composition and smooth surface finish of Swagelok bright annealed tubing make it the ideal choice for any fluid system application.

Not all tubing is manufactured to the same specifications. Swagelok bright annealed tubing is manufactured to higher quality standards, containing percentages of Nickel (Ni), Molybdenum (Mo) and Chromium (Cr) that exceed requirements for ASTM A269 in 316 stainless steel tubing to deliver superior performance, safety and cost-savings over the life of your fluid system.

Reliable:

Unwavering performance under high vibration and temperature swings

- Increased mechanical strength reduces operational downtime by prolonging installed product life-cycle
- Rigorously tested for fractures and inclusions

High-Performing:

Designed to meet the requirements of virtually any industry or application

- Tolerant of pressure up to 60,000 PSI and temperatures from cryogenic to 1100° C
- Higher grip support with tube fittings reduces potential leak points and improves flow efficiency

Corrosion Resistant:

Bright annealed surface finish and higher PREN values

- Less susceptible to pitting and crevice corrosion, especially in high-chlorine environments
- Doesn't require that the tubing be "pickled"

How Corrosion Resistance is Calculated

$$\text{PREN} = \% \text{Cr} + (3.3 \times \% \text{Mo}) + (16 \times \% \text{N})$$

ASTM 316

$$16 + (3.3 \times 2) + (16 \times 0.03) = 23.08 \text{ PREN}$$

Swagelok 316

$$17.5 + (3.3 \times 2.65) + (16 \times 0.036) = 26.82 \text{ PREN}$$

Pitting Resistance Equivalent Number (PREN) measures resistance to localized pitting corrosion. Higher PREN values indicate greater pitting corrosion resistance



Proper materials keep your systems leak-tight and operating efficiently, reducing cost over the life of your system.

Bright vs Open-Air Annealing

Bright Annealing

Bright annealing is performed in a controlled atmosphere containing an inert gas, such as hydrogen. This controlled atmosphere reduces surface oxidation, resulting in a smooth, bright surface with a much thinner oxide layer which provides better corrosion resistance.

Surface Finish: 0.04 to 0.24 Ra (μm)*

Open-Air Annealing

Open-air annealing is performed in an open furnace where exposure to atmospheric oxygen causes scaling on the material surface. Standard specifications require that tubing must be delivered with a scale free surface, so tubes are "pickled" in a solution of nitric and hydrofluoric acid to chemically remove scale. Tubes are then passivated in an alkaline solution to prevent unintentional corrosion, resulting in a rougher surface finish.

Surface Finish: 0.9 to 1.4 Ra (μm)*

**Roughness Average in microns*

to learn more or contact your local Swagelok sales and service center to request a quote:

Email: info@ALFL.Swagelok.com

Birmingham
205.988.4812

Mobile
251.625.2949

Tampa
863.425.3222