



## Long-Flex-Life Peristaltic Pump Tubing



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Tygon S3™ E-LFL Tubing now phthalate-free. We are proud to be among the first companies to offer sustainable flexible tubing products. The bio-based Tygon S3™ product line combines the high performance standards customers demand with an eco-friendly tubing design. Tygon S3™ E-LFL tubing is our best performing peristaltic pump tubing and has no industry equivalent. It has been tested rigorously to ensure that it meets the same physical standards as the old Tygon® LFL tubing, including 1,000 hours of peristaltic pump tubing life at 0 bar back pressure, low particulate spallation and chemical resistance.

### Optimal Peristaltic Pump Performance

Crystal-clear Tygon S3™ E-LFL tubing is formulated specifically for use in peristaltic pump applications. The new Tygon S3™ E-LFL non-DEHP tubing has even longer pump life not only at 0 bar but also at back pressure of up to 1,7 bar. The peristaltic pump life performance at different back pressures is shown on the back page. With its superior flex life characteristics, Tygon S3™ E-LFL Tubing reduces production downtime due to pump tubing failure. Our tests demonstrated reduced particle spallation, which eliminates the need for frequent downstream filter replacement and diminishes the risk of sensitive-fluid contamination. This is critical in several applications, such as pharmaceutical, high-purity chemicals, cosmetics and food. The non-aging and broad chemical resistance properties of Tygon S3™ E-LFL tubing enable users to utilize the new tubing for transferring food and beverages without danger of corrosion (as with metals) or oxidation (as with rubber).

### Regulatory Standards

Tygon S3™ E-LFL complies with FDA and NSF standards and meets USP Class VI, ISO 10993, Japan Food Sanitation Law # 370/1959, REACH, 1935/2004/EC and 10/2011/EU for many foods and beverages. Tygon S3™ tubing products do not contain chemicals listed in California's Proposition 65.

### Features and Benefits

- Long Flex Life – reduces downtime due to pump failure
- broad chemical resistance
- extremely low particle spallation – reliable for sensitive-fluid applications
- contains no BPA or phthalate

### Regulatory Compliance\*

- FDA
- NSF
- USP Class VI
- ISO 10993
- REACH
- 1935/2004/EC and 10/2011/EU
- Japan Food Sanitation Law #370/1959
- Contains no chemical listed in California's Proposition 65

\*For complete compliance information and appropriate use instructions, please contact us

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## Tygon S3™ E-LFL Standard Sizes

Part Number	ID	OD	Wall	Min. Bend Radius	Max. Working Pressure* 22°C (73°F)	Vacuum Rating at 22°C (73°F)
TY1,59LF4,76	1,59 mm (1/16")	4,76 mm (3/16")	1,59 mm (1/16")	6,4 mm	3,5 bar	760 mmHg
TY3,18LF6,35	3,18 mm (1/8")	6,35 mm (1/4")	1,59 mm (1/16")	12,7 mm	2,3 bar	760 mmHg
TY4,76LF7,94	4,76 mm (3/16")	7,94 mm (5/16")	1,59 mm (1/16")	19,0 mm	1,7 bar	760 mmHg
TY6,35LF9,53	6,35 mm (1/4")	9,53 mm (3/8")	1,59 mm (1/16")	25,4 mm	1,4 bar	381 mmHg
TY6,35LF12,7	6,35 mm (1/4")	12,7 mm (1/2")	3,18 mm (1/8")	19,0 mm	2,4 bar	760 mmHg
TY7,94LF11,11	7,94 mm (5/16")	11,11 mm (7/16")	1,59 mm (1/16")	31,7 mm	1,1 bar	254 mmHg
TY9,53LF15,88	9,53 mm (3/8")	15,88 mm (5/8")	3,18 mm (1/8")	25,4 mm	1,7 bar	760 mmHg
TY12,7LF19,05	12,7 mm (1/2")	19,05 mm (3/4")	3,18 mm (1/8")	38,1 mm	1,4 bar	508 mmHg
TY19,05LF31,75	19,05 mm (3/4")	31,75 mm (1-1/4")	6,35 mm (1/4")	44,4 mm	1,7 bar	760 mmHg
TY25,4LF34,93	25,4 mm (1")	34,93 mm (1-3/8")	4,76 mm (3/16")	82,5 mm	1,0 bar	127 mmHg

\*Working pressures are calculated at a 1:5 ratio relative to burst pressure using ASTM D1599

The values listed for working and burst pressures are derived from tests conducted under controlled laboratory conditions. Many factors will reduce the tubing's ability to withstand pressures, including temperature, chemical attack, stress, pulsation and the attachment to fittings. It is imperative that the user conduct tests simulating the conditions of the application prior to specifying the tubing for use.

## Typical Physical Properties of Tygon S3™ E-LFL Tubing

Property	ASTM Method	Value of Rating
Durometer Hardness	D2240	56° Shore A, 15s
Color	-	Clear
Tensile Strength	D412	12.4 MPa (1,800 psi)
Ultimate Elongation	D412	400,00%
Tensile Stress @ 100% @ 200%	D412	3.8 MPa (550 psi) 6.6 MPa (950 psi)
Tear Resistance	D1004	32,2 kN/m (184 lb-f/in)
Compression Set Constant Deflection @70°C (158°F) for 22 hrs.	D395	68,00%
Maximum Recommended Operating Temperature	-	74°C (165°F)
Brittleness by Impact Temperature	D746	-46°C (-51°F)
Cold Temp. Flexibility at 5°C increments	D380	-55°C (-67°F)
Water Absorption, % 24 hrs. @ 23°C	D570	0.20
Specific Gravity	D792	1,17
Tensile Set @ 75% Elongation	D412	54
Dietectric Strength	D149-97	15,6 kV/mm (396 v/mil)

## Peristaltic Pump Tubing Life

The table below illustrates hours until failure of ID 6,35 mm (1/4") x OD 9,53 mm (3/8") tubing for 0 bar, 0,7 bar and 1,0 bar and ID 6,35 mm (1/4") x OD 11,11 mm (7/16") tubing for 1,7 bar. In each case, a 3-roller pump head was utilized operating at 600 rpm under room temperature 23°C (73°F). Tubing failure is measured in hours of use prior to rupture.

### Tygon S3™ E-LFL Tubing

0 bar	1,000 HOURS
0.7 bar	600 HOURS
1 bar	200 HOURS
1.7 bar	150 HOURS

**TYGON S3™ E-LFL TUBING IS NOT INTENDED FOR USE AS AN IMPLANT MATERIAL.**

## Sterilization Methods

Autoclavable	30 min at 121 °C
Gas (Ethylene Oxide)	Yes

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