

# TYGON S<sup>3</sup>™ E-LFL

*The only choice for phthalate-free flexible tubing*

## Non-DEHP Tubing for Laboratory, Food & Beverage, and Biopharmaceutical Applications

Tygon S<sup>3</sup>™ E-LFL from Saint-Gobain Performance Plastics is now phthalate-free. Saint-Gobain is proud to be among the first companies to offer sustainable flexible tubing products. The bio-based Tygon S<sup>3</sup>™ line combines the high performance standards customers demand with an eco-friendly tubing design. The new Tygon S<sup>3</sup>™ E-LFL non-DEHP tubing is our best performing peristaltic pump tubing and has no industry equivalent. Tygon S<sup>3</sup>™ E-LFL 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 psi back pressure, low particulate spallation and chemical resistance.

## Tygon® Tubing Provides Optimal Peristaltic Pump Performance

Crystal-clear Tygon S<sup>3</sup>™ E-LFL tubing is formulated specifically for use in peristaltic pump applications. The new Tygon S<sup>3</sup>™ E-LFL non-DEHP tubing has even longer pump life not only at 0 psi but also at back pressure of up to 25 psi. The peristaltic pump life performance at different back pressures is shown on the back page. With its superior flex life characteristics, Tygon S<sup>3</sup>™ 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.

## Benefits of Using Tygon® Long Flexible Life Tubing

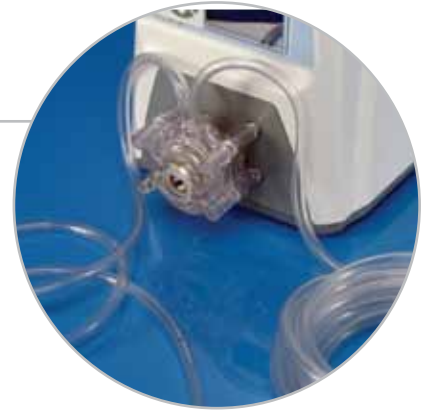
The non-aging and broad chemical resistance properties of Tygon S<sup>3</sup>™ E-LFL enable users to utilize the new tubing for transferring chemicals, cleaning agents and bactericides without danger of corrosion (as with metals) or oxidation (as with rubber). Tygon S<sup>3</sup>™ E-LFL is safe and non-toxic and can be sterilized through conventional autoclave methods (steam 30 minutes at 15 psi, 121°C) and Ethylene Oxide, making it an excellent choice for high purity applications. It can be produced in up to a 6" (15.6 cm) inside diameter, ideal for bulk transfer applications.

## Regulatory Standards

Tygon S<sup>3</sup>™ complies with FDA, NSF, 3-A, 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 S<sup>3</sup>™ tubing products do not contain chemicals listed in California's Proposition 65.

\* For complete compliance information and appropriate use instructions, please refer to the detailed document of compliance. The complete compliance information and use instructions can be found at [www.TygonS3.com](http://www.TygonS3.com).



## Tygon S<sup>3</sup>™ E-LFL Features/Benefits

- Longest flex life of any clear Tygon® tubing — reduces downtime due to pump failure
- Broad chemical resistance — excellent for laboratory applications
- Can be autoclaved — suitable for high purity applications
- Extremely low particle spallation — reliable for sensitive-fluid applications
- Contains no BPA or phthalates

## Typical Applications

- Wide range of liquid transfer in labs
- Production filtration and fermentation
- Food & beverage\* and cosmetic processing
- Biopharmaceutical
- Surfactant delivery
- Flavor and vitamin concentrate dispensing\*
- Printing ink transfer
- Highly viscous fluid transfer
- Drum and tank drainage
- Shear-sensitive fluid transfer

## Typical Physical Properties

Property	ASTM Method	Value or Rating
Durometer Hardness (Shore A), 15 Sec	D2240	56
Tensile Strength, psi (MPa)	D412	1,800 (12.4)
Ultimate Elongation, %	D412	400
Tensile Stress, @ 100% psi (MPa) @ 200% psi (MPa)	D412	550 (3.8) 950 (6.6)
Tear Resistance, lb-f/inch (kN/m)	D1004	184 (32.2)
Compression Set Constant Deflection, % @ 158°F (70°C) for 22 hrs.	D395	68
Brittleness by Impact Temp., °F (°C)	D746	-51 (-46)
Specific Gravity	D792	1.17
Water Absorption, % 24 hrs. @ 23°C	D570	0.20
Maximum Recommended Operating Temp., °F (°C)	—	165 (74)
Low Temp. Flexibility, °F (°C)	D380	-67 (-55)
Tensile Set, %	D412	54
Color	—	Clear

More sizes available upon request.

## Tygon S<sup>3</sup>™ E-LFL Inventoried Sizes

Saint-Gobain Part Number	I.D.		O.D.		Wall Thickness		Length		Minimum Bend Radius		Maximum Working Pressure		Vacuum Rating mm of Mercury at	
	In.	mm	In.	mm	In.	mm	Ft.	m	In.	mm	psi at 73°F	bars at 23°C	73°F	23°C
	AVX42003	1/16	1.6	3/16	4.8	1/16	1.6	25	7.62	1/4	6.4	50	3.5	29.9
AVX42007	1/8	3.2	1/4	6.4	1/16	1.6	25	7.62	1/2	12.7	34	2.3	29.9	760
AVX42012	3/16	4.8	5/16	7.9	1/16	1.6	25	7.62	3/4	19.0	25	1.7	29.9	760
AVX42017	1/4	6.4	3/8	9.5	1/16	1.6	25	7.62	1	25.4	20	1.4	15.0	381
AVX42019	1/4	6.4	1/2	12.7	1/8	3.2	25	7.62	3/4	19.0	35	2.4	29.9	760
AVX42022	5/16	7.9	7/16	11.1	1/16	1.6	25	7.62	1-1/4	31.75	16	1.1	10.0	254
AVX42029	3/8	9.5	5/8	15.9	1/8	3.2	25	7.62	1	25.4	25	1.7	29.9	760
AVX42038	1/2	12.7	3/4	19.0	1/8	3.2	25	7.62	1-1/2	38.1	20	1.4	20.0	508
AVX06057	3/4	19.0	1-1/4	31.75	1/4	6.4	10	3.04	1-3/4	44.4	24	1.7	29.9	760
AVX06064	1	25.4	1-3/8	34.9	3/16	4.8	10	3.04	3-1/4	82.5	15	1.0	5.0	127

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

## Peristaltic Pump Tubing Life

The table below illustrates hours until failure of 1/4" ID x 3/8" OD tubing for 0, 10 and 15 psi and 1/4" ID x 7/16" OD tubing for 25 psi. In each case, a 3-roller pump head was utilized operating at 600 rpm under room temperature (73°F). Tubing failure is measured in hours of use prior to rupture.

### Tygon S<sup>3</sup>™ E-LFL

Pressure	1000 HOURS
0 psi	1000 HOURS
10 psi	600 HOURS
15 psi	200 HOURS
25 psi	150 HOURS

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.



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**IMPORTANT:** It is the user's responsibility to ensure the suitability and safety of Saint-Gobain Performance Plastics tubing for all intended uses. Laboratory and clinical tests must be conducted in accordance with applicable regulatory requirements in order to determine the safety and effectiveness for use of tubing in any particular application.

For a period of 6 months from the date of first sale, Saint-Gobain Performance Plastics Corporation warrants this product to be free from defects in materials and workmanship. Our only obligation will be to replace any portion proving defective, or at our option, to refund the purchase price thereof. User assumes all other risk, if any, including the risk of injury, loss or damage, direct or consequential, arising out of the use, misuse, or inability to use, this product. THIS WARRANTY IS IN LIEU OF THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. No deviation is authorized.

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