

# TYGON® E-LFL

*The only choice for phthalate-free flexible tubing.*

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

Taking a proactive approach to increased corporate social responsibility, Saint-Gobain has significantly reformulated Tygon® Long Flexible Life (LFL) tubing. The new Tygon® E-LFL tubing has benefits of increased sustainability and safety for the environment and end users and reduced risk, liability, and complexity for businesses. The new Tygon® E-LFL non-DEHP tubing is our best performing peristaltic pump tubing and has no industry equivalent. Tygon® E-LFL has been tested rigorously to ensure that it meets the same physical standards, including 1,000 hours of peristaltic pump tubing life at 0 psi back pressure, low particulate spallation and chemical resistance as the old Tygon® LFL tubing.

## Tygon® Tubing Provides Optimal Peristaltic Pump Performance

Crystal-clear Tygon® E-LFL tubing is formulated specifically for use in peristaltic pump applications. The new Tygon® 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® 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.

## Various Benefits of Using Tygon® Long Flexible Life Tubing

The non-aging and broad chemical resistance properties of Tygon® 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® E-LFL is safe and non-toxic and can be sterilized through conventional autoclave methods (steam 30 minutes at 15 psi), 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.



## Tygon® 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 autoclave — Suitable for high purity applications
- Extremely low particle spallation — Reliable for sensitive-fluid applications
- Meets USP Class VI, ISO 10993 and FDA criteria
- 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 | TYGON® E-LFL 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,<br>@ 100% psi (MPa)<br>@ 200% psi (MPa)              | D412        | 550 (3.8)<br>950 (6.6)       |
| Tear Resistance, lb-f/inch (kN/m)                                    | D1004       | 184 (32.2)                   |
| Compression Set Constant Deflection,<br>% @ 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.

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® 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.

TYGON® 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.



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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.

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