

# TYGON SILVER

*The only choice for phthalate-free flexible tubing*

**Tygon S<sup>3</sup>™ Silver Antimicrobial Tubing decreases bacterial growth and provides added value.**

Tygon S<sup>3</sup>™ Silver 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.

## Is Your Tubing Protected Against Microbes?

Microorganisms are living cells so small that most can only be seen with a microscope. Microbes are a type of microorganism found everywhere, and include bacteria, fungi and algae. The majority of microbes do not interfere with human activities. However, in some situations they can cause problems. Growth of microbes on many materials can lead to foul odors, discoloration and formation of mildew and biofilm. In the case of tubing, microbes can contaminate the material being transferred as well as degrade the tubing itself.

## Leader in Antimicrobial Technology

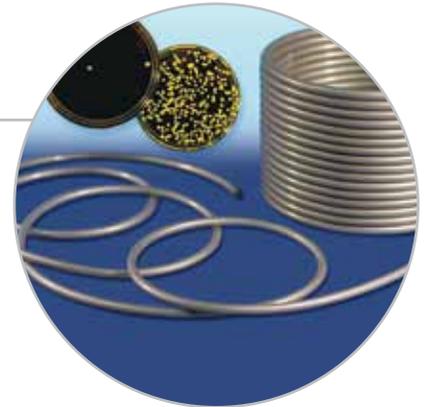
Saint-Gobain Performance Plastics is the leader in antimicrobial technology. Our custom compounding capabilities allow us to produce antimicrobial versions of many of our tubing products, including Tygon®. Tygon S<sup>3</sup>™ Silver Antimicrobial Tubing is formulated with a silver-based compound on the inner surface at the point of fluid contact; the tubing's outer surface can be treated in cases where bacteria buildup on the I.D. is a concern.

## Adds Value

Cleaning procedures, such as washing with detergent and hot water, can kill microbes. But this process can be time consuming and costly, and does not provide residual protection against fresh contamination. The additional use of a durable and safe antimicrobial treatment is the best way to provide protection against microbial contamination. Offering your customers this added protection adds value to your product.

Tygon S<sup>3</sup>™ Silver Antimicrobial tubing meets FDA 21 CFR, 177.1520 criteria for food contact applications.

\* The compliance status of Tygon S<sup>3</sup>™ Silver according to the marketing region can be found on [www.TygonS3.com](http://www.TygonS3.com). Please refer to the detailed document of compliance for a complete compliance information and appropriate use instruction. The complete compliance information and use instructions can be found at [www.TygonS3.com](http://www.TygonS3.com).



## Tygon S<sup>3</sup>™ Silver Features/Benefits

- Plasticizer-free inner bore
- Formulated with a silver-based compound on I.D. surface
- O.D. surface can also be formulated with a silver-based compound
- Reduces formation of biofilm and mildew
- Inhibits growth of microbes
- Will not discolor
- Meets FDA criteria
- Meets NSF 51 criteria
- Contains no chemicals listed in California's Prop 65
- Contains no BPA or phthalates

## Typical Applications

- Food and beverage dispensing\*
- Ice machines
- Water purification
- Chemical transfer
- Dairy processing\*

## Tygon S<sup>3</sup>™ Silver

Saint-Gobain Part Number	I.D. (inches)	O.D. (inches)	Wall Thickness (inches)	Minimum Length (inches)	Minimum Bend Radius (inches)	Max. Working Pressure at 73°F (psi)	Vacuum Rating In. of Mercury at 73°F (psi)
A5600007	1/8	1/4	1/16	50	1/2	65	29.9
A5600012	3/16	5/16	1/16	50	3/4	50	29.9
A5600017	1/4	3/8	1/16	50	3/4	40	29.9
A5600027	3/8	1/2	1/16	50	1-1/2	30	25.0
A5600038	1/2	3/4	1/8	50	1-3/4	38	29.9

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

Unless otherwise noted, all tests were conducted at room temperature (73°F). Values shown were determined on 0.075" thick extruded strip or 0.075" thick molded ASTM plaques or molded ASTM durometer buttons.

## Typical Physical Properties

Property	ASTM Method	Value or Rating
Durometer Hardness (Shore A), 15 Sec	D2240	69
Tensile Strength, psi (MPa)	D412	2,300 (15.8)
Ultimate Elongation, %	D412	350
Tear Resistance, lb-f/inch (kN/m)	D1004	250 (43.8)
Specific Gravity	D792	1.21
Water Absorption, % 24 hrs. @ 73°F (23°C)	D570	<0.01
Compression Set Constant Deflection, % @ 158°F (70°C) for 22 hrs.	D395 Method B	63
Brittleness Temp., °F (°C)	D746	-31 (-35)
Maximum Recommended Operating Temp., °F (°C)	-	165 (74)
Tensile Stress, @ 100% Elongation, psi (MPa)	-	990 (6.8)
Tensile Set, %	D412	63
Color	-	Translucent Silver

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.

## Relative Chemical Resistance Properties\*

Tubing	Acids			Bases			Salts	Alcohols	Ketones
	Conc.	Med.	Weak	Conc.	Med.	Weak			
Tygon S <sup>3</sup> ™ Silver	F	E	E	F	E	E	E	E	F
Fluoroelastomers	E	E	E	U	F	F	E	F	U
Urethane	U	U	U	U	F	F	F	U	U
PVC	F	E	E	E	E	E	E	F	U
Thermoplastic Rubber	U	F	F	F	E	E	E	F	U
Neoprene	U	F	E	E	E	E	E	E	U
Nitrile Rubber	F	F	E	F	U	E	E	E	U
Silicone	U	U	U	U	F	F	F	F	U
EVA	U	F	E	F	E	E	E	E	U

E = Excellent, F = Fair, U = Unsatisfactory

\*All tests conducted at room temperature. Refer to the comprehensive Tygon® catalog for an expanded listing of chemical resistance.

## How it Works

AlphaSan®, the antimicrobial polymer compound used by Saint-Gobain, is a zirconium phosphate-based ceramic ion-exchange resin containing silver. Silver is recognized as being safe for human contact and is an integral part of antimicrobial additives that provide the following benefits:

- Inhibitory activity against a wide range of microorganisms, improving contamination control.
- Consistent antimicrobial impact through silver ion exchange, not just during cleaning procedures.
- Antimicrobial polymer compound is EPA FIFRA registered for contact with food and drinking water, and also FDA approved for food packaging.

## Applications

Silver is known to be effective against a broad spectrum of microorganisms that cause discoloration, odor, biofouling and other aesthetic problems. Antimicrobial polymer compound can be added to approved materials at varying levels to impart fungistatic, bacteriostatic and algistatic properties to the material and the end-use product. The high temperature stability and low color formation of antimicrobial polymer compounds translate to proven performance in a wide variety of applications.

**TYGON S<sup>3</sup>™ SILVER TUBING IS NOT INTENDED FOR USE AS AN IMPLANT MATERIAL.**



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TYGON® is a registered trademark.



**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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