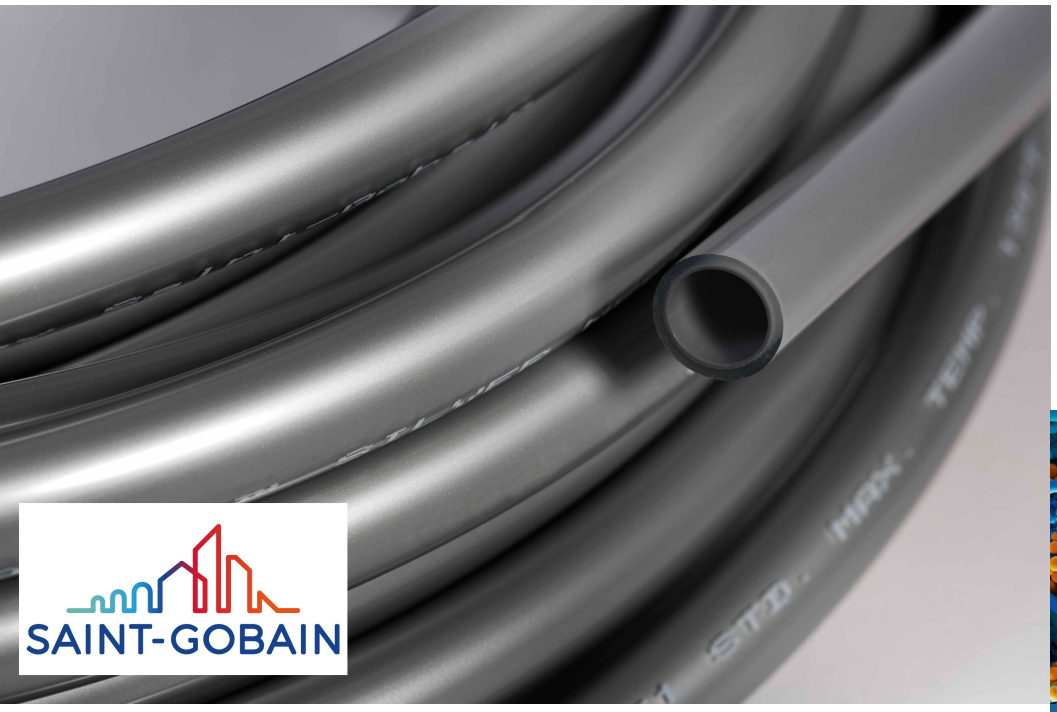
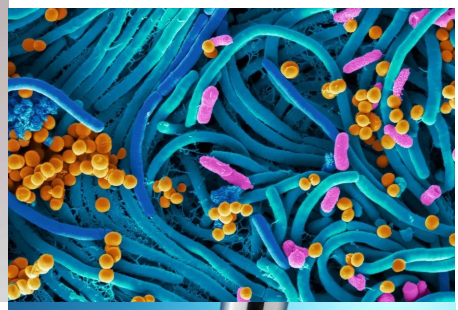
OPTUBUS
Fluid Transfer Components

Versilon™ Silver
Antimicrobial Tubing



Phthalate-Free Inhibits growth of Microbes



Phthalate-Free Antimicrobial Tubing

Versilon™ Silver is now phthalate-free. We are proud to be among the first companies to offer sustainable flexible tubing products. Versilon™ Silver 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 includes 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 Microbial Technology

The leader in antimicrobial technology. The custom compounding capabilities allow to produce antimicrobial versions of many of tubing products. Versilon™ Silver 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 outer diameter 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.

Features and Benefits

- Plasticizer-free inner bore
- Formulated with a silver-based compound on the inner diameter surface
- Outer diameter surface can also be formulated with a silver-based compound
- Reduces formation of biofilm and mildew
- Inhibits growth of microbes
- Will not discolor

Typical Applications

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

* For complete compliance information and appropriate use instructions, please refer to the detailed document of compliance.

OPTUBUS GmbH – www.optubus.com – info@optubus.com

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Versilon™ Silver Antimicrobial Tubing

Regulatory Compliance

- Meets FDA criteria
- Contains no chemicals listed in California Proposition 65
- Meets NSF-51 criteria
- Contains no BPA or phthalates

Versilon™ Silver Standard Sizes

Part Number	ID	OD	Wall	Min. Bend Radius	Max. Working Pressure* 22°C (73°F)	Vacuum Rating at 22°C (73°F)
VS3,18SV6,35	3,18 mm (1/8")	6,35 mm (1/4")	1,59 mm (1/16")	12,7 mm	4,5 bar	760 mmHg
VS4,76SV7,94	4,76 mm (3/16")	7,94 mm (5/16")	1,59 mm (1/16")	19,1 mm	3,5 bar	760 mmHg
VS6,35SV9,53	6,35 mm (1/4")	9,53 mm (3/8")	1,59 mm (1/16")	19,1 mm	2,8 bar	760 mmHg
VS9,53SV12,7	9,53 mm (3/8")	12,7 mm (1/2")	1,59 mm (1/16")	38,1 mm	2,1 bar	635 mmHg
VS12,7SV19,05	12,7 mm (1/2")	19,05 mm (3/4")	3,18 mm (1/8")	44,5 mm	2,6 bar	760 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

Property	ASTM Method	Value of Rating
Durometer Hardness	D2240	69° Shore A
Color	-	silver
Opacity	-	Opaque
Tensile Strength	D412	15.8 MPa
Ultimate Elongation	D412	350,00%
Tear Resistance	D1004	43.8 kN/m
Specific Gravity	D792	1,21
Maximum Recom. Operating Temp.	-	74°C
Brittleness by Impact Temperature	D746	-35°C
Compression Set Constant Deflection at 23°C for 24 hrs.	D395 Method B	63,00%
Tensile Stress @ 100% Elongation	D412	6.8 MPa
Tensile Set	D412	63,00%
Water Absorption, % 24 hrs. @ 23°C	D570	<0,01

Unless otherwise noted, all test were conducted at room temperature (22°C). Values shown were determined on 1,905 mm thick extruded strip or 1,905 mm thick molded ASTM plaques or molded ASTM durometer buttons.

Relative Chemical Resistance Properties*

Tubing	Acids			Bases					
	Conc.	Med.	Weak	Conc.	Med.	Weak	Salts	Alcoh.	Ketones
Versilon™ Silver	F	E	E	F	E	E	E	E	F
Fluorelastomers	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
Thermoplactic 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

How it works

AlphaSan®, the antimicrobial polymer compound 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 con-tamination 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.

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