

Tygon[®] Ink 1000 Tubing

ULTRA CHEMICAL RESISTANT TUBING FOR UV INK TRANSFER APPLICATIONS

For UV inks in particular, UV blocking properties is an industry standard. Tygon[®] Ink 1000 tubing has shown over an accelerated testing period that it can maintain the ink integrity with our patented technology, making it an ideal candidate for the UV market.

Chemical Resistance

In the ink transfer space, chemical compatibility and flexibility are two of the most important criteria for ensuring satisfactory performance. Tygon[®] Ink 1000 tubing was specially engineered to deliver premium performance in an environment where UV inks are used such as digital printing and 3D printing applications. This product has been tested with a variety of diluents (IBOA, VMOX, HDDA, etc.) and has shown excellent chemical resistance properties over an extended testing phase.

Typical Applications

- Digital printing
- Inkjet printing
- Wide format printing
- Packaging printing
- 3D printing



Features and Benefits

- Outstanding chemical resistance to small acrylic monomers
- Flexibility
- UV blocking
- Low extractable levels
- Long service life



Tygon® Ink 1000 Tubing

Tygon® Ink 1000 Tubing

Part Number	ID		OD		Wall Thickness		Length		Min. Bend Radius		Max. Working Pressure				Vacuum Rating	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(ft)	(m)	(in)	(mm)	73°F (psi)	23°C (bar)	122°F (psi)	50°C (bar)	73°F (inHg)	23°C (mmHg)
AOC1S1517	0.118	3	0.197	5	0.039	1	49.2	15	0.375	9.5	131	9.0	82	5.7	29.9	760
AOC1S2266	0.126	3.2	0.252	6.4	0.0625	1.6	49.2	15	0.25	6.4	168	11.6	104	7.2	29.9	760
AOC1S1518	0.157	4	0.236	6	0.039	1	49.2	15	0.625	15.9	107	7.4	71	4.9	29.9	760
AOC1S2136	0.189	4.8	0.315	8	0.0625	1.6	49.2	15	0.625	15.9	122	8.4	94	5.9	29.9	760
AOC1S1520	0.236	6	0.315	8	0.039	1	49.2	15	0.75	19.1	75	5.2	57	3.9	29.9	760

Typical Physical Properties

Property	ASTM Method	Value or Rating	
		Inner	Outer
Durometer Hardness, (Shore A), 15 sec	D2240	54 (Shore D)	90
Flex Modulus, kpsi (MPa)	D790	990 (6825.8)	23 (158.6)
Tensile Strength, psi (MPa)	D412	2730 (18.8)	2330 (16.1)
Ultimate Elongation, %	D412	410	470
Tear Resistance, lb-f/inch (kN/m)	D1004	800 (0.09)	525 (0.06)
Compression Set Constant Deflection, % @ 158°F (70°C) for 22 Hours	D395 Method B	34	54
Specific Gravity	D792	0.93	0.91
Water Absorption, % 24 hrs at 73°F (23°C)	D570	< 0.01	0.067
Max. Recommended Operating Temperature °F (°C)	-	131 (55)	
Color	-	Black	

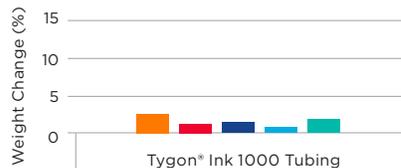
Unless otherwise noted, all tests were conducted at room temperature (73°F). Values shown were determined on 0.075" thick extruded strip or 0.075" thick molded ASTM plaques or molded ASTM durometer buttons.

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.

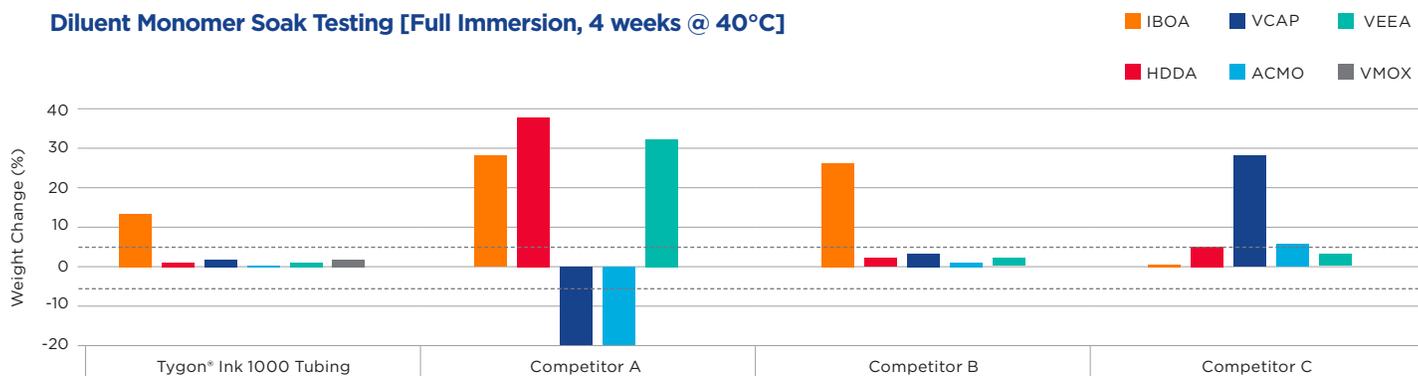
Product Characteristics

Opacity	Opaque
UV Blocking (min. 200-550nm)	Yes

Diluent Monomer Soak Testing [Cap-and-Fill, 4 weeks @ 40°C]



Diluent Monomer Soak Testing [Full Immersion, 4 weeks @ 40°C]



Note: Passable weight change limits are indicated by the dashed lines (±5% weight gain or loss).

www.ics.saint-gobain.com



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NOTE: The data and details given in this document are correct and up to date. This document is intended to provide information about the product and possible applications. This document is not the product specification and does not provide specific features, nor does it guarantee product performance in specific applications. Saint-Gobain cannot anticipate or control the conditions of the field and for this reason strongly recommends that practical tests are conducted to ensure that the product meets the requirements of a specific application.

Tygon® is a registered trademark of Saint-Gobain Performance Plastics Corporation.

Tygon[®] A-60-F, A-60-F IB Tubing

LONG-LIFE, TEMPERATURE-RESISTANT TUBING FOR FOOD AND BEVERAGE APPLICATIONS

Formulated to withstand extreme temperatures from -75°F to 275°F, Tygon[®] A-60-F tubing will not crack or deteriorate when used in demanding food and beverage applications. Extremely flexible, it resists kinks and retains its shape while installing quickly and easily. Its excellent flexural fatigue resistance makes it the absolute best choice for use in peristaltic pumps often found in dispensing equipment. Repeatedly autoclavable, it can be steam cleaned in place, eliminating the need for frequent tubing replacement. When harsh sanitizing solutions are used, it exhibits exceptional chemical resistance and is entirely unaffected by a wide variety of cleaning solutions.

Simplifies Cleaning and Sterilization

Tygon[®] A-60-F tubing is ideal for use in clean-in-place and steam-in-place cleaning and sterilization systems. It is compatible with virtually all commercial cleaners and sanitizers and can be repeatedly autoclaved for up to five cycle times without affecting its overall service life. Tygon[®] A-60-F tubing complies with FDA 21 CFR, 177.2600 criteria, 3-A Sanitary Standards and NSF[®] Standard 51, which are applicable in many food contact applications.

Now Available to Withstand Elevated Pressure

Certain applications require using pressures that only reinforced tubing can withstand. For those applications, Tygon[®] A-60-F IB tubing is now available. It has the same desirable properties as Tygon[®] A-60-F tubing with an additional reinforcement embedded within its walls to withstand elevated pressure.

Excellent Chemical Resistance

Tygon[®] A-60-F tubing has excellent acid and alkali resistance, and is compatible with numerous oxidizing agents such as peroxide, hypochlorite and ozone. For the complete listing of common chemicals and their relative effect on Tygon[®] A-60-F tubing, please refer to www.ics.saint-gobain.com.



Features and Benefits

- Long flex life in peristaltic pumps
- Temperature resistant from -75°F to 275°F
- Compatible with virtually all common sanitizers and cleaners
- Ozone and UV light resistant
- Repeatedly autoclavable
- Chemically compatible with a wide range of cleaners

Regulatory Compliance

- FDA 21 CFR, 177.2600 criteria
- NSF[®]-51
- 3-A



Tygon® A-60-F, A-60-F IB Tubing

Tygon® A-60-F Tubing

Part Number	ID	OD	Wall Thickness	Length	Min. Bend Radius	Max. Working Pressure		Vacuum Rating	
	(in)	(in)	(in)	(ft)	(in)	73°F (psi)*	180°F (psi)*	inHg at 73°F	inHg at 180°F
AAL00003	1/16	3/16	1/16	50	1/4	34	21	29.9	29.9
AAL00007	1/8	1/4	1/16	50	1/2	19	12	29.9	29.9
AAL00012	3/16	5/16	1/16	50	3/4	13	8	29.9	23.0
AAL00017	1/4	3/8	1/16	50	1-1/4	10	6	26.0	13.0
AAL00019	1/4	1/2	1/8	50	3/4	19**	12**	29.9	29.9
AAL00022	5/16	7/16	1/16	50	1-1/2	8	5	17.0	8.0
AAL00027	3/8	1/2	1/16	50	2-1/4	7	4	11.0	5.0
AAL00029	3/8	5/8	1/8	50	1-1/4	13**	8**	29.9	23.0
AAL00038	1/2	3/4	1/8	50	2	10**	6**	26.0	13.0
AAL00046	5/8	7/8	1/8	50	3-1/4	8**	5**	17.0	8.0
AAL00053	3/4	1	1/8	50	4	7**	4**	11.0	5.0

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

**Available in a reinforced construction for higher pressures

Tygon® A-60-F IB Tubing

Part Number	ID	OD	Wall Thickness	Length	Min. Bend Radius	Max. Working Pressure		Vacuum Rating	
	(in)	(in)	(in)	(ft)	(in)	73°F (psi)*	180°F (psi)*	inHg at 73°F	inHg at 180°F
APW00019	1/4	1/2	1/8	50	3/4	125	70	29.9	29.9
APW00029	3/8	5/8	1/8	50	1-1/4	105	65	29.9	20.0
APW00038	1/2	3/4	1/8	50	2-1/4	100	60	25.0	15.0
APW00046	5/8	7/8	1/8	50	2-1/2	95	55	20.0	10.0
APW00054	3/4	1-1/16	5/32	50	3-1/4	85	45	10.0	5.0
APW00064	1	1-3/8	3/16	50	5	75	40	12.0	7.0

*Working pressures are calculated at a 1:4 ratio relative to burst pressure using ASTM D1599

Typical Physical Properties

Property	ASTM Method	A-60-F Value or Rating	A-60-F IB Value or Rating
Durometer Hardness, Shore A, 15s	D2240-03	61	61
Tensile Strength, psi (MPa)	D412-98	1,000 (6.9)	1,000 (6.9)
Ultimate Elongation, %	D412-98	375	375
Tear Resistance, lb-f/in (kN/m)	D1004-03	120 (21.0)	120 (21.0)
Specific Gravity	D792-00	0.98	0.98
Water Absorption, % at 73°F (23°C) for 24 hrs	D570-98	0.30	0.30
Compression Set Constant Deflection, % at 158°F (70°C) for 22 hrs	D395-03 Method B	27	30
Maximum Recommended Operating Temp., °F (°C)	—	275 (135)	275 (135)
Tensile Modulus, at 100% Elongation, psi (MPa)	D412-98	410 (2.8)	410 (2.8)
at 300% Elongation, psi (MPa)		800 (5.5)	800 (5.5)
Tensile Set, at 75% Elongation	D412-98	47	47
Color	—	Cream	Cream
Brittleness by Impact Temp., °F (°C)	D746-98	-75 (-60)	-75 (-60)
Dielectric Strength, v/mil (kV/mm)	D149-97	535 (21.1)	535 (21.1)

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 pressure, 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® A-60-F AND A-60-F IB TUBING ARE NOT INTENDED FOR USE AS AN IMPLANT MATERIAL.

Unless otherwise noted, all tests were conducted at room temperature 73°F (23°C). Values shown were determined on 0.075" (1.905 mm) thick extruded strip or 0.075" (1.905 mm) thick molded ASTM plaques or molded ASTM durometer buttons. Size of tubing tested is 1/8" ID x 1/4" OD.



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Tygon[®] E-3603 Tubing

TUBING FOR LABORATORY AND VACUUM APPLICATIONS

Crystal clear and flexible, Tygon[®] E-3603 tubing handles virtually all organic chemicals found in the modern laboratory. It is non-oxidizing and non-contaminating, making it an ideal choice for a variety of applications.

Tygon[®] E-3603 has high tolerances and lot-to-lot consistency, which will yield reproducible results in your laboratory. It is non-toxic and non-contaminating, and less permeable than rubber tubing. The glassy-smooth inner bore helps prevent buildup to facilitate cleaning.

Engineered to Last

Tygon[®] E-3603 tubing is specially formulated for resistance to flex-fatigue and abrasion. As a tubing for instrumentation connection, vent, drain and other general laboratory applications, Tygon[®] E-3603 tubing offers superior life, which minimizes the labor and the expenses associated with replacement.

Available in Vacuum Tubing Sizes

Tygon[®] E-3603 vacuum tubing has extra-heavy walls that will withstand a full vacuum at room temperature (29.9" [759 mm] of mercury at 73°F [23°C] and up to 27" [686 mm] of mercury at 140°F [60°C]). Like standard Tygon[®] laboratory tubing, E-3603 vacuum tubing has good tensile and tear strength.

Typical Applications

- General laboratory
- Analytical instruments
- Peristaltic and vacuum pumps
- Ideal for condensers, desiccators, gas lines, and drain lines



Features and Benefits

- Lot-to-lot consistency for reproducible results
- Non-toxic and non-contaminating
- Smooth, polished inner wall
- Slips easily over fittings and grips securely for simple lab set-ups
- Contains no BPA or phthalates
- Standard sizes available to hold full vacuum at room temperature

Regulatory Compliance

- REACH
- OECHA California's Proposition 65



Tygon® E-3603 Tubing

Tygon® E-3603 Tubing

Part Number	Inner Diameter (ID)		Outer Diameter (OD)		Wall Thickness		Length		Minimum Bend Radius		Maximum Working Pressure		Vacuum Rating	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(ft)	(m)	(in)	(mm)	73°F (psi)	23°C (bar)	73°F (inHg)	23°C (mmHg)
ACF00001	1/32	0.8	3/32	2.4	1/32	0.8	50	15.2	1/8	3.2	70	4.8	29.9	760
ACF00002	1/16	1.6	1/8	3.2	1/32	0.8	50	15.2	1/4	6.4	36	2.5	29.9	760
ACF00003	1/16	1.6	3/16	4.8	1/16	1.6	50	15.2	1/8	3.2	70	4.8	29.9	760
ACF00004	3/32	2.4	5/32	4.0	1/32	0.8	50	15.2	3/8	9.5	25	1.7	29.9	760
ACF00005	3/32	2.4	7/32	5.6	1/16	1.6	50	15.2	1/4	6.4	46	3.2	29.9	760
ACF00006	1/8	3.2	3/16	4.8	1/32	0.8	50	15.2	1/2	12.7	20	1.4	20.0	508
ACF00007	1/8	3.2	1/4	6.4	1/16	1.6	50	15.2	3/8	9.5	36	2.5	29.9	760
ACF00009	5/32	4.0	7/32	5.6	1/32	0.8	50	15.2	3/8	9.5	17	1.2	12.0	305
ACF00010	5/32	4.0	9/32	7.1	1/16	1.6	50	15.2	1/2	12.7	30	2.1	29.9	760
ACF00011	3/16	4.8	1/4	6.4	1/32	0.8	50	15.2	1	25.4	15	1	9.0	229
ACF00012	3/16	4.8	5/16	7.9	1/16	1.6	50	15.2	5/8	15.9	25	1.7	29.9	760
ACF00013	3/16	4.8	3/8	9.5	3/32	2.4	50	15.2	1/2	12.7	36	2.5	29.9	760
ACF00014	3/16	4.8	7/16	11.1	1/8	3.2	50	15.2	3/8	9.5	46	3.2	29.9	760
ACF00015	3/16	4.8	9/16	14.3	3/16	4.8	50	15.2	1/4	6.4	70	4.8	29.9	760
ACF00016	1/4	6.4	5/16	7.9	1/32	0.8	50	15.2	1 5/8	41.3	12	0.8	5.0	127
ACF00017	1/4	6.4	3/8	9.5	1/16	1.6	50	15.2	1	25.4	20	1.4	20.0	508
ACF00018	1/4	6.4	7/16	11.1	3/32	2.4	50	15.2	3/4	19.0	28	1.9	29.9	760
ACF00019	1/4	6.4	1/2	12.7	1/8	3.2	50	15.2	1/2	12.7	36	2.5	29.9	760
ACF00020	1/4	6.4	5/8	15.9	3/16	4.8	50	15.2	1/2	12.7	54	3.7	29.9	760
ACF00022	5/16	7.9	7/16	11.1	1/16	1.6	50	15.2	1 3/8	34.9	17	1.2	13.0	330
ACF00023	5/16	7.9	1/2	12.7	3/32	2.4	50	15.2	1	25.4	23	1.6	29.9	760
ACF00024	5/16	7.9	9/16	14.3	1/8	3.2	50	15.2	7/8	22.2	30	2.1	29.9	760
ACF00025	5/16	7.9	5/8	15.9	5/32	4.0	50	15.2	3/4	19.0	36	2.5	29.9	760
ACF00027	3/8	9.5	1/2	12.7	1/16	1.6	50	15.2	1 1/2	38.1	15	1	9.0	229
ACF00028	3/8	9.5	9/16	14.3	3/32	2.4	50	15.2	1 3/8	34.9	20	1.4	21.0	533
ACF00029	3/8	9.5	5/8	15.9	1/8	3.2	50	15.2	1 1/8	28.6	25	1.7	29.9	760
ACF00030	3/8	9.5	7/8	22.2	1/4	6.4	50	15.2	5/8	15.9	46	3.2	29.9	760
ACF00032	7/16	11.1	9/16	14.3	1/16	1.6	50	15.2	2 1/4	57.2	13	0.9	7.0	178
ACF00033	7/16	11.1	5/8	15.9	3/32	2.4	50	15.2	1 3/4	44.4	17	1.2	15.0	381
ACF00034	7/16	11.1	11/16	17.5	1/8	3.2	50	15.2	1 3/8	34.9	22	1.5	28.0	711
ACF00036	1/2	12.7	5/8	15.9	1/16	1.6	50	15.2	2 7/8	73.0	12	0.8	5.0	127
ACF00037	1/2	12.7	11/16	17.5	3/32	2.4	50	15.2	2 1/4	57.2	15	1	12.0	305
ACF00038	1/2	12.7	3/4	19.1	1/8	3.2	50	15.2	1 1/2	38.1	20	1.4	21.0	533
ACF00039	1/2	12.7	13/16	20.6	5/32	4.0	50	15.2	1 1/2	38.1	25	1.7	29.9	760
ACF00040	1/2	12.7	1 1/8	28.6	5/16	7.9	50	15.2	7/8	22.2	45	3.1	29.9	760
ACF00041	9/16	14.3	3/4	19.1	3/32	2.4	50	15.2	2 1/2	63.5	15	1	9.0	229
ACF00042	9/16	14.3	13/16	20.6	1/8	3.2	50	15.2	2	50.8	17	1.2	17.0	432
ACF00045	5/8	15.9	13/16	20.6	3/32	2.4	50	15.2	3	76.2	13	0.9	7.0	178
ACF00046	5/8	15.9	7/8	22.2	1/8	3.2	50	15.2	2 3/8	60.3	17	1.2	13.0	330
ACF00047	5/8	15.9	15/16	23.8	5/32	4.0	50	15.2	2	50.8	20	1.4	21.0	533
ACF00049	5/8	15.9	1 3/8	34.9	3/8	9.5	50	15.2	1	25.4	44	3	29.9	760
ACF00050	11/16	17.5	7/8	22.2	3/32	2.4	50	15.2	3 1/2	88.9	12	0.8	6.0	152
ACF00053	3/4	19.1	1	25.4	1/8	3.2	50	15.2	3 1/4	82.6	15	1	9.0	229
ACF00054	3/4	19.1	1 1/16	27.0	5/32	4.0	50	15.2	2 3/4	69.8	17	1.2	15.0	381
ACF00055	3/4	19.1	1 1/8	28.6	3/16	4.8	50	15.2	2 3/8	60.3	20	1.4	21.0	533

Tygon® Lab E-3603 Tubing

Tygon® E-3603 Tubing continued

Part Number	Inner Diameter (ID)		Outer Diameter (OD)		Wall Thickness		Length		Minimum Bend Radius		Maximum Working Pressure		Vacuum Rating	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(ft)	(m)	(in)	(mm)	73°F (psi)	23°C (bar)	73°F (inHg)	23°C (mmHg)
ACF00057	3/4	19.1	1 1/4	31.8	1/4	6.4	50	15.2	2	50.8	25	1.7	29.9	760
ACF00058	3/4	19.1	1 1/2	38.1	3/8	9.5	50	15.2	1 1/2	38.1	36	2.5	29.9	760
ACF00059	7/8	22.2	1 1/8	28.6	1/8	3.2	50	15.2	4 1/8	104.8	13	0.9	7.0	178
ACF00060	7/8	22.2	1 3/16	30.2	5/32	4.0	50	15.2	3 1/2	88.9	15	1	11.0	279
ACF00062	1	25.4	1 1/4	31.8	1/8	3.2	50	15.2	4 3/4	120.6	12	0.8	5.0	127
ACF00064	1	25.4	1 3/8	34.9	3/16	4.8	50	15.2	4	101.6	16	1.1	12.0	305
ACF00065	1	25.4	1 1/2	38.1	1/4	6.4	50	15.2	3	76.2	20	1.4	21.0	533
ACF00066	1	25.4	2	50.8	1/2	12.7	50	15.2	1 7/8	47.6	36	2.5	29.9	760
ACF00068	1 1/8	28.6	1 1/2	38.1	3/16	4.8	50	15.2	4 1/2	114.3	15	1	9.0	229
ACF00069	1 1/4	31.8	1 1/2	38.1	1/8	3.2	50	15.2	7 7/8	200.0	10	0.7	3.0	76
ACF00070	1 1/4	31.8	1 5/8	41.3	3/16	4.8	50	15.2	5 1/2	139.7	13	0.9	7.0	178
ACF00073	1 1/2	38.1	1 7/8	47.6	3/16	4.8	50	15.2	7 1/4	184.2	12	0.8	5.0	127
ACF00074	1 1/2	38.1	2	50.8	1/4	6.4	50	15.2	5 7/8	149.2	15	1	9.0	229
ACF00076	1 3/4	44.5	2 1/4	57.2	1/4	6.4	50	15.2	7 1/2	190.5	13	0.9	7.0	178
ACF00078	2	50.8	2 1/2	63.5	1/4	6.4	50	15.2	9 3/8	238.1	12	0.8	5.0	127
ACF02002	1/16	1.6	1/8	3.2	1/32	0.8	100	30.5	1/8	3.2	36	2.5	29.9	760
ACF02004	3/32	2.4	5/32	4.0	1/32	0.8	100	30.5	3/8	9.5	25	1.7	29.9	760
ACF02007	1/8	3.2	1/4	6.4	1/16	1.6	100	30.5	3/8	9.5	36	2.5	29.9	760
ACF02010	5/32	4.0	9/32	7.1	1/16	1.6	100	30.5	1/2	12.7	30	2.1	29.9	760
ACF02012	3/16	4.8	5/16	7.9	1/16	1.6	100	30.5	5/8	15.9	25	1.7	29.9	760
ACF02017	1/4	6.4	3/8	9.5	1/16	1.6	100	30.5	1	25.4	20	1.4	20.0	508
ACF02019	1/4	6.4	1/2	12.7	1/8	3.2	100	30.5	1/2	12.7	36	2.5	29.9	760
ACF02037	1/2	12.7	11/16	17.5	3/32	2.4	100	30.5	2 1/4	57.2	15	1	12.0	305
ACF04002	1/16	1.6	1/8	3.2	1/32	0.8	500	152.4	1/8	3.2	36	2.5	29.9	760
ACF04006	1/8	3.2	3/16	4.8	1/32	0.8	500	152.4	1/2	12.7	20	1.4	20.0	508
ACF04007	1/8	3.2	1/4	6.4	1/16	1.6	500	152.4	3/8	9.5	36	2.5	29.9	760
ACF04012	3/16	4.8	5/16	7.9	1/16	1.6	500	152.4	5/8	15.9	25	1.7	29.9	760
ACF04017	1/4	6.4	3/8	9.5	1/16	1.6	500	152.4	1	25.4	20	1.4	20.0	508
ACF05078	2	50.8	2 1/2	63.5	1/4	6.4	20	6.1	9 3/8	238.1	12	0.8	5.0	127
ACFUN007	1/8	3.2	1/4	6.4	1/16	1.6	10/10'	10/3.0	3/8	9.5	36	2.5	29.9	760
ACFUN012	3/16	4.8	5/16	7.9	1/16	1.6	10/10'	10/3.0	5/8	15.9	25	1.7	29.9	760
ACFUN015	3/16	4.8	9/16	14.3	3/16	4.8	10/10'	10/3.0	1/4	6.4	61	4.2	29.9	760
ACFUN017	1/4	6.4	3/8	9.5	1/16	1.6	10/10'	10/3.0	1	25.4	20	1.4	20.0	508
ACFUN019	1/4	6.4	1/2	12.7	1/8	3.2	10/10'	10/3.0	1/2	12.7	36	2.5	29.9	760
ACFUN020	1/4	6.4	5/8	15.9	3/16	4.8	10/10'	10/3.0	1/2	12.7	51	3.5	29.9	760
ACFUN027	3/8	9.5	1/2	12.7	1/16	1.6	10/10'	10/3.0	1 1/2	38.1	15	1	9.0	229
ACFUN030	3/8	9.5	7/8	22.2	1/4	6.4	10/10'	10/3.0	5/8	15.9	51	3.5	29.9	760
ACFUN036	1/2	12.7	5/8	15.9	1/16	1.6	10/10'	10/3.0	2 7/8	73.0	12	0.8	5.0	127
ACFUN040	1/2	12.7	1 1/8	28.6	5/16	7.9	10/10'	10/3.0	7/8	22.2	45	3.1	29.9	760
ACFUN049	5/8	15.9	1 3/8	34.9	3/8	9.5	10/10'	10/3.0	1	25.4	41	2.8	29.9	760
ACFUN053	3/4	19.1	1	25.4	1/8	3.2	10/10'	10/3.0	3 1/4	82.6	15	1	9.0	229
ACFUN062	1	25.4	1 1/4	31.8	1/8	3.2	10/10'	10/3.0	4 3/4	120.6	12	0.8	5.0	127

Unless otherwise noted, all tests were conducted at room temperature 73°F (23°C).

Values shown were determined on 0.075 in (1,905 mm) thick extruded strip or 0.075 in (1,905 mm) thick molded ASTM plaques or molded ASTM durometer buttons.

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

Please consult factory for availability.

Metric dimensions are nominal.

Tygon® E-3603 Tubing

Relative Chemical Resistance Properties*

Acids			Bases			Salts	Alcohols	Ketones	Hydrocarbons
Conc.	Med.	Weak	Conc.	Med.	Weak				
F	E	E	F	U	U	E	F	U	U

E = Excellent F = Fair U = Unsatisfactory

*All tests conducted at room temperature.

Typical Physical Properties

Property	ASTM Method	Value or Rating
Durometer Hardness, Shore A, 15s	D2240	56
Tensile Strength, psi (MPa)	D412	1,750 (12.1)
Ultimate Elongation, %	D412	425
Tear Resistance, lb-f/in (kN/m)	D1004	173 (31.0)
Specific Gravity	D792	1.21
Water Absorption, % at 73°F (23°C) for 24 hrs.	D570	0.21
Compression Set Constant Deflection, % at 158°F (70°C) for 22 hrs.	D395 Method B	64
Brittleness by Impact Temp., °F (°C)	D746	-51 (-46)
Maximum Recommended Operating Temp., °F (°C)	—	165 (74)
Tensile Stress @ 100% Elongation, psi (MPa)	D412	582 (4.0)
Tensile Set, at 75% Elongation	D412	95
Color	—	Clear

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.

Unless otherwise noted, all tests were conducted at room temperature 73°F (23°C). Values shown were determined on 0.075 in (1,905 mm) thick extruded strip or 0.075 in (1,905 mm) thick molded ASTM plaques or molded ASTM durometer buttons.



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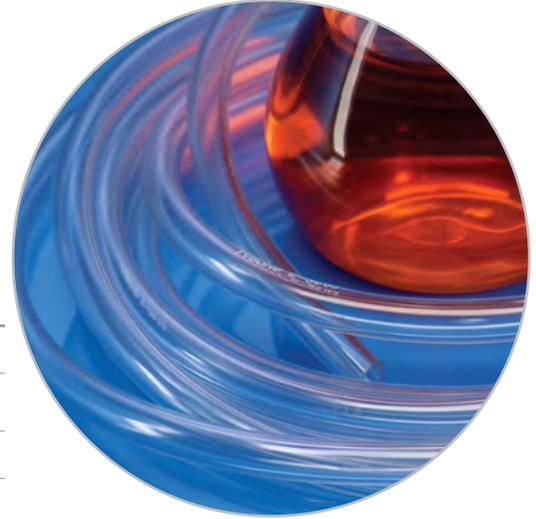


NOTE: The data and details given in this document are correct and up to date. This document is intended to provide information about the product and possible applications. This document is not the product specification and does not provide specific features, nor does it guarantee product performance in specific applications. Saint-Gobain cannot anticipate or control the conditions of the field and for this reason strongly recommends that practical tests are conducted to ensure that the product meets the requirements of a specific application.

Tygon® is a registered trademark of Saint-Gobain Performance Plastics Corporation.

Sterilization Methods

- Autoclavable — Steam 30 minutes at 15 psi at 250 °F (121°C)
- Radiation:
 - Gamma up to 2.5 MRad
- Ethylene oxide gas



Product Characteristics

Opacity	Clear
FDA Food Contact Compliance	Yes
NSF 51 Standard	Yes
USP <88> Class VI, and/or USP <87>, and/or ISO 10993-5	Passed

Typical Physical Properties

Property	ASTM Method	Value or Rating E-3603
Durometer Hardness (Shore A), 15 sec	D2240	56
Color	-	Clear
Tensile Strength, psi (MPa)	D412	1,750 (12.1)
Ultimate Elongation, %	D412	425
Tear Resistance, lb-f/inch (kN/m)	D1004	173 (31)
Specific Gravity	D792	1.21
Water Absorption, % 24 hrs. @ 73°F (23°C)	D570	0.21
Compression Set Constant Deflection, % @ 158°F (70°C) for 22 hrs.	D395 Method B	64
Brittle Temperature, °F (°C)	D746	-51 (-46)
Maximum Recommended Operating Temp., °F (°C)	-	165 (74)
Tensile Stress, @ 100% elongation psi (MPa)	-	582 (4.0)
Tensile Set, %	D412	95

Unless otherwise noted, all tests were conducted at room temperature (73°F/23°C). Values shown were determined on 0.075"/1.9 mm thick extruded strip or 0.075"/1.9 mm thick molded ASTM plaques or molded ASTM durometer buttons.

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IMPORTANT: It is the user's responsibility to ensure the suitability and safety of Saint-Gobain Performance Plastics products for all intended uses and that the materials to be used comply with all applicable medical regulatory requirements. Saint-Gobain Performance Plastics assumes no responsibility for any product failures that occur due to misuse of the materials it provides arising out of the design, fabrication or application of the products into which the materials are incorporated.

WARRANTY: For a period of 12 months from the date of first sale, Saint-Gobain Performance Plastics warrants this product to be free of 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.

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For more than four decades, Saint-Gobain and its family of companies have supplied the world with innovative, high-performance polymer products for the most demanding applications. Our tradition of excellence goes back 350 years through our parent company, Compagnie de Saint-Gobain, one of the world's top 100 industrial corporations, with operations in 64 countries. This successful corporation has been built with the single purpose of serving the customer and a commitment to quality and leadership in each of the industries served.

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TYGON S3™ E-3603



The only choice for phthalate-free flexible tubing

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

Saint-Gobain is proud to be among the first companies to offer sustainable, flexible tubing products. The bio-based Tygon S3 line combines high performance with an eco-friendly tubing design. Crystal clear and flexible, long-lasting and crack-resistant, Tygon S3 E-3603 non-DEHP tubing delivers the same superior performance you have come to expect, and in a formulation that contains a bio-based plasticizer.

Tygon S3™ E-3603 is manufactured under tightly controlled standards to ensure consistency and reduce variability in your application. It is non-toxic, non-contaminating, and the glassy-smooth inner bore helps prevent buildup and facilitates cleaning. Coils are marked at 1-foot (30.4 cm) intervals for easy measuring.

Engineered to Last

Tygon S3™ E-3603 Tubing is formulated to resist flex-fatigue and abrasion. As a tubing for instrumentation connection, vent, drain and other general laboratory applications, Tygon S3™ E-3603 Tubing offers superior life, which minimizes the labor and expense of replacement. It can be sterilized through conventional autoclave methods (steam 30 minutes at 15 psi, 121°C) and ethylene oxide.

Available in Vacuum Tubing Sizes

Tygon S3™ E-3603 Vacuum Tubing has extra-heavy walls that will withstand a full vacuum at room temperature (29.9" [759 mm] of mercury at 73°F [23°C] and up to 27" [686 mm] of mercury at 140°F [60°C]). Like standard Tygon® Laboratory Tubing, Tygon S3 E-3603 Vacuum Tubing has good tensile and tear strength.

Regulatory Standards

Tygon S3™ E-3603 complies with:

- US FDA food contact criteria *
- (EU) 10/2011 and (EC) 1935/2004 *
- Japanese Food Sanitation Law 370/1959
- NSF®-51, Food Equipment Materials
- USP <88> Class VI, and/or USP <87>, and/or ISO 10993-5
- REACH (EC) 1907/2006

* 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 obtained by contacting Saint-Gobain



Tygon S3™ E-3603 Features/Benefits

- Bio-based formulation reduces environmental impact
- Lot-to-lot consistency for reproducible results
- Non-toxic and non-contaminating
- Smooth inner wall
- Slips easily over fittings and grips securely for simple lab set-ups
- No BPA or phthalates intentionally added
- Sizes available which hold full vacuum at room temperature

Typical Applications

- General laboratory connections
- Food & beverage*
- Biopharmaceutical analysis
- Analytical Instrumentation
- Vacuum pumps
- Ideal for condensers, incubators, desiccators, gas lines and drain lines



Tygon S3™ E-3603 Non-DEHP Tubing-Available Sizes

Saint-Gobain Part Number	I.D.		O.D.		Wall Thickness		Length		Minimum Bend Radius		Maximum Working Pressure		Vacuum Rating of Mercury	
	in.	mm	in.	mm	in.	mm	ft.	m	in.	mm	psi at 73°F*	bar at 23°C*	inches at 73°F	mm at 23°C
ACF00001	1/32	0.8	3/32	2.4	1/32	0.8	50	15	1/8	3.2	69	4.8	29.9	760
ACF00002	1/16	1.6	1/8	3.2	1/32	0.8	50	15	1/4	6.4	36	2.5	29.9	760
ACF02002	1/16	1.6	1/8	3.2	1/32	0.8	100	30.5	1/8	3.2	36	2.5	29.9	760
ACF04002	1/16	1.6	1/8	3.2	1/32	0.8	500	152	1/8	3.2	36	2.5	29.9	760
ACF00003	1/16	1.6	3/16	4.8	1/16	1.6	50	15	1/8	3.2	69	4.8	29.9	760
ACF00004	3/32	2.4	5/32	4.0	1/32	0.8	50	15	3/8	9.5	25	1.7	29.9	760
ACF02004	3/32	2.4	5/32	4.0	1/32	0.8	100	30.5	3/8	9.5	25	1.7	29.9	760
ACF00005	3/32	2.4	7/32	5.6	1/16	1.6	50	15	1/4	6.4	47	3.2	29.9	760
ACF00006	1/8	3.2	3/16	4.8	1/32	0.8	50	15	1/2	12.7	20	1.4	20	508
ACF04006	1/8	3.2	3/16	4.8	1/32	0.8	500	152	1/2	12.7	20	1.4	20	508
ACF00007	1/8	3.2	1/4	6.4	1/16	1.6	50	15	3/8	9.5	36	2.5	29.9	760
ACF02007	1/8	3.2	1/4	6.4	1/16	1.6	100	30.5	3/8	9.5	36	2.5	29.9	760
ACF04007	1/8	3.2	1/4	6.4	1/16	1.6	500	152	3/8	9.5	36	2.5	29.9	760
ACF00009	5/32	4.0	7/32	5.6	1/32	0.8	50	15	3/8	9.5	17	1.2	12	305
ACF00010	5/32	4.0	9/32	7.1	1/16	1.6	50	15	1/2	12.7	30	2.1	29.9	760
ACF02010	5/32	4.0	9/32	7.1	1/16	1.6	100	30.5	1/2	12.7	30	2.1	29.9	760
ACF00011	3/16	4.8	1/4	6.4	1/32	0.8	50	15	1	25.4	14	1.0	9	229
ACF00012	3/16	4.8	5/16	7.9	1/16	1.6	50	15	5/8	15.9	25	1.7	29.9	760
ACF02012	3/16	4.8	5/16	7.9	1/16	1.6	100	30.5	5/8	15.9	25	1.7	29.9	760
ACF04012	3/16	4.8	5/16	7.9	1/16	1.6	500	152	5/8	15.9	25	1.7	29.9	760
ACF00013	3/16	4.8	3/8	9.5	3/32	2.4	50	15	1/2	12.7	36	2.5	29.9	760
ACF00014	3/16	4.8	7/16	11.1	1/8	3.2	50	15	3/8	9.5	47	3.2	29.9	760
ACF00016	1/4	6.4	5/16	7.9	1/32	0.8	50	15	1-5/8	41.3	12	0.8	5	127
ACF00017	1/4	6.4	3/8	9.5	1/16	1.6	50	15	1	25.4	20	1.4	20	508
ACF02017	1/4	6.4	3/8	9.5	1/16	1.6	100	30.5	1	25.4	20	1.4	20	508
ACF04017	1/4	6.4	3/8	9.5	1/16	1.6	500	152	1	25.4	20	1.4	20	508
ACF00018	1/4	6.4	7/16	11.1	3/32	2.4	50	15	3/4	19.0	28	1.9	29.9	760
ACF00019	1/4	6.4	1/2	12.7	1/8	3.2	50	15	1/2	12.7	36	2.5	29.9	760
ACF02019	1/4	6.4	1/2	12.7	1/8	3.2	100	30.5	1/2	12.7	36	2.5	29.9	760
ACF00022	5/16	7.9	7/16	11.1	1/16	1.6	50	15	1-3/8	34.9	17	1.2	13	330
ACF00023	5/16	7.9	1/2	12.7	3/32	2.4	50	15	1	25.4	23	1.6	29.9	760
ACF00024	5/16	7.9	9/16	14.3	1/8	3.2	50	15	7/8	22.2	30	2.1	29.9	760
ACF00025	5/16	7.9	5/8	15.9	5/32	4.0	50	15	3/4	19.0	36	2.5	29.9	760
ACF00027	3/8	9.5	1/2	12.7	1/16	1.6	50	15	1-1/2	38.1	14	1.0	9	229
ACF00028	3/8	9.5	9/16	14.3	3/32	2.4	50	15	1-3/8	34.9	20	1.4	21	533
ACF00029	3/8	9.5	5/8	15.9	1/8	3.2	50	15	1-1/8	28.6	25	1.7	29.9	760
ACF00032	7/16	11.1	9/16	14.3	1/16	1.6	50	15	2-1/4	57.2	13	0.9	7	178
ACF00033	7/16	11.1	5/8	15.9	3/32	2.4	50	15	1-3/4	44.4	18	1.2	15	381
ACF00034	7/16	11.1	11/16	17.5	1/8	3.2	50	15	1-3/8	34.9	22	1.5	28	711
ACF00036	1/2	12.7	5/8	15.9	1/16	1.6	50	15	2-7/8	73.0	12	0.8	5	127
ACF00037	1/2	12.7	11/16	17.5	3/32	2.4	50	15	2-1/4	57.2	15	1.0	12	305
ACF02037	1/2	12.7	11/16	17.5	3/32	2.4	100	30.5	2-1/4	57.2	15	1.0	12	305
ACF00038	1/2	12.7	3/4	19.0	1/8	3.2	50	15	1-1/2	38.1	20	1.4	21	533
ACF00039	1/2	12.7	13/16	20.6	5/32	4.0	50	15	1-1/2	38.1	24	1.7	29.9	760
ACF00041	9/16	14.3	3/4	19.0	3/32	2.4	50	15	2-1/2	63.5	14	1.0	9	229
ACF00042	9/16	14.3	13/16	20.6	1/8	3.2	50	15	2	50.8	18	1.2	17	432
ACF00045	5/8	15.9	13/16	20.6	3/32	2.4	50	15	3	76.2	13	0.9	7	178
ACF00046	5/8	15.9	7/8	22.2	1/8	3.2	50	15	2-3/8	60.3	17	1.2	13	330
ACF00047	5/8	15.9	15/16	23.8	5/32	4.0	50	15	2	50.8	20	1.4	21	533
ACF00050	11/16	17.5	7/8	22.2	3/32	2.4	50	15	3-1/2	88.9	12	0.8	6	152
ACF00053	3/4	19.0	1	25.4	1/8	3.2	50	15	3-1/4	82.6	14	1.0	9	229
ACF00054	3/4	19.0	1-1/16	27.0	5/32	4.0	50	15	2-3/4	69.8	17	1.2	15	381
ACF00055	3/4	19.0	1-1/8	28.6	3/16	4.8	50	15	2-3/8	60.3	20	1.4	21	533
ACF00057	3/4	19.0	1-1/4	31.8	1/4	6.4	50	15	2	50.8	25	1.7	29.9	760
ACF00059	7/8	22.2	1-1/8	28.6	1/8	3.2	50	15	4-1/8	104.8	13	0.9	7	178
ACF00060	7/8	22.2	1-3/16	30.2	5/32	4.0	50	15	3-1/2	88.9	15	1.0	11	279
ACF00062	1	25.4	1-1/4	31.8	1/8	3.2	50	15	4-3/4	120.6	12	0.8	5	127
ACF00064	1	25.4	1-3/8	34.9	3/16	4.8	50	15	4	101.6	16	1.1	12	305
ACF00065	1	25.4	1-1/2	38.1	1/4	6.4	50	15	3	76.2	20	1.4	21	533
ACF00068	1-1/8	28.6	1-1/2	38.1	3/16	4.8	50	15	4-1/2	114.3	14	1.0	9	229
ACF00069	1-1/4	31.8	1-1/2	38.1	1/8	3.2	50	15	7-7/8	200	10	0.7	3	76
ACF00070	1-1/4	31.8	1-5/8	41.3	3/16	4.8	50	15	5-1/2	139.7	13	0.9	7	178
ACF00073	1-1/2	38.1	1-7/8	47.6	3/16	4.8	50	15	7-1/4	184.2	12	0.8	5	127
ACF00074	1-1/2	38.1	2	50.8	1/4	6.4	50	15	5-7/8	149.2	14	1.0	9	229
ACF00076	1-3/4	44.4	2-1/4	57.2	1/4	6.4	50	15	7-1/2	190.5	13	0.9	7	178
ACF00078	2	50.8	2-1/2	63.5	1/4	6.4	50	15	9-3/8	238.1	12	0.8	5	127
ACF05078	2	50.8	2-1/2	63.5	1/4	6.4	20	6	9-3/8	238.1	12	0.8	5	127

Tygon S3™ E-3603 Non-DEHP Tubing-Available Sizes

Saint-Gobain Part Number	I.D.		O.D.		Wall Thickness		Length		Minimum Bend Radius		Maximum Working Pressure		Vacuum Rating of Mercury at	
	in	mm	in	mm	in	mm	ft.	m	in	mm	psi at 73°F	bar at 23°C*	inches at 73°F	mm at 23°C
Vacuum Sizes														
ACF00015	3/16	4.8	9/16	14.3	3/16	4.8	50	15	1/4	6.4	69	4.8	29.9	760
ACF00020	1/4	6.4	5/8	15.9	3/16	4.8	50	15	1/2	12.7	53	3.7	29.9	760
ACF00030	3/8	9.5	7/8	22.2	1/4	6.4	50	15	5/8	15.9	47	3.2	29.9	760
ACF00040	1/2	12.7	1-1/8	28.6	5/16	7.9	50	15	7/8	22.2	45	3.1	29.9	760
ACF00049	5/8	15.9	1-3/8	34.9	3/8	9.5	50	15	1	25.4	43	3.0	29.9	760
ACF00058	3/4	19.0	1-1/2	38.1	3/8	9.5	50	15	1-1/2	38.1	36	2.5	29.9	760
ACF00066	1	25.4	2	50.8	1/2	12.7	50	15	1-7/8	47.6	36	2.5	29.9	760
ACF05066	1	25.4	2	50.8	1/2	12.7	20	6	1-7/8	47.6	36	2.5	29.9	760
Unipacs (10/10' lengths per carton)														
ACFUN007	1/8	3.2	1/4	6.4	1/16	1.6	10/10'	10/3	3/8	9.5	36	2.5	29.9	760
ACFUN012	3/16	4.8	5/16	7.9	1/16	1.6	10/10'	10/3	5/8	15.9	25	1.7	29.9	760
ACFUN017	1/4	6.4	3/8	9.5	1/16	1.6	10/10'	10/3	1	25.4	20	1.4	20	508
ACFUN019	1/4	6.4	1/2	12.7	1/8	3.2	10/10'	10/3	1/2	12.7	36	2.5	29.9	760
ACFUN027	3/8	9.5	1/2	12.7	1/16	1.6	10/10'	10/3	1-1/2	38.1	15	1.0	9	229
ACFUN036	1/2	12.7	5/8	15.9	1/16	1.6	10/10'	10/3	2-7/8	73.0	12	0.8	5	127
ACFUN053	3/4	19.0	1	25.4	1/8	3.2	10/10'	10/3	3-1/4	82.6	15	1.0	9	229
ACFUN062	1	25.4	1-1/4	31.8	1/8	3.2	10/10'	10/3	4-3/4	120.6	12	0.8	5	127
Vacuum Unipacs (10/10' or 4/10' lengths per carton as shown below)														
ACFUN015	3/16	4.8	9/16	14.3	3/16	4.8	10/10'	10/3	1/4	6.4	70	4.8	29.9	760
ACFUN020	1/4	6.4	5/8	15.9	3/16	4.8	10/10'	10/3	1/2	12.7	54	3.7	29.9	760
ACFUN030	3/8	9.5	7/8	22.2	1/4	6.4	10/10'	10/3	5/8	15.9	46	3.2	29.9	760
ACFUN040	1/2	12.7	1-1/8	28.6	5/16	7.9	10/10'	10/3	7/8	22.2	45	3.1	29.9	760
ACFUN049	5/8	15.9	1-3/8	34.9	3/8	9.5	10/10'	10/3	1	25.4	44	3.0	29.9	760

Metric Sizes

Saint-Gobain Part Number	I.D. mm	O.D. mm	Wall Thickness mm	Length m	Minimum Bend Radius mm	Maximum Working Pressure Bars at 23°C	Vacuum Rating mm of Mercury at 23°C
ACF1S1502	2	4	1	15	7	2.5	760
ACF1S1517	3	5	1	15	13	1.7	760
ACF1S1518	4	6	1	15	16	1.4	533
ACF1S1503	5	8	1.5	15	19	1.6	760
ACF1S1504	6	9	1.5	15	22	1.4	559
ACF1S1506	8	12	2	15	29	1.4	533

Unless otherwise noted, all tests were conducted at room temperature (73°F/23°C). Values shown were determined on 0.075"/1.9 mm thick extruded strip or 0.075"/1.9 mm thick molded ASTM plaques or molded ASTM durometer buttons.

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

Custom sizes available upon request.

SAINT-GOBAIN MEDICAL

TYGON[®] ND 100-55

Tubing for Medical Device Manufacturers

Tygon[®] ND 100-55 tubing was engineered for optimal performance in medical device applications. This tubing has demonstrated excellent flow rate stability in both enteral feeding and infusion pump studies and has met the requirements of Biological Test for Plastics, Class VI, as described in USP <88> (2010; fluid path). Tygon ND 100-55 is designed and manufactured without the intentional addition of animal-derived materials or DEHP. Custom sizes available.

TYGON[®] ND 100-55 TYPICAL PHYSICAL PROPERTIES*

Property	ASTM Method	Value or Rating
Durometer Hardness, Shore A, 15 sec.	D2240	55
Tensile Strength, psi (MPa)	D412	1,725 (11.9)
Ultimate Elongation, %	D412	425
Tear Resistance, lbf/inch (kN/m)	D1004	145 (25.4)
Specific Gravity	D792	1.18
Water Absorption, % 24 hrs at 73°F (23°C)	D570	0.14
Compression Set Under Constant Deflection, % at 158°F (70°C) for 22 hours	D395 Method B	57
Maximum Recommended Operating Temperature, °F (°C)	-	165 (74)
Brittleness by Impact Temperature, °F (°C)	D746	-53 (-47)
Tensile Stress at 100% Elongation, psi (MPa)	D412	596 (4.1)

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

TYGON[®] ND 100-55 TUBING STERILIZATION METHODS

Physical properties are not significantly impacted by the following sterilization methods:

- Autoclavable (steam 30 min at 15 psi, 250°F/121°C)
- EtO (Ethylene Oxide)
- Radiation (25 kGy/2.5 Mrad)

Product recommendations are based on a combination of industry knowledge, material science expertise, and/or material testing data. Contact Saint-Gobain Medical for further tubing recommendation information.

This document is intended to provide information about the product to enable you to consider whether generally the Product meets your application need and is not intended to provide product specification. This document should not be considered a Product warranty or guaranty. To the extent this document mentions any tests done by Saint-Gobain, such tests are done under controlled laboratory circumstances and hence other factors in your use and application may impact such values.

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TYGON[®]
Trusted Performance

FEATURES/BENEFITS

- Clear for easy visualization of fluid flow
- Regular evaluations to ensure REACH compliance
- Good peristaltic pump performance (including flow rate stability)
- Good kink resistance
- USP <88>, Class VI

TYPICAL APPLICATIONS

- Dialysis Equipment
- Drug delivery
- Respiratory therapy
- Peristaltic pump applications

TYGON[®] ND 100-55 TUBING CHARACTERISTICS

Tygon ND 100-55 has met the following test requirements:

- Genotoxicity, as described in ISO 10993-3 (2014)**
- Hemolysis, as described in ISO 10993-4 (2017)**
- Cytotoxicity, as described in ISO 10993-5 (2009)**
- Intramuscular implant, as described in ISO 10993-6 (2016, after steam and EtO sterilization)
- Systemic toxicity, as described in ISO 10993-11 (2017, after steam and EtO sterilization)
- Irritation, as described in ISO 10993-23 (2021, after steam and EtO sterilization)

** Tested after steam, gamma and EtO sterilization

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SAINT-GOBAIN MEDICAL

TYGON[®] ND 100-80

Tubing for Medical Device Manufacturers

Tygon[®] ND 100-80 tubing was engineered for optimal performance in medical device applications. This tubing is clear for easy visualization of fluid flow, has good kink resistance, and is easy to bond and weld.

This thermoplastic tubing has a durometer rating of 80 Shore A, which is relatively high compared to other Tygon ND offerings. The higher durometer rating enables manufacturing at small diameters (<0.03"/1 mm OD) and wall thicknesses. During the extrusion process, individual product dimensions are maintained and monitored through in-line micrometers and off-line verification with computerized imaging equipment. A harder material rating also means this tubing is well suited for both high pressure and vacuum applications.

BIOCOMPATIBILITY CHARACTERISTICS

Tygon ND 100-80 tubing has met the requirements of Biological Test for Plastics Class VI, as described in USP <88> (2017, fluid path). The tubing formulation undergoes regular evaluations to ensure REACH compliance. Tygon ND 100-80 is designed and manufactured without the intentional addition of animal-derived materials or DEHP.

EASY TO BOND/WELD

Consistent with many medical tubing market requirements, Tygon ND 100-80 can be effectively bonded/welded using the following methods: heat, electronic (RF)/ultrasonic, solvent and adhesive. Factors to be considered when selecting the components include: security of the bond required, effect on the integrity of the materials to be joined, and presence of residues or extractables that may affect biocompatibility. When bonding procedures are not used, mechanical clamps are recommended to provide secure attachment.

TYGON[®]
Trusted Performance



FEATURES/BENEFITS

- Clear for easy visualization of fluid flow
- Kink resistant
- High pressure and vacuum resistance
- USP <88>, Class VI
- Regular evaluations to ensure REACH compliance

TYPICAL APPLICATIONS

- Cannulas or protective sheaths
- Diagnostic equipment
- Drug delivery
- External drainage system
- Pressurized fluid transfer

Product recommendations are based on a combination of industry knowledge, material science expertise, and/or material testing data. Contact Saint-Gobain Medical for further tubing recommendation information.


SAINT-GOBAIN

Tygon® ND 100-80 tubing

IDEAL CHOICE FOR MEDICAL APPLICATIONS

The characteristics and physical properties of Tygon ND 100-80 tubing make it an ideal choice for drug delivery, cannulas or protective sheaths, external drainage systems (e.g., cerebral spinal fluid drainage), diagnostic equipment (e.g., reagent manufacturing, waste transfer in IVD), and pressurized fluid transfer.

TYGON® ND 100-80 TUBING MANUFACTURED SIZES AND PRESSURES

Part Number	I.D.		O.D.		Wall Thickness		Length		French Size	Needle Gauge
	inches	mm	inches	mm	inches	mm	feet	meters		
AAD04091	0.01	0.25	0.03	0.75	0.01	0.25	500	150	3	30
AAD04103	0.02	0.51	0.06	1.53	0.02	0.51	500	150	5	23
AAD04119	0.03	0.76	0.09	2.29	0.03	0.76	500	150	7	20-21
AAD04127	0.04	1.02	0.07	1.78	0.015	0.38	500	150	6	18-20
AAD04133	0.05	1.27	0.09	2.29	0.02	0.51	500	150	7	17-18

Custom sizes available

TYGON® ND 100-80 TYPICAL PHYSICAL PROPERTIES*

Property	ASTM Method	Value or Rating
Durometer Hardness, 15 sec.	D2240	80
Tensile Strength, psi (MPa)	D412	2,625 (18.1)
Ultimate Elongation, %	D412	350
Tear Resistance, lbf/inch (kN/m)	D1004	275 (48.2)
Specific Gravity	D792	1.22
Water Absorption, % 24 hrs at 73°F (23°C)	D570	0.10
Compression Set Under Constant Deflection, % at 158°F (70°C) for 22 hours	D395 Method B	59
Maximum Recommended Operating Temperature, °F (°C)	-	185 (85)
Brittleness by Impact Temperature, °F (°C)	D746	-31 (-35)
Tensile Modulus at 100% Elongation, psi (MPa)	D412	1,450 (10.0)

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

TYGON® ND 100-80 TUBING CHARACTERISTICS

Tygon ND 100-80 has met the following test requirements:

- Plastic Class VI, as described in USP <88> (2017; fluid path)
- Genotoxicity, as described in ISO 10993-3 (2014)**
- Hemolysis, as described in ISO 10993-4 (2017)**
- Cytotoxicity as described in ISO 10993-5 (2009)**
- Intramuscular implant as described in ISO 10993-6 (2016, after steam and EtO)
- Systemic toxicity as described in ISO 10993-11 (2017, after steam and EtO)
- Irritation as described in ISO 10993-23 (2021, after steam and EtO)

** Tested after gamma, EtO and steam sterilization

TYGON® ND 100-80 TUBING STERILIZATION METHODS

Physical properties are not significantly impacted by the following sterilization methods:

- Autoclavable (steam 30 min at 15 psi, 250°F/121°C)
- EtO (Ethylene Oxide)
- Radiation (25 kGy/2.5 Mrad)

NOTE: The information provided pertains only to product manufactured at the Saint-Gobain Akron, Ohio facility. Saint-Gobain Performance Plastics Corporation's Life Science ("Saint-Gobain") products that are used as components in the manufacture of any Medical Devices (as defined by the FDA) are sold by Saint-Gobain only and exclusively to Medical Device manufacturers for use in the manufacture, assembly or distribution of their medical devices. Medical Device manufacturers, to whom Saint-Gobain sells components or for whom Saint-Gobain acts as a subcontractor for finished products, are solely responsible for determining whether their finished products are a medical device and complying with the appropriate certifications and registrations.

This document is intended to provide information about the product to enable you to consider whether generally the Product meets your application need and is not intended to provide product specification. This document should not be considered a Product warranty or guaranty. To the extent this document mentions any tests done by Saint-Gobain, such tests are done under controlled laboratory circumstances and hence other factors in your use and application may impact such values.



Tygon® A-60-G Tubing

HIGH-PERFORMANCE CHEMICAL DISPENSING ALTERNATIVE TO RUBBER TUBING

Designed to Resist Hydrocarbons

Specially formulated for chemical dispensing, Tygon® A-60-G tubing outperforms neoprene, EPDM and other general-purpose tubing in test after test, application after application. It will not weaken or crack after years of exposure to heat and ozone, providing longer pump life in industrial and institutional cleaning-chemical dispensing applications.

Engineered for outstanding performance and on-the-job reliability, Tygon® A-60-G tubing handles temperatures ranging from -75°F (-60°C) to 75°F (135°C), allowing the use of one material within a broad range of temperatures. It is heat sealable and can be joined without fittings. It also offers excellent resistance to inorganic fluids (acids and bases).

Unequaled Life in Peristaltic Pump Applications

Peristaltic pumps are used in a wide range of markets and applications, including industrial and institutional cleaning-chemical dispensing. The universal requirement common to these applications is the ability of the tubing to withstand the constant high flexural fatigue exerted by the pump rollers.

Tygon® A-60-G tubing outlasts and outperforms virtually all other general service tubing in peristaltic pump applications due to its high flexural fatigue strength.

Ideal for Use in Vacuum Systems

Tygon® A-60-G tubing is available in standard vacuum sizes that will withstand a full vacuum (29.9" [759 mm] of mercury) at 73°F (23°C). Unlike typical rubber vacuum tubing, Tygon® tubing resists the cracking and aging that are frequent causes of vacuum tubing failure.



Features and Benefits

- Superior weathering
- Abrasion resistant
- Outstanding flexural fatigue resistance
- Wide temperature range (-75°F to 275°F)
- Low gas permeability versus rubber tubing
- Ozone* and UV light resistant
*300 pphm

Typical Applications

- Soap and disinfectant dispensing
- Cleaning chemical transfer
- Caustic chemical dispensing
- Plating and etching chemicals
- Glass and window wash systems
- Vacuum pumps



Tygon® A-60-G Tubing

Tygon® A-60-G Tubing

Part Number	ID	OD	Wall Thickness	Length	Min. Bend Radius	Max. Working Pressure		Vacuum Rating	
	(in.)	(in.)	(in.)	(ft.)	(in.)	73°F (psi)*	180°F (psi)*	inHg at 73°F	inHg at 180°F
AFL00003	1/16	3/16	1/16	50	1/4	34	21	29.9	29.9
AFL00007	1/8	1/4	1/16	50	1/2	19	12	29.9	29.9
AFL00008**	1/8	3/8	1/8	50	1/2	34	21	29.9	29.9
AFL00012	3/16	5/16	1/16	50	3/4	13	8	29.9	29.9
AFL00013	3/16	3/8	3/32	50	1/2	19	12	29.9	29.9
AFL00015**	3/16	9/16	3/16	50	1/4	34	21	29.9	29.9
AFL00017	1/4	3/8	1/16	50	7/8	10	6	29.9	15.8
AFL00018	1/4	7/16	3/32	50	3/4	15	9	29.9	29.9
AFL00019	1/4	1/2	1/8	50	3/4	19	12	29.9	29.9
AFL00020**	1/4	5/8	3/16	50	1/2	26	16	29.9	29.9
AFL00022	5/16	7/16	1/16	50	1-1/4	8	5	20.2	10.1
AFL00023	5/16	1/2	3/32	50	1	12	7	29.9	25.0
AFL00026**	5/16	13/16	1/4	50	1/2	28	17	29.9	29.9
AFL00027	3/8	1/2	1/16	50	1-3/8	7	4	14.1	7.0
AFL00028	3/8	9/16	3/32	50	1-1/2	10	6	29.9	15.0
AFL00029	3/8	5/8	1/8	50	1-1/8	13	8	29.9	27.7
AFL00032	7/16	9/16	1/16	50	2-1/4	6	4	5.0	0.0
AFL00036	1/2	5/8	1/16	50	3	6	3	15.0	0.0
AFL00037	1/2	11/16	3/32	50	2-1/4	8	5	20.0	10.0
AFL00038	1/2	3/4	1/8	50	1-1/8	10	6	29.6	15.6
AFL00045	5/8	13/16	3/32	50	3-1/4	7	4	10.0	5.0
AFL00046	5/8	7/8	1/8	50	2-3/4	8	5	20.0	9.9
AFL00053	3/4	1	1/8	50	3-1/2	7	4	13.9	6.9
AFL00062	1	1-1/4	1/8	50	5	6	3	5.0	5.0

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

**Vacuum tubing sizes

Typical Physical Properties

Property	ASTM Method	Value or Rating
Durometer Hardness, Shore A, 15s	D2240	61
Tensile Strength, psi (MPa)	D412	1,000 (6.9)
Ultimate Elongation, %	D412	375
Tear Resistance, lb-f/in (kN/m)	D1004	120 (21.0)
Specific Gravity	D792	0.98
Water Absorption, % at 73°F (23°C) for 24 hrs.	D570	0.30
Compression Set Constant Deflection, % at 158°F (70°C) for 22hrs.	D395 Method B	27
Maximum Recommended Operating Temp., °F (°C)	—	275 (135)
Tensile Modulus, at 100% Elongation, psi (MPa)	D412	410 (2.8)
at 300% Elongation, psi (MPa)		800 (5.5)
Tensile Set, at 75% Elongation	D412	47
Color	—	Black
Brittleness by Impact Temp., °F (°C)	D746	-75 (-60)
Dielectric Strength, v/mil (kV/mm)	D149	535 (21.1)

Unless otherwise noted, all tests were conducted at room temperature 73°F (23°C). Values shown were determined on 0.075" (1.905 mm) thick extruded strip or 0.075" (1.905 mm) thick molded ASTM plaques or molded ASTM durometer buttons.

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 pressure, 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® A-60-G TUBING IS NOT INTENDED FOR USE AS AN IMPLANT MATERIAL.



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NOTE: The data and details given in this document are correct and up to date. This document is intended to provide information about the product and possible applications. This document is not the product specification and does not provide specific features, nor does it guarantee product performance in specific applications. Saint-Gobain cannot anticipate or control the conditions of the field and for this reason strongly recommends that practical tests are conducted to ensure that the product meets the requirements of a specific application.

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