# **TYGON®** E-3603

The only choice for phthalate-free flexible tubing

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

Taking a proactive approach to increased corporate social responsibility, Saint-Gobain has developed TYGON® E-3603 using entirely bio-based plasticizers. Crystal clear and flexible, long-lasting and crack-resistant, the new TYGON® E-3603 non-DEHP tubing delivers the same superior performance you have come to expect, but now in a formulation that contains a non-DEHP plasticizer. Replacing DEHP with a bio-based, non-phthalate plasticizer delivers the benefits of increased sustainability and safety for the environment and users.

TYGON® E-3603 Tubing handles most inorganic chemicals found in the laboratory. It is non-oxidizing and non-contaminating, and less permeable than rubber tubing. The glassy-smooth inner bore helps prevent buildup to facilitate cleaning, and coils are marked at 1-foot (30.4 cm) intervals for easy measuring.

## Engineered to Last

TYGON® E-3603 Tubing is specially formulated for resistance to flex-fatigue and abrasion. In many peristaltic pump applications it will outlast the competitor and the original R-3603 by 3 to I. 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 expense of 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" [759mm] of mercury at 73°F [23°C] and up to 27" [686mm] of mercury at 140°F [60°C]). Like standard TYGON® Laboratory Tubing, TYGON® E-3603 Vacuum Tubing resists most inorganic chemicals and can be used in corrosive atmospheres.



## Tygon® E-3603 Features/Benefits

- The new bio-based formulation delivers the same excellent performance
- · Outstanding chemical resistance
- Lot-to-lot consistency for reproducible results
- Increases productivity in peristaltic pumps Outlasts the competitor and original R-3603 by 3 to I
- · Non-oxidizing 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
- Meets USP Class VI and FDA criteria

## Typical Applications

- · General laboratory
- · Food & Beverage
- Biopharmaceutical
- · Analytical instruments
- Peristaltic and vacuum pumps
- Ideal for condensers, incubators, desiccators, gas lines and drain lines



## TYGON® E-3603 Non-DEHP Tubing-Available Sizes

Saint-Gobain Part Number	I.D.		0.	D.	Wall Ti	Wall Thickness		Length		Minimum Bend Radius		Maximum Working Pressure		Vacuum Rating of Mercury at	
	ln.	mm	ln.	mm	In.	mm	Ft.	m	In.	mm	psi at 73°F*	bars 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	I	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	- I	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 22	1.2	15	381	
ACF00034	7/16	11.1	11/16	17.5	1/8	3.2	50	15	1-3/8	34.9			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 12	127	
ACF03037	1/2	12.7	11/16	17.5	3/32	2.4	50	15	2-1/4	57.2	15 15	1.0		305	
ACF02037 ACF00038	1/2	12.7	11/16 3/4	17.5	3/32 1/8	3.2	100	30.5	2-1/4	57.2 38.1	20	1.0	12 21	305 533	
ACF00038	1/2	12.7	13/16	20.6	5/32	4.0	50 50	15 15	1-1/2	38.1	24	1.7	29.9	760	
	9/16			19.0				15					9	229	
ACF00041 ACF00042	9/16	14.3	3/4 13/16	20.6	3/32 1/8	3.2	50 50	15	2-1/2	63.5 50.8	14 18	1.0	17	432	
ACF00042 ACF00045	5/8	14.3	13/16	20.6	3/32	2.4	50	15	3	76.2	13	0.9	7	178	
ACF00045	5/8	15.9	7/8	22.2	1/8	3.2	50	15	2-3/8	60.3	17	1.2	13	330	
ACF00046 ACF00047	5/8	15.9	15/16	23.8	5/32	4.0	50	15	2-3/8	50.8	20	1.4	21	533	
ACF00047 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	
ACF00050	3/4	17.3	//6 I	25.4	1/8	3.2	50	15	3-1/2	82.6	14	1.0	9	229	
ACF00053	3/4	19.0	1-1/16	27.0	5/32	4.0	50	15	2-3/4	69.8	17	1.0	15	381	
ACF00055	3/4	19.0	1-1/16	28.6	3/16	4.8	50	15	2-3/4	60.3	20	1.4	21	533	
ACF00057	3/4	19.0	1-1/6	31.8	1/4	6.4	50	15	2-3/6	50.8	25	1.7	29.9	760	
ACF00057	7/8	22.2	1-1/4	28.6	1/4	3.2	50	15	4-1/8	104.8	13	0.9	7	178	
ACF00060	7/8	22.2	1-1/6	30.2	5/32	4.0	50	15	3-1/2	88.9	15	1.0	11	279	
ACF00060 ACF00062	//o 	25.4	1-3/16	31.8	1/8	3.2	50	15	4-3/4	120.6	12	0.8	5	127	
ACF00064		25.4	1-1/4	34.9	3/16	4.8	50	15	4	101.6	16	1.1	12	305	
ACF00065		25.4	1-1/2	38.1	1/4	6.4	50	15	3	76.2	20	1.1	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	1.4	9	229	
ACF00068	1-1/8	31.8	1-1/2	38.1	1/8	3.2	50	15	7-7/8	200	10	0.7	3	76	
ACF00069 ACF00070	1-1/4	31.8	1-1/2	41.3	3/16	4.8	50	15	7-7/8 5-1/2	139.7	13	0.7	7	178	
ACF00070 ACF00073		38.1	1-5/8	47.6	3/16	4.8	50	15	7-1/4	139.7	13	0.9	5	178	
	I-I/2 I-I/2	38.I 38.I	2	50.8	3/16 1/4	6.4		15	7-1/ <del>4</del> 5-7/8	184.2	12		9	229	
ACF00074							50					1.0			
	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	
ACF00076 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	

## TYGON® E-3603 Non-DEHP Tubing-Available Sizes

Saint-Gobain	1.1	D.	0.	D.	W Thick		Len	gth		mum Radius		mum Pressure	1	n Rating cury at
Part Number	ln.	mm	ln.	mm	ln.	mm	Ft.	m	In.	mm	psi at 73°F*	bars at 23°C*	inches at 73°F	mm at 23°C
						\	/acuum Siz	es						
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	I	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	I	25.4	2	50.8	1/2	12.7	20	6	1-7/8	47.6	36	2.5	29.9	760
					Uni	pacs (10	/IO' length	s per car	ton)					
ACFUN007	1/8	3.2	1/4	6.4	1/16	1.6	10/10'	10/3	3/8	9.5	45	3.1	29.9	760
ACFUN012	3/16	4.8	5/16	7.9	1/16	1.6	10/10'	10/3	5/8	15.9	30	2.0	29.9	760
ACFUN017	1/4	6.4	3/8	9.5	1/16	1.6	10/10'	10/3	I	25.4	25	1.7	20	508
ACFUN019	1/4	6.4	1/2	12.7	1/8	3.2	10/10'	10/3	1/2	12.7	40	2.8	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	20	1.4	9	229
ACFUN036	1/2	12.7	5/8	15.9	1/16	1.6	10/10'	10/3	2-7/8	73.0	10	0.7	5	127
ACFUN053	3/4	19.0	I	25.4	1/8	3.2	10/10'	10/3	3-1/4	82.6	18	1.2	9	229
ACFUN062	I	25.4	1-1/4	31.8	1/8	3.2	10/10'	10/3	4-3/4	120.6	15	1.0	5	127
			Va	cuum Un	ipacs (10	/10' or 4	/IO' length	ıs per car	ton as sh	nown bel	ow)			
ACFUN015	3/16	4.8	9/16	14.3	3/16	4.8	10/10'	10/3	1/4	6.4	60	4.2	29.9	760
ACFUN020	1/4	6.4	5/8	15.9	3/16	4.8	10/10'	10/3	1/2	12.7	50	3.5	29.9	760
ACFUN030	3/8	9.5	7/8	22.2	1/4	6.4	10/10'	10/3	5/8	15.9	50	3.5	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	I	25.4	40	2.8	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
ACFISI502	2	4	1	15	7	2.5	760
ACFISI5I7	3	5	I	15	13	1.7	760
ACFISI5I8	4	6	I	15	16	1.4	533
ACFISI503	5	8	1.5	15	19	1.6	760
ACFISI504	6	9	1.5	15	22	1.4	559
ACFISI506	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.

Please consult factory for availability

Metric dimensions are nominal

 $<sup>^{</sup>st}$  Working pressures are calculated at a 1:5 ratio relative to burst pressure using ASTM D1599.

For more than four decades, Saint-Gobain Performance Plastics and its family of companies have supplied the world with innovative, highperformance polymer products for the most demanding applications. Our tradition of excellence goes back more than 300 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.

## Relative Chemical Resistance Properties For TYGON® E-3603\*

Conc. Med. Weak Conc.	F E E
Weak Conc.	E
Conc.	<del>-</del>
	F
M - J	
Med.	E
Weak	E
	E
	F
	U
	U

E = Excellent F = Fair U = Unsatisfactory \*All tests conducted at room temperature.



## **Product** Characteristics

Opacity	Clear
FDA Approved for Food Contact	Yes
NSF 51 Standard	No
USP Class VI	Pending

## Typical Physical Properties

		Value or Rating	
Property	ASTM Method	E-3603	
Durometer Hardness (Shore A), 15s	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.

#### Manufacturing Facilities

Saint-Gobain Performance Plastics

Saint-Gobain Performance Plastics

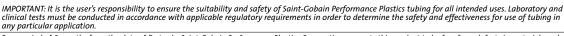
La Mothe-aux-Aulnaies F-89120 Charny, France

Tel: (33) 3-86-63-78-78 Fax: (33) 3-86-63-77-77 2664 Gilchrist Road Akron, OH 44305

Tel: (800) 798-1554 Tel: (330) 798-9240

Fax: (330) 798-6968





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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