



Chemical Resistance Properties

	Tygon S3™ B-44-3	Tygon S3™ B-44-4X	Tygon S3™ B-44-4X IB	Tygon S3™ E-3603	Tygon S3™ ELFL	Tygon™ 2375	Tygon™ A-60-F	Tygon™ A-60-F IB	Tygon™ B-44-FF	Tygon™ E-1000	Tygon™ E-70-V-CE	Tygon™ SPT-3350	Tygon™ SPT-3370 IB	Tygon™ XL-60	Tygon S3™ M-34-R	Tygon S3™ A24, A24-C	Tygon™ II
Calcium Nitrate, 55% in w																	
Calcium Sulfate																	
Calcium Sulfate, 1% in w																	
Carbon Disulfide																	
Carbon Dioxide, Wt/Dry																	
Carbon Monoxide																	
Carbon Tetrachloride																	
Carbonic Acid																	
Calcium Chloride																	
Celvolone Acetate																	
Chlorine, Dry Gas																	
Chlorine, Wet Gas																	
Chloroacetic Acid, 10% in w																	
Chloroacetic Acid, 50% in w																	
Chloroacetic Acid, 80% in w																	
Chloroacetic Acid, 90% in w																	
Chloroacetic Acid, 95% in w																	
Chloroacetic Acid, 99% in w																	
Chloroacetic Acid, 100% in w																	
Chloroacetic Acid, 10-20% in w																	
Coconut Oil																	
Com. Syrup																	
Compressed Oil																	
Cresylic Acid																	
Cresylic Acid (CrP)																	
Cupric Chloride, 40% in w																	
Cupric Nitrate, 70% in w																	
Cuprous Chloride, 1% in w																	
Cuprous Chloride, 1% in w																	
Cyclohexanone																	
Cyclohexanone																	
Deaerated Solutions																	
Dibutyl Phthalate																	
Diethylene Glycol																	
Diethylene Glycol																	
Dimethylformamide																	
Dimethylsulfoxide																	
Dioxane																	
Dioxane																	
Ether																	
Ethyl Acetate																	
Ethyl Acetate (ethanol)																	
Ethyl Alcohol																	
Ethyl Chloride																	
Ethyl Ether																	
Ethylene Bromide																	
Ethylene Dichloride																	
Ethylene Dichloride																	
Ethylene Glycol																	
Ethylene Glycol																	
Ethylene Oxide																	
Fatty Acids																	
Ferrous Chloride, 40% in w																	
Ferrous Chloride, 40% in w																	
Ferrous Chloride, 5% in w																	
Ferrous Chloride, 40% in w																	
Ferrous Sulfate, 5% in w																	
Ferrous Sulfate, 5% in w																	
Fluorine Gas																	
Fluorine Gas																	
Formaldehyde, 25% in w																	
Formaldehyde, 37% in w																	
Formic Acid, 40-50% in w																	
Formic Acid, 40-50% in w																	
Formic Acid, 98% in w																	
Formic Acid, 98% in w																	
Freon 11																	
Freon 12																	
Freon 113																	
Freon 114																	
Fuel Mix																	
Fuel Oil																	
Furfural																	
Gallic Acid, 1% in acetone																	
Gallic Acid, 1% in acetone																	
Gallic Acid, 1% in acetone																	
Glucose, 50% in w																	
Glucose, 50% in w																	
Glycerol, (Glycerin)																	
Glycerol, (Glycerin)																	
Hexane																	
Hexane																	
Hydrazine																	
Hydrobromic Acid, 20-50% in w																	
Hydrobromic Acid, 20-50% in w																	
Hydrobromic Acid, 100% in w																	
Hydrobromic Acid, 100% in w																	
Hydrochloric Acid, 27% in w																	
Hydrochloric Acid, 27% in w																	
Hydrochloric Acid																	
Hydrochloric Acid																	

E = Excellent G = Good F = Fair X = Not Recommended  
 w = Water a = Alcohol  
 in = Immersion % Conc. = Concentration of solution  
 \*\* Chemical resistance ratings based on inner liner material.  
 NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.

Chemical Resistance Properties

Chemical	Tygon S3™ B-44-3	Tygon S3™ B-44-4X	Tygon S3™ B-44-4X IB	Tygon S3™ E-3603	Tygon S3™ ELFL	Tygon™ 2375	Tygon® A-60-F	Tygon® A-60-F IB	Tygon® B-44-FF	Tygon® E-1000	Tygon® E-70-V-CE	Tygon® SPT-3350	Tygon® SPT-3370 IB	Tygon® XL-60	Tygon S3™ M-34-R	Tygon S3™ A24-A24-C	Tygon® II
Hydrofluoric Acid, 10% in w																	
Hydrofluoric Acid, 25% in w																	
Hydrofluoric Acid, 40-48% in w																	
Hydrogen Peroxide, 3% in w																	
Hydrogen Peroxide, 30% in w																	
Hydrogen Peroxide, 50% in w																	
Hydrogen Peroxide, 90% in w																	
Hydrogen Peroxide, 70% in w																	
Iodine, 50 ppm in w																	
Isobutyl Alcohol																	
Isopropyl Acetate																	
Isopropyl Alcohol																	
Isopropyl Ether																	
Jet Fuel, J18																	
Ketones																	
Lacquer Solvents																	
Lactic Acid, 3.0% in w																	
Lactic Acid, 85% in w																	
Lead Acetate, 35% in w																	
Lead Sulfate																	
Lemon Oil																	
Limonene																	
Lipoic Acid																	
Linseed Oil																	
Lubricating Oil, Petroleum																	
Magnesium Carbonate, 1% in w																	
Magnesium Chloride, 20% in w																	
Magnesium Hydroxide, 10% in w																	
Magnesium Nitrate, 50% in w																	
Magnesium Sulfate, 25% in w																	
Malic Acid, 30% in w																	
Manganese Chloride, 6% in w																	
Manganese Sulfate																	
Mercuric Chloride, 6% in w																	
Mercuric Cyanide, 8% in w																	
Mercury Sulfate																	
Methane Gas																	
Methyl Acetate																	
Methyl Bromide																	
Methyl Ethyl Ketone (MEK)																	
Methyl Isobutyl Ketone																	
Methylene Chloride																	
Methyl Methacrylate																	
Mineral Oil																	
Mineral Spirits																	
Molasses																	
Monomethylamine																	
Monoethylamine																	
Naphthalene																	
Natural Gas																	
Nickel Chloride, 10% in w																	
Nickel Nitrate, 15% in w																	
Nickel Sulfate																	
Nickel Sulfate, 25% in w																	
Nitric Acid, 10% in w																	
Nitric Acid, 15% in w																	
Nitric Acid, 48-71% in w																	
Nitrobenzene																	
Nitromethane																	
Nitrous Acid, 10% in w																	
Oil, Animal																	
Oil, Essential																	
Oil, Hydraulic (Phosphate Ester)																	
Oil, Hydraulic (Phosphate Free)																	
Oil, Hydrocarbon																	
Oil, Mineral																	
Oil, Paraffinic																	
Oil, Petroleum																	
Oil, Synthetic																	
Oleum, 25% in w																	
Ortho Dichlorobenzene																	
Oxalic Acid, 12% in w																	
Ozone, 300pphm																	
Palmic Acid, 100% in ether																	

E = Excellent G = Good F = Fair X = Not Recommended  
 w = Water a = Alcohol  
 % = Concentration in weight  
 100% = 100% concentration or the maximum percent stability in water.  
 \*\* Chemical resistance ratings based on linear material.  
 NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.

Chemical Resistance Properties

	Tygon <sup>®</sup> S3™ B-443	Tygon <sup>®</sup> S3™ B-444X	Tygon <sup>®</sup> S3™ B-444X-B	Tygon <sup>®</sup> S3™ E-303	Tygon <sup>®</sup> S3™ E-LFL	Tygon <sup>®</sup> 2375	Tygon <sup>®</sup> A-60-F	Tygon <sup>®</sup> A-60-F-B	Tygon <sup>®</sup> B-44-F	Tygon <sup>®</sup> E-1000	Tygon <sup>®</sup> E-70-V-CE	Tygon <sup>®</sup> SPT-3350	Tygon <sup>®</sup> SPT-3370-B	Tygon <sup>®</sup> XL-60	Tygon <sup>®</sup> S3™ M-34-R	Tygon <sup>®</sup> S3™ A24-A24-C	Tygon <sup>®</sup> II
Perchloric Acid, 47% in w																	
Perchloroethylene																	
Perfluoropolyether																	
Picric Acid, 5% in w																	
Picric Acid, 9.1% in w																	
Phosphoric Acid, <10% in w																	
Phosphoric Acid, 25% in w																	
Phosphoric Acid, 45% in w																	
Phosphoric Acid, 85% in w																	
Photographic Solutions																	
Phtalic Acid, 9% in a/c																	
Phtalic Anhydride, 2% in a/c																	
Piperazine, 10% in w																	
Piperazine, 40% in w																	
Potassium Carbonate, 5% in w																	
Potassium Cyanide, 33% in w																	
Potassium Dichromate, 3% in w																	
Potassium Dichromate, 15% in w																	
Potassium Dichromate, 50% in w																	
Potassium Hypochlorite, 70% in w																	
Potassium Iodide, 56% in w																	
Potassium Permanganate, 6% in w																	
Potassium Sulfate																	
Propyl Alcohol (Propanol)																	
Propylene Glycol																	
Propylene Oxide																	
Silicic Acid, 1% in w																	
Silicone Oil																	
Silver Nitrate, 5% in w																	
Silver Nitrate, 10% in w																	
Silver Sulfide																	
Silver Sulfide, 5% in w																	
Sodium Acetate, 55% in w																	
Sodium Benzoate, 22% in w																	
Sodium Bicarbonate, 2% in w																	
Sodium Bicarbonate, 7% in w																	
Sodium Bicarbonate, 15% in w																	
Sodium Chloride, 45% in w																	
Sodium Chloride, 20% in w																	
Sodium Cyanide, 30% in w																	
Sodium Hydroxide, 10-15% in w																	
Sodium Hydroxide, 30-40% in w																	
Sodium Hypochlorite, 5.5% in w																	
Sodium Hypochlorite, 1.22% in w																	
Sodium Hypochlorite, 3.5% in w																	
Sodium Salts																	
Sodium Sulfate, 5% in w																	
Sodium Sulfide, 45% in w																	
Sodium Sulfide, 10% in w																	
Sodium Sulfide, 20% in w																	
Sodium Sulfide, 50% in w																	
Sulfamic Acid, 50% in w																	
Sulfamic Acid, 30% in w																	
Sulfamic Acid, 95-98% in w																	
Sulfurous Acid																	
Tannic Acid, 75% in w																	
Tartaric Acid, 5% in w																	
Tetrahydrofuran																	
Thionyl Chloride																	
Tin Salts																	
Toluene																	
Toluene Salts																	
Trichloroacetic Acid, 90% in w																	
Trichloroethylene																	
Trinitrobenzene																	
Trinitrobenzene																	
Trichloroethylene																	
Tricresyl Phosphate																	
Trisodium Phosphate																	
Triphenylamine																	
Urethane, 100% in w																	
Uric Acid																	
Vinyl Acetate																	
Vinyl Acetate																	
Water, Distilled																	
Xylene																	
Zinc Chloride, 80% in w																	
Zinc Salts																	

E = Excellent G = Good F = Fair X = Not Recommended  
 = Not Tested in Progress  
 = Poor  
 = Not Tested  
 \* If concentration is not indicated, assume 100% concentration or the maximum percent solubility in water.  
 \*\* Chemical resistance ratings based on linear liter material.  
 NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.

# TYPICAL PHYSICAL PROPERTIES OF FLEXIBLE TUBING

Physical properties of a tubing produced from a specific compound will vary depending on its diameter and wall thickness. The following typical physical properties are average values as measured using test methods of the American Society for Testing and Materials. 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 diametrical buttons.

**IMPORTANT:** It is the user's responsibility to ensure the suitability and safety of Saint-Gobain tubing for all intended uses, including establishing the compatibility of any fluid with the tubing through which it is transmitted. Laboratory, field or clinical tests must be conducted in accordance with applicable requirements in order to determine the safety and effectiveness for use of tubing in any particular application. If intended for medical use, it is the user's responsibility to ensure that the tubing to be used complies with all applicable medical regulatory requirements.

## Typical Physical Properties

Tubing	ASTM Method D2240	Color	Opacity	Tensile Strength	Ultimate Elongation, %	Tear Resistance	Burst Pressure	
							psi	MPa
Types S3™ B-44-3	66	Clear	Transparent	2200	15.2	390	250	43.8
Types S3™ B-44-4X	66	Clear	Transparent	2200	15.2	390	250	43.8
Types S3™ B-44-4X-IB	66	Clear	Opaque	2200	15.2	390	250	43.8
Types S3™ E-3603	56	Clear	Transparent	1750	12.1	425	173	31.0
Types S3™ E-4FL	56	Clear	Translucent	1800	12.4	400	184	32.2
Types S3™ 3375	75	Clear	Translucent	1900	13.1	850	240	42.0
Types® A-60F	61	Clear	Opaque	1000	6.9	375	120	21.0
Types® A-60F-IB	61	Clear	Opaque	1000	6.9	375	120	21.0
Types® B-44F	82*	Neutral	Transparent	6050	41.7	500	475	83.1
Types® E-1000	40	Clear	Translucent	1100	7.6	435	104	18.2
Types® E-70V-CE	72	Clear	Translucent	2300	15.8	240	—	—
Types® 9F50 LF	51	Clear	Translucent	1320	9.1	627	—	—
Types® 9F13350	50	Clear	Translucent	1450	10.0	770	200	35.0
Types® 9F13370 IB	70	Clear	Translucent	1200	8.3	500	250	43.8
Types® XL-60	66	Clear	Translucent	1630	11.2	770	190	33.3
Types S3™ H34-R	60	Clear	Translucent	2205	15.2	390	250	43.8
Types S3™ A24	56	Clear	Transparent	1755	12.1	425	177	31.0
Types S3™ A24-C	56	Black	Transparent	1755	12.1	425	177	31.0
Types® II	68	Black	Translucent	—	—	950	200	35.0
Types® F-400-A	57	Yellow	Translucent	1820	12.5	310	167	29.0
Types® LP-1100	69	Yellow	Translucent	2400	16.5	450	167	29.0
Types® LP-1000	78	Clear	Translucent	3000	24.8	475	500	87.6
Types® LP-1000	85	Clear	Translucent	5000	34.5	400	540	98.0
Types® LP-1600	72	Grey	Opaque	2700	18.6	300	—	—
Types® I	60	Clear	Translucent	900	6.2	300	—	—
Types® W5A-60	61	Black	Opaque	1000	6.9	375	120	21.0
Types® A-60-G	61	Black	Opaque	1000	6.9	375	120	21.0
Types® Chemical	75	Clear	Opaque	1000	6.9	375	120	21.0
Types® 3375-C	75	Clear	Translucent	1900	13.1	850	240	42.0
Types® 9F50-IB	50	Clear	Translucent	1500	10.3	450	148	26.0
Types® 9F50-70 IB	71	Clear	Opaque	1200	8.3	300	130	22.8
Types® C-210-A	82*	Clear	Transparent	6050	41.7	500	475	83.1
Types® C-644-A-IB	85*	Clear	Opaque	5000	34.5	400	300	51.3
Types® R-360	64	Black	Opaque	2250	15.5	350	185	32.0
Types® F-500-A	60*	Black	Opaque	1400	9.3	300	100	17.5
Types® SE200	66*	Clear	Translucent	2200	15.2	390	250	43.8
Types® Silver	69	Silver	Opaque	2300	15.8	350	250	43.8
Types® EP	55D*	Clear	Transparent	2600	17.9	325	—	—
Types® PFA	60D*	Clear	Translucent	2500	17.2	300	—	—
Types® PTFE	58D*	Clear	Translucent	2450	18.3	350	—	—
Types® 347	58D*	Clear	Transparent	3750	26.0	300	—	—
Types® PVDF	65D*	Clear	Opaque	2900	20.0	400	—	—
Types® ETE	72D*	Clear	Opaque	6800	47.0	300	—	—
Types® Duality	48D*	Clear	Translucent	—	—	—	—	—

\* 1/8" ID, 1/4" diameter diameter  
 \* 1/2" diameter diameter  
 \*\* Diameter measured on outer jacket

NOTE: The ratings in the charts DO NOT reflect the extent to which extraction may occur, or the extent to which fluids may undergo any physical changes in properties or composition, as a result of coming into contact with the tubing. Saint-Gobain makes no representation or warranty with respect to the susceptibility of any fluid to become contaminated or undergo changes in properties or composition as a result of possible extraction of tubing ingredients by the fluid to be transmitted. Certain corrosives that would be destructive to tubing with prolonged exposure can be satisfactorily handled for short periods of time if flushed with water after use. All ratings are based on room temperature (73°F). Chemical resistance will be adversely affected by elevated temperatures.

Specific Gravity	Water Absorption, % at 73°F (23°C) for 24 hrs.	Compression Set, % at 73°F (23°C) for 22 hrs.	Maximum Recommended Operating Temp.	Brittleness by Impact Temp.		Low Temp. Flexibility	Tensile Str. ↑ %
				°F	°C		
ASTM Method D792	ASTM Method D570	ASTM Method D395	°F	°C	°F	°C	ASTM Method D412
1.20	0.22	59	165	74	-32	-36	-49
1.21	0.22	59	165	74	-32	-36	-49
1.21	0.22	59	165	74	-32	-36	-49
1.21	0.21	64	165	74	-31	-46	—
1.17	0.20	68	165	74	-31	-46	—
0.90	0.04	100	130	54	-103	-75	—
0.98	0.30	30	275	135	-75	-60	—
0.98	0.30	30	275	135	-75	-60	—
1.20	1.12	68	175	79	-100	-73	—
1.10	0.29	55	125	52	-47	-55	—
—	-0.01	—	160	71	-47	-44	—
—	—	—	—	—	—	—	—
1.14	0.11	7	400	204	-112	-80	—
1.18	0.11	3	320	160	-112	-80	—
0.90	0.07	55	250	121	-87	-66	—
1.21	0.22	59	165	74	-33	-36	—
1.21	0.21	64	165	74	-32	-36	—
1.21	0.21	64	165	74	-32	-36	—
1.18	0.21	64	165	74	-32	-36	—
1.18	0.47	—	212	100	-112	-80	-45
0.98	0.30	27	275	135	-75	-60	—
1.29	0.49	65	180	82	-35	-37	—
1.27	0.70	35	180	82	-130	-90	-40
1.18	0.90	35	185	85	—	—	-40
1.32	0.47	—	180	82	—	—	—
1.12	—	—	350	176	—	—	—
0.98	0.30	27	275	135	-75	-60	—
0.98	0.30	30	275	135	-75	-60	—
0.98	-0.01	30	165	74	-75	-60	—
0.90	0.04	100	130	54	-103	-75	—
1.17	0.06	10	350	177	-112	-80	—
1.20	0.08	10	320	160	-112	-80	—
0.88	0.04	40	135	57	-108	-73	—
1.20	1.12	68	175	79	-100	-73	—
1.12	1.80	19	180	82	-100	-73	—
1.31	0.19	64	165	74	-4	-21	—
1.90	0.23	37	400	204	-60	-51	—
1.21	-0.01	59	165	74	-32	-36	—
1.21	-0.01	63	165	74	-31	-35	—
2.17	-0.01	—	400	204	-100	-73	—
2.17	-0.03	—	500	260	-200	-196	—
2.18	-0.01	—	500	260	-460	-248	—
2.15	-0.03	—	450	227	-320	-196	—
1.77	0.03	—	250	121	—	—	—
1.70	-0.01	—	300	150	-150	-66	200
—	—	—	180	82	—	—	25
—	—	—	180	82	—	—	-32