CHEMICAL RESISTANCE PROPERTIES OF TUBING

The ratings in the charts on pages 20 to 23 are based on the results of both laboratory and field tests. They reflect the relative capabilities of various Norton tubing formulations to withstand specific chemicals. 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 (21°C; 73°F). Chemical resistance will be adversly affected by elevated temperatures.

IMPORTANT: It is the user's responsibility to insure the suitability and safety of Norton tubing for all intended uses. 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.

KEY

1 **Excellent**
2 **Good**
3 **Fair**
4 **Not Recommended**

Environment, % Conc.*
w-Water alc-Alcohol

	Tygon® R-3603/R-3603 vacuum	GSR	GA	Tygon® 3350/3370 I.B.	Tygon® 2275/2275 I.B.	Versilic®	Tygon® S 50 HL	Tygon® S-54-HL	Tygon® B-44-3	Tygon® B-44-4X	Tygon® B-44-4X I.B.	Norprene® A-60 F/A 60-F I.B.	PharMed®	Tygon® LFL	Tygon® R-1000	Fluran® F-5500-A	Tygon® F-4040-A	Tygon® 2075	Tygon® R-3400	Iso-Versinic®	Norprene® A-60-G	Tygothane® C-210-A/C-210 A I.B.	Butyl	Nitrile	Neoprene	Tygon® SE-200	Chemfluor® 367	Chemfluor® FEP	Chemfluor® PFA	Chemfluor® PTFE
Acetaldehyde	4	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	1	4	3	1	1	1	1	1
Acetamide, 67% in w	4	3	3	1	1	1	4	4	4	4	4	2	2	4	4	4	4	1	4	4	2	4	1	2	1	1	1	1	1	1
Acetate Solvents	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	2	4	3	1	1	1	1	1
Acetic Acid, 10% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	2	2	1	1	1	1	1	1
Acetic Acid, 50-60% in w	1	2	2	1	1	1	1	1	2	2	2	2	2	1	2	4	1	1	1	4	2	4	2	3	1	1	1	1	1	1
Acetic Acid, Glacial, 100%	4	2	2	4	1	4	4	3	4	4	2	2	4	4	4	4	4	1	4	4	2	4	2	3	3	1	1	1	1	1
Acetic Anhydride	4	2	2	1	1	1	4	4	4	4	4	1	1	4	4	4	4	1	4	4	1	4	1	4	2	1	1	1	1	1
Acetone	4	2	2	3	2	3	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	4	4	4	3	1	2	1	1	1
Acetonitrile	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	2	4	4	4	4	4	1	1	1	1	1
Acetyl Bromide	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	4	4	4	1	1	1	1	1
Acetyl Chloride	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	1	2	2	1	1	1	1	1
Acetylene Gas	1	2	2	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	4	4	3	1	1	1	1	1
Acrylonitrile	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	2	4	4	4	1	4	1	1	1	1	1
Adipic Acid, 100% in alc	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	3	4	4	4	2	4	4	1	2	1	1	1	1	1	1
Air	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	1	1
Alcohols General	4	2	2	2	1	2	4	4	4	4	4	1	1	4	4	4	2	1	4	4	1	4	4	1	2	1	1	1	1	1
Aliphatic Hydrocarbons	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	4	3	2	4	2	4	4	4	1	1	1	1	1
Allyl Alcohol	4	4	4	4	1	4	4	4	4	4	4	3	3	4	4	1	1	1	4	3	3	4	1	1	1	1	1	1	1	1
Alum, 5% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	1	1	1	1	1
Aluminum Chloride, 53% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1
Aluminum Hydroxide, 2% in w	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Aluminum Sulfate, 50% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	4	3	1	1	1	1	1
Aluminum Salts	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Amines	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	2	1	1	1	1	1	1	1
Ammonia Gas	1	1	1	4	1	4	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	1	1	1	1	1	1	1	1
Ammonia, Anhydrous Liquid	2	2	2	4	2	4	2	2	2	2	2	2	1	2	2	4	2	2	2	4	2	3	1	1	1	2	1	1	1	1
Ammonium Acetate, 45% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	1	1	2	1	1	1	1	1
Ammonium Carbonate, 20% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Ammonium Hydroxide, 5-10% in w	1	1	1	4	1	4	1	1	1	1	1	1	1	1	1	4	2	1	1	4	1	1	1	1	1	1	1	1	1	1
Ammonium Hydroxide, 30% in w	1	1	1	4	1	4	1	1	1	1	1	1	1	1	1	4	3	1	2	4	1	3	1	4	1	1	1	1	1	1
Ammonium Persulfate, 30% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ammonium Salts	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1
Ammonium Sulfate, 30% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Amyl Acetate	4	2	2	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	4	4	4	1	1	1	1	1
Amyl Alcohol	4	2	2	4	1	4	4	4	4	4	4	4	4	4	4	1	1	1	4	1	4	3	2	4	3	1	1	1	1	1
Amyl Chloride	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	2	2	4	1	1	1	1	1
Aniline	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	1	1	3	1	1	1	1	1
Aniline Hydrochloride	4	2	2	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	1	2	1	1	1	1	1	1
Antimony Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	2	4	1	1	1	1	1	1
Aqua Regia	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	4	3	4	3	2	1	2	1	1
Aromatic Hydrocarbons	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1	1	1	1	1
Arsenic Acid, 20% in w	1	1	1	3	1	3	1	1	1	1	1	3	3	1	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1
Arsenic Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ASTM Reference No. 1 Oil	4	4	4	1	4	1	4	4	4	4	4	3	3	4	4	1	1	4	4	1	3	1	4	1	1	1	1	1	1	1
ASTM Reference No. 2 Oil	4	4	4	2	4	2	4	4	4	4	4	4	4	4	4	1	1	4	4	1	4	1	4	1	2	1	1	1	1	1
ASTM Reference No. 3 Oil	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	4	1	4	1	4	1	4	1	1	1	1	1
Barium Carbonate, 1% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	1	1	1	1	1
Barium Hydroxide, 5% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	1	1	1	1	1
Beer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Benzaldehyde	4	4	4	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	1	1	1	1	1
Benzene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	3	1	1	1	1	1
Benzenesulfonic Acid	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1	1	1	1	1
Benzoic Acid	4	3	3	4	4	4	4	4	4	4	4	2	2	4	4	4	3	4	4	4	2	4	1	1	2	1	1	1	1	1
Benzyl Alcohol	4	4	4	1	1	1	4	4	4	4	4	1	1	4	4	1	4	1	4	1	1	4	1	1	1	1	1	1	1	1
Bleach Liquor, 22% in w	1			4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				1	1	1	1	1
Borax, 6% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	2	1	1	1	1	1
Boric Acid, 4% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bromine, Anhydrous Liquid	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Butadiene	1	4	4	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	3	4	2	1	1	1	1	1
Butane	1	1	4	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	4	1	2	1	1	1	1	1
Butyl Acetate	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	3	4	4	1	1	1	1	1
Butyl Alcohol	4	1	1	4	1	4	4	4	4	4	4	4	4	4	4	1	1	1	4	1	4	3	1	1	1	1	1	1	1	1
Butyric Acid	4	3	3	4	4	4	4	4	4	4	4	2	2	4	4	4	3	4	4	4	2	4	2	4	2	1	1	1	1	1
Calcium Carbonate, 2% in dilute acids	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	1	1	1
Calcium Chloride, 30% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Hydroxide, 10% in glycerol	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	4	1	1	1	1	4	1	1	1	1	1	1	1	1
Calcium Hypochlorite, 20% in w	1	4	4	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	3	1	1	1	1	1

* *If concentration is not indicated assume 100% concentration or the maximum percent solubility in water.*
NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.

KEY

1 Excellent
2 Good
3 Fair
4 Not Recommended

Environment, % Conc.*
w-Water alc-Alcohol

	Tygon® R-3603/R-3603 Vacuum	GSR	GA	Tygon® 3350/3370 I.B.	Tygon® 2275/2275 I.B.	Versilic®	Tygon® S-50-HL	Tygon® S-54-HL	Tygon® B-44-3	Tygon® B-44-4X	Tygon® B-44-4X I.B.	Norprene® A-60 F/A-60-F I.B.	PharMed®	Tygon® LFL	Tygon® R-1000	Fluran® F-5500-A	Tygon® F-4040 A	Tygon® 2075	Tygon® R-3400	Iso-Versinic®	Norprene® A-60-G	Tygothane® C-210-A/C-210-A I.B.	Butyl	Nitrile	Neoprene	Tygon® SE-200	Chemfluor® 367	Chemfluor® FEP	Chemfluor® PFA	Chemfluor® PTFE
Calcium Nitrate, 55% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Calcium Sulfate, 0.2% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Carbon Dioxide, Wet/Dry	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1
Carbon Disulfide	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	2	4	4	3	4	1	1	1	1	1
Carbon Monoxide	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Carbon Tetrachloride	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	1	1	1	1
Carbonic Acid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Castor Oil	4	1	1	2	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	2	1	1	1	1	1	1
Cellosolve	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	3	4	2	4	4	1	1	1	1	1
Cellosolve Acetate	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	3	4	2	4	4	1	1	1	1	1
Chlorine, Dry Gas	1	4	4	4	3	4	1	1	1	1	1	3	3	1	3	1	1	3	1	1	3	3	3	4	3	1	1	1	1
Chlorine, Wet Gas	2	4	4	4	3	4	2	2	1	1	1	4	4	2	4	1	1	3	1	1	4	4	2	4	4	1	1	1	1
Chloroacetic Acid, 20% in w	1	3	3	1	1	1	1	1	1	1	1	2	2	1	2	4	4	1	1	4	2	4	2	3	2	1	1	1	1
Chlorobenzene, Mono, Di, Tri	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1	1
Chloroform	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	3	4	4	4	4	1	1	1	1	1
Chlorosulfonic Acid	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1
Chromic Acid, 10-20% in w	2	4	4	4	1	4	1	1	1	1	1	1	1	2	2	1	3	1	1	1	1	4	3	4	4	1	1	1	1
Chromic Acid, 50% in w	3	4	4	4	2	4	2	2	1	1	1	3	3	3	4	1	4	2	1	1	3	1	3	4	4	1	1	1	1
Citric Acid, 10-20% in w	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	3	4	4	1	1	1	1
Coconut Oil	4	1	4	1	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	1	1	2	1	1	1	1
Corn Syrup	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cottonseed Oil	4	4	4	1	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	3	1	2	1	1	1	1
Cresol (m, o, or p)	4	4	4	2	1	2	3	3	3	3	3	4	4	4	4	1	3	1	3	1	4	4	4	3	3	1	1	1	1
Cresylic Acid	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	1	3	4	4	4	2	4	4	3	3	1	1	1	1
Cupric Chloride, 40% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cupric Nitrate, 70% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cupric Sulfate, 13% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cyclohexane	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	3	4	4	1	4	2	4	1	4	1	2	1	1
Cyclohexanone	4	2	2	4	3	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	2	1	1	1	2	1	1
Detergent Solutions	1	2	2	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1
Dibutyl Phthalate	3	3	3	1	1	1	3	3	3	3	3	1	1	3	4	1	3	1	3	1	1	4	2	4	4	1	1	1	1
Diesel Fuel	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	1	2	1	1	1	1
Diethylamine	1	2	2	4	1	4	1	1	1	1	1	1	1	1	2	4	3	1	1	4	1	2	3	3	1	2	1	1	1
Diethylene Glycol	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dimethylformamide	4	4	4	1	1	1	4	4	4	4	4	2	2	4	4	4	4	1	4	4	2	4	4	2	3	1	1	1	1
Dimethylsulfoxide	4	4	4	3	2	3	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	4	4	4	4	1	2	1	1
Dioctyl Phthalate	3	4	4	1	1	1	3	3	3	3	3	1	1	3	4	1	3	1	3	1	1	4	2	4	1	1	1	1	1
Dioxane	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	4	1	1	1	1	1
Ether	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	4	3	4	3	2	4	1	1	1	1
Ethyl Acetate	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	2	4	2	4	3	1	1	1	1	1
Ethyl Alcohol	4	1	1	2	1	2	4	4	4	4	4	1	1	4	4	4	2	1	4	4	1	1	1	1	1	1	1	1	1
Ethyl Benzoate	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	3	3	1	1	1	1	1
Ethyl Chloride	4	2	2	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	1	1	2	1	1	1	1
Ethyl Ether	4	4	4	4	4	4	4	4	4	1	4	3	3	4	4	4	3	4	4	4	3	4	3	3	4	1	1	1	1
Ethylene Bromide	4	4	4	1	3	1	4	4	4	4	4	4	4	4	4	1	4	3	4	1	4	1	4	3	4	4	1	1	1
Ethylene Chlorohydrin	4	2	2	2	1	2	4	4	4	4	4	1	1	4	4	3	2	1	4	4	1	4	4	2	1	1	1	1	1
Ethylene Dichloride	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	3	4	4	1	1	1	1
Ethylene Glycol	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ethylene Oxide	1	2	2	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	3	4	4	1	1	1	1
Fatty Acids	4	3	3	2	3	2	4	4	4	4	4	3	3	4	4	1	2	3	3	1	3	2	4	2	2	1	1	1	1
Ferric Chloride, 43% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ferric Nitrate, 60% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ferric Sulfate, 5% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ferrous Chloride, 40% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ferrous Sulfate, 5% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fluoboric Acid, 48% in w	1	2	2	4	1	4	1	1	1	1	1	4	4	1	1	1	4	1	4	1	4	4	2	3	3	1	1	1	1
Fluorine Gas	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	2	4	4	3	4	4	4	2	2	2
Fluosilicic Acid, 25% in w	1	1	1	3	1	3	1	1	1	1	1	3	3	1	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1
Formaldehyde, 37% in w	4	3	3	3	3	3	4	4	4	4	4	1	4	4	4	4	4	3	4	4	4	4	1	2	1	1	1	1	1
Formic Acid, 25% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	1	1	1	1	3	1	2	1	1	1	1	1
Formic Acid, 40-50% in w	2	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	4	1	2	3	2	4	1	2	1	1	1	1	1
Formic Acid, 98% in w	2	1	1	1	1	1	2	2	2	2	2	2	2	2	3	4	4	1	2	4	2	4	1	1	1	1	1	1	1
Freon 11	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	4	1	2	3	1	3	1
Freon 12	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	1	1	3	1	3	1
Freon 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	4	1	3	1	3	1
Fruit Juice	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fuel Oil	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	1	2	1	1	1	1
Furfural	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	2	4	1	1	1	1
Gallic Acid, 17% in acetone	4	1	1	4	4	4	4	4	4	4	4	2	2	4	4	4	3	4	4	4	2	4	2	2	2	1	1	1	1
Gasoline, Automotive	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	1	2	1	1	1	1
Gelatin	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Glucose, 50% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Glycerin	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Glycolic Acid, 70% in w	1	2	2	1	1	1	1	1	2	2	2	2	2	1	2	4	1	1	1	4	2	4	1	1	1	1	1	1	1
Heptane	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	4	3	2	4	2	4	1	2	1	1	1	1
Hexane	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	4	3	2	4	2	4	1	2	1	1	1	1
Hydrazine	4	3	3	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	3	4	1	2	2	1	1	1	1	1
Hydrobromic Acid, 20-50% in w	1	1	1	4	1	4	1	1	1	1	1	4	4	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Hydrobromic Acid, 100% in w	1	1	1	4	1	4	1	1	1	1	1	4	4	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1	1
Hydrochloric Acid, 10% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1
Hydrochloric Acid, 37% in w	1	1	1	4	1	4	1	1	1	1	1	2	2	1	3	2	4	1	1	2	2	4	1	1	1	1	1	1	1
Hydrocyanic Acid	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	1	1	1	1	1	1	1

* If concentration is not indicated, assume 100% concentration or the maximum percent solubility in water.
NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.

KEY

1 Excellent
2 Good
3 Fair
4 Not Recommended

Environment, % Conc.*
w-Water alc-Alcohol

Environment, % Conc.* w-Water alc-Alcohol	Tygon® R-3603/R-3603 vacuum	GSR	GA	Tygon® 3350/3370 I.B.	Tygon® 2275/2275 I.B.	Versilic®	Tygon® S-50-HL	Tygon® S-54-HL	Tygon® B-44-3	Tygon® B-44-4X	Tygon® B-44-4X I.B.	Norprene® A-60-F/A-60-F I.B.	PharMed®	Tygon® LFL	Tygon® R-1000	Fluran® F-5500-A	Tygon® F-4040-A	Tygon® 2075	Tygon® R-3400	Iso-Versinic®	Norprene® A-60-G	Tygothane® C-210-A/C-210-A I.B.	Butyl	Nitrile	Neoprene	Tygon® SE-200	Chemfluor® 367	Chemfluor® FEP	Chemfluor® PFA	Chemfluor® PTFE
Hydrofluoric Acid, 10% in w	1	4	4	4	1	4	1	1	1	1	1	4	4	1	1	1	1	1	1	1	4	4	1	2	2	1	1	1	1	1
Hydrofluoric Acid, 25% in w	1	4	4	4	1	4	1	1	1	1	1	4	4	1	1	1	4	1	4	1	4	4	4	4	4	1	1	1	1	1
Hydrofluoric Acid, 40-48% in w	2	3	3	4	1	4	2	2	1	1	1	4	4	3	3	1	4	1	4	1	4	4	2	4	4	1	1	1	1	1
Hydrogen Gas	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
Hydrogen Peroxide, 3% in w	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	4	4	1	1	1	1	1
Hydrogen Peroxide, 10% in w	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hydrogen Peroxide, 30% in w	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	3	4	4	4	1	1	1	1	1
Hydrogen Peroxide, 90% in w	4	4	4	3	2	3	3	3	3	3	3	2	2	4	4	1	4	2	3	1	2	4	3	4	4	1	1	1	1	1
Hydrogen Sulfide	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	2	1	1	1	1	1
Hydroquinone, 7% in w	1	2	2	2	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	2	3	3	1	1	1	1	1
Hypochlorous Acid, 25% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	4	4	1	1	1	1	1	1
Iodine, 50 ppm in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Isobutyl Alcohol	4	1	1	4	1	4	4	4	4	4	4	3	3	4	4	1	1	1	4	1	3	4	1	2	1	1	1	1	1	1
Isooctane	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	1	2	1	1	1	1	1
Isopropyl Acetate	4	3	3	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	1	4	4	1	1	1	1	1
Isopropyl Alcohol	4	1	1	4	1	4	4	4	4	4	4	3	3	4	4	1	1	1	4	1	3	4	1	2	1	1	1	1	1	1
Isopropyl Ether	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	3	4	4	4	3	4	4	2	2	1	1	1	1	1
Jet Fuel, JP8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	2	3	1	1	1	1	1
Kerosene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	1	3	1	1	1	1	1
Ketones	4	2	2	4	3	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	1	4	2	1	2	1	1	1
Lacquer Solvents	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	4	4	4	1	1	1	1	1
Lactic Acid, 3-10% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	1	1	1	1	1	1	1	1
Lactic Acid, 85% in w	4	2	2	4	1	4	4	3	4	4	4	2	2	4	4	4	4	1	4	4	2	4	2	2	2	1	1	1	1	1
Lard, Animal Fat	4	4	4	1	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	2	1	2	1	1	1	1	1
Lead Acetate, 35% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1
Lead Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lemon Oil	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	3	4	4	1	4	2	4	2	3	1	1	1	1	1
Limonene-D	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	3	4	4	1	4	2	4	2	3	1	1	1	1	1
Linoleic Acid	4	4	4	2	3	2	4	4	4	4	4	3	3	4	4	1	2	3	3	1	3	2	4	2	4	1	1	1	1	1
Linseed Oil	4	4	4	1	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	4	2	3	1	1	1	1	1
Lubricating Oils, Petroleum	4	4	4	2	4	2	4	4	4	4	4	4	4	4	4	1	1	4	4	1	4	1	4	1	2	1	1	1	1	1
Magnesium Carbonate, 1% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Magnesium Chloride, 35% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Magnesium Hydroxide, 10% in oil, acid	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Magnesium Nitrate, 50% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Magnesium Sulfate, 25% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Maleic Acid, 30% in w	4	2	2	2	3	2	4	4	4	4	4	3	3	4	4	1	2	3	3	1	3	2	2	2	3	1	1	1	1	1
Malic Acid, 36% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	2	2	3	1	1	1	1	1
Manganese Salts	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1
Mercuric Chloride, 6% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mercuric Cyanide, 8% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mercury	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mercury Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Methane Gas	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	4	1	2	1	1	1	1
Methanol	4	1	1	2	1	2	4	4	4	4	4	1	1	4	4	4	2	1	4	4	1	4	1	1	1	1	1	1	1	1
Methyl Acetate	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	2	4	2	1	1	1	1	1
Methyl Bromide	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	4	2	4	1	1	1	1	1
Methyl Chloride	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	3	4	4	1	1	1	1	1
Methyl Ethyl Ketone	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	1	4	4	1	2	1	1	1
Methyl Isobutyl Ketone	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	1	2	1	1	1
Methylene Chloride	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	4	4	4	1	1	1	1	1
Methyl Methacrylate	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	3	4	4	4	4	4	1	1	1	1	1
Milk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mineral Oil	3	4	4	4	4	4	2	2	2	2	2	4	4	3	4	1	1	4	1	1	4	1	4	2	3	1	1	1	1	1
Mineral Spirits	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	1	2	1	1	1	1
Molasses	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Monoethanolamine	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	4	3	3	1	1	1	1	1
Motor Oil	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	4	4	1	4	1	4	1	2	1	1	1	1	1
Naphtha	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	3	3	1	1	1	1	1
Naphthalene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	4	4	1	1	1	1	1
Natural Gas	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	4	1	1	1	1	1	1
Nickel Chloride, 40% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nickel Nitrate, 75% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Nickel Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nickel Sulfate, 25% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Nitric Acid, 10% in w	1	4	4	3	1	3	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	4	2	4	1	1	1	1	1	1
Nitric Acid, 35% in w	1	4	4	4	1	4	1	1	1	1	1	1	1	1	1	4	3	4	1	1	3	1	4	3	4	2	1	1	1	1
Nitric Acid, 68-71% in w	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	4	3	4	3	2	1	2	1
Nitrobenzene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1	1
Nitromethane	4	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	4	3	1	1	1	1	1
Nitrous Acid, 10% in w	1	4	4	2	1	2	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	3	3	4	3	1	1	1	1	1
Nitrous Oxide	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	4	3	4	1	1	1	1	1
Oils, Animal	4	4	4	1	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	2	1	2	1	1	1	1	1
Oils, Essential	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	3	4	4	1	4	2	4	1	2	1	1	1	1
Oils, Hydraulic (Phosphate Ester)	4	4	4	4	4	4	3	3	3	3	3	4	4	4	4	1	1	4	3	1	4	2	4	1	2	1	1	1	1	1
Oils, Hydrocarbon	4	4	4	2	4	2	4	4	4	4	4	4	4	4	4	1	1	4	4	1	4	1	4	1	4	1	1	1	1	1
Oils, Vegetable	4	4	4	1	2	1	3	2	3	3	3	3	3	4	4	1	1	2	2	1	3	1	2	1	2	1	1	1	1	1
Oleic Acid	4	3	3	2	3	2	4	4	4	4	4	3	3	4	4	1	2	3	3	1	3	2	2	3	3	1	1	1	1	1
Oleum, 25% in w	1	4	4	2	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	4	4	2	3	1	1	1	1	1
Ortho Dichlorobenzene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1
Oxalic Acid, 12% in w	2	2	2	1	1	1	2	2	2	2	2	2	2	2	3	4	4	1	2	4	2	4	1	2	2	1	1	1	1	1
Oxygen	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1
Ozone, 300pphm	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	2	1	1	1	1	1

** If concentration is not indicated, assume 100% concentration or the maximum percent solubility in water.*
NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.

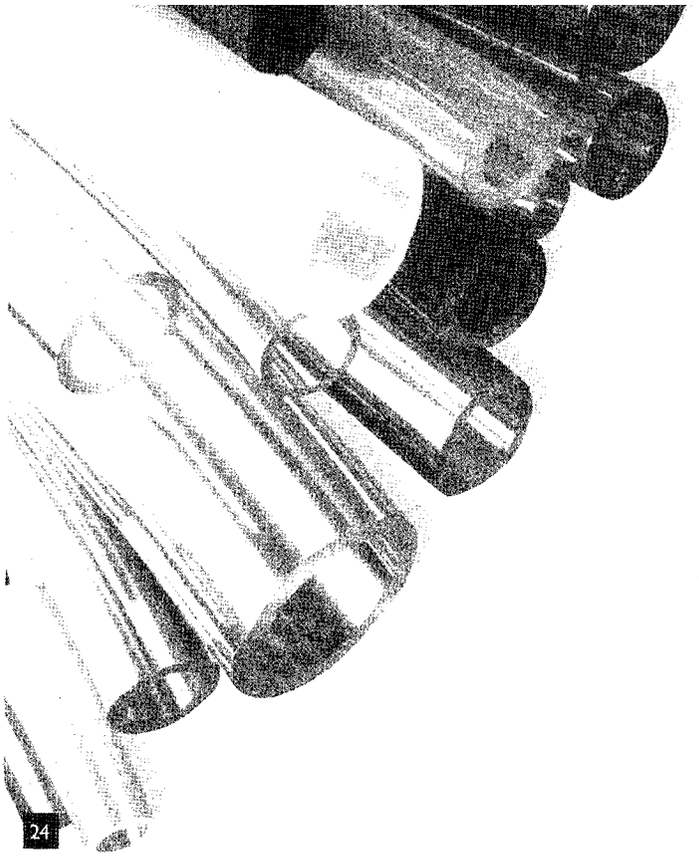
KEY

1 **Excellent**
2 **Good**
3 **Fair**
4 **Not Recommended**

Environment, % Conc.*
w-Water alc-Alcohol

	Tygon® R-3603/R-3603 vacuum	GSR	GA	Tygon® 3350/3370 I.B.	Tygon® 2275/2275 I.B.	Versilic®	Tygon® S-50-HL	Tygon® S-54-HL	Tygon® B-44-3	Tygon® B-44-4X	Tygon® B-44-4X I.B.	Norprene® A-60-F/A-60-F I.B.	PharMed®	Tygon® LFL	Tygon® R-1000	Fluran® F-5500-A	Tygon® F-4040-A	Tygon® 2075	Tygon® R-3400	Iso Versinic®	Norprene® A-60-G	Tygothane® C-210-A/C-210-A I.B.	Butyl	Nitrile	Neoprene	Tygon® SE-200	Chemfluor® 367	Chemfluor® FEP	Chemfluor® PFA	Chemfluor® PTFE
Palmitic Acid, 100% in ether	4	2	2	2	3	2	4	4	4	4	4	3	3	4	4	1	2	3	3	1	3	2	2	1	2	1	1	1	1	1
Paraffins	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	4	3	2	4	2	4	1	2	1	1	1	1	1
Perchloric Acid, 67% in w	3	4	4	4	1	4	2	3	2	2	2	1	1	3	4	1	4	1	1	1	1	4	2	3	1	1	1	1	1	1
Perchloroethylene	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	4	3	4	1	1	1	1	1
Phenol, 5-10% in w	2	3	3	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	3	1	1	4	2	3	2	1	1	1	1	1
Phenol, 91% in w	4	4	4	2	1	2	3	3	3	3	3	1	1	4	4	1	3	1	4	1	1	4	2	4	3	1	1	1	1	1
Phosphoric Acid, <10% in w	1	2	2	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phosphoric Acid, 25% in w	1	2	2	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1
Phosphoric Acid, 85% in w	1	4	4	4	1	4	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	4	2	4	2	1	1	1	1	1
Phosphorous Trichloride Acid	1	4	4	4	1	4	1	1	1	1	1	2	2	1	3	2	4	1	1	2	2	4	1	4	4	1	1	1	1	1
Photographic Solutions	1	3	3	2	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1
Phthalic Acid, 9% in alc	4	2	2	2	1	2	3	3	3	3	3	1	1	4	4	1	3	1	4	1	1	4	1	4	1	1	1	1	1	1
Phthalic Anhydride, 9% in alc	4	2	2	1	1	1	4	4	4	4	4	1	1	4	4	4	4	1	4	4	1	4	1	4	1	1	1	1	1	1
Picric Acid, 1% in w	1	2	2	4	1	4	1	1	1	1	1	4	4	1	1	1	1	1	1	1	4	4	1	2	2	1	1	1	1	1
Plating Solutions	1	4	4	4	1	4	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	4	1	3	2	1	1	1	1	1
Potassium Carbonate, 55% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Potassium Cyanide, 33% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Potassium Dichromate, 5% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Potassium Hydroxide, <10% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	4	1	4	1	1	1	1	4	2	1	1	1	1	1	1	1
Potassium Iodide, 56% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Potassium Permanganate, 6% in w	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	1	1	1
Potassium Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Propane Gas	1	4	4	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
Propylene Glycol	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Propylene Oxide	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	4	1	1	1	1	1	1	1
Pyridine	4	4	4	4	3	4	4	4	4	4	4	3	3	4	4	4	4	3	4	4	3	4	2	4	4	2	2	2	2	1
Salicylic Acid, 1% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	1	1	1	1	1	1	1	1
Silicone Oils	2	1	1	4	1	4	2	2	2	2	2	3	3	2	4	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1
Silver Nitrate, 55% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Skydrol 500A	4	4	4	4	4	4	3	3	3	3	3	4	4	4	4	1	1	4	3	1	4	2	2	4	4	1	1	1	1	1
Soap Solutions	1	2	2	1	1	1	1	1	1	1	1	2	2	1	3	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Sodium Acetate, 55% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1
Sodium Benzoate, 22% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Bicarbonate, 7% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Carbonate, 7% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Chlorate, 45% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Chloride, 20% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Cyanide, 30% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	4	1	1	1	1	4	1	1	1	1	1	1	1	1
Sodium Fluoride, 3% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Hydroxide, 10-15% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	4	1	1	1	1	4	1	2	1	1	1	1	1	1
Sodium Hydroxide, 30-40% in w	3	1	1	1	1	1	1	1	1	1	1	1	1	3	4	1	4	1	1	1	1	4	1	4	1	1	1	1	1	1
Sodium Hypochlorite, 5.5% in w	1	2	2	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	3	1	1	1	1	1
Sodium Hypochlorite, 12.2% in w	1	2	2	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	3	1	1	1	1	1
Sodium Nitrate, 3.5% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Sodium Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Sulfates, 3.6% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Sulfide, 13% in w	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Stannic Chloride, 50% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1
Stannous Chloride, 45% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Stearic Acid, 5% in alc	4	2	2	2	3	2	4	4	4	4	4	3	3	4	4	1	2	3	3	1	3	2	2	2	2	1	1	1	1	1
Styrene Monomer	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	3	4	4	4	4	4	1	1	1	1	1
Sulfur Chloride	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	1	4	1	4	1	4	4	3	3	1	1	1	1	1	1
Sulfur Dioxide, Dry Gas	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	3	3	4	3	1	1	1	1	1
Sulfur Dioxide, Wet Gas	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	3	3	4	3	1	1	1	1	1
Sulfur Trioxide, Wet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	4	2	4	4	2	2	2	2	2
Sulfuric Acid, 10% in w	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	2	1	1	1	1	1	1
Sulfuric Acid, 30% in w	1	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	4	2	4	2	1	1	1	1	1
Sulfuric Acid, 95-98% in w	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	1	4	1	4	1	4	4	4	4	4	1	1	1	1	1
Sulfurous Acid	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1
Tannic Acid, 75% in w	2	1	1	1	1	1	2	2	2	2	2	2	2	2	3	4	4	1	2	4	2	4	1	1	1	1	1	1	1	1
Tartaric Acid, 56% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tetrahydrofuran	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	1
Thionyl Chloride	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	3	4	4	4	1	1	1	1	1	1
Tin Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Titanium Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Toluene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	3	4	4	4	4	4	1	1	1	1	1
Trichloroacetic Acid, 90% in w	1	3	3	1	1	1	1	1	1	1	1	2	2	1	2	4	4	1	1	4	2	4	2	2	2	1	1	1	1	1
Trichloroethane	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	4	4	4	1	1	1	1	1
Triethanolamine	4	2	2	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	3	4	2	3	1	1	1	1	1	1
Trichloroethylene	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	3	4	4	3	4	1	1	1	1	1	1
Trichloropropane	4	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	3	4	4	3	4	1	1	1	1	1	1
Tricresyl Phosphate	3	4	4	1	1	1	3	3	3	3	3	1	1	3	4	1	3	1	3	1	1	4	1	4	3	1	1	2	1	1
Trisodium Phosphate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turpentine	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	4	4	1	4	2	4	2	3	1	1	1	1	1
Urea, 20% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uric Acid	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	3	3	1	1	3	1	3	1	2	2	1	1	1	1	1
Vinegar	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	4	1	2	1	2	1	1	1	1	1	1
Vinyl Acetate	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	2	4	2	4	4	1	1	1	1	1
Water, Deionized	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water, Distilled	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Xylene	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	3	4	4	4	4	4	1	1	1	1	1
Zinc Chloride, 80% in w	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Zinc Salts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

** If concentration is not indicated, assume 100% concentration or the maximum percent solubility in water.*
NOTE: Concentrations of room temperature liquids are given in % volume. Concentrations of room temperature solids are given in % weight.



TYPICAL PHYSICAL PROPERTIES OF TYGON® & OTHER NORTON TUBINGS

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 23°C (73°F). Values shown were determined on 2mm (0,075") thick extruded strip or 2mm (0,075") thick ASTM plaques or molded ASTM durometer buttons.

IMPORTANT: It is the user's responsibility to insure the suitability and safety of Norton tubing for all intended uses. 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.

	Durometer Hardness Shore, A, 15s	Colour	Maximum Recommended Operating Temp. °C (°F)	Tensile Strength psi (M Pa)	Ultimate Elongation %	Tensile Set %	Tear Resistance lb.-f/in. (kN/m)	Compression Set** Constant Deflection, B	Brittle Temperature	Specific Gravity	Water Absorption %
ASTM Method	**D2240-91**			**D412-92**	**D412-92**	**D412-92**	**D1004-93**	**D395-89**	**D746-79**	**D792-91**	**D570-81**
Tygon® R-3603	55	Clear	74(165)	1650 (11.4)	450	107	125 (22)	61	-50°C (-58°F)	1.18	0.24
Tygon®R-3603 Vacuum	55	Clear	74(165)	1650 (11.4)	450	107	125 (22)	61	-50°C (-58°F)	1.18	0.24
GSR	45	Red	70(158)	1305 (9)	400	23	80 (14)	28	-56°C (-72°F)	1.13	0.28
GA	40	Light brown	70(158)	3045 (21)	500	13	170 (30)	17	-68°C (-90°F)	0.98	0.47
Tygon® 3350	50*	Translucent	200(392)	1450 (10.0)	770	13	200 (35)	7	-80°C (-112°F)	1.14	0.11
Tygon® 3370 I.B.	70*	Translucent *(between braid)*	160(320)	1200 (8.3)	500	21	250 (44)	3	-80°C (-112°F)	1.22	0.22
Tygon® 2275	72	Clear	52(125)	2000 (13.8)	700	187	220 (39)	84	-78°C (-108°F)	0.90	0.00
Tygon® 2275 I.B.	72	Clear	52(125)	2000 (13.8)	700	187	220 (39)	84	-78°C (-108°F)	0.90	<0.01
Versilic®	60	Clear	200(392)	1305 (9)	300	8	100 (18)	36	-60°C (-80°F)	1.16	0.06
Tygon® S-50-HL	66	Clear	74(165)	2000 (13.8)	350	76	165 (29)	53	-48°C (-55°F)	1.20	0.14
Tygon® S-54-HL	80	Clear	85(185)	2700 (18.6)	320	33	305 (53)	34	-31°C (-25°F)	1.24	0.11
Tygon® B-44-3	63	Clear	74(165)	2300 (15.8)	410	81	180 (32)	65	-45°C (-49°F)	1.20	0.13
Tygon® B-44-4X	65	Clear	74(165)	2100 (14.5)	450	78	200 (35)	62	-44°C (-47°F)	1.21	0.15

* *1-second reading.*

** *Test performed at 70°C (158°F) for 22 hours.*

	Durometer Hardness Shore, A, 15s	Colour	Maximum Recommended Operating Temp. °C (°F)	Tensile Strength psi (M Pa)	Ultimate Elongation %	Tensile Set %	Tear Resistance lb./in. (kN/m)	Compression Set** Constant Deflection, B	Brittle Temperature	Specific Gravity	Water Absorption %
ASTM Method	**D2240-91**			**D412-92**	**D412-92**	**D412-92**	**D1004-93**	**D395-89**	**D746-79**	**D792-91**	**D570-81**
Tygon® B-44-4X I.B.	65	Clear *(between braid)*	74(165)	2100 (14.5)	450	78	200 (35)	62	-44°C (-47°F)	1.21	0.15
Norprene® A-60-F	61	Beige	135(275)	1000 (6.9)	375	57	120 (21)	30	-60°C (-75°F)	0.98	0.30
Norprene® A-60-F I.B.	61	Cream	135(275)	1000 (6.9)	375	57	120 (21)	30	-60°C (-75°F)	0.98	0.30
PharMed® Tubing	64	Tan	135(275)	1050 (7.2)	375	47	128 (22)	32	-73°C (-99°F)	0.97	0.30
Tygon® LFL	56	Clear	74(165)	1550 (10.7)	380	44	122 (21)	64	-54°C (-65°F)	1.16	0.18
Tygon® R-1000	40	Clear	52(125)	1200 (8.3)	375	73	52 (9)	57	-75°C (-103°F)	1.12	0.30
Fluran® F-5500-A	60*	Black	204(400)	1400 (9.3)	300	13	100 (18)	37	-51°C (-60°F)	1.90	0.23
Tygon® F-4040-A	57	Translucent Yellow	74(165)	1821 (12.5)	312	50	167 (29)	65	-35°C (-37°F)	1.26	0.49
Tygon® 2075	72	Clear	52(125)	2000 (13.8)	700	187	220 (39)	84	-78°C (-108°F)	0.90	0.01
Tygon® R-3400	64	Black	74(165)	2250 (15.5)	350	66	185 (32)	69	-21°C (-5°F)	1.31	0.19
Iso-Versinic®	60/70	Black	200(392)	(9)	250	9	143 (25)	22	-50°C (-58°F)	1.90	0.20
Norprene® A-60-G	61	Black	135(275)	1000 (6.9)	375	57	120 (21)	30	-60°C (-75°F)	0.98	0.30
Tygothane® C-210-A	82*	Clear	93(200)	6050 (41.7)	500	98	475 (83)	68	-73°C (-100°F)	1.19	1.12
Tygothane® C-544-A I.B.	85*	Transparent Clear	82(180)	5000 (34.5)	400	45	350 (61.3)	19	-73°C (-100°F)	1.12	1.80
Butyl	65	White	100(212)	1160 (8)	600	80	130 (22.8)	64	-40°C (-40°F)	1.45	0.15
Nitrile	65	Black	100(212)	1160 (8)	600	30	100 (17.5)	64	-10°C (-14°F)	1.45	0.81
Neoprene	50	Black	100(212)	1088 (7.5)	450	28	60 (10.5)	31	-38°C (-36°F)	1.55	1.23
Tygon® SE-200	67***	Clear	77(170)	2000 (13.8)	350	76	165 (29)	53	-40°C (-40°F)	1.45	<0.01
Chemfluor® 367	58D*	Clear	204(400)	2300 (15.8)	300	N.A.	N.A.	N.A.	-196°C (-320°F)	2.15	<0.03
Chemfluor® FEP	55D*	Translucent	204(400)	2600 (17.9)	275	N.A.	N.A.	N.A.	-73°C (-100°F)	2.17	<0.01
Chemfluor® PFA	60D*	Translucent	260(500)	2500 (17.2)	300	N.A.	N.A.	N.A.	-196°C (-320°F)	2.17	<0.03
Chemfluor® PTFE	58D*	Translucent	288(550)	2650 (18.3)	250	N.A.	N.A.	N.A.	-268°C (-450°F)	2.18	<0.01

** 1-second reading.*

*** Test performed at 70°C (158°F) for 22 hours. Versilic/Iso-Versinic 22 hours at 175°C. Butyl/Nitrile 22 hours at 100°C*

**** Durometer measured on outer jacket.*