Chemical compatibilities of vial and closure materials

Key to chart

E – No damage after 30 days of constant exposure.
G – Little or no damage after 30 days of constant exposure.
F – Some effect after 7 days of constant exposure.
N – Immediate damage may occur. Not recommended for continous use.
S – Surface.
The first letter of each pair applies to minimum temperature conditions; the second to maximum temperature conditions.

Chemical	LDPE	HDPE	PP	PTFE	TPX	Glass
Acetaldehyde	GN	GF	GN	EE	GN	EE
Acetamide, Sat.	EE	EE	EE	EE	EE	EE
Acetic acid, 5%	EE	EE	EE	EE	EE	EE
Acetic acid, 50%	EE	EE	EE	EE	EE	EE
Acetic acid, Glacial	EG	EE	EG	EE	EG	EE
Acetic anhydride	NN	FF	GF	EE	EG	EE
Acetone	NN	NN	EG	EE	EE	EE
Acetonitrile	EE	EE	FN	EE	FN	EE
Acetophenone	NN	FF	FF	EE	GN	EE
Acrylonitrile	EE	EE	FN	EE	FN	EE
Adipic acid	EG	EE	EE	EE	EE	EE
Allyl alcohol	EE	EE	EE	EE	EG	EE
Aluminium Hydroxide	EG	EE	EG	EE	EG	SS
Amino acids	EE	EE	EE	EE	EE	EE
Ammonia	EE	EE	EE	EE	EE	SS
Ammonia, 25%	EE	EE	EE	EE	EE	SS
Ammonium glycolate	EG	EE	EG	EE	EG	EE
Ammonium hydroxide, 30%	EG	EE	EG	EE	EG	SS
Ammonium Hydroxide, 5%	EE	EE	EE	EE	EE	SS
Ammonium Oxalate	EG	EE	EG	EE	EG	EE
Ammonium Salts	EE	EE	EE	EE	EE	EE
Amyl Alcohol	EE	EE	EE	EE	EE	EE
Amyl Chloride	NN	FN	EE	EE	NN	EE
Aniline	EG	EG	NN	EE	GF	EE
Aqua Regia	NN	NN	GF	EE	NN	SS
Arsenic Acid	GF	EG	NN	EE	EE	EE
Benzaldehyde	EG	GN	EE	EE	EG	EE
Benzenamine	EG	EG	EG	EE	GF	EE
Benzene	NN	NN	NN	EE	GF	EE
Benzoic Acid, Sat.	EE	EE	EG	EE	EG	EE
Benzyl Acetate	EG	EE	EG	EE	EG	EE
Benzyl Alcohol	NN	FN	NN	EE	NN	EE
Boric Acid	EE	EE	EE	EE	EE	EE
Bromine	NN	FN	NN	EE	NN	EE
Bromobenzene	NN	NN	NN	EE	NN	EE
Bromoform	NN	NN	NN	EE	NN	EE
Bromobenzene	NN	NN	NN	EE	NN	EE
Bromoform	NN	NN	NN	EE	NN	EE
Butadiene	NN	FN	NN	EE	NN	EE
2-Butanol	EE	EE	EE	EE	EG	EE
Butyl Acetate	NN	FF	FF	EE	GF	EE
Butyl Chloride	NN	NN	NN	EE	FN	EE
Butyric Acid	NN	FN	NN	EE	NN	EE
Calcium Hydroxide	EE	EE	EE	EE	EE	SS
Calcium Hypochlorite	EE	EE	EE	EE	EG	EE
Carbazole	EE	EE	EE	EE	EE	EE
Carbon Disulfide	NN	NN	NN	EE	NN	EE
Carbon Tetrachloride	FN	GF	GF	EE	NN	EE
Cellosolve Acetate	EG	EE	EG	EE	EG	EE
Chlorine Water	GN	GF	FN	EE	GF	EE
Chlorine, 10% moist	GN	GF	FN	EE	GN	EE
Chlorine, 10% in air	GN	EF	GN	EE	GN	EE
Chlorine, wet gas	GN	GF	FN	EE	GN	EE
Chloroacetic Acid	EE	EE	EG	EE	EG	EE
Chlorobenzene	NN	NN	NN	EE	FN	EE
Chloroform	FN	FN	NN	EE	NN	EE
Chromic Acid, 10%	EE	EE	EE	EE	EE	EE

Chemical	LDPE	HDPE	PP	PTFE	TPX	Glass
Chromic Acid, 20%	EE	EE	GG	EE	EE	EE
Chromic Acid, 50%	EE	EE	GF	EE	GF	EE
Chromic:Sulfuric Acid Mixture, 96%	NN	NN	NN	EE	NN	EE
Citric Acid, 10%	EE	EE	EE	EE	EE	EE
Cresol	NN	FN	GF	EE	NN	EE
Cyclohexane	FN	FN	FN	EE	NN	EE
Cyclohexanone	NN	FN	FN	EE	GF	EE
Cyclopentane	NN	FN	FN	EE	FN	EE
Decahydronaphthalene	GF	EG	GF	EE	FN	EE
Diacetone	NN	NN	GF	EE	FF	EE
Diacetone Alcohol	FN	EE	EF	EE	EE	EE
Dibutylphthalate	--	-N	NN	EE	GG	EE
1,2 Dichloroethane	NN	NN	NN	EE	NN	EE
2,4 Dichlorophenol	NN	NN	NN	EE	FN	EE
Diethyl Benzene	NN	FN	NN	EE	NN	EE
Diethyl Ether	NN	FN	NN	EE	NN	EE
Diethyl Ketone	NN	NN	GG	EE	GF	EE
Diethyl Malonate	EE	EE	EE	EE	EG	EE
Diethylamine	NN	FN	GN	EE	FF	EE
Diethylene Dioxide	GF	GG	GF	EE	FN	EE
Diethylene Glycol	EE	EE	EE	EE	EE	EE
Dimethyl Acetamide	FN	EE	EE	EE	FG	EE
Dimethyl Formamide	EE	EE	EE	EE	EE	EE
Dimethylsulfoxide (DMSO)	EE	EE	EE	EE	EE	EE
Dioxane	GF	GG	GF	EE	FN	EE
1,4-Dioxane	GF	GG	GF	EE	GF	EE
Dipropylene Glycol	EE	EE	EE	EE	EE	EE
Ethanol, 40%	EG	EE	EG	EE	EG	EE
Ether	NN	FN	NN	EE	NN	EE
Ethyl Acetate	EE	EE	EG	EE	FN	EE
Ethyl Alcohol (Absolute)	EG	EE	EG	EE	EG	EE
Ethyl Alcohol, 40%	EG	EE	EE	EE	EG	EE
Ethyl Alcohol, 96%	EG	EG	EE	EE	EG	EE
Ethyl Benzene	NN	NN	NN	EE	NN	EE
Ethyl Benzoate	FF	GG	GF	EE	GF	EE
Ethyl Benzoate	FF	GG	GF	EE	GF	EE
Ethyl Butyrate	GN	GF	GN	EE	FN	EE
Ethyl Chloride	FN	FF	FN	EE	FN	EE
Ethyl Chloride, Liquid	FN	FF	FN	EE	FN	EE
Ethyl Cyanoacetate	EE	EE	EE	EE	EE	EE
Ethyl Lactate	EE	EE	EE	EE	EE	EE
Ethylene Chloride	GN	GF	FN	EE	NN	EE
Ethylene Glycol	EE	EE	EE	EE	EE	EE
Ethylene Oxide Gas	FF	GF	FF	EE	FN	EE
Ethylene Oxide, 100%	FF	GF	FF	EE	FN	EE
Fatty Acids	EG	EE	EG	EE	EG	EG
Fluorine	FN	GN	FN	EG	FN	FN
Formaldehyde, 10%	EE	EE	EE	EE	EG	EG
Formaldehyde, 40%	EG	EE	EG	EE	EG	EG
Formalin, 10%	EE	EE	EE	EE	EG	EG
Formalin, 40%	EG	EE	EG	EE	EG	EG
Formic Acid	EG	EE	EG	EE	EF	EF
Formic Acid, 3%	EG	EE	EG	EE	EG	EG
Formic Acid, 50%	EG	EE	EG	EE	EG	EG
Formic Acid, 85%	EE	EE	EG	EE	EF	EF
Formic Acid, 100%	EG	EE	EG	EE	EF	EF
Freon TF	EG	EG	EG	EE	FN	FN

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Glutaraldehyde	EG	EE	EE	EE	FF	FF
Glycerine (Glycerol)	EE	EE	EE	EE	EE	EE
Hexane	NN	GF	GF	EE	FN	FN
Hydrazine	NN	NN	NN	EE	NN	NN
Hydrobromic Acid, 4%	EG	EE	EG	EE	EG	EG
Hydrobromic Acid, 48%	EE	EE	EE	EE	EE	EE
Hydrobromic Acid, 69%	--	-N	EG	EE	EE	EE
Hydrochloric Acid, 5%	EE	EE	EE	EE	EG	EG
Hydrochloric Acid, 20%	EE	EE	EE	EE	EG	EG
Hydrochloric Acid, 35%	EE	EE	EG	EE	EG	EG
Hydrogen Peroxide, 3%	EE	EE	EE	EE	EE	EE
Hydrogen Peroxide, 30%	EG	EE	EG	EE	EG	EG
Hydrogen Peroxide, 90%	EG	EE	EG	EE	EG	EG
Iodine crystals	NN	NN	FN	EE	GN	GN
Iodine tincture	EG	EG	GG	EE	NN	EE
Isobutanol	EE	EE	EE	EE	EG	EG
Isopropanol, 100%	EE	EE	EE	EE	EE	EE
Isopropyl Acetate	GF	EG	GF	EE	GF	GF
Isopropyl Benzene	FN	GF	FN	EE	NN	NN
Isopropyl Ether	NN	NN	NN	EE	EE	EE
Lactic Acid, 3%	EG	EE	EG	EE	EG	EG
Lactic Acid, 85%	EG	EE	EG	EE	EG	EG
Mercury	EE	EE	EE	EE	EE	EE
Methanol, 100%	EE	EE	EE	EE	EE	EE
2-Methoxyethanol	EG	EE	EE	EE	EE	EE
Methoxyethyl Oleate	EG	EE	EG	EE	EG	EG
Methyl Acetate	FN	FF	GF	EE	EE	EE
Methyl Ethyl Ketone	NN	NN	EG	EE	NN	NN
Methyl Isobutyl Ketone	NN	NN	GF	EE	FF	FF
Methyl Propyl Ketone	GF	EG	GF	EE	FF	FF
Methylene Chloride	FN	FN	FN	EE	FN	FN
Propane Gas	NN	FN	NN	EE	NN	EE
2-Propanol	EE	EE	EE	EE	EE	EE
Proprionic Acid	FN	EF	EG	EE	EF	EE
Propylene Glycol	EE	EE	EE	EE	EE	EE
Propylene Oxide	EG	EE	EG	EE	EG	EE
Pyridine	NN	NN	NN	EE	NN	EE
Resorcinol, 5%	EE	EE	EE	EE	EE	EE
Resorcinol, Sat.	EE	EE	EE	EE	EE	EE
Salicylaldehyde	EG	EE	EG	EE	EG	EE
Salicylic Acid, Sat.	EE	EE	EE	EE	EE	EE
Salt Solutions, Metallic	EE	EE	EE	EE	EE	SS
Silicone Oil	EG	EE	EE	EE	EE	EE
Silver Nitrate	EG	EE	EG	EE	EE	EE
Sodium Dichromate	EE	EE	EE	EE	EE	EE
Sodium Hydroxide, 1%	EE	GF	EE	EE	EE	SS
Sodium Hydroxide, 10%	EE	GF	EE	EE	EE	SS
Sodium Hydroxide, 50%	GG	GF	EE	EE	EE	SS
Sodium Hypochlorite, 15%	EE	EE	GF	EE	EE	EE
Stearic Acid	EE	EE	EE	EE	EE	EE
Sulfur Dioxide	NN	FN	NN	EE	NN	EE
Sulfur Dioxide, wet or dry	EE	EE	EE	EE	EE	EE
Sulfur Salts	FN	GF	FN	EE	FN	EE
Sulfuric Acid, 6%	EE	EE	EE	EE	EE	EE
Sulfuric Acid, 20%	EE	EE	EG	EE	EG	EE
Sulfuric Acid, 30%	EE	EE	GG	EE	EG	EE
Sulfuric Acid, 60%	EG	EE	EG	EE	EG	EE
Sulfuric Acid, 96%	GG	GG	FN	EE	GG	EE
Sulfuric Acid, 98%	GG	GG	FN	EE	GG	EE
Tartaric Acid	EE	EE	EE	EE	EE	EE
Tetrahydrofuran	FN	GF	GF	EE	FF	EE
Thionyl Chloride	NN	NN	NN	EE	NN	EE
Toluene	FN	FN	FN	EE	FF	EE
Tributyl Citrate	GF	EG	GF	EE	GF	EE
Trichloroacetic Acid (TCA)	FN	FF	FN	EE	EE	EE
1,2,4-Trichlorobenzene	NN	NN	NN	EE	GF	EE
Trichloroethane	NN	FN	NN	EG	NN	EE
Trichloroethylene	NN	FN	NN	EE	NN	EE
Triethylene Glycol	EE	EE	EE	EE	EE	EE
2,2,4-Trimethylpentane	FN	FN	FN	EE	FN	EE
Tripropylene Glycol	EE	EE	EE	EE	EE	EE
Tris Buffer, Solution	EG	EG	EG	EE	EG	EE
Urea	EE	EE	EE	EE	EE	EE
Xylene	GN	GF	FN	EE	NN	EE

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