# Chemical Compatibility Guide for Savillex Products

**APPLICATION NOTE** 



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### **OVERVIEW - EFFECTS OF CHEMICALS ON PLASTICS**



Chemicals can affect the strength, flexibility, surface appearance, color, dimensions or weight of plastics. The basic modes of interaction which cause these changes are:

- 1. Chemical attack on the polymer chain, with resultant reduction in physical properties, including oxidation; reaction of functional groups in or on the chain, and depolymerization
- 2. Physical change, including absorption of solvents, resulting in softening and swelling of the plastic; ermeation of solvent through the plastic, and dissolution in a solvent
- 3. Stress-cracking from the interaction of a "stress-cracking agent" with molded-in or external stresses

Mixing and/or dilution of certain chemicals in plastic labware can be potentially dangerous. The reactive combination of compounds of two or more classes may cause a synergistic or undesirable chemical effect. Other factors affecting chemical resistance include temperature, pressure and internal or external stresses (e.g., centrifugation), length of exposure and concentration of the chemical. As temperature increases, resistance to attack decreases.

Another concern is environmental stress cracking, which is the failure of a plastic material in the presence of certain types of chemicals. This failure is not a result of chemical attack. Simultaneous presence of three factors causes stress cracking: tensile strength, a stress cracking agent and inherent susceptibility of the plastic to stress cracking. Common stress cracking agents are detergents, surface active chemicals, lubricants, oils, ultra-pure water and plating additives such as brighteners and wetting agents. Relatively small concentrations of stress cracking agent may be sufficient to cause cracking. Mixing and/or dilution of certain chemicals may result in reactions that produce excessive heat which may lead to product failure. Pretest your specific usage and always follow correct lab safety procedures.

NOTE: Although several polymers may have excellent resistance to various flammable organic chemicals and solvents, OSHA H CFR 29 1910.106 for flammable and combustible materials, or other local regulations, may restrict the volume of solvents which may legally be stored in an enclosed area.

**CAUTION:** Do not store strong oxidizing agents in plastic labware except those made of FEP or PFA. Prolonged exposure causes embrittlement and failure.

The Chemical Resistance Charts on the following pages are provided as general references for comparing Savillex PFA and FEP products with products manufactured of other common polymers. Because there are many different factors which can affect the chemical resistance of a given product, we recommend that you test under your own conditions. If any doubt exists about specific applications, please contact Savillex. These Chemical Resistance Charts can be used for all PFA and FEP labware including Purillex™ bottles.

6.0	LDI	PE	HD	PE	PF	•	PP	co	PN	1P	PE	TG	FE	P	TF	Έ	PF	Α	EC.	TFE	ET	FE	Р	С	PVDF
<b>€</b> Chemical	20"	50"	20	50	20"	50°	20	50"		50"		° 50°		50°		50°		50°	20°			50°	20°	50"	20° 50
1,4-Dioxane, pure	G	F	1000	G	N	9000	G	F	F	N	1 -	-	E	E	E	E	E	E	E	F	E	F	N		N N
2,2,4-Trimethylpentane, pure	F	N	F	N	F	N	F	N	F	N	-	-	E	E	Ε	Ε	E	Ε	Ε	G	Ε	G	N	N	EE
2,4,6-Trinitrophenol, pure	N	N	N	N	N	N	N	N	Ε	E			Ε	Е	Ε	E	E	E	G	F	G	F	N	N	G N
2-Methoxyethanol, pure	Ε	G	Ε	E	G	F	E	E	E	E	F	N	Ε	E	Ε	E	E	E	Ε	G	Ε	E	N	N	EE
2-Propanol, pure	Ε	Ε	E	E	E	E	E	E	Ε	Ε	-	-	E	Е	Ε	Ε	E	Ε	Ε	E	Ε	E	Ε	E	EE
Acetaldehyde, pure	G	N	G	F	G	N	G	N	G	N		-	Е	Е	1000	Ε	Ε	Е	G	F	Ε	Е	N	N	N N
Acetamide, saturated	Е	Ε	Ε	Е	E	E	E	Е	E	Ε			E	E	E	Ε	E	E	E	E	E	Ε	N	N	G N
Acetic Acid, 5%	E	E	E	E	E	E	E	Е	E	E	F	N	E	Е	E	E	E	Ε	E	E	E	Е	E	G	EE
Acetic Acid, 50%	G	F	E	G	E	E	E	E	E	E	N	N	E	E	E	Ε	E	E	E	G	E	E	G	F	EE
Acetic Acid, Glacial	G	N	G	G	E	G	E	G	G	G	N	N	E	E	E	Ε	Ε	Ε	E	E	E	Ε	N	N	E G
Acetic Anhydride, pure	N	N	F	F	G	F	G	F	Ε	G	-	-	E	E	E	Ε	E	Ε	E	E	E	Ε	N	N	N N
Acetone, pure	G	N	N	N	F	N.	N	N	E	E	N	N	E	E	E	E	E	E	E	G	G	N	N	N	N N
Acetonitrile, pure	Ε	E	E	E	E	G	F	N	F	N		-	E	E	E	E	E	E	E	E	E	E	N	N	GG
Acetophenone, pure	N	N.	F	F	F	N	F	N	G	N	- 5-	-	E	E	E	E	Ε	Ε	E	E	E	E	N	N	NN
Acrylonitrile, pure	Ε	E	E	E	F	N	F	N	F	N	-	-	E	E	E	E	E	E	E	G	E	G	N	N	G N
Adipic Acid, pure	E	G	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	EE
Alanine, pure	E	E	E	Е	E	E	E	E	E	E	-	-	E	E	E	E	E	Е	E	E	E	E	E	E	G N
Allyl Alcohol, pure	E	E	E	E	E	E	E	E	E	G	-	-	E	E	E	E	E	Ε	E	E	E	E	G	G	E G
Aluminum Chloride, pure	E	E	E	Ε		E	E	Е	E	Ε	-	-	E	Е	E	Ε	E	Ε	E	E	E	E	E	G	EE
Aluminum Hydroxide, pure		G	E	E	120	G	E	Е	E	G	0	-	E	Е	E	Ε	E	Ε	E	E	E	E	F	N	EE
Aluminum Salts, pure		Е	E	E	E		E		E	E	-	-	E	E	E	E	E	E	E	E		E	E	G	EE
Amino Acids, pure		Ε	E	Ε		E	E	E	E	E	-	-	E	E	E	Е	E	Ε	E	E	E	E	E	E	G N
Ammonia, 25%	200	E	E	E	8,840	E	E	E	E	E		-	E	E	E	E	E	Е	E	E	E	E	N	N	NN
Ammonia, pure	20.20	Ε	E	Ε	57.8	E	E	E	E	E	-	-	E	E	E	E	E	E	E	Ε	E	E	N	N	NN
Ammonium Acetate, saturated	E	Ε	E	E	100	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	G	G	EE
Ammonium Chloride, pure	E	E	E	E		E	E	E	E	E		-	E	E	E	E	E	E	E	E	E	E	E	G	EE
Ammonium Glycolate, pure	E	G	E	E	7.0	G	E	G	E	G			E	E	E	E	E	E	E	E	E	E	G	F	EE
Ammonium Hydroxide, 5%	E	E	E	E		E	E	E	E	E	F		E	E	E	E	E	E	E	E	E	E	F	N	EE
Ammonium Hydroxide, 30%	E	G	E	E		G	E	G	E	G	N	N	E	E	E	E	E	E	E	E	E	E	N	N	EE
Ammonium Oxalate, pure	E	G	E	E		G	E	G E	E	G		-	E	E	E	E	E	E	E	E	E	E	E	E G	EE
Ammonium Salts, pure Amyl Alcohol, pure	E	E	E	E	E	E F	E	E	E G	E			E	E	E	E	E	E	E	E	E	E	G	F	EE
Amyl Chloride, pure	N	E N	F	N	N	last I	N	N	F	F			E	E	E	E	E	E	E	E	E	E	N	N	EE
Aniline, pure	E	G	G	E	100	G	G	F	G	E		5	E	E	E	E	E	E	G	N	E	G	N	N	EE
Aqua Regia, pure	-	N	N	N	N	5	N		N	N			E	E	E	E	E	E	E	G	E	G	N	N	GN
Arsenic Acid, pure	G	F	E	E	6.5	E	E	G	E	E			E	E	E	E	E	E	E	E	- 23	E	E	E	EE
Benzaldehyde, pure	E	G	G	N		G	E	G	E	F	1		E	E	E	E	E	E	E	F	E	F	N	N	FN
Benzenamine, pure	E	G	G	F		G	G	F	G	F	-		E	E	E	E	E	E	G	N	E	G	N	N	EF
Benzene, pure	N	N	N	N	N		N	N	N	N		N	E	E	E	E	E	E	E	G	E	G	N	N	E E
Benzoic Acid, saturated	E	E	E	E		G	E	G	E	E			100	E	E	E	E	E	E	E	E	E	E	G	EE
Benzol, pure	N	N	N	N	N		N	N	N	N	N	N	E	E	E	E	E	E	E	G	E	G	N	N	EE
Benzyl Acetate, pure	35000	G	E	E	E		E	G	E	G	3.7		-50	E	100	E	E	Ε	E	G	72.5	133	F	N	
Benzyl Alcohol, pure	367.7	N	F	N	G		N	N	G	G	N	N	E	Ε	Е	E	E	E	E	Е	E	E	N	N	EE
Boric Acid, pure	Ε	E	E	Ε	E	E	E	E	Е	E	N	N	E	E	Е	E	E	Ε	E	E	E	E	E	E	EE
Bromine, pure	N	N	F	N	N	N	N	N	N	N	774	-	Ε	Е	Е	Е	Ε	Ε	Е	G	Е	G	F	N	EE
Bromobenzene, pure	N	N	N	N	N	N	N	N	N	N	-	-	Е	E	E	E	E	E	G	N	Ε	F	N	N	EE
Bromoform, pure	N	N	N	N	N	N	N	N	N	N		-	Е	Е	E	Е	Е	Ε	G	F	Е	F	N	N	EE
Butadiene, pure	N	N	F	N	N	N	N	N	N	N	-	-	E	E	Е	Ε	Е	Ε	E	E	E	E	N	N	EE
Butyl Acetate, pure	G	F	G	F	F	N	G	F	F	F	-	-	E	E	Е	Е	Е	E	Е	G	Е	G	N	N	FN
Butyl Chloride, pure	N	N	N	N	N	N	N	N	F	N	-	-	E	Ε	Е	Е	E	Ε	E	E	Ε	Е	N	N	EE
Butyric Acid, pure	N	N	F	N	N	N	N	N	N	N		-	Е	E	Е	Ε	E	Ε	Е	Е	Ε	Е	N	N	EE
Calcium Chloride, pure	Е	E	Ε	Е	E	E	Ε	Е	Е	E			Ε	Е	Ε	E	Ε	Ε	Ε	Е	Ε	Е	Е	Ε	EE
Calcium Hydroxide, concentrated	Ε	Е	Ε	E	Е	E	E	E	Ε	E		-	Е	E	Е	Ε	Ε	Е	Е	Ε	Е	Е	N	N	ΕE
Calcium Hypochlorite, saturated	Е	Ε	Ε	E	E	E	E	E	Ε	G		-	E	E	Е	E	Ε	E	E	E	E	E	F	N	ΕE
Carbazole, pure	Ε	Ε	E	E	Е	E	E	Ε	E	Е		-	E	Ε	Е	Ε	Е	E	E	E	Е	E	N	N	
Carbon Disulfide, pure	N	N	N	N	N	N	N	N	N	N	-	-	E	E	Е	Ε	Ε	Е	E	F	E	G	N	N	G N
Carbon Tetrachloride, pure	F	N	G	F	G	F	N	N	N	N	N	N	E	Ε	Е	Ε	Е	Ε	E	E	E	E	N	N	EE

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 continuous use.

[e E]	LDPE		HD	HDPE PP		P	PPCO		PMP		PETG		FEP	TFE		PFA	ECTFE	ETFE	PC	PVDF
Chemical	20°	50"	20	50°	20°	50°	20°	50°	20°	50'	20	50°	20' 50	° 20° 50	D° 2	0° 50°	20' 50'	20' 50'	20° 50°	20' 50'
Caustic Potash, 30%	E	E	E	E	E		E		Е	E	-	-	EE	EE		EE	EE	EE	NN	EG
Caustic Potash, 50%	E	E	Е	Е	Е	E	E	E	E	E	N	Ν	E E	EE		EE	EE	EE	N N	NN
Caustic Potash, concentrated	E	E	E	Ε	E	E	Е	Е	E	Е	N	Ν	EE	EE		EE	EE	EE	N N	E G
Caustic Soda, 1%	E	E	F	F	Е	E	Е	Е	Е	Е	G	-	E E	EE		EE	E E	E E	FN	EE
Caustic Soda, 50%	G	G	G	F	E	E	E	Ε	Ε	E	N	N	E E	EE		EE	EE	EE	NN	NN
Caustic Soda, concentrated	G	G	G	F	E	Ε	Ε	Ε	Е	E	N	N	E E	EE		EE	EE	EE	NN	N N
Cedanwood Oil, pure	Ν	N	F	Ν	N	N	N	Ν	N	N	N	Ν	E E	EE		EE	E G	E G	G F	EE
Cellosolve Acetate, pure	Ε	G	E	Ε	F	N	Ε	G	E	G	-	-	E E	EE		EE	EE	E G	FN	E G
Chlorine, water solution	G	N	G	G	F	N	F	N	N	N	-	-	E E	EE		EE	EE	EE	G F	EE
Chlorine, wet gas	G	N	G	F	F	N	F	N	N	N	-	-	EE	EE		EE	EE	EE	G F	EE
Chlorine Wet Gas, 10%	G	N	G	F	F	N	F	N	N	N	-	-	EE	EE		EE	EE	EE	G F	EE
Chlorine, Dry Gas, 10%	G	N	Е	F	F	N	G	N	G	N	-	-	EE	EE		EE	EE	EE	E G	EE
Chloroacetic Acid, pure	E	E	Е	Е	E	G	Е	G	Е	G	-	-	EE	EE		EE	EE	EE	FN	NN
Chlorobenzene, pure	N	N	N	N	N	N	N	N	N	N	-		ΕE	EE		EE	GF	E E	NN	ΕE
Chloroform, pure	F	N	F	N	N	N	N	N	N	N	-	-	ΕE	EE		EE	G F	E G	NN	E G
Chromic Acid, 10%	Е	Е	Е	Е	Е	Е	Е	Е	Е	Ε	G	-	ΕE	EE		EE	EE	EE	G F	ΕE
Chromic Acid, 20%	Е	Ε	Е	Е	G	G	G	F	Е	Ε	G	-	EE	EE		EE	EE	EE	G F	ΕE
Chromic Acid, 50%	E	E	Е	E	G	F	G	F	G	G	-	-	ΕE	EE		EE	EE	EE	FN	E G
Chromic Aold: Surfuric	N		N	N	N	N	N	N	N	N	-	-	ΕE	EE		EE	E G	E G	NN	E G
Acid Mixture, 96%																				
Cinnamon Oil, pure	N	N	N	N	N	N	N	N	N	N		_	ΕE	EE		EE	E G	E G	G F	
Citric Acid, 10%	Е	E		E		E	3.00	Ε	Е	Ε	G	_	EE	EE		EE	EE	EE	EE	EE
Cítrio Acid, 1M	E	E		E	E	E		E	E	E	G	F	EE	EE		EE	EE	EE	EE	EE
Copper Sulfate, pure	E	E		E		E		E	E	E	E	_	EE	EE		EE	EE	EE	EE	EE
Cresol, pure	N	N		N	100	F		F	N	N	_		EE	EE		EE	E G	EE	NN	EG
Cyclohexane, pure	F	N		N		N	F		N	N	G	N	EE	EE		EE	E G	EE	E F	EE
Cyclohexanone, pure		N	F	N		N	F		G	F	N	N	EE	EE		EE	EE	EE	N N	GN
Cyclopentane, pure	N	N	F	N		N		N	F	N		-	EE	EE		EE	EE	EE	N N	EE
Decahydronaphthalane, pure		F	E	G		N		F	F.	N	_	_	EE	EE		EE	EE	EE	E -	
Decalin, pure	G	F	E	G	N	N	G	F	F	N	_	_	EE	EE		EE	EE	EE	E -	
Diacetone, pure	N	N	N	N	G	F	G	F	F	F	N	N	EE	EE		EE	E G	EG	NN	NN
Discetone Alcohol, pure	F	N	E	E	G	F	E	F	E	E	'`	_	EE	EE		EE	E G	EG	N N	FN
Dibutyl Phthalate, pure	F	N	F	N		, N	_		G	G			EE	EE		EE	GN	E G	G N	NN
Diethyl Benzene, pure		N	1 1	N		N	N	NI	N	N			EE	EE		EE	E G	EE	FN	EE
Diethyl Ether, pure		N		N		N	N	12.1	N	N	Е	_	EE	EE		EE	E G	EE	NN	EG
Diethyl Ketone, pure		N	, N	N	G		G	100000	G	F	_	_	EE	EE		EE	G F	G F	NN	NN
Diethyl Malonate, pure		E	E	E	E		E		E	G	_	_	EE	EE		EE	EE	EE	FN	NN
Diethylamine, pure	N		F	N	G			N	F	F	_		EE	EE		EE	EN	E G	N N	GN
Diethylene Dioxide, pure	G		G	G		N		F	F	N		-	EE	EE		EE	E F	E F	N N	NN
Diethylene Glycol, pure		E	E	E	E			E	E	E			EE	EE		EE	EE	EE	G F	EE
				E	E					E	-		EE					EE		
Diethylene Glycol	E	E	Е	Е			E	_	Е	C	-	-	C C	EE		EE	EE	E E	FN	NN
Monoethyl Ether, pure	г	N	Е	_	Г	Е	г	Е	F	C			ЕЕ	- г		EE	E 0	EC	N N	NI NI
Dimethyl Acetamide, pure		N	E	E	E		E			G	NI	NI.	EE	EE			E G	EG	N N	NN
Dimethyl Formamide, pure		E	E	E	E	E	E		E	E	N		EE	EE			GG	GG	N N	NN
Dimethylsulfoxide, pure	E	E	E	E	E	E		E	E	E		N	EE	EE		EE	E G	E G	N N	NN
Dioxane, pure	G	F		G	N			F	F	N	-	-	EE	EE		EE	E F	EF	NN	NN
Dipropylene Glycol, pure		E	-	E	E	10000		E	E	E	-	-	EE	EE		EE	EE	EE	G F	NN
DMSO, pure	E	E	E	Ε	E			E	E	E		N	EE	EE		EE	E G	E G	NN	NN
Ethanol, 40%	E	G	E	Е	E	E	E	E	E	G	G	-	EE	EE		EE	EE	EE	EE	EE

[F F]	LD	PE	HD	PE	PP		PPCC	)	PMP		PETG	FEP	TFE	PFA	ECTFE	ETFE	PC	PVDF
<b>€ Chemical</b>	20	' 50 <b>'</b>	20	50°	20° 5	60°	20' 50	)'	20' 5	0°	20° 50°	20° 50°	20° 50′	20' 50'	20° 50°	20° 50°	20' 50°	20' 50'
Ether, pure	N	N	F	N	N N	4	N N		F N	1	E  -	EE	EE	E E	E   G	E G	NN	GN
Ethyl Acetate, pure	E	E	Е	E	G N	1	G F		FN	1	N N	EE	EE	EE	EE	EE	N N	NN
Ethyl Alcohol, 40%	E	G	E	E	EE		EE		E G	6	FN	EE	EE	EE	EE	EE	EE	EE
Ethyl Alcohol, 96%	E	G	E	G	EE		EE		E G	3	FN	EE	EE	EE	EE	EE	E G	EE
Ethyl Alcohol, pure	E	G	E	E	EE		E G		E G	}	FN	EE	EE	EE	EE	EE	E G	EE
Ethyl Benzene, pure	N	N	F	N	N N	1	NN		N N	1	E -	EE	EE	EE	G F	G F	N N	G N
Ethyl Benzoate, pure	F	F	G	G	G F	-	G F		G F			EE	EE	EE	E G	E G	N N	NN
Ethyl Butyrate, pure	G	N	G	F	G N	1	G N		FN	1		EE	EE	EE	E G	E G	N N	NN
Ethyl Chloride, pure	F	N	N	N	FN	1	FN		FN	1		EE	EE	EE	EE	EE	N N	EE
Ethyl Cyanoacetate, pure	E	E	Е	Е	EE	:	ΕE		EE			EE	EE	EE	EE	ΕE	FN	NN
Ethyl Lactate, pure	Ε	E	E	E	EE	:	EE		EE			EE	EE	EE	EE	EE	FN	NN
Ethylene Chloride, pure	N	N	N	N	N N	1	N N		N N	ı	N N	EE	EE	EE	EN	EE	N N	EE
Ethylene Glycol, pure	Е	G	E	Ε	EE		EE		EE		E -	EE	EE	EE	EE	EE	E G	EE
Ethylene Glycol	E	G	E	Е	G F	:	EE		EE		FN	EE	EE	EE	E G	EE	N N	EE
Monomethyl Ether, pure																		
Ethylene Oxide, 100%	F	F	G	F	FN	1	FF		FN	1	G F	EE	EE	EE	EE	EE	FN	EE
Ethylene Oxide, gas	G	G	Е	Е	EE		G G		G G	3	G F	EE	EE	EE	EE	EE	EE	EE
Ethylene Oxide, pure	F	F	G	F	FN	1	FF		FN	1	G F	EE	EE	EE	EE	E E	FN	EE
EtO, gas	G	G	E	E	EE		GG		G G	•	G F	EE	EE	EE	EE	EE	EE	EE
EtO, pure	F	F	G	F	FN	1	FF		FN	1	G F	EE	EE	EE	EE	EE	FN	EE
Fatty Acids - saturated, pure	G	F	E	E	EG	3	E G		E G	6	G F	EE	EE	EE	E G	EE	G F	EE
Fatty Acids - unsaturated, oure	G	F	Е	E	EG	3	E G		E G	•	G F	EE	EE	EE	E G	EE	GF	EE
Fluorides	E	E	E	Е	EE		EE		EE			EE	EE	EE	EE	EE	EE	EE
Fluorine, gas	F	N	G	N	NN		FN		FN	1		EG	E G	E G	E F	G N	G F	GN
Formaldehyde, 10%	E	E	E	E	EE		EE		EE			EE	EE	EE	EE	EE	EE	EE
Formaldehyde, 40%	E	G	E	G	EE		E G		EE			EE	EE	EE	EE	EE	EE	EE
Formalin, 10%	E	E	E	E	EE		EE		EE			EE	EE	EE	EE	EE	EE	EE
Formalin, 40%	E	G	E	G	EE		E G		EE		,	EE	EE	EE	EE	EE	EE	EE
Formio Acid, 3%	E	G	E	E	EE		E G		EE			EE	EE	EE	EE	EE	E G	EE
Formic Acid, 50%	G	G	E	E	EG		E G		EE		-   -	EE	EE	EE	EE	EE	G F	EE
Formic Acid, 85%	G	G	E	E	EG		E G		EE		-   -	EE	EE	EE	EE	EE	FN	EE
Formic Acid, 100%	G	G	E	E	EG		E G		EE			EE	EE	EE	EE	EE	FN	EE
Formic Acid, pure	G	G	E	E	EG		E G		EE		-   -	EE	EE	EE	EE	EE	FN	EE
Freon TF, pure	E	G	E	G	EG		E G		FN			EE	EE	EE	EG	E G	GN	EE
Fuel Oil	F	N	G	F	EF		EG		G F			EE	EE	EE	E E	EE	EG	EE
Gasoline	N	N	F	N E	FN		N N E E		G F		G -	EE	EE	EE	E E	E E	FNEF	EE
Glutaraldehyde, pure Glutaraldehyde Disinfectant	E	G G	E	E	EE		E E		FF		G -	EE	EE	EE	E G	E G E G	E F	EE
Glycorino, pure	E	E	E	E	EE		EE		EE			EE	EE	EE	EE	EE	EE	EE
Glycerol, pure	E	E	E	E	EE		EE		EE			EE	EE	EE	EE	EE	EE	EE
Hexane, pure	N		G	F	GF		FN		FN		G -	EE	EE	EE	EG	EE	FN	EE
Hydrazine, pure	N		N	N	NN		NN		N N			EE	EE	EE	G F	GN	NN	EE
Hydrobromio Acid, 69%	E	E	E	G	EG		14 14		EE			EE	EE	EE	EE	EE	G F	EE
Hydrochloric Acid, 5%	E	E	E	E	EE		EE		EE		G -	EE	EE	EE	EE	EE	EE	EE
Hydrochlorio Acid, 20%	E	E	E	E	EE		EE		EE		G -	EE	EE	EE	EE	EE	G F	EE
Hydrochloric Acid, 35%	E	E	E	E	EG		EG		E G		G -	EE	EE	EE	EE	EE	FN	EE
Hydrofluoric Acid, 4%	E	E	E	E	EE		E G		EE		FN	EE	EE	EE	EE	EE	G G	EE
Hydrofluoric Acid, 48%	E	E	E	E	EG		EE		E G		N N	EE	EE	EE	EE	EE	FN	EE
Hydrogen Peroxide, 3%		E	Е	Е	EG		ΕE		E E		G -	EE	EE	EE	E E	E E	EE	EE

[G F]	LDPE I		LDPE HDPE		PP PPCO		PMP	PETG	FEP	FEP TFE		ECTFE	ETFE	PC	PVDF		
<b>E Chemical</b>	20°	50°	20°	50°	20° 5	0° 2	20" 50	).	20° 50°	20° 50°	20° 50°	20° 50°	<b>20</b> ° 50°	20' 50'	20° 50°	20' 50'	20° 50°
Hydrogen Peroxide, 30%	ΙE	G	E	E	EF		E G	1	E G	G  -	E E	EE	E E	E E	E E	E E	EE
Hydrogen Peroxide, 90%	Е	N	Е	E	EF		E G		E G	G -	EE	EE	EE	EE	EF	EE	GN
lodine Crystals, pure	N	N	N	N	EE		FN		G N		EE	EE	EE	EE	E G	G N	EE
Isobutanol, pure	Е	Е	Е	E	EE		EE		E G		EE	EE	EE	EE	EE	E G	EE
iso-Butyl Alcohol, pure	E	Е	Е	Е	EE		EE		E G		EE	EE	EE	EE	EE	E G	EE
Isopropanol, 100%	Е	E	Е	E	EE		EE		E G		EE	EE	EE	EE	EE	EE	EE
Isopropanol, pure	E	Е	Е	Е	EE		EE		E G		EE	EE	EE	EE	EE	EE	EE
iso-Propanol, 100%	E	Е	Е	Е	EE		EE		E G		EE	EE	EE	EE	EE	EE	EE
Isopropyl Acetate, pure	G	F	Е	G	G F		G F		G F		EE	EE	EE	E G	E G	NN	GN
Isopropyl Alcohol, 100%	Е	Е	Е	Е	EE		E E		E G		EE	EE	EE	EE	EE	EE	EE
Isopropyl Alcohol, pure	Е	E	E	E	EE		EE		E G		EE	EE	EE	EE	EE	EE	EE
Isopropyl Benzene, pure	F	N	F	N	FN	1	FN		NN		EE	EE	EE	E G	E G	NN	
Isopropyl Ether, pure	N	N	F	N	N N	ı	NN		N N		EE	EE	EE	E G	E G	N N	EG
Jet Fuel	F	N	F	N	FN	1	FN		FN		EE	EE	EE	EE	EE	G N	EE
Kerosene	F	N	F	N	FN	ı	NN		G F	G -	EE	EE	EE	EE	GF	E -	EE
Lecquer Thinner	N	N	F	N	FN	ı	FN		FF	NN	EE	EE	EE	EE	EE	NN	EE
Lactic Acid, 3%	Е	G	Е	Ε	EE		E G		E G	FN	EE	EE	EE	EE	EE	EE	EG
Lectic Acid, 85%	E	G	Е	Е	EG	;	E G		E G	NN	EE	EE	EE	EE	EE	E G	EG
Lead Acetate, pure	Е	Е	Е	Ε	E E		E E		ΕE		EE	E E	ΕE	EE	EE	ΕE	EE
Magnesium Chloride, pure	E	Е		E	EE		EE		EE		EE	EE	EE	EE	EE	EE	EE
MEK, pure	N	N	N	N	EG	3	E G		FN	G -	EE	EE	EE	G F	EG	NN	NN
Merourio Chloride, pure	Е	E	Е	Ε	EE		EE		EE	N N	EE	EE	EE	EE	EE	EE	EE
Methanol, 100%	Е	G	Е	Е	EE		EE		E G	G -	EE	EE	EE	EE	EE	G F	EE
Methoxyethyl Oleate, pure	Е	G	Е	Е	EG	;	E G		E G	G -	EE	EE	EE	EE	EE	FN	
Methyl Acetate, pure	F	N	F	F	GF		G F		EE	N N	EE	EE	EE	E G	EG	NN	EN
Methyl Alcohol, 100%	Е	G	Е	Е	EE		EE		E G	G -	EE	EE	EE	EE	EE	G F	EE
Methyl Alcohol, pure	Е	G	Е	Ε	EE		EE		E G	G -	EE	EE	EE	EE	EE	G F	EE
Methyl Ethyl Ketone, pure	N	N	N	N	EG	,	E G		FN	G -	EE	EE	EE	G F	EG	NN	NN
Methyl Isobutyl Ketone, pure	N	N	N	N	G F		G F		FF	N N	EE	EE	EE	E G	E G	NN	NN
Methyl Propyl Ketone, pure	N	N	F	Ν	GF	:	G F		FF	N N	EE	EE	EE	E G	E G	NN	NN
Methylene Chloride, pure	N	N	F	Ν	FN	Į	FN		FN	N N	E E	EE	EE	FN	G N	NN	EG
Methyl-t-Butyl Ether, pure	N	N	F	Ν	FN	ĺ	FN		E E	N N	EE	EE	EE	E G	E G	N N	EE
MIBK, pure	N	N	N	Ν	G F		G F		FF	N N	E E	EE	EE	E G	EG	N N	NN
Mineral Oll	G	N	Е	E	EF		EE		E G	G N	EE	EE	EE	EE	EE	EE	EE
Mineral Spirits	F	N	F	N	FN	1	FN		EE	G -	EE	EE	EE	E G	EG	FF	EE
n-Amyl Acetate, pure	G	F	E	G	GF		G F		G F		EE	EE	EE	EE	EE	NN	EG
n-Butanol, purø	Е	E	Е	E	EE		EE		E G		EE	EE	EE	EE	EE	G F	EE
n-Butyl Acetate, pure	G	F	G	F	GF		G F		G F		EE	EE	EE	E G	EG	NN	GN
n-Butyl Alcohol, pure	Ε	Е	Е	E	EE		E E		E G		EE	EE	EE	EE	EE	G F	EE
n-Decane, pure	F	N	F	Ν	FN	ı	FN		FN		EE	EE	EE	EE	EE	FN	EE
n-Heptane, pure	N	N	F	F	FF		FF		FF	E -	EE	EE	EE	EE	EE	FN	EE
Nitric Acid, 10%	Е	Е	E	E	EE		EE		EE	G -	EE	EE	EE	EE	EE	E G	EE
Nitrie Acid, 20%	Е	Е	G	G	FF		G F		E E	G -	EE	E E	EE	EE	EE	E G	E G
Nitrio Acid, 50%	G	F	F	N	FN	1	FN		FN	G -	EE	EE	EE	EE	EE	G F	EG
Nitrio Acid, 70%	F	N	F	N	NN	ı	NN		FN	N N	EE	EE	EE	EE	E G	G N	NN
Nitrobenzene, pure	N	N	N	N	NN	1	NN		FN	NN	EE	EE	EE	E G	E G	NN	GN
Nitromethane, pure	N	N	F	N	FN	ı	FN		E F	N N	EE	EE	EE	EF	E G	FN	EG
n-Octane, pure	Е	Е	Е	E	EE		EE		EE		EE	EE	EE	EE	EE	G F	EE
o-Dichlorobenzene, pure	F	N	N	N	FN	J	FN		FN	N N	EE	E E	EE	E N	EF	N N	EE

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 continuous use.

[e e]	LDPE	LDPE HDPE		PPCO	PMP	PETG	FEP	TFE	PFA	ECTFE	ETFE	PC	PVDF
्रि-	20' 50	20' 50'	20' 50'	20' 50'	20' 50'	20' 50'	20' 50'	20' 50'	20° 50°	20' 50'	20' 50'	20' 50'	20' 50'
Oīl, Cedarw∞d	N N	FN	NN	N N	N   N	- -	EE	EE	EE	E G	E G	GF	E E
Oil, Cinnamon	N N	FN	NN	N N	NN		EE	ΕE	E E	E G	E G	G F	
Oil, Mineral	G N	EE	EE	EE	E G		EE	ΕE	EE	EE	EE	E G	EE
Oil, Pine	G N	FN	E G	E G	G F		EE	EE	EE	E G	E G	G F	EE
Orange Oil	FN	G F	G F	G F	FF		EE	EE	EE	EE	EE	FF	EE
Oxalic Acid, 10%	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	EE	EG
Ozone, pure	GN	GN	FN	EG	EE		EE	EE	EE	EE	EE	NN	EE
p-Chloroacetophenone, pure	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	G N	NN
p-Dichlorobenzone, pure	FN	N N	G F	G F	G F	N N	EE	EE	EE	E N	EF	NN	EE
Perchlorio Acid, 70%	G N	G N	G N	G N	G N		E E	G F	E E	E G	E G	N N	E G
Perchloric Acid, concentrated	G N	G N	G N	G N	G N		G F	G F	G F	G F	G F	NN	E G
Perchlorio Acid, oure	G N	G N	G N	G N	G N		G F	G F	G F	G F	G F	N N	E G
Perchloroethylene, pure	N N	N N	N N	N N	N N		EE	EE	EE	E G	EE	N N	EE
Petroleum	N N	G N	N N	N N	G F		EE	EE	EE	EE	EE	FF	EE
Phenol, 50%	N N	N N	N N	N N	N N	N N	EE	EE	EE	E G	EE	NN	EG
Phenol, 100%	N N	NN	N N	N N	NN	N N	EE	EE	EE	E G	EF	NN	E G
Phonol, Crystal	FN	G F	G N	G N	F G	N N	EE	EE	EE	EE	EE	NN	E G
Phenol, liquid	N N	N N	N N	N N	NN	N N	EE	EE	EE	E G	EF	N N	EG
Phosphoric Acid, 5%	EE	EE	EE	EE	EE		EE						
Phosphoric Acid, 85%	E N	E E	E G	E G	E G		EE	E E	E E	E E	EE	E G	EE
Picric Acid, pure	N N	NN	NN	N N	EE		EE	EE	EE	G F	G F	NN	GN
Pine Oil, pure	G N	FN	E G	E G	G F		E E	EE	EE	E E	EE	G F	EE
Potassium Chloride, pure	EE	EE	EE	EE	EE		EE						
Potassium Hydroxide, 1%	E E	FF	E E	EE	EE		EE	EE	EE	EE	EE	FN	EE
Potassium Hydroxide, 30%	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	NN	EG
Potassium Hydroxide,	EE	EE	EE	EE	EE	N N	EE	EE	EE	EE	EE	N N	EG
concentrated													
Potassium Permanganate, pure	EE	EE	E G	EE	EE		EE						
Propane, gas	N N	EE	N N	N N	N N		EE	EE	EE	EE	EE	FN	EE
Proprionic Acid, pure	FN	E F	E G	E G	EF		EE	EE	EE	EF	E G	N N	EE
Propylene Glycol, pure	E E	EE	E E	EE	EE		EE	E E	EE	EE	E E	G F	EE
Propylene Oxide, pure	E G	EE	E G	E G	E G		EE	EE	EE	N N	E F	G F	NN
Pyridine, pure	N N	NN	EE	N N	FN		EE	EE	EE	N N	E G	NN	NN
Resorainol, 5%	EE	EE	EE	EE	EE		EE	EE	EE	E E	EF	G F	EE
Resorcinol, saturated	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	G F	EE
Salicylaldehyde, pure	E G	EE	EG	E G	E G		EE	EE	EE	EN	E G	G F	EG
Salicylic Acid, powder	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	E G	EE
Salicylic Acid, saturated	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	E G	EE
sec-Butanol, pure	EE	EE	EE	EE	E G		EE	EE	EE	EE	EE	E G	EE
sec-Butyl Alcohol, pure	EE	EE	EE	EE	E G		EE	EE	EE	EE	EE	E G	EE
Sîlicone Oil, pure	E G	EE	EE	EE	EE	N N	E E	EE	EE	EE	EE	EE	EE
Silver Acetate, pure	EE	EE	EE	EE	EE		EE	EE	EE	EE	EE	E G	EE
Silver Nitrate, pure	E G	EE	EE	E G	EE		EE						
Skydrol LD4 Aviation	G F	E G	E G	E G	E G		EE	EE	EE	EE	EE	NN	EF
Hydraulio Fluid													
Sodium Acetate, pure	EE	EE	EE	E E	EE		EE	EE	EE	EE	EE	E G	EE
Sodium Carbonate, pure	EE	EE	EE	EE	EE	G -	EE	EE	EE	EE	EE	G F	EE
Sodium Dichromate, pure	EE	EE	EE	EE	EE		EE						
Sodium Hydroxide, 1%	EE	EE	EE	EE	EE	G -	EE	EE	EE	EE	EE	FN	E E

[e E]	LDPE HDPE		PE PP		PPCO		PMP		PETG		FEP	TFE		PFA	ECTFE		E ETFE		PC	PVDF		
<b>१ Chemical</b>	20	50'	20	50°	20'	50°	20°	50'	20	50°	20'	50'	20' 50'	20' 5	<b>60</b> '	20' 50	20	50.	20°	50°	20' 50'	20' 50'
Sodium Hydroxide, 10%	E	E	Е	E	Е	Ε	Е	Е	Е	Е	G	-	EE	E	E	EE	E	E	Е	E	NN	EE
Sodium Hydroxide, 50%	G	G	Е	Е	Е	Е	Е	Ε	Е	Е	N	N	EE	E	Ε	EE	E	E	Е	E	NN	NN
Sodium Hydroxide,	G	G	Е	Е	Е	Е	Е	Ε	Е	Ε	N	N	ΕE	E	E	E E	E	E	Ε	Е	N N	NN
concentrated																						
Sodium Hypochlorite, 15%	E	F	E	G	F	N	G	N	E	Е	G	-	ΕE	E !	Ε	EE	E	E	Е	E	G F	EE
Stearic Acid, pure	E	Ε	G	G	Е	E	E	Ε	Е	E	-	-	EE	E	Ε	EE	E	E	Е	E	E G	EE
Sulfur Dioxide, dry gas	E	E	Ε	Ε	Е	Ε	E	Ε	Е	Ε	-	-	E E	E	E	E E	E	E	Е	E	E G	EE
Sulfur Dioxide, liquid (46 psig)	N	N	F	N	Е	Ε	N	N	N	N	-	-	E E	E	E	EE	E	E	Е	G	G N	EE
Sulfur Dioxide, wet gas	E	E	Е	E	Ε	E	Ε	Ε	Е	Ε	-	-	EE	E	E	EE	E	E	Е	E	EG	EE
Sulfur Dioxide, pure	N	N	F	N	Е	E	N	N	N	N	-	-	EE	E	Е	EE	E	E	Е	G	G N	EE
Sulfur Salts, pure	F	N	G	F	F	N	F	N	F	N	-	-	EE	E	E	EE	E	E	E	G	FN	FN
Sulfuric Acid, 6%	E	E	Ε	E	E	E	E	Е	Ε	E	Ε	-	EE	E		EE	E	E	E	E	EE	EE
Sulfurio Acid, 20%	E	E	E	E	E	E	E	G	Ε	E	Ε	-	EE	E	Ē	EE	E	E	Е	E	E G	EE
Sulfune Acid, 30%	Е	Е	Ε	Е	Е	Ε	Е	G	Е	Ε	G	-	E E	E 8	E	E E	E	E	Ε	Е	G F	ΕE
Sulfuric Acid, 60%	E	G	Е	G	G	F	G	F	Е	G	-	-	E E	E E	E	EE	E	E	Е	E	G F	EE
Sulfurio Acid, 96%	G	G	F	N	F	N	F	N	G	F	N	N	E E	E E		E E	E	E	Ε	Е	NN	EE
Sulfurio Acid, 98%	G	G	F	N	F	N	F	N	G	F	N	N	EE	EE	<u> </u>	EE	E	E	Ε	G	N N	E G
Sulfurio Acid, concentrated	G	G	F	N	N	N	N	N	N	N	N	N	E E	E	E	EE	E	E	Е	G	N N	NN
Tartaric Acid, pure	E	E	Е	E	Е	Е	Е	Ε	Е	Ε	-	-	EE	E	E	EE	E	E	Е	E	EG	EE
TCA, pure	F	N	F	N	G	F	F	N	Е	E			EE	E	E	EE	E	F	Е	G	FN	EG
tort-Butanol, pure	E	G	Е	E	Е	G	Е	G	Е	G	-	-	EE	E	E	EE	E	E	Е	E	G F	EE
tert-Butyl Alcohol, pure	E	G	Е	Е	Е	G	Е	G	Е	G			E E	E	E	EE	E	E	Е	Е	GF	EE
Tetrahydrofuran, pure	F	N	F	N	G	F	G	F	F	F	-	_	EE	E		EE		I N	G	F	NN	NN
THF, pure	F	N	F	N	G	F	G	F	F	F	-	-	E E	E 6	E	E E	N	l N	G	F	NN	NN
Thionyl Chloride, pure	N	N	N	N	N	N	N	N	N	N	_	-	E E	E		EE	E	E	Е	Е	N N	NN
Tincture of lodine	E	G	G	F	Е	E	G	N	N	N	-	-	E E	EE	Ε	EE	E	E	Е	Ε	G N	E G
Toluene, pure	F	N	N	N	N	N	N	N	F	F	N	N	E E	E	Ε	EE	Е	G	Е	Е	N N	EE
Tributyl Citrate, pure	G	F	Е	G	G	F	G	F	G	F		-	EE	E	Ε	EE	E	G	Е	G	N N	EF
Trichloroacetic Acid, pure	F		F	N	G	F	F	N	E	Е	-	_	EE	E	E	EE	E	F	Е	G	FN	E G
Trichloroethane, pure	N	N	N	N	N	N	N	N	N	N			EE	E	E	E E	E	E	G	N	NN	EE
Trichloroethylene, pure	N	N	N	N	N	N	N	N	N	N	_	_	EE	E	E	EE	N	l N	Е	E	NN	EE
Triethylene Glycol, pure	E		Е	E	Е	Ε	E	Ε	E	E	_	-	EE	E	E	EE	E		E	E	E G	
Tripropylene Glycol, pure	E		Е	E	Е	Ε	Е	E	Е	E			EE	E	Ε	EE	E		E	Е	E G	
Tris Buffer Solution, pH 11	Е		Е	G		G	Е	G	Е	G	F	N	EE	E I		E E			Е	Е	FN	EE
Tris Buffer Solution, pH 7.0	E		E	G	Е	G	E	G	E	G	G		EE	E		EE			Е	E	G F	EE
Trisodium Phosphate, pure	E		Е	E	Ε	E	E	E	E	Е			EE	E		EE			E	E	G N	EE
Turpentine	F		F	N	F	N	N		F	N	G	_	EE	E		EE			E	E	FN	EE
Undecyl Alcohol, pure	E		E	G	E	G		G	E	G		-	EE	E		EE			E	G	G F	EE
Urea, pure	E		E	E		E	E		E	G	-		EE	E		EE			E	E	G F	EE
Vinylidene Chloride, pure	N			N		N	N		N	N	_		EE	E		EE			G	F	N N	EE
Xylene, pure		N	F	N		N		N	F	N			EE	E		EE			E	G	NN	EE
Zinc Chloride, 10%	E		E	E	E	E	E	E	E	E			EE	E		EE			E	E	EE	EE
Zinc Stearate, pure	E		E		E	E	E		E	E	Ĺ	_	EE	E		EE			E	Е	EE	EE
Zinc Sulfate, 10%		E	E		E		E		E	E			EE	E		EE		E	E	E	EE	EE
ZITO SUITALE, 1070	=	-	=	_	=	L .	-	-	=	-	1		-  -	-	-	-   -	1 5	.   -	-	_	-   -	I FIE

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 continuous use.

### **RESIN CODE REFERENCES**

ABBREVIATION	FULL RESIN NAME
ECTFE	Halar ECTFE* (ethylene-chlorotrifluoroethylene copolymer)
ETFE	Tefzel ETFE* (ethylene-tetrafluoroethylene)
FEP	Teflon FEP* (fluorinated ethylene propylene)
HDPE	High-density polyethylene
LDPE	Low-density polyethylene
PC	Polycarbonate
PETG	Polyethylene terephthalate copolymer
PFA	Teflon PFA* (polyfluoroalkoxy)
PMP	Polymethylpentene
PP	Polypropylene
PPCO*	Polypropylene copolymer
PVDF	Polyvinylidene fluoride
TFE	Teflon TFE* (tetrafluoroethylene)
TMX	Thermanox
PMX	Permanox

<sup>\*</sup>Halar is a registered trademark of Solvay Solexis

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<sup>\*</sup>PPCO has replaced polyallomer (PA) in all products