First letter of each pair applies to conditions at 20°C; the second applies to conditions at 50°C. At 20°C < EG >at 50°C.

CHEMICAL	HDPE	CHEMICAL	HDPE	CHEMICAL	HDPE	CHEMICAL	HDPE
Acetaldehyde	GF	Chloroform	GF	Gasoline	GG	Picric Acid	NN
Acetamide, Sat.	EE	Chromic Acid, 10%	EE	Glacial Acetic Acic	EE	Pine Oil	EG
Acetic Acid, 5%	EE	Chromic Acid, 50%	EE	Glutaraldehyde (Disinfectant)	EE	Potassium Hydroxide, 1%	EE
Acetic Acid, 50%	EE	Cinnamon Oil	FN	Glycerine	EE	Potassium Hydroxide, Conc.	EE
Acetic Anhydride	FF	Citric Acid, 10%	EE	n-Heptane	GF	Propane Gas	FN
Acetone	EE	Cresol	FN	Hexane	GF	Propionic Acic	EF
Acetonitrile	EE	Cyclohexane	FN	Hydrazine	NN	Propylene Glycol	EE
Acrylonitrile	EE	Cyclohexanone	FN	Hydrochloric Acid, 1-5%	EE	Propylene Oxide	EE
Adipic Acic	EE	Cyclopentane	FN	Hydrochloric Acid, 20%	EE	Resorcinol, Sat.	EE
Alanine	EE	DeCalin	EG	Hydrochloric Acid, 35%	EE	Resorcinol, 5%	EE
Allyl Alcohol	EE	n-decane	FN	Hydrofluoric Acid, 4%	EE	Salicylaldehyde	EE
Aluminum Hydroxide	EE	Diacetone Alcohol	EE	Hydrofluoric Acid, 48%	EE	Salicylic Acid, Powder	EE
Aluminum Salts	EE	o-Dichlorobenzene	FF	Hydrogen Peroxide, 3%	EE	Salicylic Acid, Sat.	EE
Amino Acids	EE	p-Dichlorobenzene	GF	Hydrogen Peroxide, 30%	EE	Salt Solutions, Metallic	EE
Ammonia	EE	1,2-Dichloroethane	NN	Hydrogen Peroxide, 90%	EE	Silicone Oil	EE
Ammonium Acetate, Sat.	EE	2,4-Dichlorophenol	NN	Iodine Crystals	NN	Silver Acetate	EE
Ammonium Glycolate	EE	Diethyl Benzene	FN	Isobutyl Alcohol	EE	Silver Nitrate	EE
Ammonium Hydroxide, 5%	EE	Diethyl Ether	FN	Isopropyl Acetate	EG	Skydrol LD4	EG
Ammonium Hydroxide, 30%	EE	Diethyl Ketone	GG	Isopropyl Alcohol	EE	Sodium Acetate, Sat.	EE
Ammonium Oxalate	EE	Diethyl Malonate	E	Isopropyl Benzene	GF	Sodium Hydroxide, 1%	EE
Ammonium Salts	EE	Diethylamine	FN	Isopropyl Ether	NN	Sodium Hydroxide, 50% to Sat	EE
n-Amyl Acetate	EG	Diethylene Glycol	EE	Jet Fuel	FN	Sodium Hypochlorite, 15%	EE
Amyl Chloride	FN	Diethylene Glycol Ethyl Ether	EE	Kerosene	GG	Stearic Acid, Crystals	EE
Aniline	EG	Dimethyl Acetamide	EE	Lacquer Thinner	FN	Sulfuric Acid, 1-6%	EE
Aqua Regia	NN	Dimethyl Formamide	EE	Lactic Acid, 3%	EE	Sulfuric Acid, 20%	EE
Benzaldehyde	EE	Dimethylsulfoxide	EE	Lactic Acid, 85%	EE	Sulfuric Acid, 60%	EE
Benzene	GG	1,4-Dioxane	GG	Mercury+	EE	Sulfuric Acid, 98%	GG
Benzoic Acid, Sat.	EE	Dipropylene Glycol	EE	2-Methoxyethanol	EE	Sulfur Dioxide, Liq., 46 psig	FN
Benzyl Acetate	EE	Ether	FN	Methoxyethyl Oleate	EE	Sulfur Dioxide, Wet or Dry	EE
Benzyl Alcohol	FN	Ethyl Acetate	EE	Methyl Acetate	FF	Sulfur Salts	GF
Bromine	FN	Ethyl Alcohol (Absolute)	EE	Methyl Alcohol	EE	Tartaric Acic	EE
Bromobenzene	FN	Ethyl Alcohol, 40%	EE	Methyl Ethyl Ketone	EE	Tetrahydrofuran	GF
Bromoform	NN	Ethyl Benzene	GF	Methyl Isobutyl Ketone	EG	Thionyl Chloride	NN
Butadiene	FN	Ethyl Benzoate	GG	Methyl Propyl Ketone	EG	Toluene	GG
Butyl Chloride	NN	Ethyl Butyrate	GF	Methyl-t-butyl Ether	FN	Tributyl Citrate	EG
n-Butyl Acetate	EG	Ethyl Chloride, Liquic	FF	Methylene Chloride	GF	Trichloroacetic Acic	FF
n-Butyl Alcohol	EE	Ethyl Cyanoacetate	EE	Mineral Oil	EE	1, 2 ,4-Trichlorobenzene	NN
sec-Butyl Alcohol	EE	Ethyl Lactate	EE	Mineral Spirits	FN	Trichloroethane	FN
tert-Butyl Alcohol	EE	Ethylene Chloride	GF	Nitric Acid, 1-10%	EE	Trichloroethylene	FN
Butyric Acic	FN	Ethylene Glycol	EE	Nitric Acid, 50%	GN	Triethylene Glycol	EE
Calcium Hydroxide, Conc.	EE	Ethylene Glycol Methyl Ether	EE	Nitric Acid, 70%	GN	2, 2, 4-Trimethylpentane	FN
Calcium Hypochlorite, Sat.	EE	Ethylene Oxide	GF	Nitrobenzene	FN	Tripropylene Glycol	EE
Carbazole	EE	Fatty Acids	EE	Nitromethane	FN	Tris Buffer, Solution	EG
Carbon Disulfide	NN	Fluorides	EE	n-Octane	EE	Turpentine	GG
Carbon Tetrachloride	GF	Fluorine	GN	Orange Oil	GF	Undecyl Alcohol	EG
Cedarwood Oil	FN	Formaldehyde, 10%	EE	Ozone	EE	Urea	EE
Cellosolve Acetate	EE	Formaldehyde, 40%	EE	Perchloric Acic	FN	Vinylidene Chloride	FN
Chlorobenzene	FN	Formic Acid, 3%	EE	Perchloroethylene	NN	Xylene	GF
Chlorine, 10% in Air	EF	Formic Acid, 50%	EE	Phenol, Crystals	GF	Zinc Stearate	EE
Chlorine, 10% (Moist)	GF	Formic Acid, 98-100%	EE	Phenol, Liquic	NN		
Chloroacetic Acic	EE	Freon TF	EG	Phosphoric Acid,1-5%	EE		
p-Chloroacetophenone	EE	Fuel Oil	GF	Phosphoric Acid, 85%	EE		

CHEMICAL RESISTANCE CHART

Interpretation of Chemical Resistance

The Chemical Resistance Chart and Chemical Resistance Summary Chart that follow are general guides only. Because so many factors can affect the chemical resistance of a given product, you should test under your own conditions.

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; permeation of solvent through the plastic; dissolution in a solvent; and (3) stress-cracking from the interaction of a "stress-cracking agent" with molded-in or external stresses. Also see "Chemical Resistance Classification."

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.

Environmental Stress-Cracking

Environmental stress-cracking 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 stress, 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.

Chemical Resistance Classification:

E - 30 days of constant exposure cause no damage. Plastic may even tolerate for years.

G - Little or no damage after 30 days of constant exposure to the reagent.

F - Some effect after 7 days of constant exposure to the reagent. Depending on the plastic, the effect may be crazing, cracking, loss of strength or discoloration. Solvents may cause softening, swelling and permeation losses with LDPE, HDPE, PP, PA and PMP. The solvent effects on these five resins are normally reversible; the part will usually return to its normal condition after evaporation.

N - Not recommended for continuous use. Immediate damage may occur. Depending on the plastic, the effect will be a more severe crazing, cracking, loss of strength, discoloration, deformation, dissolution or permeation loss.