

# Chemical Resistance of Polypropylene and Polyethylene

Generally speaking, the chemical resistance of polypropylene and polyethylene is considered superior to that of metals. They are unaffected by most inorganic acids, alkalis, and aqueous solutions which rapidly corrode metals, although some concentrated acids and oxidizing agents can attack them, especially at elevated temperatures.

**IMPORTANT NOTICE:** This data refers to drainage systems usage only.

For chemicals not listed, check with Orion.

The information appearing here has been assembled from sources believed to be reliable, but is not guaranteed by Orion. Orion is not responsible for its accuracy or reliability. In manufacturing its products, Orion uses raw materials manufactured by others, and Orion has no control over the methods used in installing its products or the conditions under which they are used. It does not make any representation concerning either the chemical resistance properties of its products or the toxicological effects of chemicals reacting with them. Nothing appearing here should be considered as a recommendation for any use that would infringe patent rights or an endorsement for the use of any particular material or chemical or any class of materials or chemicals.

Chemical Substance	Concentration	Temperature°F	Chemical Substance	Concentration	Temperature°F
Acetaldehyde		100	Ammonia	99	120
Acetamide		100	Ammonium, Acetate		150
Acetate Solvents, Crude		NR	Ammonium, Bifluoride		180
Acetate Solvents, Pure		NR	Ammonium, Carbonate		180
Acetic Acid	5	180	Ammonium, Chloride		150
Acetic Acid	10	180	Ammonium, Fluoride	10	180
Acetic Acid	20	180	Ammonium, Fluoride	20	180
Acetic Acid	30	180	Ammonium, Hydroxide		180
Acetic Acid	50	180	Ammonium, Nitrate		180
Acetic Acid	60	150	Ammonium, Persulfate		NR
Acetic Acid	80	150	Ammonium, Phosphate		180
Acetic Acid, Glacial		120	Dibasic		180
Acetic Anhydride		73	Monobasic		180
Acetic Ether (See Ethyl Acetate)		73	Tribasic		180
Acetone		120	Ammonium, Sulfate		180
Acetonitrile (Methyl Cyanide)		NR	Ammonium, Sulfide		180
Acetophenone		73	Amyl, Acetate		NR
Acetyl Propane		130	Amyl Chloride		NR
Acetylene		73	Aniline		150
Acid Mine Water		150	Aniline Hydrochloride		73
Acrylic Acid		NR	Anthraquinone Sulfonic Acid		73
Acrylonitrile		73	Anti-Freeze (See Ethylene Glycol)		150
Adipic Acid Aqueous		120	Antimony Trichloride		120
Alcohol, Allyl		140	Aqua Regia		NR
Alcohol, Amyl		73	Arsenic Acid		140
Alcohol, Butyl		180	Aryl Sulfonic Acid		NR
Alcohol, Ethyl		180	Baking Soda (See Sodium Bicarbonate)		-
Alcohol, Isopropyl		120	Barium Carbonate		180
Alcohol, Methyl		180	Barium Chloride		180
Alcohol, Polyvinyl		120	Barium Hydroxide		180
Allyl Chloride		73	Barium Nitrate		180
Alum (See Aluminum Sulfate)		180	Barium Sulfate		180
Alum, Ammonium		180	Barium Sulfide		180
Alum, Chrome		180	Beer		180
Alum, Potassium		180	Beet Sugar Liquors		150
Aluminum, Chloride		180	Benzaldehyde	10	120
Aluminum, Fluoride		180	Benzene		NR
Aluminum, Hydroxide		180	Benzene Sulfonic Acid	10	180
Aluminum, Nitrate		180	Benzene Sulfonic Acid	100	150
Aluminum, Potassium Sulfate (Potash Alum)		180	Benzoic Acid		150
Aluminum, Sulfate	10	180	Benzol (see Benzene)		NR
Ammonia	25	150	Bismuth Carbonate		180

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Chemical Substance	Concentration	Temperature°F	Chemical Substance	Concentration	Temperature°F
Bismuth Carbonate		180	Copper Carbonate		150
Black Liquor		150	Copper Chloride		150
Bleach—see Sodium Hypochlorite	12.5	150	Copper Cyanide		150
Borax, Sodium Borate		180	Copper Fluoride		150
Boric Acid		180	Copper Nitrate		150
Brine		180	Copper Salts		150
Bromic Acid		NR	Copper Sulfate		150
Bromine Dry		NR	Copper Sulfate	5	150
Bromine Gas, Wet		NR	Corn Oil		100
Bromine Liquid		NR	Corn Syrup		150
Bromine Water		NR	Cottonseed Oil		180
Butane		73	Creosote		NR
Butanol (see Alcohol, Butyl)		NR	Cresols		NR
Butyl Acetate		NR	Cresylic Acid		NR
Butyl Chloride (Chlorobutane)		NR	Croton Aldehyde		73
Butyl Ether		NR	Crude Oil		73
Butyl Phenol		NR	Cupric Cyanide (see Copper Cyanide)		150
Butyl Phthalate		180	Cupric Fluoride		150
Butylamine		NR	Cupric Nitrate		150
Butylene (Liquid Petroleum Gas)		NR	Cupric Salts		150
Butyric Acid		180	Cupric Sulfate (see Copper Sulfate)		150
Calcium Acetate		180	Cyclohexane		NR
Calcium Bisulfide		180	Cyclohexanol		73
Calcium Bisulfite		180	Cyclohexanone		NR
Calcium Carbonate		180	Decalin		180
Calcium Chlorate		180	Detergents		180
Calcium Chloride		150	Detergents Heavy Duty		150
Calcium Hydroxide		180	Dextrin Starch Gum		150
Calcium Hypochlorite		120	Dextrose (Glucose)		150
Calcium Nitrate		180	Diacetone Alcohol		120
Calcium Sulfate		180	Diazo Salts		120
Cane Sugar Liquors		180	Dibenzyl Ether		NR
Carbon Dioxide (wet or dry)		180	Dibutyl Phthalate		73
Carbon Disulfide		NR	Dichlorethane (Ethylene Dichloride)		NR
Carbon Monoxide		180	Dichlorobenzene		73
Carbon Tetrachloride		NR	Dichloroethylene		NR
Carbonic Acid		180	Dichloroisopropyl (Ether)		NR
Castor Oil		120	Dichloromethane		NR
Caustic Lime (Calcium Hydroxide)		180	Diesel Fuel		73
Caustic Soda (Sodium Hydroxide)	10	180	Diethyl Cellosolve		73
Chloric Acid	20	NR	Diethylamine		120
Chlorine Gas Wet		NR	Diethylbenzene		NR
Chlorine Liquid		NR	Diethylether (Ether)		73
Chlorine Water Sat		180	Dimethyl Ketone (see Acetone)		120
Chlorosulfonic Acid		NR	Dimethyl Phthalate		NR
Chromic Acid	5	120	Dimethylamine		120
Chromic Acid	10	120	Dimethylbenzene		NR
Chromic Acid	20	120	Dimethylformamide		120
Chromium Alum		120	Diethyl Phthalate		NR
Citric Acid		150	Dioxane		73
Clorox Bleach		120	Dipropylene Glycol		120
Coconut Oil		150	Disodium Phosphate		180
Coke Oven Gas		73	Distilled Water		180

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Chemical Substance	Concentration	Temperature°F	Chemical Substance	Concentration	Temperature°F
Divinylbenzene		NR	Gelatin		180
Dry Cleaning Solvents		73	Gin		120
Epichlorohydrin		120	Glucose		180
Epsom Salts		150	Glue		120
Esters (General)		NR	Glycerine (see Glycerol)		NR
Ethane		NR	Glycerol (Glycyl Alcohol)		180
Ethanol (see Alcohol Ethyl)		180	Glycolic Acid		150
Ethanolamine		NR	Glycols		120
Ethers		NR	Grape Sugar		120
Ethyl Acetate		73	Green Liquor (Alkaline pulp)		73
Ethyl Acetate		120	Heptane		73
Ethyl Alcohol		150	Hexane		73
Ethyl Bromide		NR	Hexyl Alcohol (Hexanol)		73
Ethyl Chloride (Chiroethane)		NR	Honey		180
Ethyl Ether		73	Hydraulic Oil		NR
Ethyl Formate		NR	Hydraulic Oil (synthetic)		NR
Ethylbenzene		NR	Hydrazine		NR
Ethylene Bromide		NR	Hydrobromic Acid	10	150
Ethylene Chlorohydrin		73	Hydrobromic Acid	20	150
Ethylene Diamine		73	Hydrobromic Acid	48	120
Ethylene Dichloride (Dichloroethane)		NR	Hydrochloric Acid	10	180
Ethylene Glycol		150	Hydrochloric Acid	20	160
Ethylene Oxide		NR	Hydrochloric Acid	25	160
Fatty Acids		180	Hydrochloric Acid (Muriatic Acid)	37	120
Ferric Chloride		180	Hydrocyanic Acid		150
Ferric Nitrate		180	Hydrocyanic Acid (Prussic Acid)	10	73
Ferric Sulfate		180	Hydrofluoric Acid	10	150
Ferrous Chloride		180	Hydrofluoric Acid	20	150
Ferrous Nitrate		180	Hydrofluoric Acid	30	120
Ferrous Sulfate		180	Hydrofluoric Acid	40	120
Fish Solubles		180	Hydrofluoric Acid	50	73
Fluoboric Acid		73	Hydrofluoric Acid	65	73
Fluorine Gas 1 wet		NR	Hydrofluoric Acid	75	73
Fluorine, Liquid	25	NR	Hydrofluosilicic Acid	20	120
Fluosilicic Acid (Hydro Fluosilic Acid)		120	Hydrofluosilicic Acid		120
Formaldehyde		150	Hydrogen		73
Formaldehyde	35	150	Hydrogen Cyanide		73
Formaldehyde	50	150	Hydrogen Fluoride		73
Formic Acid		120	Hydrogen Peroxide	5	73
Freon 11 (MF)		73	Hydrogen Peroxide	10	73
Freon 12		73	Hydrogen Peroxide	30	73
Freon 22		73	Hydrogen Peroxide	50	73
Fructose		180	Hydrogen Peroxide	90	NR
Fruit Juice		180	Hydrogen Peroxide		NR
Fruit Pulp		180	Hydrogen Phosphide (see Phosphine)		73
Fuel Oil		NR	Hydrogen Sulfide		150
Furfural (Ant Oil) Bran Oil		NR	Hydrogen Sulfide (Ag Sol)		150
Gallic Acid		73	Hydrogen Sulfide (dry)		150
Gas, Natural		73	Hydroquinone		150
Gasoline, Leaded		NR	Hydroxyacetic Acid		150
Gasoline, Sour		NR	Hydroxylamine Sulfate		120
Gasoline, Unleaded (1 Dry)		NR	Hypochlorous Acid		120

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Chemical Substance	Concentration	Temperature°F	Chemical Substance	Concentration	Temperature°F
Iodine Solution		73	Methylene Chloride		NR
Isoctane		73	Methylene Iodine		NR
Isopropyl Ether		NR	Milk		180
Jet Fuel JP-3		NR	Mineral Oil		73
Jet Fuel JP-4		NR	Molasses		120
Jet Fuel JP-5		NR	Monoethanolamine		150
Kerosene		73	Naphtha		120
Ketones		73	Naphthalene (Tar Camphor)		NR
Kraft Liquor		73	Natural Gas		73
Lactic Acid (Milk Acid)		150	Nickel Acetate		180
Lard Oil		73	Nickel Chloride		180
Lauric Acid		120	Nickel Nitrate		180
Lauryl Chloride		NR	Nickel Sulfate		180
Lead Acetate (Sugar of Lead)		180	Nicotine		NR
Lead Chloride		150	Nicotine Acid (see Niacin)		73
Lead Nitrate		150	Nitric Acid	10	150
Lead Sulfate		150	Nitric Acid	20	140
Lemon Oil		NR	Nitric Acid	30	120
Lime-Sulfur Solution		120	Nitric Acid	40	120
Linoleic Acid (Linolic Acid)		120	Nitric Acid	50	73
Linseed Oil (Flaxseed Oil)		150	Nitric Acid	70	NR
Lubricating Oil		73	Nitric Acid Concentrate	100	NR
Machine Oil		120	Nitric Acid Fuming (Red)		NR
Magnesium Carbonate		180	Nitroglycerine		NR
Magnesium Chloride		180	Nitrous Oxide		NR
Magnesium Citrate		180	Ocenolol (Oleyl Alcohol)		NR
Magnesium Hydroxide		180	Octane		NR
Magnesium Nitrate		180	Oils		
Magnesium Sulfate (Epsom Salts)		180	120		
Maleic Acid		120	Oils, Citric		73
Malic Acid (Apple Acid)		73	Oils, Clove		73
Manganese Sulfate		180	Oils, Coconut		120
Mercuric Chloride		180	Oils, Cod liver		73
Mercuric Cyanide		180	Oils, Corn		73
Mercuric Nitrate		120	Oils, Cotton Seed		120
Mercuric Sulfate		120	Oils, Creosote		NR
Mercurous Nitrate		120	Oils, Crude Sour		73
Mercury (Quicksilver)		150	Oils, Diesel Fuel		73
Methane (Methyl Hydride)		120	Oils, Fuel		73
Methanol (see Alcohol, Methyl)		-	Oils, Linseed		150
Methyl Alcohol		180	Oils, Mineral		120
Methyl Benzene (see Toluene)		-	Oils, Olive		150
Methyl Bromide		NR	Oils, Silicone		150
Methyl Butyl Ketone		NR	Oils, Vegetable		73
Methyl Cellosolve		73	Oleic Acid (Red Oil)		73
Methyl Chloride (Chloromethane)		NR	Oleum (Fuming Sulfuric Acid)		NR
Methyl Chloroform (Trichloroethane)		NR	Oxalic Acid		73
Methyl Ethyl Ketone (MEK)		73	Oxygen Gas		NR
Methyl Isobutyl Ketone		NR	Ozonized Water		NR
Methyl Methacrylate		NR	Palmitic Acid	10	180
Methyl Salicylate (Wintergreen 011)		73	Palmitic Acid	70	180
Methyl Sulfate		73	Peracetic Acid	40	NR

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Chemical Substance	Concentration	Temperature°F	Chemical Substance	Concentration	Temperature°F
Perchloric Acid		70	Potassium Dichromate		180
Petroleum (Sour)			Potassium Ferricyanide		180
Petroleum Oils			Potassium Ferrocyanide		180
Phanois (Carbolic Acid)			Potassium Fluoride		180
Phenylhydrazine			Potassium Hydroxide (Caustic Potash)		180
Phosgene Gas			Potassium Perbotate		150
Phosgene Liquid			Potassium Perchlorate		150
Phosphoric Acid	10	180	Potassium Permanganate	20	73
Phosphoric Acid	20	180	Potassium Persulfate		120
Phosphoric Acid	40	180	Potassium Pitrate		150
Phosphoric Acid	50	180	Potassium Sulfate		180
Phosphoric Acid	80	180	Potassium Sulfide		120
Phosphoric Acid	85	180	Propane (Dimethyl-Methane)		73
Phosphorus Oxychloride			Salenic Acid		73
Phosphorus Trichloride, dry			Salt Brine		180
Photographic Developer			Sea Water		180
Photographic Solutions			Silver Cyanide		180
Phthalic Acid (Terephthalic Acid)			Silver Nitrate		180
Phthalic Anhydride			Silver Salts		180
Pickle Brine			Silver Sulfate		150
Pickling Solutions			Soap Solutions		180
Plating Solutions, Antimony			Soda Ash (Sodium Carbonate)		180
Plating Solutions, Arsenic			Sodium Acetate		180
Plating Solutions, Brass			Sodium Alum		150
Plating Solutions, Bronze			Sodium Benzoate		180
Plating Solutions, Cadmium			Sodium Bicarbonate		180
Plating Solutions, Chrome			Sodium Bisulfate		180
Plating Solutions, Copper			Sodium Bisulfite		180
Plating Solutions, Gold			Sodium Borate (Borax)		120
Plating Solutions, Indium			Sodium Bromide		180
Plating Solutions, Iron			Sodium Carbonate (Soda Ash)		180
Plating Solutions, Lead			Sodium Chlorate		180
Plating Solutions, Nickel			Sodium Chloride (Salt)		180
Plating Solutions, Rhodium			Sodium Chlorite		150
Plating Solutions, Silver			Sodium Cyanide		180
Plating Solutions, Tin			Sodium Dichromate		180
Plating Solutions, Zinc			Sodium Ferricyanide		150
Polyethylene Glycol Emulsion			Sodium Ferrocyanide		150
Polyvinyl Alcohol			Sodium Fluoride		180
Potash Potassium Carbonate			Sodium Hydroxide	15	180
Potassium Aluminum Sulfate			Sodium Hydroxide	20	180
Potassium Bicarbonate			Sodium Hydroxide	30	180
Potassium Bichromate (see Potassium Dichromate)			Sodium Hydroxide	50	180
150			Sodium Hydroxide	70	180
Potassium Bisulfate			Sodium Hydroxide Conc (Caustic Soda)		180
Potassium Bromate			Sodium Hypochlorite (Bleach)	12.5	120
Potassium Bromide	30	180	Sodium Hypochlorite Conc	20	73
Potassium Carbonate			Sodium Metaphosphate		150
Potassium Chlorate Aqueous	30	180	Sodium Metasilicate		150
Potassium Chloride			Sodium Nitrate		180
Potassium Chromate			Sodium Paimitale		120
Potassium Copper Cyanide			Sodium Perborate		180

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Chemical Substance	Concentration	Temperature°F	Chemical Substance	Concentration	Temperature°F
Sodium Peroxide		180	Turpenline		NR
Sodium Phosphate Acid		180	Urea		180
Sodium Phosphate Alkaline (Mono Basic)		180	Urine		180
Sodium Phosphate Neutral (Tri Basic)		180	Vaseline		150
Sodium Silicate (Water Glass)		180	Vegetable Oil		120
Sodium Sulfate		180	Vinegar (4-8% Acetic Acid)		150
Sodium Sulfide		180	Vinyl Ether		NR
Sodium Sulfite		180	Water Acid Mine		150
Sodium Thiocyanate		150	Water Deionized		180
Sodium Thiosulfate		180	Water Demineralized		180
Soybean Oil		120	Water Distilled		180
Stannic Chloride (Tin Chloride)		150	Water Potable		180
Stannous Chloride (Tin Salts)		150	Water Salt		180
Stearic Acid		120	Water Sewage		180
Stoddard Solvent (Dry Cleaning Solvent)		73	Whiskey		180
Succinic Acid (Butanedioic Acid)		150	White Liquor		73
Suffonated Detergents		120	Wines		150
Sugar Solutions		180	Xylene		NR
Sulfamic Acid		NR	Zinc Chloride		180
Sulfate Liquors (Paper Pulp)		150	Zinc Nitrate		180
Sulfur		73	Zinc Sulfate		180
Sulfur Chloride		NR			
Sulfur Dioxide (Dry)		73			
Sulfur Dioxide (Wet)		73			
Sulfuric Acid	10	180			
Sulfuric Acid	30	150			
Sulfuric Acid	50	73			
Sulfuric Acid	60	73			
Sulfuric Acid	70	73			
Sulfuric Acid	80	NR			
Sulfuric Acid	90	NR			
Sulfuric Acid	95	NR			
Sulfuric Acid	100	NR			
Sulfurous Acid		150			
Tall Oil		180			
Tannic Acid		180			
Tartaric Acid (Dihydrxy Succinic Acid)		150			
Tatralin (Tetrahydro-Naphthalene)		NR			
Tetrachlorethane		NR			
Thionyl Chloride		NR			
Thread Cutting Oils		120			
Titanium Teirachloride		NR			
Toluene		NR			
Transformer Oil (Liquid Insulators)					
Mineral Oil Type		73			
Tributyl Phosphate		73			
Trichlorethylene		73			
Trichloroacetic Acid		73			
Trichloroethane (Methyl Chloroform)		NR			
Triethanolamine		NR			
Triethylamine		NR			
Trisodium Phosphate		120			

# Chemical Resistance of PVDF

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<sup>a</sup>pure substance unless otherwise indicated

<sup>b</sup>temperatures in °F have been rounded to °C in 5 degree increments

<sup>c</sup>NR indicates that KYNAR resin is not recommended for use with the chemical at room temperature or at the temperature indicated

	Maximum <sup>b</sup> Temperature			Maximum <sup>b</sup> Temperature	
Acetaldehyde	NR		Ammonium Phosphate	Aqueous solution or solid	275 135
Acetamide	75	25	Ammonium Sulfate	Aqueous solution or solid	275 135
Acetic Acid	120	50	Ammonium Sulfide	Aqueous solution or solid	125 50
Acetic Acid	10% in water	225 110	Ammonium Thiocyanate	Aqueous solution or solid	275 135
Acetic Acid	50% in water	200 95	Amyl Acetate		125 50
Acetic Acid	80% in water	150 65	Amyl Alcohol		275 135
Acetic Anhydride	NR		Sec-Amyl Alcohol		125 50
Acetone	NR		Amyl Chloride		275 135
Acetone	10% in water	125 50	Aniline		120 50
Acetonitrile	125	50	Aniline Hydrochloride	Aqueous solution or solid	75 25
Acetophenone	NR		Aqua Regia		75 25
Acetyl Bromide	125	50	Arsenic Acid	Aqueous solution	275 135
Acetyl Chloride	125	50	Asphalt		250 120
Acetylacetone	NR		Barium Carbonate		275 135
Acetylene	250	120	Barium Chloride	Aqueous solution or solid	275 135
Acrylonitrile	75	25	Barium Hydroxide		275 135
Adipic Acid	150	65	Barium Nitrate	Aqueous solution or solid	275 135
Air	275	135	Barium Sulfate		275 135
Alcoholic Spirits	40% Ethyl Alcohol	200 95	Barium Sulfide		275 135
Allyl Alcohol	125	50	Beer		212 100
Allyl Chloride	212	100	Beet Sugar Liquors		225 110
Aluminum Acetate	Aqueous solution or solid	275 135	Benzaldehyde		70 20
Aluminum Bromide		275 135	Benzene		170 75
Aluminum Chloride	Up to 40% in water	275 135	Benzenesulfonic Acid	Aqueous solution or solid	125 50
Aluminum Fluoride	Aqueous solution or solid	275 135	Benzoic Acid		225 110
Aluminum Hydroxide		275 135	Benzoyl Chloride		170 75
Aluminum Nitrate	Aqueous solution or solid	275 135	Benzoyl Peroxide		170 75
Aluminum Oxychloride		275 135	Benzyl Alcohol		250 120
Aluminum Sulfate	Aqueous solution or solid	275 135	Benzyl Chloride		275 135
Ammonia, gas	NR		Benzyl Ether		100 40
Ammonia, Liquid	NR		Benzylamine	Aqueous solution or liquid	75 25
Ammonium Acetate	Aqueous solution or solid	175 80	Black Liquor		175 80
Ammonium Alum	Aqueous solution or solid	275 135	Bleaching Agents		275 135
Ammonium Bifluoride	Aqueous solution or solid	150 65	Borax		275 135
Ammonium Bromide	Aqueous solution or solid	250 120	Boric Acid		275 135
Ammonium Carbonate	Aqueous solution or solid	275 135	Boron Trifluoride		75 25
Ammonium Chloride	Aqueous solution or solid	275 135	Brine		275 135
Ammonium Dichromate	Aqueous solution or solid	250 120	Brine, acid		275 135
Ammonium Fluoride	Aqueous solution or solid	275 135	Brine, basic		275 135
Ammonium Hydroxide	Up to "concentrated"	225 110	Brine, chlorinated acid		200 95
Ammonium			Bromic Acid	Aqueous solution	200 95
Metaphosphate	Aqueous solution or solid	275 135	Bromine dry gas		150 65
Ammonium Nitrate	Aqueous solution or solid	275 135	Bromine, liquid		150 65
Ammonium Persulfate	Aqueous solution or solid	75 25	Bromine, Water		212 100

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Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature		Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature	
		°F	°C			°F	°C
Bromobenzene		150	65	Chloroacetic Acid	Aqueous solution or pure	NR	
Bromoform		150	65	Chloroacetyl Chloride		125	50
m-Bromotoluene		175	80	Chlorobenzene		170	75
Butadiene		250	120	Chlorobenzene-sulfonic Acid	Aqueous solution or pure	200	95
Butane		250	120	Chlorobenzyl Chloride		125	50
Butanediol	Aqueous solution or liquid	275	135	Chlorofluorocarbon 11		200	95
Butyl Acetate		80	25	Chlorofluorocarbon 12		200	95
Butyl Acrylate		125	50	Chlorofluorocarbon 13		200	95
Butyl Alcohol	Aqueous solution or liquid	225	110	Chlorofluorocarbon 14		200	95
sec-Butyl Alcohol	Aqueous solution or liquid	200	95	Chlorofluorocarbon 21		200	95
t-Butyl Alcohol	Aqueous solution or liquid	200	95	Chlorofluorocarbon 22		200	95
Butyl Bromide		275	135	Chlorofluorocarbon 113		200	95
Butyl Chloride		275	135	Chlorofluorocarbon 114		200	95
Butyl Ether		100	40	Chloroform		125	50
Butyl Mercaptan		275	135	6-Chlorohexanol		170	75
Butyl Stearate		100	40	Chlorohydrin		125	50
Butylamine	Aqueous solution or liquid	NR		Chloropicrin		150	65
sec-Butylamine	Aqueous solution or liquid	70	20	Chlorosulfonic Acid		NR	
t-Butylamine	Aqueous solution or solid	70	20	Chlorotrimethylsilane		125	50
1-Butylene		275	135	Chrome Alum	Aqueous solution or solid	200	95
Butylphenol		225	110	Chromic Acid	Up to 40% in water	175	80
Butyraldehyde		150	65	Chromic Acid	50% in water	125	50
Butyric Acid		225	110	Chromyl Chloride		125	50
Calcium Acetate	Aqueous solution or solid	275	135	Cider		140	60
Calcium Bisulfate	Aqueous solution or solid	285	135	Citric Acid	Aqueous solution or solid	275	135
Calcium Bisulfite	Aqueous solution or solid	200	95	Coal Gas		225	110
Calcium Bromide	Aqueous solution or solid	275	135	Coconut Oil		275	135
Calcium Carbonate		275	135	Copper Acetate	Aqueous solution or solid	250	120
Calcium Chlorate	Aqueous solution or solid	275	135	Copper Carbonate, basic		275	135
Calcium Chloride	Aqueous solution or solid	275	135	Copper Chloride	Aqueous solution or solid	275	135
Calcium Hydroxide		275	135	Copper Cyanide		275	135
Calcium Hypochlorite	Aqueous solution or solid	200	95	Copper Fluoride		275	135
Calcium Nitrate	Aqueous solution or solid	275	135	Copper Nitrate	Aqueous solution or solid	275	135
Calcium Oxide		250	120	Copper Sulfate	Aqueous solution or solid	275	135
Calcium Phosphate		275	135	Corn Oil		275	135
Calcium Sulfate		275	135	Corn Syrup		250	120
Cane Sugar Liquors		275	135	Cottonseed Oil		275	135
Caprylic Acid		175	80	Cresol		150	65
Carbon Dioxide		275	135	Cresylic Acid		150	65
Carbon Disulfide		75	25	Crotonaldehyde		125	50
Carbon Monoxide		275	135	Crude Oil		275	135
Carbon Tetrachloride		275	135	Cryolite		250	120
Carbonic Acid		275	135	Cuprous Chloride		250	120
Casein		250	120	Cyclohexane		275	135
Castor Oil		275	135	Cyclohexanol		150	65
Chloral Hydrate		75	25	Cyclohexanone		75	25
Chlorinated Phenol		150	65	Cyclohexyl Acetate		200	95
Chlorine	5% in CCl <sub>4</sub>	200	95	Decane		250	120
Chlorine, gas		200	95	Dextrin	Aqueous solution or solid	250	120
Chlorine, liquid		200	95	Diacetone Alcohol		75	25
Chlorine Dioxide		150	65	p-Dibromobenzene		200	95
Chlorine Water		225	110				



# Chemical Resistance of PVDF

Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature		Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature	
		°F	°C			°F	°C
1,2,-Dibromopropane		200	95	Ethylene Glycol	Aqueous solution or liquid	275	135
Dibutyl Phthalate		NR		Ethylene Oxide		200	95
Dibutyl Sebacate		NR		Ethylenediamine	Aqueous solution or liquid	225	110
Dibutylamine	Aqueous solution or liquid	70	20	2-Ethyl-1-hexanol		250	120
Dichloroacetic Acid	Aqueous solution or liquid	125	50	Fatty Acids		275	135
o-Dichlorobenzene		150	65	Fatty Acids, Sulfonates		175	80
Dichlorodimethylsilane		125	50	Ferric Chloride	Aqueous solution or solid	275	135
Dichloroethylene		225	110	Ferric Hydroxide		250	120
2,2,-Dichloropropionic Acid		125	50	Ferric Nitrate	Aqueous solution or solid	275	135
aa-Dichlorotoluene		150	65	Ferric Sulfate		275	135
Diesel Fuels		275	135	Ferric Sulfide		250	120
Diethanolamine	Aqueous solution or liquid	NR		Ferrous Chloride	Aqueous solution or solid	275	135
Diethylamine	Aqueous solution or liquid	75	25	Ferrous Hydroxide		250	120
Diethyl Malonate		NR		Ferrous Nitrate	Aqueous solution or solid	275	135
Diethylenetriamine	Aqueous solution or liquid	125	50	Ferrous Sulfate		275	135
Diglycolic Acid		75	25	Fluorine		75	25
Diisobutyl Ketone		200	95	Fluoroboric Acid	Aqueous solution	275	135
Diisobutyene		275	135	Fluosilicic Acid		275	135
Diisopropyl Ketone		125	50	Formaldehyde	37% in water	125	50
Dimethyl Acetamide		NR		Formic Acid	Aqueous solution or liquid	250	120
Dimethyl Formamide		NR		Fructose	Aqueous solution or solid	275	135
Dimethyl Phthalate		75	25	Fruit Juices, Pulp		212	100
Dimethyl Sulfate		75	25	Fuel Oil		275	135
Dimethyl Sulfoxide		NR		Fumaric Acid		170	65
2,6,-Dimethyl-4-heptanol		200	95	Furan		NR	
2,5,-Dimethyl-1,5-hexadiene		250	120	Furfural		75	25
Dimethylamine	Aqueous solution or gas	75	25	Furfuryl Alcohol	Aqueous solution or liquid	100	40
Dimethylaniline		75	25	Gallic Acid		75	25
Diocetyl Phthalate		75	25	Gas, manufactured		275	135
1,4-Dioxane		NR		Gas, natural		275	135
Dioxolane		NR		Gasoline, leaded		275	135
Dipropylene Glycol Methyl Ether		75	25	Gasoline, sour		275	135
Disodium Phosphate	Aqueous solution or solid	200	95	Gasoline, unleaded		275	135
Divinyl Benzene		125	50	Gelatin		250	120
Epichlorohydrin		NR		Gin		200	95
Epsom Salts	Aqueous solution or solid	200	95	Glucose	Aqueous solution or solid	275	135
Ethanethiol		75	25	Glue		250	120
Ethanolamine	Aqueous solution or liquid	NR		Glutamic Acid		200	95
2-Ethoxyethyl Acetate	Aqueous solution or liquid	200	95	Glycerin	Aqueous solution or liquid	275	135
Ethyl Acetate		NR		Glycine	Aqueous solution or solid	75	25
Ethyl Acetoacetate		75	25	Glycolic Acid		75	25
Ethyl Acrylate		75	25	Heptane		275	135
Ethyl Alcohol	Aqueous solution or liquid	275	135	Hexachloro-1,3-butadiene		125	50
Ethyl Chloride		275	135	Hexamethylenediamine		NR	NR
Ethyl Chloroacetate		75	25	Hexamethylphosphotriamide		NR	
Ethyl Chloroformate		125	50	Hexane		275	135
Ethyl Cyanoacetate		75	25	Hexyl Alcohol		175	80
Ethyl Ether		125	50	Hydrazine	Aqueous solution or liquid	200	95
Ethyl Formate		75	25	Hydrazine			
Ethylbenzene		125	50	Dihydrochloride	Aqueous solution or solid	75	25
Ethylene Chlorohydrin	Aqueous solution or liquid	75	25	Hydrazine Hydrate	Aqueous solution or liquid	125	50
Ethylene Dichloride		275	135	Hydriodic Acid	Aqueous solution	275	135

# Chemical Resistance of PVDF

Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature		Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature	
		°F	°C			°F	°C
Hydrobromic Acid	Up to 50% in water	275	135	Maleic Anhydride		75	25
Hydrochloric Acid	Up to "concentrated"	275	135	Malic Acid	Aqueous solution or solid	250	120
Hydrocyanic Acid	Aqueous solution	275	135	Manganese Sulfate	Aqueous solution or solid	250	120
Hydrofluoric Acid	Up to 40% in water	250	120	Mercuric Chloride		250	120
Hydrofluoric Acid	41 -100% in water	200	95	Mercuric Cyanide		250	120
Hydrogen		275	135	Mercuric Nitrate	Aqueous solution or solid	275	135
Hydrogen Chloride		275	135	Mercury		275	135
Hydrogen Cyanide		275	135	Methacrylic Acid		125	50
Hydrogen Fluoride		200	95	Methane		275	135
Hydrogen Peroxide	Up to 30% in water	200	95	Methanesulfonic Acid	Aqueous solution or liquid	200	95
Hydrogen Peroxide	90% in water	70	20	Methyl Acetate		100	40
Hydrogen Sulfide		275	135	Methyl Acrylate		100	40
Hydrogen Sulfide	Aqueous solution	225	110	Methyl Alcohol	Aqueous solution or liquid	275	135
Hydroquinone		250	120	Methyl Bromide		275	135
Hypochlorous Acid	Aqueous solution	70	20	Methyl Chloride		275	135
Iodine	10% in Non-Aqueous solvent	150	65	Methyl Chloroacetate		75	25
Iodine, gas		150	65	Methyl Chloromethyl Ether		75	25
Iodoform		200	95	Methyl Ethyl Ketone		NR	
Isoamyl Ether		250	120	Methyl Isobutyl Ketone		NR	
Isobutyl Alcohol		250	120	Methyl Methacrylate		125	50
Isooctane		250	120	Methyl Salicylate		150	65
Isophorone		175	80	Methylamine		NR	
Isopropyl Alcohol	Aqueous solution or liquid	140	60	Methylchloroform		125	50
Isopropyl Chloride		100	40	Methylene Bromide		175	80
Isopropyl Ether		125	50	Methylene Chloride		125	50
Isopropylbenzene		100	40	Methylene Iodide		200	95
Jet Fuel (JP4, JP5)		200	95	Methylsulfuric Acid	Aqueous solution or liquid	125	50
Kerosene		275	135	Methyltrichlorosilane		150	65
Lactic Acid	Aqueous solution or pure	125	50	Milk		250	120
Lanolin		250	120	Mineral Oil		275	135
Lard Oil		275	135	Molasses		175	80
Lauric Acid		225	110	Morpholine	Aqueous solution or liquid	75	25
Lauroyl Chloride		250	120	Motor Oil		275	135
Lauryl Mercaptan		200	95	Naphtha		275	135
Lauryl Sulfate		250	120	Naphthalene		200	95
Lead Acetate	Aqueous solution or solid	275	135	Nickel Acetate	Aqueous solution or solid	250	120
Lead Chloride		250	120	Nickel Chloride	Aqueous solution or solid	275	135
Lead Nitrate	Aqueous solution or solid	250	120	Nickel Nitrate	Aqueous solution or solid	275	135
Lead Sulfate		250	120	Nickel Sulfate	Aqueous solution or solid	275	135
Lemon Oil		250	120	Nicotine		70	20
Linoleic Acid		250	120	Nicotinic Acid		250	120
Linseed Oil		275	135	Nitric Acid	Up to 10% in water	175	80
Lithium Bromide	Aqueous solution or solid	225	110	Nitric Acid	11 - 70% in water	125	50
Lithium Chloride	Aqueous solution or solid	250	120	Nitric Acid	"Concentrated"	NR	
Lubricating Oil		275	135	Nitric Acid, fuming		NR	
Magnesium Carbonate		275	135	Nitrobenzene		75	25
Magnesium Chloride	Aqueous solution or solid	275	135	Nitroethane		70	20
Magnesium Citrate		250	120	Nitrogen		275	135
Magnesium Hydroxide		275	135	Nitrogen Dioxide		170	75
Magnesium Nitrate	Aqueous solution or solid	275	135	Nitroglycerin		125	50
Magnesium Sulfate	Aqueous solution or solid	275	135	Nitromethane		120	50
Maleic Acid	Aqueous solution or solid	250	120	Nitrotoluene		175	80

# Chemical Resistance of PVDF

Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature		Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature	
		°F	°C			°F	°C
Nitrous Oxide		NR		Polyvinyl Alcohol		275	135
Octane		275	135	Potassium		NR	
Octene		275	135	Potassium Acetate	Aqueous solution or solid	275	135
Oleic Acid		250	120	Potassium Alum	Aqueous solution or liquid	275	135
Oleum		NR		Potassium Aluminum Chloride		275	135
Olive Oil		250	120	Potassium Bicarbonate	Aqueous solution or solid	200	95
Oxalic Acid		125	50	Potassium Bisulfate	Aqueous solution or solid	275	135
Oxygen		275	135	Potassium Borate	Aqueous solution or solid	275	135
Ozone		225	110	Potassium Bromate	Aqueous solution or solid	275	135
Palm Oil		200	95	Potassium Bromide	Aqueous solution or solid	275	135
Palmitic Acid		250	120	Potassium Carbonate	Aqueous solution or solid	275	135
Paraffin		250	120	Potassium Chlorate		200	95
Paraffin Oil		250	120	Potassium Chloride	Aqueous solution or solid	275	135
Peanut Oil		250	120	Potassium Chromate	Aqueous solution or solid	275	135
Perchloric Acid	10% in water	200	95	Potassium Cyanide	Aqueous solution or solid	275	135
Perchloric Acid	70% in water	125	50	Potassium Dichromate		275	135
Perchloroethylene		275	135	Potassium Ferricyanide	Aqueous solution or solid	275	135
Perchloromethyl Mercaptan		125	50	Potassium Ferrocyanide	Aqueous solution or solid	275	135
Petrolatum		275	140	Potassium Fluoride	Aqueous solution or solid	275	135
Petroleum		275	135	Potassium Hydroxide	5 to 10% in water	NR	
Phenol	5% in water	175	80	Potassium Hydroxide	Greater than 50% in water	NR	
Phenol		125	50	Potassium Hypochlorite	Aqueous solution	200	95
1-Phenol-2-sulfonic Acid		125	50	Potassium Iodide	Aqueous solution or solid	250	120
Phenyl Ether		125	50	Potassium Nitrate	Aqueous solution or solid	275	135
Phenylhydrazine		125	50	Potassium Perborate		275	135
Phenylhydrazine Hydrochloride	Aqueous solution or solid	125	50	Potassium Perchlorate		200	95
o-Phenylphenol		175	80	Potassium Permanganate	Aqueous solution or solid	250	120
Phosgene		175	80	Potassium Persulfate		125	50
Phosphoric Acid	Less than 85% in water	275	135	Potassium Sulfate	Aqueous solution or solid	275	135
Phosphoric Acid	85% in water	225	110	Potassium Sulfide		275	135
Phosphorus, red		75	25	Propane		275	135
Phosphorus, Oxychloride		NR		Propyl Acetate		100	40
Phosphorus, Pentachloride		200	95	Propyl Alcohol	Aqueous solution or liquid	150	65
Phosphorus, Pentoxide		200	95	Propylamine		NR	
Phosphorus, Trichloride		200	95	Propylene Dibromide		200	95
Phthalic Acid		200	95	Propylene Dichloride		200	95
Picric Acid		75	25	Propylene Glycol	Aqueous solution or liquid	150	65
Plating Solutions: Brass		200	95	Propylene Oxide		NR	
Cadmium		200	95	Pyridine		NR	
Chrome		200	95	Pyrogallol	Aqueous solution or solid	120	50
Copper		200	95	Salicylaldehyde		125	50
Iron		200	95	Salicylic Acid		200	95
Lead		200	95	Selenic Acid	Aqueous solution or pure	150	65
Nickel		200	95	Silicon Tetrachloride		125	50
Rhodium		200	95	Silicone Oil		250	120
Silver		200	95	Silver Cyanide		275	135
Speculum		200	95	Silver Nitrate	Aqueous solution or solid	275	135
Tin		200	95	Silver Sulfate		250	120
Zinc		200	95	Sodium		NR	
Polyethylene Glycol		200	95	Sodium Acetate	Aqueous solution or solid	275	135
Polyvinyl Acetate		275	135	Sodium Amalgam		NR	
				Sodium Benzoate	Aqueous solution or solid	275	135

# Chemical Resistance of PVDF

Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature		Chemical Substance	Concentration	Maximum <sup>b</sup> Temperature	
		°F	°C			°F	°C
Sodium Bicarbonate	Aqueous solution or solid	275	135	Tar		250	120
Sodium Bisulfate	Aqueous solution or solid	275	135	Tartaric Acid	Aqueous solution or solid	250	120
Sodium Bisulfite	Aqueous solution or solid	275	135	1,1,2,2,-Tetrabromoethane		250	120
Sodium Bromate	Aqueous solution or solid	200	95	1,1,2,2,-Tetrachloroethane		250	120
Sodium Bromide	Aqueous solution or solid	275	135	2,3,4,6,-Tetrachlorophenol		150	65
Sodium Carbonate	Aqueous solution or solid	275	135	Tetraethyllead		275	135
Sodium Chlorate	Aqueous solution or solid	250	120	Tetrahydrofuran	Aqueous solution or liquid	NR	
Sodium Chlorite	Aqueous solution or solid	250	120	Tetramethylammonium			
Sodium Chromate	Aqueous solution or solid	200	95	Hydroxide	Up to 10% in water	200	95
Sodium Cyanide	Aqueous solution or solid	275	135	Tetramethylurea		NR	
Sodium Dichromate	Aqueous solution or solid	200	95	Thioglycol		75	25
Sodium Dithionite	Aqueous solution or solid	100	40	Thioglycolic Acid		175	80
Sodium Ferricyanide	Aqueous solution or solid	275	135	Thionyl Chloride		NR	
Sodium Ferrocyanide	Aqueous solution or solid	275	135	Thiophosphoryl Chloride		NR	
Sodium Fluoride	Aqueous solution or solid	285	135	Thread Cutting Oils		200	95
Sodium Fluosilcate		200	95	Titanium Tetrachloride		150	65
Sodium Hydrogen Phosphate	Aqueous solution or solid	250	120	Toluene		175	80
Sodium Hydroxide	Up to 10% in water	100	40	Toluenesulfonyl Chloride		125	50
Sodium Hydroxide	Greater than 50% in water	NR		Tomato Juice		212	100
Sodium Hypochlorite	Up to 5% in water	275	135	Tributyl Phosphate		75	25
Sodium Hypochlorite	6-15% in water	200	95	Trichloroacetic Acid	Up to 10% in water	200	95
Sodium Iodide	Aqueous solution or solid	275	135	Trichloroacetic Acid	50% in water to pure	125	50
Sodium Nitrate	Aqueous solution or solid	275	135	1,2,4,-Trichlorobenzene		200	95
Sodium Nitrite	Aqueous solution or solid	275	135	1,1,2,-Trichloroethane		150	65
Sodium Palmitate		250	120	Trichloroethylene		275	135
Sodium Perchlorate	Aqueous solution or solid	250	120	2,4,5,-Trichlorophenol		150	65
Sodium Peroxide		200	95	Tricresyl Phosphate		NR	
Sodium Phosphate	Aqueous solution or solid	275	135	Triethanolamine	Aqueous solution or liquid	125	50
Sodium Thiocyanate	Aqueous solution or solid	250	120	Triethyl Phosphate		NR	
Sodium Thiosulfate	Aqueous solution or solid	275	135	Triethylamine		125	50
Sour Crude Oil		275	135	Trifluoroacetic Acid	50% in water	200	95
Soy Bean Oil		250	120	Trifluoroacetic Acid		125	50
Stannic Chloride	Aqueous solution or solid	275	135	Trimethylamine	Aqueous solution or gas	150	65
Stannous Chloride	Aqueous solution or solid	275	135	Turpentine		275	135
Starch		200	95	Urea	Aqueous solution or solid	250	120
Stearic Acid		275	135	Varnish		250	120
Stilbene		175	80	Varsol		250	120
Styrene		180	85	Vegetable Oil		275	135
Succinic Acid		150	65	Vinagar		225	110
Sugar Syrup		275	135	Vinyl Acetate		250	120
Sulfur		250	120	Vinyl Chloride		200	95
Sulfur Chloride		75	25	Vinylidene Chloride		200	95
Sulfur Dichloride		75	25	Water		275	135
Sulfur Dioxide		175	80	Water, salt		275	135
Sulfur Trioxide		NR		Water, sewage		250	120
Sulfuric Acid	Up to 60% in water	250	120	Whiskey		200	95
Sulfuric Acid	80 - 93% in water	200	95	Wine		200	95
Sulfuric Acid	98% in water	150	65	Xylene		200	95
Sulfuric Acid, fuming		NR		Zinc Acetate	Aqueous solution	250	120
Sulfuryl Chloride		NR		Zinc Bromide	Aqueous solution or solid	250	120
Sulfuryl Fluoride		75	25	Zinc Chloride	Aqueous solution or solid	275	135
Tall Oil		275	135	Zinc Nitrate	Aqueous solution or solid	275	135
Tallow		275	135	Zinc Sulfate	Aqueous solution or solid	275	135
Tannic Acid		225	110				