

# CHEMICAL RESISTANCE OF PVC PIPE

R = generally resistant

C = less resistant than

R, but still suitable for some conditions

N = not resistant

<u>CHEMICAL</u>	<u>(23C)</u>	<u>(60C)</u>	<u>CHEMICAL</u>	<u>(23C)</u>	<u>(60C)</u>
Acetaldehyde	N	N	Antimony trichloride	R	R
Acetaldehyde, aq 40%	C	N	Aqua regia	C	N
Acetamide	-	-	Arsenic acid, 80%	R	R
Acetic acid, vapor	R	R	Aryl-sulfonic acid	R	R
Acetic acid, glacial	R	N			
			Barium salts	R	R
Acetic acid, 20%	R	R	Beer	R	R
Acetic acid, 80%	R	C	Beet sugar liquor	R	R
Acetic anhydride	N	N	Benzaldehyde, 10%	R	N
Acetone	N	N	Benzaldehyde, above 10%	N	N
Acetylene	C	C			
			Benzene (benzol)	N	N
Adipic acid	R	R	Benzene sulfonic acid, 10%	R	R
Alcohol, allyl	R	C	Benzene sulfonic acid	N	N
Alcohol, benzyl	N	N	Benzoic acid	R	R
Alcohol, butyl (n-butanol)	R	R	Black liquor - paper	R	R
Alcohol, butyl (2-butanol)	R	N			
			Bleach, 12.5% active chlorine	R	R
Alcohol, ethyl	R	R	Bleach, 5.5% active chlorine	R	R
Alcohol, hexyl	R	R	Borax	R	R
Alcohol, isopropyl (2-propanol)	R	R	Boric acid	R	R
Alcohol, methyl	R	R	Boron trifluoride	R	R
Alcohol, propyl (1-propanol)	R	R			
			Bromic acid	R	R
Allyl chloride	N	N	Bromine, liquid	N	N
Alums	R	R	Bromine, gas, 25%	R	R
Ammonia, gas	R	R	Bromine, aq	R	R
Ammonia, liquid	N	N	Butadiene	R	R
Ammonia, aq	R	R			
			Butane	R	R
Ammonium salts	R	R	Butantetrol (erythritol)	R	N
Ammonium fluoride, 25%	R	C	Butanediol	R	R
Amyl acetate	N	N	Butyl acetate	N	N
Amyl chloride	N	N			
Aniline	N	N	Butyl phenol	R	N
			Butylene	R	R
Aniline chlorohydrate	N	N			
Aniline hydrochloride	N	N	Butyric acid	R	N

Aniline dyes	N	N	Calcium salts, aq	R	R
Anthraquinone	R	R	Calcium hypochlorite	R	R
Anthraquinone sulfonic acid	R	R	Calcium hydroxide	R	R

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Cane sugar liquors	R	R	Cresol	N	N
Carbon bisulfide	N	N	Cresylic acid, 50%	R	R
Carbon dioxide	R	R	Croton aldehyde	N	N
Carbon dioxide, aq	R	R	Crude oil	R	R
Carbon monoxide	R	R	Cyclohexane	N	N
Carbon tetrachloride	R	N	Cyclohexanol	N	N
Casein	R	R	Cyclohexanone	N	N
Castor oil	R	R	Diazo salts	R	R
Causticpotash (potassium hydrox)	R	R	Diesel fuels	R	R
Caustic soda (sodium hydroxide)	R	R	Diethyl amine	N	N
Cellosolve	R	C	Diocetyl phthalate	N	N
Cellosolve acetate	R	-	Disodium phosphate	R	R
Chloral hydrate	R	R	Diglycolic acid	R	R
Chloramine	R	-	Dioxane-1,4	N	N
Chloric acid, 20%	R	R			
			Dimethylamine	R	R
Chlorine, gas, dry	C	N	Dimethyl formamide	N	N
Chlorine, gas, wet	N	N	Detergents, aq	R	R
Chlorine, liquid	N	N	Dibutyl phthalate	N	N
Chlorine water	R	R	Dibutyl sebacate	C	N
Chloroacetic acid	R	R	Dichlorobenzene	N	N
			Dichloroethylene	N	N
Chlorobenzene	N	N			
Chlorobenzyl chloride	N	N	Ethers	N	N
Chloroform	N	N	Ethyl esters	N	N
Chlorosulfonic acid	R	N	Ethyl halides	N	N
Chromic acid, 10%	R	R	Ethylene halides	N	N
			Ethylene glycol	R	R
Chromic acid, 30%	R	C	Ethylene oxide	N	N
Chromic acid, 40%	R	C			
			Fatty acids	R	R
Chromic acid, 50%	N	N	Ferric salts	R	R
Citric acid	R	R	Fluorine, dry gas	C	N
Coconut oil	R	R	Fluorine, wet gas	C	N
Coke oven gas	R	R	Fluoboric acid, 25%	R	R
Copper salts, aq	R	R	Fluosilicic acid	R	R
Corn oil	R	R	Formaldehyde	R	R
Corn syrup	R	R	Formic acid	R	N
Cottonseed oil	R	R	Freon - F11, F12, F13, F14	R	R

Freon - F21, F22

N N

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Fruit juices and pulps	R	R	Lacquer thinners	C	N
Fuel oil	C	N	Lactic acid, 25%	R	R
Furfural	N	N	Lard oil	R	R
Gas, coal, manufactured	N	N	Lauric acid	R	R
Gas, natural, methane	R	R	Lauryl chloride	R	R
Gasolines	C	C	Lauryl sulfate	R	R
Gelatin	R	R	Lead salts	R	R
Glycerine (glycerol)	R	R	Lime sulfur	R	R
Glycols	R	R	Linoleic acid	R	R
Glue, animal	R	R	Linseed oil	R	R
Glycolic acid	R	R	Liqueurs	R	R
Green liquor, paper	R	R	Liquors	R	R
Gallic acid	R	R	Lithium salts	R	R
Heptane	R	R	Lubricating oils	R	R
Hexane	R	C	Machine oil	R	R
Hydrobromic acid, 20%	R	R	Magnesium salts	R	R
Hydrochloric acid	R	R	Maleic acid	R	R
Hydrofluoric acid, 10%	R	C	Malic acid	R	R
Hydrofluoric acid, 60%	R	C	Manganese sulfate	R	R
Hydrofluoric acid, 100%	R	C			
Hydrocyanic acid	R	R	Mercuric salts	R	R
Hydrogen	R	R	Mercury	R	R
Hydrogen peroxide, 50%	R	R	Mesityl oxide	N	N
Hydrogen peroxide, 90%	R	R	Metallic soaps, aq	R	R
Hydrogen sulfide, aq	R	R	Methane	R	R
Hydrogen sulfide, dry	R	R	Methyl acetate	N	N
Hydroquinone	R	R	Methyl bromide	N	N
Hydroxylamine sulfate	R	R			
Hydrazine	N	N	Methyl cellosolve	N	N
Hypochlorous acid	R	R	Methyl chloride	N	N
			Methyl chloroform	N	N
Iodine, in KI, 3%, aq	C	N	Methyl cyclohexanone	N	N
Iodine, alc	N	N	Methyl methacrylate	R	-
Iodine, aq, 10%	N	N			
Jet fuels, JP-4 and JP-5	R	R	Methyl salicylate	R	R
Kerosene	R	R	Methyl sulfate	R	C
Ketones	N	N	Methyl sulfonic acid	R	R
Kraft paper liquor	R	R	Methylene bromide	N	N

Methylene chloride	N	N
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Methylene iodide	N	N	Palmitic acid, 10%	R	R
Milk	R	R	Palmitic acid, 70%	R	N
Mineral oil	R	R	Paraffin	R	R
Mixed acids (sulfuric & nitric)	C	N	Pentane	C	C
Mixed acids (sulfuric & phosphoric)	R	R	Peracetic acid, 40%	R	N
Molasses	R	R	Perchloric acid, 10%	R	C
Monochlorobenzene	N	N	Perchloric acid, 70%	R	N
Monoethanolamine	N	N	Perchloroethylene	C	C
Motor oil	R	R	Petroleum, sour	R	R
			Petroleum, refined	R	R
Naphtha	R	R	Phenol	C	N
Naphthalene	N	N			
Nickel salts	R	R	Phenylcarbinol	N	N
Nicotine	R	R	Phenylhydrazine	N	N
Nicotinic acid	R	R	Phenylhydrazine HC1	C	N
			Phosgene, gas	R	C
Nitric acid, 0 to 50%	R	C	Phosgene, liquid	N	N
Nitric acid, 60%	R	C			
Nitric acid, 70%	R	C	Phosphoric acid	R	R
Nitric acid, 80%	C	C	Phosphorus, yellow	R	C
Nitric acid, 90%	C	N	Phosphorus, red	R	R
Nitric acid, 100%	N	N			
Nitric acid, fuming	N	N	Phosphorus pentoxide	R	C
			Phosphorus trichloride	N	N
Nitrobenzene	N	N			
Nitroglycerine	N	N	Photographic chemicals, aq	R	R
Nitrous acid	R	C	Phthalic acid	C	C
Nitrous oxide, gas	R	C	Picric acid	N	N
Nitroglycol	N	N	Plating solutions, metal	R	C
Nitropropane	C	C	Potassium salts, aq	R	R
Oils, vegetable	R	R	Potassium permanganate, 25%	C	C
Oils and fats	R	R	Potassium alkyl xanthates	R	N
Oleic acid	R	R	Propane	R	R
			Propylene dichloride	N	N
Oleum	N	N	Propylene glycol	R	R
Olive oil	C	-			
Oxalic acid	R	R	Propylene oxide	N	N
Oxygen, gas	R	R	Pyridine	N	N
Ozone, gas	R	C	Pyrogallic acid	C	N

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Rayon coagulating bath	R	R	Thread currint oils	R	-
Sea water	R	R	Terpineol	C	C
Salicylic acid	R	R	Titanium tetrachloride	C	N
Salicylaldehyde	C	C	Toluene	N	N
Selenic acid	R	R	Tributyl phosphate	N	N
Sewage, residential	R	R			
Silicic acid	R	R	Tributyl citrate	R	-
Silicone oil	R	N	Tricresyl phosphate	N	N
Silver salts	R	R	Trichloroacetic acid	R	R
Soaps	R	R	Trichloroethylene	N	N
Sodium salts, aq, except	R	R	Triethanolamine	R	C
Sodium chlorite	R	R	Triethylamine	R	R
Sodium chlorate	R	C	Trimethyl propane	R	C
Sodium dichromate, acid	R	R	Turpentine	R	R
Sodium perborate	R	R			
			Urea	R	R
Stannic chloride	R	R	Urine	R	R
Stannous chloride	R	R			
Starch	R	R	Vaseline	N	N
Stearic acid	R	R	Vegetable oils	R	R
Stoddard solvent	N	N	Vinegar	R	R
			Vinyl acetate	N	N
Sulfite liquor	R	R			
Sulfur	R	R	Water, distilled	R	R
Sugars, aq	R	R	Water, fresh	R	R
Sulfur dioxide, dry	R	R	Water, mine	R	R
Sulfur dioxide, wet	R	C	Water, salt	R	R
			Water, tap	R	R
Sulfur trioxide, gas, dry	R	R			
Sulfur trioxide, wet	R	C	Whiskey	R	R
Sulfuric acid, up to 70%	R	R	Wines	R	R
Sulfuric acid, 70 to 90%	R	C			
Sulfuric acid, 90 to 100%	C	N	Xylene	N	N
Sulfurous acid	C	N			
			Zinc salts	R	R
Tall Oil	R	R			
Tannic acid	R	R			
Tanning liquors	R	R			
Tartaric acid	R	R			
Tetrachloroethane	C	C			
Tetraethyl lead	R	C			

Tetrahydrofuran	N	N
Thionyl chloride	N	N

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This table is meant to aid the designer in decisions as to transporting/conveyance of undiluted chemicals.

Source: PPI TR-19 Plastic Pipe Institute, New York, New York

Chemical resistance data is provided as a guide only. Information is based primarily on immersion of unstressed strips in chemicals and to a lesser degree on field experience.

The chemical resistance information for PVC pipe provided is based on short-term immersion of unstressed strips of PVC in various chemicals (usually undiluted). Results of this type of test can be used only as a guide to estimate the response of PVC. It should be emphasized that this chart is merely a guide line, Nylon Tubes & Coils can in no way be held responsible for any damage, loss or injury.

An additional source of information on the chemical resistance of PVC pipe is the National Association of Corrosion Engineers' publication entitled, "Corrosion Data Survey, Nonmetals Section."