Chemical Resistance List

In the tables of British Standard Code of practise 312: Part 1, the resistance of plastic pipe materials to a variety of chemicals is listed. The information offered is intended to be used as a guide, and each project requires require that each piece of information be verified. Unless otherwise specified, the data is based on room temperature. The impact of the chemicals on elastomers will be amplified by higher temperatures. Regarding the information printed in this paper, no warranties can be made.

Drain pipes and accessories

The following is a summary of the expected behaviour for PVC-U to various compounds based on laboratory studies. In certain cases, the created stories have received additional material based on real-world occurrences.

Acids

Even while PVC-U is extremely resistant to strong acids, some oxidising acids, especially those in high concentrations, might damage the substance. The following is a succinct recommendation for using acids:

- Hydrochloric acid – Useful at high concentrations and up to 60 °C

- Sulphuric acid - concentrations of 90 to 95% should not be carried at temperatures above 50°C because they have an adverse effect at temperatures up to 60°C.

- Hot concentrated acid will damage PVC-U, but cold nitric acid is satisfactory at concentrations up to 50%.

Alkalis

At temperatures up to 60 °C, no concentration of alkalis will ever destroy PVC-U.

Halogens

While dry chlorine gas won't damage PVC-U at ambient temperature, moist chlorine gas will cause some damage at higher temperatures. At room temperature, fluorine and bromine, even in small amounts, will corrode PVC-U.

Organic Vapours and Liquids

The majority of alcohols, fats, oils, and petrol won't dissolve PVC-U.

Activating Agents

With the exception of the most extreme oxidising conditions, PVC-U is robust.

Hydrogen peroxide has no effect at any concentration, and even concentrated solutions, oxidising solutions, or attacks from oxidising salts like potassium permanganate only have a surface-level effect.

Reducing Agents

These reagents have essentially no impact on PVC-U up to temperatures of 60 °C.

Diluted with Water

Evidence of PVC-U pipe failures brought on by contact with water or aqueous solutions of the sort that adhere to the pertinent British Standard have been seen.

General

Ketones, Nitro Compounds, and Aromatic, Chlorinated Hydrocarbons and Cyclic ethers and Easters are among the substances that general PVC should not be used with.

All of these chemicals will permeate the PVC, resulting in significant swelling and product softening.

Products made of PVC-U may swell when exposed to petroleum-based fuels including benzene.

Even when diluted, penetrating solvents could be detrimental to PVC-U. However, their benefits start to clearly diminish when they are diluted. Use of PVC-U is safe at very low concentrates, such as those found in effluent.

PVC-U pipes should not be used to transport gas. Detail information about the components, especially any aromatic components of the gas, must be carefully considered.

Chemical Medium	
A	
Acetaldehyde	✓
Acetamide	X
Acetic Acid, 30%	✓
Acetic Acid, Glacial	X
Acetone	X
Acetophenone	X
Acetyl Chloride	X
Acetylene	✓
Acrylonitrile	X
Alcohols (Aliphatic)	✓
Alcohols (Aromatic)	X
Acetaldehyde	X
Aldehyes (Aliphatic)	X
Aldehyes (Aromatic)	X
Alkalines (up to 60°C)	✓
Aluminum Acetate (aqueous solution)	X
Aluminum Chloride (aqueous solution)	✓
Aluminum Fluoride (aqueous solution)	✓
Aluminum Nitrate (aqueous solution)	✓
Aluminum Phosphate (aqueous solution)	X
Aluminum Sulphate (aqueous solution)	✓
Ammonia Gas (cold)	✓
Ammonia Gas (hot)	✓
Ammonium Carbonate (aqueous solution)	✓
Ammonium Chloride (aqueous solution)	✓
Ammonium Hydroxide (concentrated)	✓
Ammonium Nitrate (aqueous solution)	✓
Ammonium Nitrite (aqueous solution)	X
Ammonium Persulphate (aqueous solution)	✓
Ammonium Phosphate (aqueous solution)	✓
Ammonium Salts (up to 600°C)	✓
Ammonium Sulphate (aqueous solution)	✓
Amyl Acetate	X
Amyl Alcohol	X
Amyl Borate	X
Amyl Chloronapthalene	X
Amyl Napthalene	X
Aniline	X
Aniline Dyes	X
Aniline Hydrochloride	X
Animal Oils	✓
Ansul Ether (Anesthetics)	X
Aqua Regia	X
Arsenic Acid	✓
Arsenic Trichloride (aqueous solution)	X
Asphalt	X
Aqueous Solutions (Dilute)	✓
B	
Barium Chloride (aqueous solution)	✓
Barium Hydroxide (aqueous solution)	✓
Barium Sulphate (aqueous solution)	✓
Barium Sulphide (aqueous solution)	✓
Beer	✓
Beet Sugar Liquors	✓

Benzaldehyde	X
Benzene	X
Benzene Sulphonic Acid	X
Benzonic Acid	X
Benzoyl Chloride	X
Benzyl Alcohol	X
Benzyl Benzoate	X
Benzyl Chloride	X
Blast Furnace Gas	X
Bleach Solutions	✓
Borax	X
Bordeaux Mixture	X
Boric Acid	✓
Brine	✓
Bromine Trifluoride	X
Bromine Water	X
Bromine (anhydrous)	X
Bromobenzene	✓
Butadiene	X
Butane	✓
Butter	X
Butyl Acetate	X
Butyl Acrylate	X
Butyl Alcohol	✓
Butyl Amine	X
Butyl Benzoate	X
Butyl Oleate	X
Butyl Stearate	✓
C	
Calcium Acetate (aqueous solution)	X
Calcium Chloride (aqueous solution)	✓
Calcium Hydroxide (aqueous solution)	✓
Calcium Hypochlorite (aqueous solution)	✓
Calcium Nitrate (aqueous solution)	✓
Calcium Sulphide (aqueous solution)	X
Cane Sugar Liquors	X
Carbolic Acid	X
Carbon Dioxide	✓
Carbon Disulphate	X
Carbon Monoxide	✓
Carbon Tetrachloride	X
Carbonic Acid	✓
Castor Oil	✓
Cellosolve	X
Cellosolve Acetate	X
Chloral Hydrate	X
Chlorine (Dry)	X
Chlorine (Wet)	X
Chlorine Dioxide	X
Chlorine Trifluoride	X
Chloroacetic Acid	✓
Chloroacetone	X
Chlorobenzene	X
Chlorobromomethane	X
Chloroform	X
Chlorotoluene	X
Chlorsulphonic Acid	X
Chromic Acid	X
Cider	✓
Citric Acid	✓

Coconut Oil	X
Cod Liver Oil	X
Coke Oven Gas	X
Copper Acetate (aqueous solution)	X
Copper Chloride (aqueous solution)	✓
Copper Cyanide (aqueous solution)	✓
Copper Sulphate (aqueous solution)	✓
Cottonseed Oil	✓
Creosote (Coal Tar)	X
Cresols	✓
Cyclohexane	✓
Cyclohexanol	X
Cyclohexanone	X
D	
Decalin	✓
Decane	X
Detergents (up to 600°C)	✓
Developers (up to 600°C)	✓
Diacetone	X
Diacetone Alcohol	X
Dibenzyl Ether	X
Dibutyl Ether	X
Dibutyl Phthalate	X
Dibutyl Sebecate	X
Dichlorobenzene	X
Dicyclohexylamine	X
Diesel Oil	X
Diethyl Benzene	X
Diethylamine	X
Diethylene Glycol	X
Diisobutylene	X
Diisopropyl Benzene	X
Diisopropyl Ketone	X
Dim ethylamine	✓
Dimethyl Formamide	✓
Dimethyl Phthalate	X
Dinitrotoluene	X
Dioctyl Phthalate	✓
Dioxane	X
Dioxolane	X
E	
Emulsifiers	✓
Emulsion (Photographic)	✓
Epichlorohydrin	X
Esters	X
Ethane	✓
Ethanol	✓
Ether	X
Ethyl Acetate	X
Ethyl Acetoacetate	✓
Ethyl Acrylate	X
Ethyl Alcohol	✓
Ethyl Benzoate	X
Ethyl Cellosolve	X
Ethyl Chlorocarbonate	X
Ethyl Chloroformate	X
Ethyl Chloride	X
Ethyl Formate	X
Ethyl-Methyl-Ketone	X
Ethylene	X

Ethylene Chlorohydrin	X
Ethylene Glycol	✓
Ethylene Oxide	X
F	
Fatty Acids (higher)	✓
Ferric Chloride (aqueous solution)	✓
Ferric Nitrate (aqueous solution)	✓
Ferric Sulfate (aqueous solution)	✓
Fish Oil	X
Fixing Solution (Photographic)	✓
Fluorine (Liquid)	X
Fluorobenzene	X
Fluoroboric Acid	✓
Fluorolube	X
Formaldehyde (RT)	✓
Formic Acid	✓
Fruit Pulp	✓
Fruit Juices	✓
Fructose	✓
Fuel Oil	✓
Fumaric Acid	X
Furfural	X
Furfural Alcohol	X
G	
Gallic Acid	✓
Gelatin	X
Gin	✓
Glucose	✓
Glycerin	✓
Glycerol	✓
Glycol	✓
H	
Halogenated Hydrocarbons	X
Hexane	X
Hexyl Alcohol	✓
Hydraulic Oils	X
Hydrazine	X
Hydrobromic Acid	✓
Hydrobromic Acid 40%	X
Hydrocarbons (Aliphatic)	✓
Hydrocarbons (Aromatic)	✓
Hydrocarbon Liquids	X
Hydrochloric Acid (Cold) 37%	✓
Hydrochloric Acid (Hot) 37%	✓
Hydrocyanic Acid	✓
Hydrocylamic Acid (10%)	✓
Hydrofluoric Acid (Aqueous)	✓
Hydrofluoric Acid (Conc.)	X
Hydrofluoric Acid-Anhydrous	X
Hydrogen Bromide	✓
Hydrogen Chloride	✓
Hydrogen Gas	✓
Hydrogen Peroxide (90%)	✓
Hydrogen Sulphide (Wet) Cold	✓
Hydrogen Sulphide (Wet) Hot	✓
Hydroquinone	✓
Hypochlorous Acid	✓
I	

Inks	✓
Iodine in KI Solution	X
Iodine Pentafluoride	X
Isobutyl Alcohol	✓
Isooctane	X
Isophorone	X
Isopropyl Acetate	X
Isopropyl Alcohol	✓
Isopropyl Chloride	X
Isopropyl Ether	X
K	
Kerosene	X
Ketones	X
L	
Lactic Acid (Cold)	✓
Lactic Acid (Hot)	X
Lard	X
Lavender Oil	X
Lead Acetate (aqueous solution)	✓
Lead arsenate	✓
Lead Nitrate (aqueous solution)	X
Lead Sulphamate (aqueous solution)	X
Linoleic Acid	X
Linseed Oil	✓
Lubricating Oils (Petroleum)	X
Lubrication Oil (Petroleum)	✓
M	
Magnesium Chloride (aqueous solution)	✓
Magnesium Hydroxide (aqueous solution)	✓
Magnesium Nitrate	✓
Magnesium Sulphate (aqueous solution)	✓
Malic Acid	✓
Margarine	✓
Mercury	✓
Mercury Chloride (aqueous solution)	X
Metallic Soaps (Water Soluble)	✓
Metal Salts and Solutions	✓
Methane	X
Methyl Acetate	X
Methyl Acrylate	X
Methyl Alcohol	✓
Methylene Bromide	✓
Methylene Chloride	✓
Methyl-Ethyl Ketone	X
Methylated Spirits	✓
Milk	✓
Mineral Oil	✓
Molasses	✓
Monochlorobenzene	X
N	
Naphtha	✓
Naphthalene	X
Naphthalenic Acid	X
Natural Gas	✓
Nickel Acetate (aqueous solution)	X
Nickel Chloride (aqueous solution)	✓
Nickel Sulphate (aqueous solution)	✓
Nicotine	✓
Nitric Acid (Conc.)	X

Nitric Acid (Cold conc. up to 50%)	✓
Nitric Acid- Fuming	X
Nitric Acid (Hot)	X
Nitrobenzene	X
Nitroethane	X
Nitrogen	✓
Nitromethane	X
O	
Octadecane	X
Oils and fats	✓
Oleic Acid	✓
Olive Oil	X
Oxalic Acid	✓
Oxidising Acids	X
Oxygen-Cold	✓
Ozone	✓
P	
Paraffin	✓
Peanut Oil	X
Perch loric Acid	✓
Petrol	✓
Petroleum-Above 120°C	X
Petroleum-Below 120°C	X
Petroleum Ether	X
Phenol	✓
Phenylbenzene	X
Phenyl Hydrazine	X
Phosphoric Acid (Conc.)	✓
Phosphoric Acid-45%	✓
Phosphorus Trichloride	X
Potassium Acetate (aqueous solution)	X
Potassium Chloride (aqueous solution)	✓
Potassium Cupro Cyanide (aqueous solution)	X
Potassium Cyanide (aqueous solution)	✓
Potassium Dichromate (aqueous solution)	✓
Potassium Hydroxide (aqueous solution)	✓
Potassium Nitrate (aqueous solution)	✓
Potassium Sulphate (aqueous solution)	✓
Propane	✓
Propyl Alcohol	✓
Propyl Nitrate	X
Propylene	X
Propylene Oxide	✓
Pyridine	X
R	
Radiation	X
Rapeseed Oil	X
S	
Salicylic Acid	X
Salt Water	✓
Silicate Esters	X
Silicone Greases	X
Silicone Oils	X
Silver Nitrate	✓
Soap Solutions	✓
Sodium Acetate (aqueous solution)	✓
Sodium Bicarbonate (aqueous solution)	✓
Sodium Bisulphite (aqueous solution)	✓
Sodium Borate (aqueous solution)	X

Sodium Carbonate (aqueous solution) Sodium Chloride (aqueous solution)	✓ ✓
Sodium Cyanide (aqueous solution) Sodium Hydroxide (aqueous solution) Sodium Hypochlorite (aqueous solution)	✓ ✓ ✓
Sodium Metaphosphate (aqueous solution) Sodium Nitrate (aqueous solution)	X ✓
Sodium Peroxide (aqueous solution)	X
Sodium Phosphate (aqueous solution)	X
Sodium Silicate (aqueous solution)	X
Sodium Sulphate (aqueous solution)	✓
Soybean Oil	X
Stannic Chloride (aqueous solution)	✓
Stannous Chloride (aqueous solution)	✓
Stearic Acid	✓
Styrene	X
Sucrose Solution	X
Sugars	✓
Sulphur Sulphur Dioxide (Dry)	✓ ✓
Sulphur Dioxide (Wet)	X
Sulphur Hexafluoride Sulphur Trioxide	X ✓
Sulphuric Acid (up to 80%)	✓
Sulphuric Acid (Conc.) Sulphuric Acid (Dilute)	X ✓
Sulphurous Acid Surface Active Agents (normal solutions of.)	✓ ✓
T	
Tannic Acid	✓
Tanning Extracts	✓
Tar, Bituminous	X
Tartaric Acid Tetrahydrofuram Titanium Tetrachloride	✓ X X
Toluene Toluene Diisocyanate Transformer Oil	X X ✓
Trichlorobenzene Trichloroethane	X X
Triethanolamine	✓
Trinitrotoluene Turpentine	X
U	
Urine	✓
V	
Vegetable Oils Vinegar Vinyl Chloride	X ✓ X
W	
Water	✓
Whiskey, Wines	✓
Whey	✓
Wines and Spirits	✓
Wood Oil	X
X	
Xylene	X
Z	

Zinc Acetate (aqueous solution)	X
Zinc Chloride (aqueous solution)	✓
Zinc Sulphate (aqueous solution)	✓