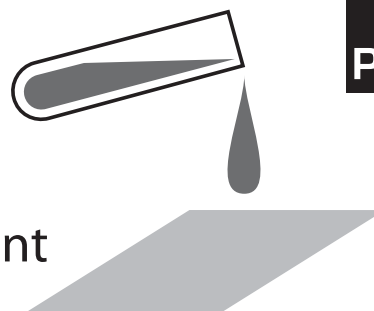


# Chemical Resistance of PVC Products



## PALRAM Technical Support Department

The mechanism of chemical attack on thermoplastics in general, and PALRAM PVC sheets in particular, differs significantly from the mechanism of corrosion of metals. Corrosion of metals results in a gradual loss of surface material as a result of electrolytic action by the relevant chemicals. Chemical attack on PALRAM PVC sheet, where it occurs, consists generally of absorption of the chemical by the PVC sheet and its subsequent swelling. The chemical resistance behavior of PALRAM PVC sheets is therefore simple to determine. The chemical resistance is expressed in terms of weight change (usually an increase) and volume change.

The table that appears in the following pages lists the resistance of PALRAM PVC sheets to a number of commonly encountered chemicals and other corrosive media at room temperature. (Information on chemical resistance at higher temperatures will be supplied upon request.) Where the chemical resistance varies with concentration, the results of tests at different concentrations is presented. The information listed is based on long-term laboratory tests and actual service installations.

For chemicals and corrosive media not listed in the list, please contact your PALRAM representative. He will place you in contact with the PALRAM Technical Support Department.

It is important to note that PALRAM PVC sheets are generally not recommended for use with acetone, ketones, ethers, and aromatic and chlorinated hydrocarbons.

The information on chemical resistance is based on our research and experience. It serves as a basis for recommendation. PALRAM does not guarantee chemical resistance, unless specific tests are carried and separate documentation is supplied.

The table on the following pages uses the following key:

R - Resistant

LR - Limited Resistance (gradual attack over time may occur)

N - Not Resistant (rapid attack or attack over short time period will occur)

Inasmuch as PALRAM Industries has no control over the use to which others may put the product, it does not guarantee that the same results as those described herein will be obtained. Each user of the product should make his own tests to determine the product's suitability for his own particular use including the suitability of environmental conditions for the product. Statements concerning possible or suggested uses of the products described herein are not to be construed as constituting a license under any PALRAM Industries patent covering such use or as recommendations for use of such products in the infringement of any patent. PALRAM Industries or its distributors cannot be held responsible for any losses incurred through incorrect installation of the product. In accordance with our Company policy of continual product development you are advised to check with your local PALRAM Industries supplier to ensure that you have obtained the most up to date information.



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# Chemical Resistance of PVC Products at Room Temperature



Chemical	Concentration %*	Resistance	Chemical	Concentration %*	Resistance
Acetaldehyde	100	N	Bromobenzene		N
Acetic Acid	80	R	Butadiene		N
Acetic Acid	100	LR	Butane		N
Acetic Anhydride		N	Butyl Acetate		N
Acetone		N	Butyl Alcohol		R
Acrylonitrile		N	Butyl Stearate		R
Acetylene		R	Butyric Acid		N
Ajax		R	Calcium Chloride	Saturated	R
Allyl Alcohol		LR	Calcium Hydroxide		R
Aluminum Chloride	Saturated	R	Calcium Hypochlorite		R
Aluminum Fluoride		R	Calcium Nitrate		R
Aluminum Hydroxide		R	Calcium Sulfate		R
Aluminum Sulfate	Saturated	R	Camphor		R
Ammonia (Gas)		R	Carbon Dioxide Gas (Moist)		R
Ammonia (Liquid)		N	Carbon Disulfide		N
Ammonium Acetate		R	Carbon Monoxide		R
Ammonium Bifluoride		R	Carbon Tetrachloride		N
Ammonium Bisulfate		R	Castor Oil		R
Ammonium Chloride		R	Caustic Potash (Potassium Hydroxide)	50	R
Ammonium Fluoride	25	LR	Caustic Soda (Sodium Hydroxide)	50	R
Ammonium Hydroxide	28	R	Chlorine Dioxide	15	R
Ammonium Nitrate		R	Chlorine Gas (Dry)		N
Ammonium Sulfate	Saturated	R	Chlorine Gas (Wet)		N
Ammonium Sulfide	Saturated	R	Chlorine Water	2	R
Amyl Acetate		N	Chloroacetic Acid		R
Amyl Alcohol	Pure	LR	Chlorobenzene		N
Aniline		N	Chloroform		N
Antimony Trichloride		R	Chrome Alum	Saturated	R
Aqua Regia (3 parts HCl:1 part HNO <sub>3</sub> )		N	Chromic Acid	10	R
Arsenic Acid	80	R	Citric Acid	Saturated	R
Barium Chloride		R	Copper Fluoride		R
Barium Hydroxide		R	Copper Nitrate		R
Barium Sulfate		R	Copper Sulfate		R
Barium Sulfide		R	Corn Syrup		R
Beer		R	Cottonseed Oil		R
Beet (Sugar Liquor)		R	Cresol		N
Benzaldehyde		LR	Cresylic Acid	50	R
Benzene		N	Cupric Chloride	Saturated	R
Benzoic Acid		R	Cuprous Chloride	Saturated	R
Benzyl Alcohol		R	Cyclohexane		N
Bleach	12% Chlorine	R	Cyclohexanol		N
Boric Acid		R	Cyclohexanone		N
Brake Fluid		LR	Dextrose		R
Brine		R	Detergent (most)		R
Bromic Acid		R	Diesel Fuel		R
Bromine (Liquid)		N	Diethyl Ether (Ethyl Ether)		R
Bromine (Water)		LR	Dimethyl Amine		N
Bromine (Vapor)	25	R	Diocetyl Phthalate		N

Entries indicate the following: R - resistant, LR - limited resistance, N - not resistant  
 \*concentration of aqueous solution except where noted

# Chemical Resistance of PVC Products at Room Temperature



Chemical	Concentration %*	Resistance	Chemical	Concentration %*	Resistance
Dioxane		N	Linseed Oil		R
Ethanol (Ethyl Alcohol) and Water	All	R	Lithium Bromide		R
Ethanol (Ethyl Alcohol)	Pure	R	Lubricating Oil		R
Ethyl Acetate		N	Magnesium Carbonate		R
Ethyl Chloride		N	Magnesium Chloride		R
Ethylene Chlorohydrin		N	Magnesium Hydroxide		R
Ethylene Dichloride		N	Magnesium Sulfate		R
Ethylene Glycol		R	Maleic Acid		R
Fatty Acids		R	Malic Acid		R
Ferric Acetate		R	Manganese Chloride		R
Ferric Chloride	Saturated	R	Manganese Sulfate		R
Ferric Hydroxide		R	Mercuric Chloride		R
Ferric Nitrate		R	Mercuric Nitrate		R
Ferric Sulfate		R	Mercuric Sulfate		R
Ferrous Chloride		R	Mercury		R
Ferrous Hydroxide		R	Methanol and Water	All	R
Ferrous Sulfate		R	Methanol (Methyl Alcohol)	Pure	R
Fluorine Gas		LR	Methyl Chloride		N
Fluorine Gas (wet)		R	Methyl Ethyl Ketone (MEK)		N
Fluoroboric Acid		R	Methylmethacrylate		R
Formaldehyde		LR	Methyl Sulfate		LR
Formic Acid		R	Methyl Sulfuric Acid		R
Freon 11, 12, 113, 114		LR	Methylamine		N
Fluosilicic Acid		R	Methylene Bromide		N
Fruit Juices and Pulp		R	Methylene Chloride		N
Gasoline		R	Methylene Chlorobromate		N
Glucose		R	Methylene Iodide		N
Glycerine		R	Milk		R
Heptane		R	Mineral Oil		R
Hexane		N	Motor Oil		R
Hydrazine		N	Naphtha		R
Hydrobromic Acid	20	R	Naphthalene		N
Hydrochloric Acid	35	R	Nickel Chloride		R
Hydrofluoric Acid	70	LR	Nickel Nitrate		R
Hydrogen		R	Nickel Sulfate		R
Hydrogen Peroxide	50	R	Nitric Acid	60	R
Hydrogen Sulfide		R	Nitrobenzene		N
Iodine		N	Nitroglycerine		N
Kerosene		R	Nitrous Oxide		R
Ketones		N	Oleic Acid	Saturated	R
Lactic Acid	20	R	Oxalic Acid		R
Laurel Chloride		R	Oxygen		R
Lead Acetate		R	Ozone		R
Lead Chloride		R	Palmitic Acid		R
Lead Nitrate		R	Paracetic Acid	40	LR
Lead Sulfate		R	Perchloric Acid	70	LR
Linoleic Acid		R	Phenol		N
Linoleic Oil		R	Phosphoric Acid	85	R

Entries indicate the following: R - resistant, LR - limited resistance, N - not resistant  
 \*concentration of aqueous solution except where noted

# Chemical Resistance of PVC Products at Room Temperature



Chemical	Concentration %*	Resistance	Chemical	Concentration %*	Resistance
Phosphorous (Yellow)		R	Sodium Ferricyanide		R
Phosphorous Pentoxide		R	Sodium Ferrocyanide		R
Phosphorous Trichloride		N	Sodium Fluoride		R
Photographic Chemicals		R	Sodium Hydroxide	50%	R
Picric Acid		N	Sodium Hypochlorite	16% Chlorine	R
Plating Solutions		R	Sodium Nitrate		R
Potassium Bichromate		R	Sodium Nitrite		R
Potassium Bromate		R	Sodium Perchlorate		R
Potassium Bromide	Saturated	R	Sodium Peroxide		R
Potassium Chloride		R	Sodium Sulfate		R
Potassium Chlorate		R	Sodium Sulfide		R
Potassium Chromate		R	Sodium Sulfite		R
Potassium Cyanide		R	Sodium Thiosulfate		R
Potassium Dichromate		R	Stannic Chloride		R
Potassium Ferricyanide		R	Stannous Chloride		R
Potassium Fluoride		R	Stearic Acid		R
Potassium Hydroxide	50	R	Succinic Acid		R
Potassium Nitrate		R	Sugar	Saturated	R
Potassium Perborate		R	Sulfur Dioxide (Dry Gas)		R
Potassium Perchlorate		R	Sulfuric Acid	<80 (>80)	R (LR)
Potassium Permanganate	10	R	Sulfurous Acid		R
Potassium Persulfate		R	Tannic Acid		R
Potassium Sulfate		R	Tanning Liquors		R
Propane		R	Tartaric Acid		R
Propyl Alcohol (1Propanol)	100	R	Tetraethyl Lead		R
Propylene Dichloride		N	Tetrahydrofuran		N
Propylene Oxide		N	Tetrasodium Pyrophosphate		R
Pyridene		N	Thionyl Chloride		N
Pyrogallic Acid		R	Titanium Tetrachloride		R
Salad Oil		R	Toluene		N
Salicylic Acid		R	Trichloroacetic Acid		R
Selenic Acid		R	Trichloroethylene		N
Silicic Acid		R	Triethanolamine		R
Silver Cyanide		R	Triethylamine		N
Silver Nitrate		R	Trimethylamine		LR
Silver Sulfate		R	Trisodium Phosphate		R
Sodium Acetate		R	Tuepentine		LR
Sodium Benzoate		R	Urea		R
Sodium Bicarbonate		R	Vasilene		N
Sodium Bichromate		R	Vegetable Oils		R
Sodium Bisulfate		R	Vinegar		R
Sodium Bisulfite		R	Vinyl Acetate		N
Sodium Carbonate		R	Water (Deminerlized or Sea)		R
Sodium Chlorate		R	Wine or Whiskey		R
Sodium Chloride		R	Xylene		N
Sodium Chlorite		N	Zinc Chloride		R
Sodium Cyanide		R	Zinc Nitrate		R
Sodium Dichromate		R	Zinc Sulfate		R

Entries indicate the following: R - resistant, LR - limited resistance, N- not resistant

\*concentration of aqueous solution except where noted

The chemical resistance information in this table is based on our research and experience and may be considered solely as a basis for recommendation, but not as a guarantee, unless specifically furnished as such by PALRAM.