

# 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.



Europe  
UK  
Israel  
USA  
Australia  
Far East



### EUROPE

#### PALRAM EUROPE LTD.

Tel ▶ (44) 1302 380 776  
Fax ▶ (44) 1302 380 788  
sales.europe@palram.com

#### PALRAM UK

Tel ▶ (44) 1302 380 738  
Fax ▶ (44) 1302 380 739  
sales@palram.co.uk

### ISRAEL

#### PALRAM ISRAEL LTD.

Tel ▶ (972) 4 8459 900  
Fax ▶ (972) 4 8459 980  
palram@palram.com

### USA

#### PALRAM AMERICAS

Tel ▶ 610 285 9918  
Fax ▶ 610 285 9928  
palramamericas@palram.com

# 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          | Diethyl 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          |
| Pyrogalllic 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 (Demineralized 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.