Makrolon Environmental Resistance

Makrolon polycarbonate sheet may be used in a diverse range of environmental conditions. However, as with any thermoplastic, some environmental conditions have proven to be detrimental to Makrolon sheet. Varying degrees of stress, strain and temperature may also alter the resistance of Makrolon sheet; consequently fabricated parts should be tested thoroughly under actual in-service conditions prior to final design.

Makrolon is resistant to:

Chemicals:
Amyl Alcohol
Aluminum Chloride
Aluminum Sulphate
Ammonium Chloride
Ammonium Nitrate
Ammonium Sulphate
Antimony Trichloride
Arsenic Acid 20%
Butyl Alcohol
Calcium Nitrate
Chlorinated Lime Paste
Chrome Alum
Chromic Acid 20%
Citric Acid 40%
Copper Chloride
Copper Sulphate
Cuprous Chloride
Formic Acid 10%
Formalin 30%
Glycerine
Heptane
Hydrochloric Acid 10%
Hydrogen Peroxide 30%
Hydrofluoric Acid 10%
Isopropanol
Lactic Acid 20%
Magnesium Chloride
Magnesium Sulphate
Manganese Sulphate
Mercuric Chloride
Nickel Sulphate
Nitric Acid 10%
Nitric Acid 20%
Oleic Acid
Oxalic Acid
Pentane
Phosphoric Acid 10%
Potassium Bromate
Potassium Bromide
Potassium Nitrate
Potassium Perchlorate
Potassium Permanganate
Potassium Persulphate
Potassium Sulphate
Silicone Oil
Silver Nitrate
Sodium Bicarbonate
Sodium Bisulphate
Sodium Carbonate
Sodium Chlorate
Sodium Chloride
Sodium Hypochlorite
Sodium Sulphate
Stannous Chloride
Sulfur
Sulfuric Acid 10%*
Sulfuric Acid 50%
Tartaric Acid 30%
Zinc Chloride
Zinc Sulphate

Industrial Petroleum Products:
Axle Oil
Compressor Oil
Diesel Oil
Kerosene
Refined Oil
Spindle Oil
Transformer Oil
Vacuum Pump Oil

Common Household Materials:
Beer
Borax
Cocoa
Cement
Chocolate
Cod Liver Oil
Cognac
Coffee
Detergents (nonionic and anionic)
Fish Oil
Fruit Syrup
Grapefruit Juice
Gypsum
Joy Liquid Detergent
Insulating Tape
Linseed Oil
Liquor
Milk
Mineral Water
Mustard
Olive Oil
Onions
Orange Juice
Paraffin Oil
Rapeseed Oil
Rum
Salad Oil
Salt Solution 10%
Soap (soft and hard)
Table Vinegar
Tincture of Iodine 5%
Tomato Juice
Vodka
Washing Soap
Water
Wine

Sulfuric acid 1% attacks polycarbonate

Makrolon has limited resistance to:

Anti-freeze
Calcium Chloride
Cyclohexanol
Ethylene Glycol
Hydrochloric Acid (concentrate)
Milk of lime (CaOH)
Nitric Acid (concentrate)
Sulfuric Acid (concentrate)

Makrolon is not resistant to:

Acetaldehyde
Acetic Acid (concentrate)
Acetone
Acrylonitrile
Ammonia
Ammonium Fluoride
Ammonium Hydroxide
Ammonium Sulfide
Benzene
Benzoic Acid
Benzyl Alcohol
Brake Fluid
Bromobenzene
Butyric Acid
Carbon Tetrachloride
Carbon Disulfide
Carbonic Acid
Caustic Potash Solution 5%
Caustic Soda Solution 5%
Chlorothene
Chlorobenzene
Cutting Oils
Cyclo Hexanone
Cyclohexene
Dimethyl Formamide
Ethane Tetrachloride
Ethylamine
Ethyl Ether
Ethylene Chlorohydrin
Formic Acid (concentrate)
Freon (refrigerant & propellant)
Gasoline
Lacquer Thinner
Methyl Alcohol
Nitrobenzene
Nitrocellulose Lacquer
Ozone
Phenol
Phosphorous Hydroxy Chloride
Phosphorous Trichloride
Propionic Acid
Sodium Sulfide
Sodium Hydroxide
Sodium Nitrate
Tetradydronaphthalene
Thiophene
Toluene
Turpentine
Xylene

Makrolon is dissolved by:

Chloroform
Cresol
Dioxane
Ethylene Dichloride
Methylene Chloride
Pyridine

In general, Makrolon sheet has good resistance to water, organic and inorganic acids, neutral and acid salts and aliphatic and cyclic hydrocarbons. Alkalines, amines, ketones, esters and aromatic hydrocarbons attack Makrolon. Solvents for Makrolon are: methylene chloride, ethylene dichloride and dioxane

This chemical and solvent resistant listing is intended to assist designers in determining whether Makrolon sheet can be used in certain environments. It is very important to test prototype parts under end-use conditions for final verification of performance. All data is based on 70^{0}F and 0% strain.

Makrolon sheet has good resistance to water up to approximately 150^{0}F Above this temperature, the effect of moisture is time-temperature related. Exposing Makrolon sheet to repeated steam cleaning or dish washing can create hydrolic crazing. The result can be a clouding of the surface and ultimately a loss of physical strength properties.

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