

Chemical Resistance Table Low Density and High Density Polyethylene

Introduction

The table in this document summarises the data given in a number of chemical resistance tables at present in use in various countries, derived from both practical experience and test results.

Source: ISO/TR 7472, 7474; Carlowitz: "Kunststofftabellen-3. Auflage".

The table contains an evaluation of the chemical resistance of a number of fluids judged to be either aggressive or not towards low and high density polyethylene. This evaluation is based on values obtained by immersion of low and high density polyethylene test specimens in the fluid concerned at 20 and 60°C and atmospheric pressure, followed in certain cases by the determination of tensile characteristics.

A subsequent classification will be established with respect to a restricted number of fluids deemed to be technically or commercially more important, using equipment which permits testing under pressure and the determination of the coefficient of chemical resistance for each fluid. These tests will thus furnish more complete indications on the use of low and high density polyethylene products for the transport of stated fluids, including their use under pressure.

Scope and Field Application

This document establishes a provisional classification of the chemical resistance of low and high density polyethylene with respect to about 300 fluids. It is intended to provide general guidelines on the possible utilisation of low and high density polyethylene.

- at temperatures up to 20 and 60°C
- in the absence of internal pressure and external mechanical stress (for example flexural stresses, stresses due to thrust, rolling loads etc).

Definitions, Symbols and Abbreviations

The criteria of classification, definitions, symbols and abbreviations adopted in this document are as follows:

S = Satisfactory

The chemical resistance of low and high density polyethylene exposed to the action of a fluid is classified as "satisfactory" when the results of test are acknowledged to be satisfactory by the majority of the countries participating in the evaluation.

L = Limited

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Chemical Resistance Table Low Density and High Density Polyethylene

The chemical resistance of low and high density polyethylene exposed to the action of a fluid is classified as "limited" when the results of tests are acknowledged to be "limited" by the majority of the countries participating in the evaluation.

Also classified as "limited" is the resistance to the action of chemical fluids for which judgements "S" and "NS" or "L" are pronounced to an equal extent.

NS = Not satisfactory

The chemical resistance of low and high-density polyethylene exposed to the action of a fluid is classified as "not satisfactory" when the results of tests are acknowledged to be "not satisfactory" by the majority of the countries participating in the evaluation.

Also classified as "not satisfactory" are materials for which judgements "L" and "NS" are pronounced to an equal extent.

Sat.sol Saturated aqueous solution, prepared at 20°C

Sol Aqueous solution at a concentration higher than 10%, but not saturated

Dil.sol Dilute aqueous solution at a concentration equal to or lower than 10%

Work.sol Aqueous solution having the usual concentration for industrial use

Solution concentrations reported in the text are expressed as a percentage by mass. The aqueous solution of sparingly soluble chemicals are considered, as far as chemical action towards low or high-density polyethylene is concerned, as saturated solutions.

In general, common chemical names are used in this document.

The table is made as a first guideline for user of polyethylene. If a compound is not to be found or if there is an uncertainty on the chemical resistance in an application, please contact Borealis for advice and proposal on testing.

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Chemical or Product	Concentration	HD °C	
		20	60
Acetaldehyde	100 %	S	L
Acetanilide	-	S	S
Acetic acid	10 %	S	S
Acetic acid	60 %	S	S
Acetic acid, glacial	Greater than 96 %	S	L
Acetic anhydride	100 %	S	L
Acetone	100 %	L	L
Acrylnirile	-	S	S
Acetylsilicacid	-	S	S
Adipic acid	Sat.sol	S	S
After shave	-	NS	NS
Aliphatic hydrocarbons	-	L	L
Allyl acetate	-	S	L
Allyl alcohol	100 %	-	-
Allyl alcohol	96 %	S	S
Aliminum chloride	-	L	NS
Aliminum fluoride	Sat.sol	S	S
Aliminum hydroxide	Sat.sol	S	S
Aliminum nitrite	Sat.sol	S	S
Aliminum oxychloride	Sat.sol	S	S
Aliminum sulphate	Sat.sol	S	S
Aliminum sulphate	Sat.sol	S	S
Alums	Sol	S	S
Aminobenzoic acid	-	S	S
Ammonia, dry gas	100 %	S	S
Ammonia liquid	100 %	S	S
Ammonia aqueous	Dil.sol	S	S
Ammonium acetate	-	S	S
Ammonium carbonate	Sat.sol	S	S
Ammonium chloride	Sat.sol	S	S
Ammonium fluoride	Sol	S	S
Ammonium hexafluorosilicate	Sat.sol	S	S
Ammonium hydrogen caronate	Sat.sol	S	S

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		20	60
Ammonium hydroxide	10 %	S	S
Ammonium hydroxide	30 %	S	S
Ammonium metaphosphate	Sat.sol	S	S
Ammonium nitrate	Sat.sol	S	S
Ammonium oxalate	Sat.sol	S	S
Ammonium phosphate	Sat.sol	S	S
Ammonium persulphate	Sat.sol	S	S
Ammonium sulphate	Sat.sol	S	S
Ammonium sulphide	Sol	S	S
Ammonium thiocyanate	Sat.sol	S	S
Amyl acetate	100 %	L	L
Amyl alcohol	100 %	S	L
Amyl chloride	100 %	-	-
Amyl phthalate	-	S	L
Aniline	100 %	S	L
Anilinchlorohydrate	-	-	-
Antimony (III) chloride	90 %	S	S
Antimony (III)	Sat.sol	S	S
Antimony trichloride	Sol	S	S
Apple juice	Sol	S	L
Aqua regia	HCl/HNO ₃ =3/1	NS	NS
Aromatic hydrocarbons	-	NS	NS
Arsenic acid	Sat.sol	S	S
Asorbic	10 %	S	S
Barium bormide	Sat.sol	S	S
Barium carbonate	Sat.sol	S	S
Borium chloride	Sat.sol	S	S
Barium hydroxide	Sat.sol	S	S
Barium sulphate	Sat.sol	S	S
Barium sulphide	Sat.sol	S	S
Beer	-	S	S
Benzaldehyde	100 %	S	L
Benzene	100 %	L	L
Benzoic acid	Sat.sol	S	S
Benzoylchloride	-	S	L

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		20	60
Benzyl alcohol	-	S	S
Benzylsulphonic acid	10 %	S	S
Bismuty carbonate	Sat.sol	S	S
Bitumen	-	S	S
Bleach lye	10 %	S	S
Borax	Sat.sol	S	S
Boric acid	Sat.sol	S	S
Boron trifluoride	-	L	NS
Brake fluid	-	L	NS
Brine	-	S	S
Bromine, dry gas	100 %	NS	NS
Bromine, liquid	100 %	NS	NS
Bromoform	100 %	NS	NS
Butandiol	10 %	S	S
Butandiol	60 %	S	S
Butandiol	100 %	S	S
Butane, gas	100 %	S	S
Butanol	100 %	S	S
Butter	-	S	S
Butyl acetate	100 %	S	L
Butyl alcohol	100 %	S	S
Butyl chloride	-	S	-
Bytylene glycol	10 %	S	S
Bytylene glycol	60 %	S	S
Bytylene glycol	100 %	S	S
Butyraldehyde	-	S	L
Butyric acid	100 %	S	L
Calcium arsenate	-	S	S
Calcium benzoate	-	S	S
Calcium bisulphide	-	S	S
Calcium bromate	10 %	S	S
Calcium bromide	Sat.sol	S	S
Calcium carbonate	Sat.sol	S	S
Calcium chlorate	Sat.sol	S	S
Calcium chloride	Sat.sol	S	S

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		20	60
Calcium chromate	40 %	S	S
Calcium cyanide	-	S	S
Calcium hydrosulphide	Sol	S	S
Calcium hydroxide	Sat.sol	S	S
Calcium hypochlorite	Sol	S	S
Calcium nitrate	Sat.sol	S	S
Calcium oxide	Sat.sol	S	S
Calcium perchlorate	1 %	S	S
Calcium permanganate	20 %	S	S
Calcium persulphate	Sol	S	S
Calcium sulphate	Sat.sol	S	S
Calcium sulphide	Dil.sol	L	L
Camphor oil	-	L	L
Carbon dioxide, dry gas	100 %	S	S
Carbon dioxide, wet	-	S	S
Carbon disulphide	100 %	L	NS
Carbon monoxide	100 %	S	S
Carbon tetrachloride	100 %	L	NS
Carbonic acid		S	S
Castor oil	Sol	S	S
Chlorine, water	2 % sat.sol	S	S
Chlorine, aqueous	Sat.sol	L	NS
Chlorine, dry gas	100 %	L	NS
Chloroacetic acid	Sol	S	S
Chlorobenzene	100 %	NS	NS
Chloroethanol	100 %	S	S
Chloroform	100 %	NS	NS
Chloromethane, gas	100 %	L	-
Chlorosulphonic acid	100 %	NS	NS
Chloropropene	-	L	-
Chrome alum	Sol	S	S
Chrome acid	Sat.sol	-	-
Chrome acid	20 %	S	L
Chrome acid	50 %	S	L
Chromium VI oxide	Sat.sol	S	S
Cider	-	S	S

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		20	60
Citric acid	Sat.sol	S	S
Citric acid	10 %	S	S
Cirtic acid	25 %	S	S
Coconut oil alcoholic	-	S	S
Coffee	-	S	S
Copper (II) chloride	Sat.sol	S	S
Copper cyanide	Sat.sol	S	S
Copper (II) fluoride	Sat.sol	S	S
Copper (II) fluoride	2 %	S	S
Copper (II) nitrate	Sat.sol	S	S
Copper (II) sulphate	Sat.sol	S	S
Corn oil	-	S	S
Cottonseed oil	-	S	S
Cresylic acid	Sat.sol	L	-
Crotonaldehyde	Sat.sol	-	-
Cyclanone	-	S	S
Cyclohexane	-	NS	NS
Cyclohexanol	Sat.sol	-	-
Cyclohexanol	100 %	S	S
Cyclohexanone	100 %	S	L
Decahydronaphthalene	100 %	S	L
Decane	-	L	NS
Decalin	100 %	S	L
Detergents, synthetic	-	S	S
Developers (photographic)	Work.conc	S	S
Dextrin	Sol	S	S
Dextrose	Sol	S	S
Diacetone alcohol	-	L	L
Diazo salts	-	S	S
Dibutyl amine	-	L	NS
Dibutyl ether	-	L	-
Dibutylphthalate	-	S	L
Dichlorobenzene	-	NS	NS
Dichloropropylene	-	NS	NS
Diesel oil	-	S	L

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Chemical or Product	Concentration	HD °C	
		20	60
Diethyl ether	100 %	L	-
Diethyl ketone	-	L	L
Diethylene glycol	-	S	S
Diglycolic acid	-	S	S
Diisobutylketone	100 %	S	L
Dimethyl amine	100 %	-	-
Dimethyl formamid	-	S	S
Diocetyl phtalate	100 %	S	L
Dioxan	100 %	S	S
Dipentene	-	NS	NS
Disodium phosphate	-	S	S
Drano, plumbing cleaner	-	S	S
Emulsions, photographic	-	S	S
Ehtandiol	100 %	S	S
Ethanol	40 %	S	L
Ethanol	96 %	-	-
Ethyl acetate	100 %	S	NS
Ethyl acrylate	100 %	L	NS
Ethyl alcohol	35 %	S	S
Ethyl alcohol	100 %	S	S
Ethyl benzene	-	NS	NS
Ethyl chloride	100 %	NS	NS
Ethylene chloride	100 %	NS	NS
Ethylene diamine	100 %	S	S
Ethyl ether	-	NS	NS
Ethylene glycol	100 %	S	S
Ethyl mercaptan	-	NS	NS
Ferric chloride	Sat.sol	S	S
Ferric nitrite	Sat.sol	S	S
Ferric sulphate	Sat.sol	S	S
Ferrous chloride	Sat.sol	S	S
Ferrous sulphate	Sat.sol	S	S
Fich solubles	Sol	S	S
Fluoboric acid	-	S	S

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Chemical or Product	Concentration	HD °C	
		20	60
Fluorine gas	100 %	NS	NS
Fluorine gas, dry	100 %	NS	NS
Fluorine gas, wet	100 %	NS	NS
Fluorosilic acid	Conc	S	L
Fluorosilic acid	40 %	S	S
Formaldehyde	40 %	S	S
Formic acid	40 %	S	S
Formic acid	98 to 100 %	S	S
Fructose	Sat.sol	S	S
Fruit pilps	Sol	S	S
Furfural	100 %	NS	NS
Furfural alcohol	100 %	S	L
Gallic acid	Sat.sol	S	S
Gasoline, petrol	-	L	L
Gelatine	-	S	S
Glucose	Sat.sol	S	S
Glycerine	100 %	S	S
Glycerol	100 %	S	S
Glycolic acid	30 %	-	-
Glycolic acid	Sol	S	S
n-Heptane	100 %	L	NS
Hexachlorobenzene	-	S	L
Hexachlorophene	-	L	L
Hexamethylenetrimine	40 %	S	-
Hexane	-	S	L
Hexanol, tertiary	-	S	S
Hydrobromic acid	50 %	S	S
Hydrobromic acid	Up to 100 %	S	S
Hydrobromic acid	Up to 36 %	S	S
Hydrobromic acid	Conc	S	S
Hydrochlorous acid	Conc	S	S
Hydrucyanic acid	10 %	S	S
Hydrocyanic acid	Sat.sol	S	S
Hydrofluoric acid	40 %	S	S

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Chemical or Product	Concentration	HD °C	
		20	60
Hydrofluoric acid	60 %	S	L
Hydrogen	100 %	S	S
Hydrogen chloride	Dry gas	S	S
Hydrogen peroxide	30 %	S	S
Hydrogen peroxide	90 %	S	NS
Hydrogen sulphide gas	100 %	S	S
Hydroquinone	Sat.sol	-	-
Hydroxylamine	Up to 12 %	S	S
Inks	-	S	S
Iodine (in potassium sil)	-	NS	NS
Iodine (in alcohol)	-	NS	NS
Iron (II) chloride	Sat.sol	S	S
Iron (II) sulphate	Sat.sol	S	S
Iron (III) chloride	Sat.sol	S	S
Iron (II) nitrate	Sol	S	S
Iron (III) sulphate	Sat.sol	S	S
Iso octane	100 %	S	L
Iso pentane	-	NS	NS
Isopropanol	-	S	S
Isopropy amine	-	NS	NS
Isopropyl ether	100 %	S	NS
Kerosene	-	NS	NS
Lactic acid	10 %	S	S
Lactic acid	28 %	S	S
Lactic acid	Up to 100 %	S	S
Latex	-	S	S
Lead acetate	Dil.sol	S	S
Lead acetate	Sat.sol	S	S
Lead arsenate	-	S	S
Lubricating oil	-	S	S
Lysol	-	L	NS

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Chemical or Product	Concentration	HD °C	
		20	60
Magnesium carbonate	Sat.sol	S	S
Magnesium chloride	Sat.sol	S	S
Magnesium hydroxide	Sat.sol	S	S
Magnesium nitrite	Sat.sol	S	S
Magnesium sulphate	Sat.sol	S	S
Maleic acid	Sat.sol	S	S
Mercury	-	S	S
Mercury (I) nitrite	Sol	S	S
Mercury (II) chloride	Sat.sol	S	S
Mercury (II) Cyanide	Sat.sol	S	S
Mercury	100 %	S	S
Methanol	100 %	S	S
Methyl alcohol	100 %	S	S
Methyl benzoic acid	Sat.sol	L	-
Methyl bromide	100 %	NS	NS
Methyl chloride	100 %	NS	NS
Methylcyclohexane	-	L	NS
Methyl ethyl ketone	100 %	S	L
Methylene chloride	-	NS	NS
Methoxybutanol	100 %	S	L
Milk	-	S	S
Milk of Magnesia	-	S	L
Mineral oils	-	S	L
Molasses	Work.conc	S	S
Motor oil	-	S	S
Naphtha	-	L	NS
Naphtahalene	-	L	-
Nickel chloride	Sat.sol	S	S
Nickel nitrate	Sat.sol	S	S
Nickel sulphate	Sat.sol	S	-
Nicotine	Dil.sol	S	S
Nicotinic acis	Dil.sol	S	-
Nitric acid	25 %	S	S
Nitric acid	50 %	S	L
Nitric acid	70 %	S	L

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		20	60
Nitric acid	95 %	NS	NS
Nitric acid	100 %	NS	NS
Nitrobenzene	100 %	NS	NS
Nitroethane	100 %	S	NS
Nitromethane	100 %	S	-
Nitrotoluene	-	NS	NS
n-Octane	-	S	S
Octyl alcohol	-	S	NS
Oil and fats		S	L
Oleic acid	100 %	S	S
Oleum (H ₂ SO ₄ + 10 % SO ₃)		NS	NS
Oleum (H ₂ SO ₄ + 50 % SO ₃)		NS	NS
Olive oil	-	S	NS
Orthophosphoric acid	50 %	S	S
Orthophosphoric acid	95 %	S	L
Oxalic acid	Sat.sol	S	S
Oxygen	100 %	S	L
Ozone	100 %	L	NS
Paraffin oil	-	S	S
n-Pentane	-	NS	NS
Pentane-2	-	NS	NS
Perchloric acid	20 %	S	S
Perchloric acid	50 %	S	L
Perchloric acid	70 %	S	NS
Perchloroethylene	-	NS	NS
Phenol	Sol	S	S
Phosphine	100 %	S	S
Phosphoric acid	Up to 25 %	S	S
Phosphoric acid	25 to 50 %	S	S
Phosphoric (III) chloride	100 %	S	L
Phosphorous (II) chloride	100 %	S	L
Phosphorous pentoxide	100 %	S	S
Phosphorous trichloride	100 %	S	L
Photographic solutions	-	S	S

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Chemical or Product	Concentration	HD °C	
		20	60
Phtalic acid	50 %	S	S
Picric acid	Sat.sol	S	-
Plating solutions	-	S	S
Potassium acetate	-	S	S
Potassium aluminium sulphate	Sat.sol	S	S
Potassium bezoate	-	S	S
Potassium bicarbonate	Sat.sol	S	S
Potassium borate	Sat.sol	S	S
Potassium bromate	Sat.sol	S	S
Potassium bromide	Sat.sol	S	S
Potassium carbonate	Sat.sol	S	S
Potassium chlorate	Sat.sol	S	S
Potassium chloride	Sat.sol	S	S
Potassium chromate	Sat.sol	S	S
Potassium cyanide	Sol	S	S
Potassium dichromate	Sat.sol	S	S
Potassium fluoride	Sat.sol	S	S
Potassium hexacyanoferrate (III)	Sat.sol	S	S
Potassium hexacyanoferrate (II)	Sat.sol	S	S
Potassium hexafluorosilicate	Sat.sol	S	S
Potassiumhydrogen carbonate	Sat.sol	S	S
Potassium hydrogen sulphate	Sat.sol	S	S
Potassium hydrogen sluphide	Sol	S	S
Potassium hydroxide	10 %	S	S
Potassium hydroxide	Sol	S	S
Potassium hypochlorite	Sol	S	L
Potassium iodate	10 %	S	S
Potassium iodate	Sat.sol	S	S
Potassium nitrate	Sat.sol	S	S
Potassium orthophosphate	Sat.sol	S	S
Potassium oxalate	Sat.sol	S	S
Potassium perchlorate	Sat.sol	S	S
Potassium permanganate	20 %	S	S
Potassium persulphate	Sat.sol	S	S
Potassium phosphate	Sat.sol	S	S
Potassium sulphate	Sat.sol	S	S

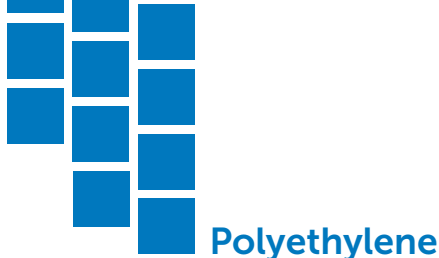
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		20	60
Potassium sulphide	Sol	S	S
Potassium sulphite	Sat.sol	-	-
Potassium thiocyanate	Sat.sol	S	S
Potassium thiosulphate	Sat.sol	S	S
Propargul alcohol	-	S	S
n-Propyl alcohol	-	S	S
Propionic acid	50 %	S	S
Propionic acid	100 %	S	L
Propylene dichloride	100 %	NS	NS
Propylene glycol	-	S	S
Pyridine	100 %	S	L
Quinol (hydroquinone)	Sat.sol	S	S
Salicylic	Sat.sol	S	S
Sea water	-	S	S
Selenic acid	-	S	S
Silicon oil	-	S	S
Silver acetate	Sat.sol	S	S
Silver cyanide	Sat.sol	S	S
Silver nitrate	Sat.sol	-	-
Sop solution	100 %	S	S
Soduim acetate	Sat.sol	-	-
Soduim antimonate	Sat.sol	S	S
Soduim arsenite	Sat.sol	S	S
Soduim benzoate	Sat.sol	S	S
Soduim bicarbonate	Sat.sol	S	S
Soduim bisulphate	Sat.sol	S	S
Soduim bisulphite	Sat.sol	S	S
Soduim borate	-	S	S
Soduim bromide	Sat.sol	S	S
Soduim carbonate	Sat.sol	S	S
Soduim chlorate	Sat.sol	S	S
Soduim chloride	Sat.sol	S	S
Soduim chlorite	Sat.sol	-	-
Soduim cyanide	Sat.sol	S	S

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		20	60
Sodium dichromate	Sat.sol	S	S
Sodium fluoride	Sat.sol	S	S
Sodium hexacyanoferrate (III)	Sat.sol	S	S
Sodium hexacyanoferrate (II)	Sat.sol	S	S
Sodium hexafluorosilicate	Sat.sol	S	S
Sodium hydrogen carbonate	Sat.sol	S	S
Sodium hydrogen sulphate	Sat.sol	S	S
Sodium hydrogen sulphite	Sol	S	S
Sodium hydroxide	40 %	S	S
Sodium hydroxide	Sol	S	S
Sodium hypochloride	-	S	S
Sodium hypochlorite	15 % available Cl	S	S
Sodium iodate	10 %	S	S
Sodium iodite	Sat.sol	S	S
Sodium nitrate	Sat.sol	S	S
Sodium nitrite	Sat.sol	S	S
Sodium orthophosphate	Sat.sol	S	S
Sodium oxalate	Sat.sol	S	S
Sodium phosphite	Sat.sol	S	S
Sodium silicate	Sol	S	S
Sodium sulphate	Sat.sol	S	S
Sodium sulphide	Sat.sol	S	S
Sodium sulphite	Sat.sol	S	S
Sodium thiocyanate	Sat.sol	S	S
Stannic chloride	Sat.sol	S	S
Stannous chloride	Sat.sol	S	S
Starch solution	Sat.sol	S	S
Stearic acid	Sat.sol	S	-
Styrene	Sol	L	NS
Sulphur dioxide, dry	100 %	S	S
Sulphur trioxide	100 %	NS	NS
Sulphur acid	10 to 50 %	S	S
Sulphuric acid	10 %	S	S
Sulphuric acid	50 %	S	S
Sulphuric acid	70 %	S	L
Sulphuric acid	80 %	S	NS

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Chemical Resistance Table Low Density and High Density Polyethylene

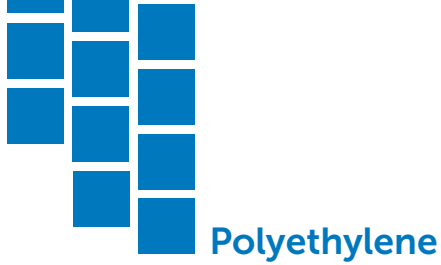
Chemical or Product	Concentration	HD °C	
		20	60
Sulphuric acid	98 %	S	NS
Sulphuric acid	Fuming	NS	NS
Sulphurous acid	30 %	S	S
Sulphurous acid	Sol	S	S
Tallow	-	S	L
Tannic acid	Sol	S	S
Tartaric acid	Sat.sol	S	S
Tartaric acid	Sol	S	S
Tetrachloroethylene	100 %	NS	NS
Tetrachloromethane	100 %	L	NS
Tetradecane	-	NS	NS
Tetrahydrofuran	-	NS	NS
Tetrahydronaphthalene	100 %	S	L
Thionyl chloride	100 %	NS	NS
Tin (II) chloride	Sat.sol	S	S
Tin (IV) chloride	Sol	S	S
Tin (IV) chloride	Sat.sol	S	S
Titanium tetrachloride	Sat.sol	NS	NS
Toluene	100 %	L	NS
Tribromomethane	-	NS	NS
Trichloroacetaldehyde	-	S	-
Trichlorobenzene	-	-	-
Trichloroethylene	100 %	NS	NS
Triethanolamine	100 %	S	-
Triethanolamine	Sol	S	L
Triethylene glycol	-	S	S
Trisodium phosphate	Sat.sol	-	-
Turpentine	-	NS	NS
Urea	Up to 30 %	S	S
Urea	Sol	S	S
Urine	-	S	S
Vanilla extract	-	S	S
Vaseline	-	S	S

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Chemical Resistance Table Low Density and High Density Polyethylene

Chemical or Product	Concentration	HD °C	
		20	60
Vegetables oils		S	S
Vinegar		S	S
Water		S	S
Wetting agents	-	S	S
Wines and spirits		S	S
Xylene	100 %	L	NS
Yeast	Sol	S	S
Zinc bromide	Sat.sol	S	S
Zinc carbonate	Sat.sol	S	S
Zinc chloride	Sat.sol	S	S
Zinc oxide	Sat.sol	S	S
Zinc stearate	-	S	S
Zinc sulphate	Sat.sol	S	S
o-Zylene		NS	NS
p-Zylene	-	NS	NS

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