CHEMICAL RESISTANCE OF LDPE, HDPE & PP

Chemical substance	HDPE		LDPE		PP	
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Acetaldehyde	-	-	+	--	-	--
Acetamide, saturated	++	++	++	++	++	++
Acetic acid, 100 % (Glacial acetic acid)	o	o	o	o	++	-
Acetic acid, 50 %	++	++	++	++	++	++
Acetone	++	++	-	-	++	-
Acetonitrile	++	++	++	++	-	--
Acetophenone	o	o	++	o	++	-
Acetylene, 100 %	++	o	++	o	++	o
Acrylonitrile	++	++	++	-	-	--
Adipic acid, saturated	++	++	++	+	++	++
Allyl alcohol, 96 %	++	-	-	-	+	+
Aluminium chloride, 10 %	++	++	++	+	++	++
Aluminium oxide, solid	++	++	++	++	++	++
Amino acids, generally	++	++	++	++	++	++
Ammonia, aquaous, 25 %	++	++	++	++	++	++
Ammonium chloride, aquaous	++	++	++	++	++	++
Ammonium hydroxide solution	+	+	+	o	+	+
Ammonium hydroxide, 5 %	++	++	++	++	++	++
Ammonium nitrate, aquaous, saturated	+	+	+	o	+	+
Ammonium oxalate	++	++	++	+	++	+
Ammonium sulfide	++	++	++	++	++	++
Ammonium sulphate, aquaous, saturated	+	+	+	o	+	+
Amyl acetate, n-	++	+	+	-	-	--
Amyl alcohol (1-Pentanol)	++	++	++	+	++	++
Aniline	++	+	++	-	+	-
Anti-freeze agent (Diethylene glycol)	++	++	++	++	++	++
Aqua regia	--	--	--	--	--	--
Barium chloride	++	++	++	++	++	++
Battery acid (sulphuric acid, 38 %)	+	+	+	+	+	+
Benzene	-	--	-	--	-	--
Benzoic acid, saturated	++	++	++	++	++	-
Benzyl alcohol	-	--	--	--	--	--
Benzyldehyde	++	-	-	-	++	--
Bleaching solution (NaOCl, 12.5 % chlorine)	-	--	o	o	-	-
Blood	+	+	+	+	+	+

\+ good resistance (less damage of the material)

++ very good resistance (virtually no damage of the material)

\- poor resistance (not recommended)

-- no resistance (heavy damage up to the complete destruction of the material)

o no value existing

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Chemical substance	HDPE		LDPE		PP	
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Boric acid, 10 %	++	++	++	++	++	++
Boric acid, 100 %	+	+	o	o	+	+
Brake fluid	++	o	++	o	++	++
Bromine	--	--	--	--	--	--
Bromine vapours	--	o	--	o	--	o
Bromobenzene	-	--	--	--	--	--
Butadiene (1,3-Butadiene)	-	--	--	--	--	--
Butane, gaseous (n-)	+	+	+	+	+	+
Butanol, technical pure (n-)	++	++	++	-	++	+
Butyl acetate	++	+	+	-	-	--
Butyric acid	-	--	--	--	--	--
Calcium carbonate, aquaous, saturated	++	++	++	++	++	++
Calcium chloride, aquaous	++	++	++	++	++	++
Calcium hydroxide, concentrated	++	++	++	++	++	++
Calcium hypochlorite, saturated	++	++	++	++	++	++
Calcium nitrate, aquaous, saturated	++	++	++	o	++	++
Calcium sulphate, saturated	++	++	++	++	++	++
Carbazole	++	++	++	++	++	++
Carbon dioxide	++	++	o	o	++	++
Carbon disulphide	--	--	--	--	--	--
Carbon tetrachloride	-	--	--	--	--	--
Cellosolve acetate	++	++	++	+	++	+
Chlorinated water	-	o	o	--	-	--
chlorine, gaseous, anhydrous	-	--	-	--	--	o
Chlorobenzene	-	--	-	--	-	--
Chloroform	-	--	--	--	+	-
Chromic acid, 10 %	++	++	++	++	++	++
Chromosulphuric acid	--	--	-	--	--	--
Citric acid, 10 %	++	++	++	++	++	++
Cresol	-	--	--	--	+	-
Crude oil	+	+	+	o	+	-
Cyclohexane	-	--	-	--	-	--
Cyclohexanol	+	+	+	+	+	-
Decalin (Decahydronaphthalene)	++	+	+	--	+	--
Diammonium hydrogen phosphate	++	++	++	++	++	++

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Chemical substance	HDPE		LDPE		PP	
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Dibutyl phthalate	++	-	-	-	+	+
Dichlorobenzene	-	-	-	--	-	--
Diesel fuel	+	+	+	o	+	+
Diethyl ether	-	--	--	--	--	--
Diethylbenzene	-	--	--	--	--	--
Dimethylformamide	++	++	++	-	++	++
Dioxin, 1,4	+	+	+	-	-	-
Ethanol, 50 %	++	++	++	++	++	++
Ethanol, 96 %	++	++	-	++	++	++
Ether	-	--	--	--	--	--
Ethyl acetate	++	-	-	--	++	-
Ethyl acrylate, 100 %	--	--	--	--	--	--
Ethyl chloride	-	-	-	--	-	--
Ethyl ether, technical pure	-	o	+	-	--	--
Ethylbenzene	+	-	-	--	-	--
Ethylene glycol (PEG)	++	++	++	++	++	++
Ethylene oxide	+	-	-	-	-	-
Film developer	++	-	++	++	++	+
Film fixing bath	++	o	++	++	++	++
Fluorides	++	++	++	++	++	++
Fluorine	--	--	--	--	--	--
Formaldehyde, 40 %	++	+	+	-	++	+
Formic acid, 98-100 %	++	++	++	+	++	-
Fuel oil (domestic)	-	-	-	--	++	-
Glucose	++	++	++	++	++	++
Glycerin	++	++	++	++	++	++
Glycol	+	+	+	+	+	+
Heptane, n-	+	-	-	--	+	--
Hexane, n-	+	-	--	--	+	-
Hydraulic oil	+	+	o	o	+	+
Hydrazine hydrate, aquaous	++	++	++	o	++	++
Hydrobromic acid	++	++	++	+	++	+
Hydrochloric acid, 20 %	++	++	++	++	++	++
Hydrocyanic acid, aquaous	++	++	++	++	++	++
Hydrofluoric acid, 50 %	++	++	++	++	++	++

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Chemical substance	HDPE		LDPE		PP	
	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Hydrogen peroxide, 10 %	+	+	+	+	+	+
Hydrogen peroxide, 30 %	-	+	+	+	+	+
Iodine tincture	++	-	++	-	++	+
Isopropanol, technical pure	++	++	++	++	++	++
Isopropyl acetate	++	+	+	-	+	-
Kerosine	+	+	-	--	-	-
Kerosine, technical pure	++	-	-	--	++	-
Lactic acid, 85 %	++	++	++	++	++	+
Lanolin (wool fat), technical pure	++	-	++	-	++	-
Lead acetate, aquaous	++	++	++	++	++	++
Lemon juice	+	+	+	o	+	+
Linseed oil	+	+	+	o	+	+
Lubricant oils	++	-	+	-	-	o
Machine oil, 100 %	o	o	++	--	++	-
Menthol, 100 %	++	-	-	--	++	-
Mercury chloride	++	++	++	++	++	++
Mercury, pure	++	++	++	++	++	++
Metal salts, generally, dissolved	++	++	++	++	++	++
Methane, gaseous	+	+	+	o	+	+
Methanol	++	++	++	++	++	++
Methyl acetate, 100 %	++	o	++	++	++	-
Methyl ethyl ketone (MEK)	++	-	-	--	++	-
Methylene chloride	--	--	--	--	-	--
Milk	+	+	+	+	+	+
Mineral oil	++	++	+	--	++	-
Monochloracetic acid	++	++	++	++	++	+
Naphthalene, 100 %	+	-	--	o	o	o
Nitric acid, 50 %	+	--	-	--	-	--
Nitrobenzene	-	--	--	--	+	--
Octane, n-	++	++	++	++	++	++
Oils and fats, herbal	++	-	++	-	++	-
Oleic acid	+	-	+	-	+	+
Olive oil	+	+	+	o	+	+
Oxalic acid	++	++	++	++	++	++
Paraffin oil, 100 %	+	+	+	o	+	+

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	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Paraffin, 100 %	+	+	+	o	+	+
Perchlorethylene (PER)	--	--	--	--	--	--
Perchloric acid	+	--	+	--	+	--
Petrol	+	-	-	--	-	--
Phenol, 100 %	+	-	-	-	++	+
Phenylhydrazine, technical pure	-	o	o	o	-	--
Phosphoric acid, 85 %	++	++	++	++	++	+
Pine needle oil, 100 %	+	+	+	o	+	+
Potassium carbonate, aquaous, saturated	+	+	+	+	+	+
Potassium chloride, aquaous, saturated	+	+	+	+	+	+
Potassium hydroxide solution, 50 %	++	++	++	++	++	++
Potassium nitrate, aquaous, saturated	+	+	+	+	+	+
Potassium perchlorate, saturated	++	++	++	++	++	++
Potassium permanganate	++	-	++	++	++	++
Potassium sulphate, aquaous, saturated	+	+	o	o	+	+
Propane, gaseous	-	--	--	--	+	--
Propane, liquid	+	+	+	+	+	+
Propylene glycol (PG)	++	++	++	++	++	++
Propylene oxide	++	++	++	+	++	+
Pyridine	++	-	o	+	-	-
Resorcin, saturated	++	++	++	++	++	++
Salicylic acid, saturated	++	++	++	++	++	++
Salicylic aldehyde	++	++	++	+	++	+
Sea water	+	+	+	+	+	+
Silicone oil	+	+	+	+	+	+
Silver acetate	++	++	++	++	++	++
Silver nitrate	++	++	++	+	++	+
Sodium acetate	++	++	++	++	++	++
Sodium bisulfite, aquaous, saturated	+	+	o	o	+	+
Sodium carbonate	++	++	++	++	++	++
Sodium chlorate, aquaous, 25 %	+	+	o	o	+	+
Sodium chloride	++	++	++	++	++	++
Sodium dichromate	o	o	++	++	++	++
Sodium hydroxide, 100 % (caustic soda)	+	+	+	o	+	-
Sodium hydroxide, 50 % (soda lye)	++	++	++	++	++	++

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	20 °C	50 °C	20 °C	50 °C	20 °C	50 °C
Sodium hypochloride, 15 %	++	++	++	++	++	++
Sodium hypochloride, 50 %	-	-	-	-	-	-
Sodium thiosulphate (fixing salt), saturated	+	+	o	o	+	+
Softener, generally	++	-	++	-	++	-
Soya oil	+	+	+	o	+	+
Stearic acid, crystalline	++	-	++	-	++	-
Sulphur dioxide, humid	++	++	++	++	++	-
Sulphuric acid, 95 %	-	--	-	--	-	--
Tar	+	o	o	o	+	o
Tetrahydrofuran	-	--	--	--	-	--
Thionyl chloride, technical pure	--	--	--	--	--	--
Toluene	-	--	-	--	+	--
Trichlorethylene, 100 %	-	--	--	--	--	--
Turpentine oil	+	+	-	--	--	--
Urea	++	++	++	++	++	++
Vinyl chloride, technical pure	o	o	o	o	-	-
Water	++	++	++	++	++	++
White spirit	+	+	+	+	+	+
Xylene	--	--	-	--	--	o

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The mentioned resistance levels are only guide values, because the chemical resistance depends on many parameters, e. g. the concentration and temperature of the chemical, as well as simultaneous mechanical stress to the plastic. Anyhow, it is recommended to do some preliminary tests under the real conditions of the final application. Th. Geyer assumes no liability for the following recommendations.

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