

Explanation

Symbol	Meaning	Notes
++	Good	The product has no effect
+	Fair	Less suitable grades and unfavourable conditions give rise to difficulties
o	Doubtful	Application of PE as packaging material (bottles) involves hazards which can be disregarded in some special cases only
-		Is not recommended for packaging applications
v	Unsuitable	The product produces inflammable, toxic or unpleasant-smelling vapours
CO ₂		Permeable to carbon dioxide
O ₂		Permeable to oxygen

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
A						
Acetaldehyde	++	++	o	o	-	V
Acetanilide	++	++	++	++	++	
Acetic acid 5%	++	++	+	++	++	
Acetic acid 50%	++	++	+	+	+	V
Acetic anhydride	++	++	o	o	o	V
Acetone	++	++	o	o	-	V
Acetophenone	++	++	+	o	-	V
Acetylsalicylic acid	++	++	++	++	++	
Acrylonitrile	++	++	+	o	-	V
Adipic acid	++	++	+	+	+	
Alcohol	++	++	o	+	+	
Allyl alcohol	++	++	+	o	o	V
Alum (all types)	++	++	++	++	++	
Aluminium oxide	++	++	++	++	++	
Aluminium salts						See page 24
Amino acids	++	++	++	++	++	
Ammonia	++	++	++	++	++	CO ₂
Ammonium salts						See page 24
Ammonium-nitrate lime	++	++	++	++	++	
Amylacetate	++	++	o	o	-	V
Amylalcohol	++	++	+	+	+	V
Aniline	++	++	o	o	o	V

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Aniline dyes dry, -oil-soluble	++	++	+	+	+	
Aniline dyes dry, -water-soluble	++	++	++	+	+	
Aniline salts	++	++	+	+	+	
Aniseed oil	++	++	+	-	-	V
Anisole	++	++	o	o	-	V
Anthraquinone	++	++	+	++	++	
Antifreeze	++	++	+	++	++	
Antimony	++	++	++	++	++	
Antimony compounds						See page 24
Aqua regia	-	-	o	++	++	not recommended
Arsenic	++	++	++	++	++	
Arsenic trioxide	++	++	++	++	++	
Aspirin	++	++	++	++	++	
Atropine and its salts	++	++	++	++	++	
B						
Barium hydroxide	++	++	+	++	++	CO ₂
Barium salts						See page 24
Barium sulphide	++	++	++	+	++	
Battery acid	++	++	++	++	++	
Beer	++	++	++	+	+	CO ₂ (pressure)
Benzaldehyde	++	++	o	o	-	V
Benzene (benzole)	++	++	+	-	-	V

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Benzene hexachloride	++	++	+	+	+	V
Benzene sulphonic acid	++	++	o	++	++	
Benzoic acid	++	++	+	++	++	
Benzyl acetate	++	++	+	-	-	V
Benzyl Alcohol	++	++	o	+	+	V
Bicarburetted soda	++	++	++	++	++	
Bichromate sulphuric acid	o	-	+	++	++	
Bicycle oil	++	++	+	o	o	
Bismuth compounds						See page 24
Bismuth trichloride	++	++	o	+	+	
Bitumen	++	++	+	o	o	V
Blankite	++	++	++	++	++	O ₂ ,CO ₂
Bleaching liquor	+	-	++	++	++	
Bleaching lye	+	-	++	++	++	
Bleaching powder	++	+	++	++	++	
Blue ashes	++	++	++	++	++	
Borax	++	++	++	++	++	
Boric acid	++	++	++	++	++	
Boric acid solution	++	++	++	++	++	
Braking fluids	++	++	o	+	+	
Brass polish	++	++	+	++	++	
Brillantine	++	++	+	+	o	
Brine	++	++	++	++	++	

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Bromine	-	-	-	-	-	
Bromobenzene(-benzole)	++	++	+	-	-	
Bromophorm	++	++	+	-	-	
Butane diol	++	++	+	++	++	
Butanol	++	++	+	+	+	V
Butter	++	++	+	+	o	CO ₂
Butyl acetate	++	++	o	-	-	V
Butyl alcohol	++	++	+	+	+	V
Butyl chloride	++	++	+	-	-	
Butyl phenol	++	++	o	+	o	
Butylraldehyde	++	++	o	o	o	
Butyric acid	++	++	o	+	+	V

C

Cadmium salts	See page 24					
Cadmium sulphide	++	++	++	++	++	
Caffeine and its salts	++	++	++	++	++	
Calcium hydroxide	++	++	++	++	++	CO ₂
Calcium hypochlorite	++	+	++	++	++	
Calcium salts	See page 24					
Californian mixture	++	++	++	++	++	CO ₂
Calomel	++	++	++	++	++	
Camphor	++	++	o	o	o	V
Camphor oil	++	++	+	o	o	V

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Caprolactam	++	++	+	++	++	
Carbazole	++	++	++	+	o	V
Carbolineum	++	++	o	o	-	V
Carbon black	++	++	++	++	++	
Carbon disulphide	++	++	+	-	-	
Carbon tetrachloride	++	++	+	-	-	
Carnauba wax	++	++	+	+	+	
Castor oil	++	++	o	+	o	
Cattle feed	++	++	++	++	++	
Caustic potash	++	++	+	++	++	CO ₂
Caustic soda	++	++	+	++	++	CO ₂
Cellosolve	++	++	+	+	o	
Cellulose varnish	++	++	o	-	-	
Cetyl alcohol	++	++	+	+	+	
Chloral (+chloral hydrate)	++	++	o	o	o	V
Chloro-acetic acids	++	++	o	++	++	V
Chloroamine	++	++	++	++	++	
Chlorobenzene (-benzole)	++	++	+	-	-	
Chloroform	++	++	+	-	-	
Chloronitrobenzene - liquid	++	++	o	o		V
Chloronitrobenzene - solid	++	++	+	+		V
Chlorophenol (mono, etc.)	++	++	+	o	-	V
Chloropropionic acid	++	++	o	++		

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Chlorosulphonic acid						not recommended
Chromate yellow	++	++	++	++	++	
Chromatic acid	+	-	+	++	++	
Chromium salts						See page 24
Cinnamon	++	++	++	+	+	V
Cinnamon oil	++	++	+	-	-	
Citric acid	++	++	++	++	++	
Citronel oil	++	++	+	-	-	
Clove oil	++	++	+	o	o	V
Cloves	++	++	+	+	+	V
Cobalt salts						See page 24
Coconut fat	++	++	+	++	++	
Coconut oil	++	++	+	+	+	
Codliver oil	++	++	+	+	+	CO ₂
Coffee	++	++	++	o	o	V
Colophonium(resin)	++	++	++	++	++	
Copper green	++	++	++	++	++	
Copper oxide	++	++	++	++	++	
Copper oxychloride	++	++	++	++	++	
Copper salts						See page 24
Cotton-seed oil	++	++	+	+	o	
Cream (face , hands)	++	++	+	+	+	
Creolin	++	++	o	o	-	V

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Creosote	++	++	o	o	-	V
Cresol (ortho,meta,para)	++	++	o	o	o	V
Crude oils (minerals)	++	++	o	o	o	V
Cyanamide	++	++	++	++	++	
Cyclohexane	++	++	o	o	-	V
Cyclohexanol	++	++	o	+	+	V
Cyclohexanone	++	++	o	o	o	V
D						
DDT (powder)	++	++	+	++	++	
Decalin	++	++	+	-	-	
Detergents (liquid)	++	++	o	++	++	
Detergents (powder)	++	++	+	++	++	
Developer (phot.)	++	++	++	++	++	
Dextrin	++	++	++	++	++	
Dibutyl phthalate	++	++	o	+	++	
Dichlorobenzene (-benzole)	++	+	+	-	-	
Dichloroethylene	++	++	+	-	-	
Dichloromethane	++	++	+	-	-	
Diesel oil	++	++	+	o	o	V
Diethanol amine	++	++	+	++	++	CO2
Diethyl ether	++	++	++	-	-	
Diethyl Ketone	++	++	o	o	-	
Diethylene glycoether	++	++	o	+	+	V

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Dimethyl formamide	++	++	+	+	+	
Diocetyl phthalate	++	++	+	+	+	
Dioxane	++	++	o	o	o	V
Diphenyl amine	++	++	+	+	+	V
Diphenyl ether	++	++	+	o	-	V
Diphenyl oxide	++	++	+	o	-	V
Dolomite	++	++	++	++	++	
E						
Eau de cologne	++	++	+	o	o	V
Eau de Javelle	+	-	++	++	++	
Emulsion paint	++	++	++	++	++	
Engine oil	++	++	+	o	o	
Epsom salt	++	++	++	++	++	
Ether	++	++	o	-	-	V
Etheric oil	++	++	+	-	-	
Ethyl acetate	++	++	o	o	-	V
Ethyl alcohol	++	++	+	+	+	
Ethyl aniline	++	++	+	o	o	V
Ethyl benzene (-benzole)	++	++	+	-	-	
Ethyl benzoate	++	++	o	o	o	V
Ethyl chloride	++	++	+	-	-	
Ethylene chloride (mono,di)	++	++	+	-	-	
Ethylene chlorohydrine	++	++	+	-	-	

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Gallic acid (tannic acid)	++	++	+	++	++	
Galvanizing liquor	++	++	++	++	++	
gas liquor	++	++	+	+	+	
gasoline	++	++	+	o	-	V, HD grades only
Glacial-acetic acid	++	++	o	o	o	V
Glauber salt	++	++	++	++	++	
Glucose	++	++	++	++	++	
Glue (fish,bone)	++	++	++	++	++	
Glycerine (glycerol)	++	++	++	++	++	
Glycol	++	++	+	++	++	
Gypsum	++	++	++	++	++	
H						
Heptane	++	++	+	-	-	
Hexachlorocyclohexane	++	++	+	+	+ v	
Hexane	++	++	+	-	-	
Hexanol	++	++	+	+	+	V
Hexylalcohol	++	++	+	+	+	V
Honey	++	++	++	++	++	
Hydrobromic acid	++	++	++	++	++	
Hydrochloric acid	++	++	++	++	+	
Hydrochloric acid (chem.pure)	++	++	++	++	++	
Hydrocyanic acid	++	++	+	o	o	V, CO2
Hydrofluoric acid	++	++	+	+	+	V,CO2

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability	Remarks
	+20°C	+60°C			
Hydrogen peroxide (sol.)	+	+	++	++	0
Hydroquinone	++	++	++	++	++
Hypo	++	++	++	++	++
I					
I cont.					
Ink (printing ink)	++	++	+	+	0
Ink (writing ink)	++	++	++	++	++
Insecticides (oil solution)	++	++	0	-	-
Insecticides (powder)	++	++	+	+	+
Insecticides (aqueous dispersion)	++	++	+	++	++
Iodine	++	++	+	0	0
Iodine tincture	++	++	+	+	0
Iron salts					See page 24
Isobutanol	++	++	+	+	+
Isobutyl alcohol	++	++	+	+	+
Iso-Octane	++	++	+	0	-
Isopropyl acetate	++	++	+	0	0
Isopropyl ether	++	++	+	-	-
J					
Jam	++	++	++	++	++
K					
Kerosene	++	++	+	0	-
Ketchup	++	++	++	++	++
L					

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Lactic acid	++	++	+	++	++	
Lanolin	++	++	+	+	+	
Lard	++	++	+	+	o	
Latex	++	++	+	++	++	
Lauryl alcohol	++	++	+	+	+	
Lauryl sulphate	++	++	o	+	+	
Lead acetate	++	++	++	++	++	
Lead oxide	++	++	++	++	++	
Lead salts						See page 24
Lemon oil	++	++	+	-	-	
Lime milk	++	++	+	++	++	
Lime salts						See page 24
Lime, slaked	++	++	++	++	++	
Lime, unslaked	++	++	++	++	++	
Lindane powder	++	++	+	+	+	
Linseed oil	++	++	+	+	o	
Lithium salts						See page 24
Liver of sulphur						see sodium sulphide
Lotion (hair, shaving)	++	++	+	+	o	
Lubricating oil	++	++	+	o	o	
M						
Magnesia	++	++	+	++	++	
Magnesium oxide	++	++	+	++	++	

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability	Remarks
	+20°C	+60°C			
Magnesium salts					See page 24
Maleic acid	++	++	+	++	++
Manganese salts					See page 24
Margarine	++	++	+	+	o
Mayonnaise	++	++	+	++	o
Menthol	++	++	+	+	o V
Mercuric salts					See page 24
Mercurochrome	++	++	++	++	++
Mercurous salts					See page 24
Mercury (metal)	++	++	++	++	++
Mercury oxide	++	++	++	++	++
Mercury salts					See page 24
Methanol	++	++	o	+	+
Methyl acetate	++	++	o	o	o V
Methyl alcohol	++	++	o	+	+
Methyl salicylate	++	++	+	o	o V
Methylene chloride	++	++	+	-	-
Methylethylene ketone	++	++	o	o	-
Milk	++	++	++	++	++
Mineral oil	++	++	+	+	o
Minerals	++	++	++	++	++
Mohr's salt	++	++	++	++	++

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Monochlorobenzene(-benzole)	++	++	+	-	-	
Morpholine	++	++	o	+	+	V
Mustard	++	++	++	++	++	
N						
Nail varnish	++	++	o	o	-	
Naphthalene	++	++	+	o	o	V
nickel oxide	++	++	++	++	++	
Nickel salts						See page 24
Nicotine	++	++	+	+	+	
Nitric acid (<=50%)	+	++	++			
Nitric acid (>50%)	-	-	o	+	+	
Nitrobenzene (-benzole)	++	++	o	o	o	V, not recommended
Nitrocresole	++	++	+	o	o	
Nitroglycerine	++	++	+	o	o	
Nonyl alcohol	++	++	+	o	o	V
Nutmeg	++	++	++	o	o	V
Nutmeg oil	++	++	+	-	-	
O						
Ochre	++	++	++	++	++	
Octane	++	++	+	o	-	V, see gasoline
Octanol	++	++	+	o	o	
Octyl alcohol	++	++	+	o	o	V
Oleic acid	++	++	+	+	o	

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Oleum	o	-	o	+	+	not recommended
Olive oil	++	++	+	+	o	
Oxalic acid (solid or solution)	++	++	++	++	++	
P						
Paint						see terpine, varnish & emulsion paint
Palm oil	++	++	+	+	o	
Palmitinic acid	++	++	+	++	++	
Paraffin (solid)	++	++	+	++	++	
Paraffin oil	++	++	+	o	-	
Patent potash	++	++	++	++	++	
Peanut butter	++	++	+	+	o	
Pentachlorophenol	++	++	++	o	o	V
Pentane	++	++	+	-	-	
Pepper	++	++	++	++	++	
Peppermint oil	++	++	+	-	-	V
Perchloric-acid solution	+	o	++	++	+	
Perchloroethylene	++	++	+	-	-	
Perfumes	++	++	+	o	-	V, not recommended
Petrol						see gasoline
Petroleum	++	++	+	o	-	V
Petroleum ether	++	++	+	o	-	V
Phenol	++	++	o	+	+	V

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Phenol sulphonic acid	++	++	+	++	++	
Phenoxy-acetic acid	++	++	+	++	++	
Phenyl phenol	++	++	+	+	+	
Phosphating liquor (for metal)	++	++	++	++	++	
Phosphor chlorides (tri, penta,oxychloride)						not recommended
Phosphoric acid (conc.)	++	++	+	+	+	
Phthalic acid	++	++	++	++	++	
Phthalic anhydride	++	++	++	++	++	
Picric acid	++	++	+	+	+	
Pigments,dry for paints, plastics etc.)	++	++	++	++	++	
Pine oil	++	++	o	o	o	V
Pitch	++	++	+	++	++	
Polishing wax	++	++	+	o	o	
Potash	++	++	++	++	++	
Potassium bromide	++	++	++	++	++	
Potassium cyanide	++	++	+	+	+	CO ₂ , hazardous
Potassium hydroxide	++	++	+	++	++	CO ₂
Potassium iodide	++	++	++	++	++	
Potassium permanganate	+	+	++	++	++	
Potassium salts						See page 24
Potassium sulphate						See page 24
Potassium sulphide	++	++	+	+	++	O ₂ , CO ₂

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Propanol	++	++	+	+	+	
Propargyl alcohol	++	++	+	+	+	
Propionic acid	++	++	o	++	++	V
Propylene glycol	++	++	+	++	++	
Propyl alcohol	++	++	+	+	+	
Prussic acid	++	++	+	o	o	V, very hazardous
Pyridine	+	++	o	o	o	V
Q						
Quinine ad its salts	++	++	++	++	++	
R						
Ratbane	++	++	++	++	++	
Red ochre						See page 24
Resorcine (resorcinol)	++	++	++	++	++	
Ricinus oil	++	++	o	+	o	
S						
Salad oil	++	++	+	+	o	
Salas sauce	++	++	+	++	o	
Salicyl aldehyde	++	++	+	o	o	V
Salicylic acid	++	++	++	++	++	
Salmiac	++	++	++	++	++	
Saltpetre (nitrate)						See page 24
Saponin	++	++	++	++	++	
Scouring powder	++	++	+	++	++	
Sesame oil	++	++	+	+	o	

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Shampoo	++	++	o	++	++	
Silicone oil	++	++	o	+	+	
Silver polish	++	++	+	++	++	
Silver salts						See page 24
Soap(soft, green & yellow)	++	++	o	++	++	
Soda	++	++	++	++	++	
Sodium cyanide	++	++	+	+	+	hazardous
Sodium hydroxide	++	++	+	++	++	CO2
Sodium hypochlorite	+	-	+	++	++	
Sodium salts						See page 24
Sodium sulphide	++	++	+	+	+	O2, CO2
Soldering fluid	++	++	++	++	++	
Solvent naphtha	++	++	+	-	-	
Soy oil	++	++	+	+	o	
Spermaceti	++	++	+	+	+	
Spindle oil	++	++	+	o	o	
Spirit	++	++	+	+	+	
Stannic salts (tin)						See page 24
Stannous salts (tin)						See page 24
Starch	++	++	++	++	++	
Stearic acid	++	++	++	++	++	
Strontium salts						See page 24
Styrene (styrol)	++	++	+	o	-	

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability		Remarks
	+20°C	+60°C		+40°C	+60°C	
Sublimate	++	++	++	++	++	
Succinic acid	++	++	++	++	++	
Sucrose	++	++	++	++	++	
Sugar	++	++	++	++	++	
Sulphate of ammonia						See page 24
Sulphur	++	++	++	++	++	
Sulphur chloride						not recommended
Sulphur trioxide	o	-	o	+	0	V, not recommended
Sulphuric acid (50-90%)	+	+	+	++	++	
Sulphuric acid (90-100 %)	o	o	+	++	++	
Sulphuric acid (dilute)	++	++	++	++	++	
Sulphonyl chloride						not recommended
Superphosphate	++	++	++	++	++	
Syrup	++	++	++	++	++	
T						
Talcum grease	++	++	+	+	0	
Talcum powder	++	++	++	++	++	
Tannic acid	++	++	+	++	++	
Tannin	++	++	+	++	++	
Tar oil	++	++	o	o	o	V
Tartaric acid	++	++	++	++	++	
Tea	++	++	++	++	++	
Tetra						see "carbon tetrachl"

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability	Remarks
	+20°C	+60°C			
Tetra-ethyl lead					
Tetra-ethyl lead					
Tetrahydrochloroethane	++	++	+	-	-
Tetrahydrofuran	++	++	o	-	-
Tetralin	++	++	+	-	-
Thallium salts					See page 24
Thio(sodium thiosulphate)					See page 24
Thioglycolic acid	++	++	+	o	o
Thionylchloride					not recommended
Thiophene	++	++	o	-	-
Thomas meal	++	++	++	++	++
Tin compounds					See page 24
Titanium tetrachloride					not recommended
Titanium white	++	++	++	++	++
Toluene (toluol)	++	++	+	-	-
Tomato juice	++	++	++	++	++
Toothpaste	++	++	+	+	+
Transformer oil	++	++	+	o	o
Trichloro-acetic acid	++	++	o	+o	v
Trichlorobenzene (benzole)	++	++	+	-	-
Trichloroethane	++	++	+	-	-
Trichloroethylene	++	++	+	-	-

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability	Remarks
	+20°C	+60°C		+40°C +60°C	
Tricresylphosphate	++	++	o	+	+
Triethanolamine (turkey red oil)	++	++	o	++	++
Turkey red oil	++	++	+	+	+
Turpentine	++	++	+	-	-
Turpentine (synthetic)	++	++	+	o	-
Turpentine varnish	++	++	+	o	- O2, not recommended
U					
Urea	++	++	++	++	++
V					
Vanilla extract	++	++	+	o	o V
Varnish					see terpentine varnish
Vaselin	++	++	+	+	o
Vinegar	++	++	++	++	++
Vinylchloride	++	++	+	-	-
W					
Waterglass	++	++	+	++	++
Wax: beeswax	++	++	+	+	+
Wax: carnauba wax	++	++	+	+	+
Wax: mineral-oil wax	++	++	+	+	o
White lead	++	++	++	++	++
White spirit	++	++	+	o	-
X					
Xylene (xylol)	++	++	+	-	-
Y					

Chemicals	Resistance to Chemical attack		Resistance to Physical attack	Permeability	Remarks
	+20°C	+60°C			
Yeast	++	++	++	++	++
Yoghurt	++	++	++	++	++
Z					
Zinc white	++	++	++	++	++
Zinc, salts					
	See page 24				

Metal salts

In the following table the resistance of polyethylene is evaluated to the action of various chemicals. Salts (and their solutions) whose chemical names can be composed out of the diagram are not included in the tables. These metal salts, nor solid nor in an aqueous solution, have no influence on polyethylene.

Metals	Salts
Aluminium	Nickel acetate
Ammonium	Potassium arsenate
Antimoon	Silver benzoate
Barium	Sodium borate
Bismuth	Strontium bromate
Cadmium	Thallum bromide
Calcium	Tin carbonate
Chromium	Zinc chlorate
Cobalt	
Copper	chloride
Iron	chromate
Lead	dicarbonate
Lithium	dichromate
Magnesium	disulphate
Manganese	ferric/ferrous cyanide
Mercury	fluoride
Molybdenum	formiate
	gluconate