Chemical Compatibility Guide for: Barrier Film Liners

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ChemLiner Chemical Resistance Chart

ChemLiner Round-Bottom Liners are made from only the highest-quality, raw materials available. These materials demonstrate outstanding resistance to both physical and chemical attack. The following chart may be used as a guide as part of an evaluation of the suitability of the ChemLiner series with intended chemical agents. Prior to employing ChemLiners, the user should thoroughly and independently determine the suitability of the liner for the intended use (See Effects of Factors.)

EXPLANATION OF THE COLUMNS

COLUMN #1 NAMES OF CHEMICALS

The names of the various substances whose effects have been tested are entered in alphabetical order.

COLUMN #2 MASS FRACTION

In many cases, the substance listed is an aqueous solution and the mass fraction of the solute has been multiplied by one hundred (W/%) and given in Column 2. Other terms used include:

d.s. (dilute solution) when W is less than 10% or s.s. when the solution is saturated at 23 °C.

C (commercial), lower purity mixtures of several components

T (technical), higher purity mixtures of several components

In a few other cases the volumetric ratios of liquid components are given, e.g. 3:2 for the ratio of concentrated hydrochloric acid to nitric acid in aqua regia.

COLUMN #3 TEMPERATURES

Column 3 indicates the temperature at which the resistance rating is given. If no temperature is listed, the resistance is given at room temperature, which can be between 15 °C and 35 °C.

SUBSTANCE	W/%	° C	RESISTANCE
Acetaldehyde soln	40		12+
Acetic acid conc.	95		-
	95	90	s
Acetic acid dil.	10		(+)
	10	50	-
Acetic acid very dil.	5		10+
Acetone	T		2+
Air at all pressures			+
Alkylbenzenes (Shellsol A)	T		+
Aluminum hydroxide soln	s.s.		+
Aluminium salts of strong	s.s.	50	-
mineral acids in soln	20		(+)
Amines, aliphatic	T		8+
Aminoacid mixture	C		+
Antimony trichloride soln	s.s.		-
Aqua regia (hydrochloride	75:50		-
& nitric acid)	(Vol.)		
Aromatic hydrocarbons (arenes)	T	80	+
Asphalt	C		+
	C	100	(+)
Baking enamels	C	150	+
Barium salts of strong	s.s.		+
mineral acids in soln			
Benzene, alkylbenzenes	H	80	+
		20	
Benzoic acid soln	20		+
	s.s.		-
Bleaching fluid	H		-
(12.5% active chlorine)			
Boric acid soln	10		10+
Boron trifluoride	T		-
Butadiene	T		+
Butane to DIN 51622	T		+
1,4-Butanediol	T		+
(BASF Diol 14B)		>140	s

COLUMN #4
RESISTANCE FINDINGS

The resistance findings are based on immersion tests carried out with standard specimens, which generally remain in contact with the substance for up to a year. The results of trials and performance in practice have also been taken into account if these data were available.

Keep in mind that there are differences between particular grades and even greater differences between specimens of different crystallinity, where the higher the crystallinity, the lower the absorption. Values given are typical values.

The ratings in Column 4 have the following meanings.

+ Resistant: generally only slight changes in mass or dimensions; no irreversible change in the material that is at all significant; no reports of deterioration in practice

(+) Limited resistance: noticeable changes in mass, dimensions or other properties of the material (such as color, strength, impact resistance); practical trials under the appropriate conditions are adviable

(-) Non-resistant to prolonged contact: practical trials are necessary even if periods of contact are short

- Non-resistant: rapid attack; environmental stress cracking; irreversible damage (by acids, for instance)

s The ChemLiner material is soluble in the substance

The level to which various plastics absorb liquids or vapors depends on the crystallinity of the polymer, the chemical composition of the contacting substances, temperature and vapor pressure. With time, a state of equilibrium will be reached. For these cases and where known, the relative gain in mass in parts percent (W%) is also given in Column 4.

EFFECTS OF FACTORS

The effects of these factors, which are often impossible to predicate clearly, can determine whether or not a material is suitable for a given application. Many times it is also necessary to consider other demands on the component, including dimensional stability, strength, rigidity and impact resistance.

The suitability of a material for a particular application cannot be assessed by considering chemical resistance in isolation. Before an application is approved, especially when it involves a highly stressed component in contact with chemicals that might attack it, the chemical resistance of the component must be established beyond doubt by practical trials and evaluations undertaken by the user.

2-Butoxyethanol	T		+
Butyl acetate	T		2+
Butyric acid soln	20		+
C_4 - Alcohols (Isanol)			2-
Calcium chloride in conc. acetic acid		50	s
Calcium chloride sol in alcohol	20		s
Calcium chloride soln in water	s.s.		10+
Calcium hydroxide soln (limewater)	s.s.		+
Calcium hypochlorite & bleaching powder soln	s.s.	-	-
Calcium or lithium chloride in methanol	20		s
Carbon disulphide	T		2-
Carbon tetrachloride	T		1-
	T	60	+
Casein	C		+
Cellulosic lacquers	H		+
Cellulosic lacquers alcholoic	C		+
other			+
Chloramines	d.s.		-
Chlorine, chlorine water	C		-
Chloroacetic acid soln	10		-
Chlorobenzene	T	50	+
		20	
Chromic acid soln	10		8(-)
Citric acid soln	10		10+
	10	50	+
	20	80	+
Citrus fruit juices	C		+
Citrus Oil	C		+
Cooking fats & oils	C	100	+
Copper (II) salt solns	10		(+)
Coumarin, coumarin resins			+
Crude oil, natural gas	C		+
Cyclohexanol	T		3+
Cyclohexanone	T		+
Dibutyl phthalate	T		+
1,4-Dichlorobenzene	T		2+
Dimethyl ether	T		+
Dimethylamine	T		+
Electroplating baths	C		(+)
Ethane	T		+
Ethanol, dilute	40		+
Ethyl acetate	T		1+
Ethylene	T		+
Ethylene oxide	T		+
Fat acids	C		+
Fat alcohols	C		+
Fats & waxes	C		+
Fertilizers	C		+
Floor polishes	C		+
Fluorinated hydrocarbons	C		+
(refrigerants)	C	70	+
Formic acid soln	10		(+)
	10	50	-

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COLUMN #3
TEMPERATURES

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Furfuryl alcohol	T		+
	T	>90	s
Gelatin, bone glue	C		+
Glycerol	T		+
		>170	s
Glycolic acid soln	30		-
Heptane, hexane	T		+
Hexachlorobenzene	T	80	1+
Hydrobromic acid soln	10		-
Hydrochloric acid,	20		s
strong & dilute	2		-
Hydrogen peroxide soln	0.5		+
	30		-
Indian ink	C		+
Isocyanates, aromatic (ex. tolylene diisocyanate)	C		+
Isoprophyl alcohol	T		5-
		60	+
Ketones (aliphatic)	T		+
Lactic acid soln	10		+
	90		-
Linseed Oil	C		+
Lithium chloride or bromide soln in water	10		(+)
Lubricating greases, ester based	C	110	+
Lubricating oil, HD & special oils, including hydraulic & transformer oils	C		+
Mercury	T		+
Mercury (II) chloride soln	s.s.		-
Methane	T		+
Methyl acetate	T		2+
Methyl ethyl ketone	T		2+
		60	
Milk	C		+
Molasses	C		+
Naptha	C		+
Naphthalene	T		+
Naphthenic acids	T		+
Nickel plating baths			(+)
Nitric acid,	>50		s
strong & dilute	2		-
Oils (vegetable, ethereal, mineral)	C		+
Oleic acid	C		3+
Palamoll & Palatinol plasticizers	C		+
Perchloroethylene	T		2(+)
(tetrachloroethylene)	T	80	-
Perfumes in alcohol	C		+
Photographic emulsion	C		+
Plasticizers	C		+
Plastomoll plasticizers (adipates)	C		+
Potassium chloride soln	10		+
Potassium dichromate soln	5		(+)
Potassium nitrate soln	10		+
Potassium permanganate soln	1		-

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Pyridine	T		+
	T	80	15(+)
Resorcinol in ethanol	50		s
Resorcinol-methanol-benzene-water (40:35:10:5)	40		s
Salicylic acid soln	s.s.		+
Soap soln	d.s.	80	+
Sodium chlorate soln	10		(+)
Sodium chlorite soln	10		(+)
Sodium hypochlorite soln	10		-
Sodium lactate soln	60		(+)
Sodium lauryl sulphate paste	30		+
Sodium salt solns (neutral or alkaline)	10		+
Stearic acid & its salts & esters	T		+
Styrene	T		+
	T	80	+
Suplhuric acid conc. & dil.	80		s
	2		-
Sulphurous acid soln	s.s.		(+)
Tall oil	C		+
Tallow	C		+
Tar	C		+
		80	(+)
Tetrafluoromethane (R 14)	T		+
Tetrahydrofuran	T		2-
Toluene	T		+
	T	100	+
Trichlorethylene	T		4+
	T	80	20(-)
Trimethylamine	T		+
Urea soln	20		+
Uric acid soln	10		+
Vaseline	C		+
Vinyl halides	T	80	+
Wax	C	80	+
Wines & spirits	C		10+
Xylenes	T		+
	T	100	+

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