



The Pioneer Of Geosynthetics

S I N C E 1 9 7 2

Chemical Resistance Chart

GSE is the world's leading supplier of high quality, polyethylene geomembranes. GSE polyethylene geomembranes are resistant to a great number and combinations of chemicals. Note that the effect of chemicals on any material is influenced by a number of variable factors such as temperature, concentration, exposed area and duration. Many tests have been performed that use geomembranes and certain specific chemical mixtures. Naturally, however, every mixture of chemicals cannot be tested for, and various criteria may be used to judge performance. Reported performance ratings may not apply to all applications of a given material in the same chemical. Therefore, these ratings are offered as a guide only.

Medium	Concentration	Resistance at:		Medium	Concentration	Resistance at:	
		20° C (68° F)	60° C (140° F)			20° C (68° F)	60° C (140° F)
A							
Acetic acid	100%	S	L	Copper chloride	sat. sol.	S	S
Acetic acid	10%	S	S	Copper nitrate	sat. sol.	S	S
Acetic acid anhydride	100%	S	L	Copper sulfate	sat. sol.	S	S
Acetone	100%	L	L	Cresylic acid	sat. sol.	L	—
Adipic acid	sat. sol.	S	S	Cyclohexanol	100%	S	S
Allyl alcohol	96%	S	S	Cyclohexanone	100%	S	L
Aluminum chloride	sat. sol.	S	S	D			
Aluminum fluoride	sat. sol.	S	S	Decahydronaphthalene	100%	S	L
Aluminum sulfate	sat. sol.	S	S	Dextrine	sol.	S	S
Alum	sol.	S	S	Diethyl ether	100%	L	—
Ammonia, aqueous	dil. sol.	S	S	Diethylphthalate	100%	S	L
Ammonia, gaseous dry	100%	S	S	Dioxane	100%	S	S
Ammonia, liquid	100%	S	S	E			
Ammonium chloride	sat. sol.	S	S	Ethandiol	100%	S	S
Ammonium fluoride	sol.	S	S	Ethanol	40%	S	L
Ammonium nitrate	sat. sol.	S	S	Ethyl acetate	100%	S	U
Ammonium sulfate	sat. sol.	S	S	Ethylene trichloride	100%	U	U
Ammonium sulfide	sol.	S	S	F			
Amyl acetate	100%	S	L	Ferric chloride	sat. sol.	S	S
Amyl alcohol	100%	S	L	Ferric nitrate	sol.	S	S
Aniline	100%	S	L	Ferric sulfate	sat. sol.	S	S
Antimony trichloride	90%	S	S	Ferrous chloride	sat. sol.	S	S
Arsenic acid	sat. sol.	S	S	Ferrous sulfate	sat. sol.	S	S
Aqua regia	HCl-HNO ₃	U	U	Fluorine, gaseous	100%	U	U
B				Fluorosilicic acid	40%	S	S
Barium carbonate	sat. sol.	S	S	Formaldehyde	40%	S	S
Barium chloride	sat. sol.	S	S	Formic acid	50%	S	S
Barium hydroxide	sat. sol.	S	S	Formic acid	98-100%	S	S
Barium sulfate	sat. sol.	S	S	Furfuryl alcohol	100%	S	L
Barium sulfide	sol.	S	S	G			
Benzaldehyde	100%	S	L	Gasoline	—	S	L
Benzene	—	L	L	Glacial acetic acid	96%	S	L
Benzoic acid	sat. sol.	S	S	Glucose	sat. sol.	S	S
Beer	—	S	S	Glycerine	100%	S	S
Borax (sodium tetraborate)	sat. sol.	S	S	Glycol	sol.	S	S
Boric acid	sat. sol.	S	S	H			
Bromine, gaseous dry	100%	U	U	Heptane	100%	S	U
Bromine, liquid	100%	U	U	Hydrobromic acid	50%	S	S
Butane, gaseous	100%	S	S	Hydrobromic acid	100%	S	S
1-Butanol	100%	S	S	Hydrochloric acid	10%	S	S
Butyric acid	100%	S	L	Hydrochloric acid	35%	S	S
C				Hydrocyanic acid	10%	S	S
Calcium carbonate	sat. sol.	S	S	Hydrofluoric acid	4%	S	S
Calcium chlorate	sat. sol.	S	S	Hydrofluoric acid	60%	S	L
Calcium chloride	sat. sol.	S	S	Hydrogen	100%	S	S
Calcium nitrate	sat. sol.	S	S	Hydrogen peroxide	30%	S	L
Calcium sulfate	sat. sol.	S	S	Hydrogen peroxide	90%	S	U
Calcium sulfide	dil. sol.	L	L	Hydrogen sulfide, gaseous	100%	S	S
Carbon dioxide, gaseous dry	100%	S	S				
Carbon disulfide	100%	L	U	Lactic acid	100%	S	S
Carbon monoxide	100%	S	S	Lead acetate	sat. sol.	S	—
Chloracetic acid	sol.	S	S	M			
Carbon tetrachloride	100%	L	U	Magnesium carbonate	sat. sol.	S	S
Chlorine, aqueous solution	sat. sol.	L	U	Magnesium chloride	sat. sol.	S	S
Chlorine, gaseous dry	100%	L	U	Magnesium hydroxide	sat. sol.	S	S
Chloroform	100%	U	U	Magnesium nitrate	sat. sol.	S	S
Chromic acid	20%	S	L	Maleic acid	sat. sol.	S	S
Chromic acid	50%	S	L	Mercuric chloride	sat. sol.	S	S
Citric acid	sat. sol.	S	S	Mercuric cyanide	sat. sol.	S	S
				Mercuric nitrate	sol.	S	S

-Continued-

Medium	Concentration	Resistance at:	
		20° C (68° F)	60° C (140° F)
Mercury	100%	S	S
Methanol	100%	S	S
Methylene chloride	100%	L	—
Milk	—	S	S
Molasses	—	S	S
N			
Nickel chloride	sat. sol.	S	S
Nickel nitrate	sat. sol.	S	S
Nickel sulfate	sat. sol.	S	S
Nicotinic acid	dil. sol.	S	—
Nitric acid	25%	S	S
Nitric acid	50%	S	U
Nitric acid	75%	U	U
Nitric acid	100%	U	U
O			
Oils and Grease	—	S	L
Oleic acid	100%	S	L
Orthophosphoric acid	50%	S	S
Orthophosphoric acid	95%	S	L
Oxalic acid	sat. sol.	S	S
Oxygen	100%	S	L
Ozone	100%	L	U
P			
Petroleum (kerosene)	—	S	L
Phenol	sol.	S	S
Phosphorus trichloride	100%	S	L
Photographic developer	cust. conc.	S	S
Picric acid	sat. sol.	—	—
Potassium bicarbonate	sat. sol.	S	S
Potassium bisulfide	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 ferricyanide	sat. sol.	S	S
Potassium ferrocyanide	sat. sol.	S	S
Potassium fluoride	sat. sol.	S	S
Potassium hydroxide	10%	S	S
Potassium hydroxide	sol.	S	S
Potassium hypochlorite	sol.	S	L
Potassium nitrate	sat. sol.	S	S
Potassium orthophosphate	sat. sol.	S	S
Potassium perchlorate	sat. sol.	S	S
Potassium permanganate	20%	S	S
Potassium persulfate	sat. sol.	S	S
Potassium sulfate	sat. sol.	S	S
Potassium sulfite	sol.	S	S
Propionic acid	50%	S	S
Propionic acid	100%	S	L
Pyridine	100%	S	L
Q			
Quinol (Hydroquinone)	sat. sol.	S	S
S			
Salicylic acid	sat. sol.	S	S

Medium	Concentration	Resistance at:	
		20° C (68° F)	60° C (140° F)
Silver acetate	sat. sol.	S	S
Silver cyanide	sat. sol.	S	S
Silver nitrate	sat. sol.	S	S
Sodium benzoate	sat. sol.	S	S
Sodium bicarbonate	sat. sol.	S	S
Sodium biphosphate	sat. sol.	S	S
Sodium bisulfite	sol.	S	S
Sodium bromide	sat. sol.	S	S
Sodium carbonate	sat. sol.	S	S
Sodium chlorate	sat. sol.	S	S
Sodium chloride	sat. sol.	S	S
Sodium cyanide	sat. sol.	S	S
Sodium ferricyanide	sat. sol.	S	S
Sodium ferrocyanide	sat. sol.	S	S
Sodium fluoride	sat. sol.	S	S
Sodium hydroxide	40%	S	S
Sodium hydroxide	sat. sol.	S	S
Sodium hypochlorite	15% active chlorine	S	S
Sodium nitrate	sat. sol.	S	S
Sodium nitrite	sat. sol.	S	S
Sodium orthophosphate	sat. sol.	S	S
Sodium sulfate	sat. sol.	S	S
Sodium sulfide	sat. sol.	S	S
Sulfur dioxide, dry	100%	S	S
Sulfur trioxide	100%	U	U
Sulfuric acid	10%	S	S
Sulfuric acid	50%	S	S
Sulfuric acid	98%	S	U
Sulfuric acid	fuming	U	U
Sulfurous acid	30%	S	S
T			
Tannic acid	sol.	S	S
Tartaric acid	sol.	S	S
Thionyl chloride	100%	L	U
Toluene	100%	L	U
Triethylamine	sol.	S	L
U			
Urea	sol.	S	S
Urine	—	S	S
W			
Water	—	S	S
Wine vinegar	—	S	S
Wines and liquors	—	S	S
X			
Xylenes	100%	L	U
Y			
Yeast	sol.	S	S
Z			
Zinc carbonate	sat. sol.	S	S
Zinc chloride	sat. sol.	S	S
Zinc (II) chloride	sat. sol.	S	S
Zinc (IV) chloride	sat. sol.	S	S
Zinc oxide	sat. sol.	S	S
Zinc sulfate	sat. sol.	S	S

Specific immersion testing should be undertaken to ascertain the suitability of chemicals not listed above with reference to special requirements.

NOTES:

- (S) **Satisfactory:** Liner material is resistant to the given reagent at the given concentration and temperature. No mechanical or chemical degradation is observed.
- (L) **Limited Application Possible:** Liner material may reflect some attack. Factors such as concentration, pressure and temperature directly affect liner performance against the given media. Application, however, is possible under less severe conditions, e.g. lower concentration, secondary containment, additional liner protections, etc.
- (U) **Unsatisfactory:** Liner material is not resistant to the given reagent at the given concentration and temperature. Mechanical and/or chemical degradation is observed.
- (-) **Not tested**

sat. sol. = Saturated aqueous solution, prepared at 20°C (68°F)
sol. = aqueous solution with concentration above 10% but below saturation level
dil. sol. = diluted aqueous solution with concentration below 10%
cust. conc. = customary service concentration