Liqui-Cel®
MEMBRANE CONTACTORS

Chemical Resistance Guidelines for Liqui-Cel®, SuperPhobic®, MiniModule®, and MicroModule® Contactors

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CHEMICAL RESISTANCE TABLE

The Chemical Resistance Table below is an informational guide for the use of various chemicals with components used in Membrana Membrane Contactors. The contents of this table are the general chemical resistance characteristics of the raw materials for the contactor components. The table is a general guide only and should not be considered as a substitute for testing under your specific conditions.

Chemical Resistance Classification	
S	Satisfactory. No or very little chemical influence on performance
L	Limited Resistance. Exposure time must be limited to maintain adequate performance
U	Unsatisfactory. Adequate performance not possible with this chemical
	Blank. Chemical is Untested

Chemical Resistance Summary

	POTTING/CASE			FIBER/CASE		HOUSINGS						O-RINGS/SEALS		
	Epoxy	PU	PE	PP	PO	316LSS	ABS	PVDF	PVC	NYLON	PC	Viton®	Kalrez®	EPDM
Water & Aqueous Solutions	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Bases	S	U	S	S	S	S	S	S	S	L	L	L	S	S
Acids-Dilute	L	L	S	S	S		S	S	S	U	S	L	S	S
Acids-Strong	U	U	L	L	L		U	S	U	U	L	L	S	L
Halogens	U	U	U	U	U		U	S	U	U	L	L	S	U
Aliphatic Hydrocarbons	S	L	L	L	L		U	S	L	S	L	S	S	U
Alicyclic Hydrocarbons	S	L	L	L	L		U	L	U	L	L	S	S	U
Aromatic Hydrocarbons	L	L	L	L	L		U	S	U	S	U	S	S	U
Heterocyclic Compounds	L	U	L	L	L			L	U	L	L	L	S	U
Amines	L	U	L	L	L		U	U	U	L	U	U	S	L
Alcohols	S	U	S	S	S	S	U	S	L	S	S	L	S	S
Glycols & Glycerols	S	U	S	S	S		L	S	S	S	L	L	S	S
Aldehydes	L	U	L	L	L		U	U	L	S	L	L	S	L
Ketones	L	U	S	S	S		U	U	U	S	U	U	S	L
Anhydrides	U	U	S	S	S			U	U	S	U	U	S	
Halogenated Hydrocarbons	L	U	U	U	U		U	L	U	L	U	L	L	U
Esters	L	U	S	L	L		U	L	U	S	U	U	S	L
Phenolics	L	L	S	S	S		U	L	L	U	U	U	S	L

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	POTTING/CASE			FIBER/CASE		HOUSINGS						O-RINGS/SEALS		
	Epoxy	PU	PE	PP	PO	316LSS	ABS	PVDF	PVC	NYLON	PC	Viton®	Kalrez®	EPDM
Acetaldehyde	U	U	L	L	L	S	U	U	U	S	L	U	S	L
Acetic Acid (10%)	L	L	S	S	S	S	L	S	U	U	S	L	S	S
Acetic Acid (Glacial)	U	U	S	S	S	S	U	L	U	S	S	U	S	L
Acetic Anhydride	U	U	S	S	S	S	U	U	U	S	U	U	S	L
Acetone	L	U	S	S	S	S	U	U	U	S	U	U	S	S
Acetonitrile	U	U	S	S	L	S		L	U	S	U	U	S	S
Acetophenone	U	U	S	S	L		U	U	U	S	U	U	S	S
Acetyl Chloride	U	U	L	U		S	U	L	L	S		S	S	U
Acrylic Acid140	U	U	S	L				S				U	S	L
Aluminum Chloride (10%)	S	L	S	S	S	U	S	S	S	U	S	S	S	S
Aluminum Sulphate	S	L	S	S	S	L	S	S	S	S	S	S	S	S
Ammonium Hydroxide (35%)	L	U	S	S	S	S	S	S	S	S	S	L	S	S

PO = Polyolefin in SuperPhobic Products
PC=Polycarbonate
PU=Polyurethane
PE = Polyethylene
PP = Polypropylene

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	Epoxy	PU	PE	PP	PO	316LSS	ABS	PVDF	PVC	NYLON	PC	Viton®	Kalrez®	EPDM
Ammonium Sulphate (50%)	S	L	S	S	S	S	S	S	S	S	S	S	S	S
Amyl Acetate	L	U	S	L	L	S	U	L	U	S	U	U	S	S
Amyl Alcohol	S	U	S	L	L	S	S	L	S	S	S	L	S	S
Aniline	U	U	S	S	L	S	U	L	L	S	U	S	S	L
Antimony Trichloride (10%)	S	S	S	S		U	S		S	U	S	S	S	
Aqua Regia	U	U	U	U	U	U	U	L	L	U	U	L	S	L
Arsenic Acid	L	L	S	S	S	S	S	S	S	L	S	S	S	S
ASTM OIL #1	S	L	S	S								S	S	U
ASTM OIL #2	S	L	S	L								S	S	U
ASTM OIL #3	S	L	S	L								S	S	U
Barium Chloride	S	S	S	S		S	S	S	S	S	S	S	S	S
Benzaldehyde	U	U	S	U	L	S	S	L	U	S	U	U	S	S
Benzene	S	U	L	U	U	S	U	S	L	S	U	S	S	U
Benzyl Alcohol	U	U	S	S	S		U	S	L	U	U	S	S	L
Benzyl Chloride	U	U	L	L		S	U	S		S	U	S	S	U
Boric Acid	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Bromine	U	U	U	U	U	U	U	S	L	U	L	S	S	U
Butyl Acetate	L	U	S	L	L	S	U	L	U	S	U	U	S	L
Butyl Alcohol (Butanol)	S	U	S	S	S	S	U	S	L	S	S	L	S	L
Butyl Amine	L	U		L			U	U	U	S	U	U	S	U
Butyric Acid	U	U	L	S	U	S	U	S	S	L	U	S	S	L
Butyl Chloride	S	U	U	U	L		U	S	L	S	S	L	S	
Calcium Chloride	S	S	S	S	S	S	S	S	L	S		S	S	S
Carbon Disulphide	S	U	U	U	U	S	U	L	U			S	S	U
Carbon Tetrachloride	S	U	U	U	U	S	U	S	U	U	U	S	L	U
Castor Oil	S	S	S	S			S	S				S	S	L
Cello-Solve Glycol Ether	U	U										S	S	
Cello-Solve Acetate	U	U	S	S	S		U	S	L	S	L	U	S	L
Chloroacetic Acid	U	U	S	L	S	S		U	S	U	U	U	S	L
Chlorobenzene	U	U	L	U	U	S	U	S	U	U	U	S	S	U
Chlorine Dioxide	U	U			U			S				S	S	L
Chlorine Gas	L	U	L	U	L	S		S	U	U	L	S	S	U
Chlorine (Water)	L	L	L	U	U	L	U	S	S	L	L	S	S	L
Chloroform	U	U	L	U	U	S	U	L	U	S	U	S	S	U
Chlorosulphuric Acid	U	U	U	U								U	S	
Chrome Plating Solutions	U	U	S	L								S	S	L
Chromic Acid	U	U	S	L	L	S	L	L	S	U	U	S	S	L
Citric Acid (10%)	S	S	S	S	S	S	S	S	S	S	S	S	S	S
COD Liver Oil	L	L	S	S								S	S	S
Copper Sulphate	S	S	S	S	S	S	S	S	S	U	S	S	S	S
Cottonseed Oil	S	S	S	S				S	S	S		S	S	L
Cresols	U	U	L	L	U	S	U	S	U	U	U	S	S	U
Cyclohexane	S	S	L	L	U	S	U	S	U	S	S	S	S	U
Cyclohexanol	S	L	S	L	S		U	S	U	L	L	S	S	U
Cyclohexanone	S	L	S	U	L	S	U	L	U	S	U	U	S	L
Decahydronapthalene	L	U	L	U	L				S	S	S	S	S	U
Diesel	S	L	L	L		S		S	S	S	S	S	S	U
Diethylamine	U	U	L	L	L	S	U	L	U	S		S	S	L
Diethylene Glycol	S	U	S	S	S	S	S	S	L	S	L	S	S	S
Diethyl Ether	L	U	L	L	U	S	U	S	U	S	U	U	S	U

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PE = Polyethylene
PC=Polycarbonate
PP = Polypropylene
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	POTTING/CASE			FIBER/CASE		HOUSINGS						O-RINGS/SEALS		
	Epoxy	PU	PE	PP	PO	316LSS	ABS	PVDF	PVC	NYLON	PC	Viton®	Kalrez®	EPDM
Dimethyl Formamide	U	U	S	S	S	S	U	U	U	S	U	U	S	L
Dimethyl Hydrazine	U	U	S	S								U	S	
Dimethylamine	U	U	S	L				L			U	U	S	
Dioctyl Phthalate	S		S	S	S			L	U	S		L	S	
Dioxane	U	U	S	U	L		U	U	U	L	U	U	S	L
Ethyl Acetate	L	U	S	L	L	S	U	U	U	S	U	U	S	L
Ethyl Alcohol (Ethanol)	S	U	S	S	S	S	S	S	L	S	S	L	S	S
Ethyl Chloride	U	L	U	U	L	S	U	S	U	S	U	L	S	L
Ethylamine	U	U	L	L								U	S	
Ethylene Bromide	L	U	L	U		S	U		U		U	U	S	
Ethylene Dichloride	U	U	L	U		S		S	U	S	U	L	S	L
Ethylene Glycol	S	U	S	S	S	S	S	S	S	S	S	L	S	S
Ferric Chloride	S	S	S	S	S	U	S	S	S	S	S	S	S	S
Fluorine (Gas)	U	U	U	U	L	S	S	L	U	U	L	L	S	U
Fluoroboric Acid	L	U	S	L				S	S	U		S	S	S
Flurosilicic Acid	L		S	S		S	S	S	U	U	S	S	S	
Formaldehyde (40%)	S	U	S	S	S	S	S	L	S	S	S	S	S	L
Formic Acid (90%)	U	U	S	S	S	S	U	S	S	U	S	L	S	88% S
Freon 11 Refrigerant	S	U	L	S		S	U	S	S	U		S	L	
Freon 113 Refrigerant	S		L	U			S		S		S	S	L	
Freon 115 Refrigerant	S		L	U								S	L	
Freon 12 Refrigerant	S	L	L	S		S	S	S	S	S	U	L	L	
Freon 13 Refrigerant	S		S									S	L	
Freon 21 Refrigerant	S		S									U	S	
Freon 22 Refrigerant	S	U	S	L		S	U	S	S	S		U	S	
Freon 32 Refrigerant	S		S									U	L	
Furfural	S		L	U		S	U	L	U	S	U	U	S	L
Gasoline	S	U	L	U	L	S	U	S	S	S	S	S	S	U
Glycerol	S	S	S	S	S	S		S	S	S	S	S	S	S
Hexane	S	L	L	L	L		U	S	S	S	L	S	S	U
Hydrazine	L	L	S	U	U	S		S	U	U	U	U	S	S
Hydrobromic Acid (50%)	L	U	S	L	S	U	S	S	S	U	L	S	S	
Hydrochloric Acid (10%)	S	U	S	S	S	U	S	S	S	U	S	S	S	S
Hydrochloric Acid (36%)	U	U	S	S	S	U	S	S	S	U	U	S	S	Hot – U
Hydrofluoric Acid (40%)	U	U	S	S	S	S	L	S	S	U	U	S	S	U
Hydrogen Peroxide (35%)	U	U	S	L	S	S	S	S	S	To 5% L	S	S	S	S
Hydrogen Peroxide (87%)	U	U	S	U	S	S	S	L	S	U	S	S	S	
Hydrogen Sulphide (Gas)	S	L	S	S		S		S	S	L		S	S	S
Iso-Octane	S	U	S	U				S	S	S	S	S	S	U
Iso-Propyl Alcohol	S	L	S	S	S	S		S	L	U	S	S	S	S
Lactic Acid	S	S	S	S	S	S	U	L	S	S	S	S	S	S
Lead Acetate (10%)	S	U	S	S	S	S	S	S	S	S	S	L	S	S
Linseed Oil	S	L	S	S	S	S		S	S	S	S	S	S	L
Lubricating Oil	S	L	S	S		U		S	S	S	S	S	S	U
Magnesium Chloride	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Methyl Bromide	U	U	U	U		S	U	S	U	S		S	S	U
Methyl Ethyl Ketone	U	U	S	S	L	S	U	U	U	S	U	U	S	S
Methyl Alcohol (Methanol)	S	U	S	S	S	S	U	S	S	S	S	U	S	S

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	POTTING/CASE			FIBER/CASE		HOUSINGS						O-RINGS/SEALS		
	Epoxy	PU	PE	PP	PO	316LSS	ABS	PVDF	PVC	NYLON	PC	Viton®	Kalrez®	EPDM
Methylene Dichloride	U	U	L	L		S						L	S	
Molasses	S	S	S	S		S	S	S	S	S		S	S	
Monoethanolamine	L	U	L	L				U	U	**S**		U	S	
N-Propyl Alcohol	S	U	S	S		L		S				S	S	S
Nickel Chloride	S	S	S	S	S	L	S	S	S	L	S	S	S	S
Nitric Acid (10%)	L	L		S	S	S	S	S	U	U	S	S	s	L
Nitric Acid (70%)	U	U	L	L	L	S	L	L	U	U	L	U	S	U
Nitrobenzene	U	U	L	L	L	S	U	L	U	S	U	L	S	U
Nitromethane	U	U	L	L	L	S	U	S	S	S	U	U	S	L
Nitropropane	L	U	L	L			U	U				U	S	L
Oleic Acid	S	L	S	S		S	U	S	L	L	S	S	S	U
Olive Oil	S	S	S	S		S	S	S	L	S	S	S	S	L
Oxalic Acid	S	L	S	S	S	S	S	L	S	S	S	S	S	S
Ozone (Gas)	L	L	L	U	S	S	S	S	S	U	S	S	S	S
Parrafin Oil	S	L	S	S	L	S	S	S	S	S	S	S	S	
Perchloroethylene	S	U	L	U	U	S	U	S	L	L	U	S	S	U
Peroxymono-sulphuric Acid	U	U			S	S						S		
Phenol	U	U	S	L	U	S	U	L	L	U	U	S	S	U
Phosphoric Acid (85%)	L	L	S	S	S	U	L	S	S	S	S	S	S	S
Picric Acid	U	U	S	U	S	S	S	L	U	L	U	S	S	L
Plating Solutions (*not chrome)*	L	L	S	S				S				S	S	S
Potassium Cyanide	S	S	S	S	S	S	S	S	S	S		S	S	S
Potassium Fluoride	S	S	S	S		S	S	S				S	S	
Potassium Hydroxide (50%)	S	U	S	S	S	S	S	U	S	L	U	L	S	S
Potassium Permanganate	U	U	S	S	S	S	S	S	S	U	S	S	S	
Potassium Sulphate	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Propionic Acid	S	L	S	S	L		U	S	L	U	U	S	S	
Pyridine	U	U	L	S	L	S	U	U	U	L	U	U	S	L
Rapeseed Oil	L	L	L	U		S						S	S	S
Silicone Fluids	L	S	S	S	S	S	U	S	S	S	S	S	S	
Silver Nitrate	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sodium Borate	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sodium Carbonate	S	S	S	S	S	S	S	S	S	S	S	S	S	
Sodium Chloride	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sodium Chlorite	S	S	S	S			S	S				S	S	
Sodium Cyanide	S	S	S	S	S	S	S	S	S	S		L	S	S
Sodium Hydroxide (10%)	S	U	S	S	S	S	S	L	S	S	S	L	S	S
Sodium Hydroxide (60%)	S	U	S	S	S	S	S	U	S	L	U	L	S	S
Sodium Hypochlorite (20%)	L	U	L	L	S	L	S	S	S	U	L	L	S	L
Sodium Nitrate	S	S	S	S	S	S	S	S	S	S	U	S	S	S
Sour Oil	S		L					L				L	S	U
Stannic Chloride	S	S	S	S		U		S	S	S	S	S	S	S
Styrene	L	U	L	L	L	S		S	U	S	U	S	S	U
Sulfamic Acid	L	U					S					L	S	
Sulphur Dioxide (Gas)	S	L	S	S	S	S	U	S	S	L	S	S	S	S
Sulphuric Acid (10%)	S	L	S	S	S	L	S	S	S	L	S	S	S	S
Sulphuric Acid (70%)	U	U	S	L	S	U	S	S	S	U	S	S	S	
Sulphuric Acid (96%)	U	U	S	L	L	U	S	S	U	U	U	L	S	U

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Sulphuric Acid (Fuming)	U	U	L	U	U	U		U	U	**U**	U	L	S	
Tetrachloroethane	S	U	L	L		S	U	S	L	L		S	S	U
Tetrahydrofurane	U	U	L	L	L	S	U	U	U	S	U	U	S	L
Tetrahydro-napthalene	S	U	L	U								S	S	
Thionyl Chloride	U		U	U	U		U	U	U	U	U	U	S	L
Titanium Tetrachloride	S	S	L	L				S				S	S	U
Toluene	L	U	L	U	L	S	U	S	U	S	U	S	S	U
Transformer Oil	S	S	S	L			S					S	S	U
Trichloroacetic Acid	L	U	S	S	S	L		L	L	L	U	L	S	L
Trichloroethane	L	U	U	U	U	S	U	S	L	L	U	S	S	U
Trichloroethylene	L	U	U	U	U	S	U	S	U	L	U`	L	S	U
Tricresyl Phosphate	S		S	S		S	U	U	U	S		S		S
Triethanolamine	S	U	S	L				L				U	S	L
Triethylamine	S	U	S	U		S	U	L	S	S		L	S	
Turpentine	L	U	L	L	L	S	U	S	U	S	U	S	S	U
Vegetable Oils	S	S	L	L		S	S	S	S	S		S	S	L
Vinyl Acetate	L	L	S	S		S	U	S	U			U	S	L
Vinyl Chloride	U	L	U			S	U	S	U	S		S	S	U
Water (Distilled)	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Water (Sea)	S	S	S	S	S	S		S	S	S	S	S	S	
Wine	S	U	S	S		S	L	S	S	S	S	S	S	S
Xylene	L	U	L	U	L	S	U	S	U	S	U	S	S	U

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Certified System ™
ISO 9001
ISO 14001

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