



Tech Fact

Estimated Percent Rejection of Various Solutes by FilmTec™ Membranes

Introduction

In order to assist customers in estimating the rejection of FilmTec™ FT30 membranes, tests have been performed with a variety of solute compounds. The results of these tests are indicated as a % rejection for each compound listed in the tables below.

Actual system performance may vary from the listed data, particularly with changes in feed water concentration, pH and temperature. For this reason, these tables should be used as a quick screen. Pilot trials should be performed to determine actual rejection in a specific application.

Estimated Rejections

Solute	MW	Rejection, %
1, 1, 1-Trichloroethane	133	98
1, 2-Dibromoethane	173	15
1, 2-Dichloroethane	99	37
1, 2, 3-Trichlorobenzene	181	> 57
1, 2, 4-Trichlorobenzene	181	96
1, 2, 4-Trimethylbenzene	120	57
1, 2-Dichlorobenzene	147	70 – 92
1, 3-Dichlorobenzene	147	66 – 69
1, 4-Dichlorobenzene	147	61
1-Chlorododecane	204	87
1-Methylnaphthalene	142	67
2, 2', 5, 5'-Tetrachlorobiphenyl	290	46
2, 4, 6-Trichlorophenol	197	100
2, 4-Dichlorophenol	163	93
2, 6-Dimethylphenol	122	92
2, 6-Di-Tert-Butyl-4-Methylphenol	220	96
3, 8-Dimethylphenol	122	92
3-Hydroxy-Capric Acid	188	> 98
3-Pentanone	86	74
4-Ethylphenol	122	84
4-Isopropylphenol	136	84
5-Chlorouracil	146	88
Acetic Acid	60	45
Acetone	58	70
Aluminum Nitrate	213	86
Aluminum Sulfate	342	89
Aniline	93	64 – 75
Anthraquinone	208	93
Benzene	78	19
Benzoic Acid	122	92

Solute	MW	Rejection, %
Benzothiazole	133	79
Biphenyl	154	91
Bis (2-Ethylhexyl) Phthalate	390	94
Bromodichloromethane	163	79
Bromoform	253	> 67
Cadmium Sulfate	208	97
Caffeine	174	99
Calcium Chloride	111	99
Calcium Nitrate	164	95
Carbon Tetrachloride	153	98
Cesium Chloride	168	97
Chlorinated Pesticide (traces)		> 99
Chlorobenzene	112	0 – 50
Chloroform	119	71 – 90
cis-1, 2-Dichloroethylene	97	20
Clofibric Acid	214	> 99
Copper Sulfate	160	99
Cyclohexanone	98	95
Dibromochloromethane	208	79
e-Caprolactum	113	85
Ethanol	46	38 – 70
Ethyl Benzene	106	71
Formaldehyde	30	35
Furfural	96	35
Glucose	180	98 – 99
Glycine	188	78
Heptaldehyde	114	100
Humic Acid		98
Hydrochloric Acid	36	28
Isophorone	138	96

Solute	MW	Rejection, %
Isopropanol	60	90
Lactic Acid (pH 2)	90	94
Lactic Acid (pH 5)	90	99
Magnesium Chloride	95	99
Magnesium Sulfate	120	> 99
Manganese (II) Sulfate	151	97
Methanol	32	25
Methyl Ethyl Ketone	72	73
Methyl Isobutyl Ketone	100	98
Naphthalene	128	80
Nickel Chloride	130	96 – 99
Nickel Sulfate	155	97 – 99
o-Cresol	108	84
o-Xylene	106	67
p- & m-Xylene	106	38
Pentachlorophenol	266	> 86
Phenol-80%	94	65
Phosphoric Acid	96	94
Quinoline	129	97
Silica	60	98
Sodium Acetate (1%)	82	88
Sodium Bicarbonate	84	99
Sodium Bromide	103	96

Solute	MW	Rejection, %
Sodium Chloride	58	> 99
Sodium Cyanide (pH 11)	49	95
Sodium Di-H Phosphate	120	98
Sodium Fluoride ¹	42	99
Sodium Hydrogen Sulfate	120	76
Sodium Iodide	150	97
Sodium Mono-H Phosphate	142	98
Sodium Nitrate	85	93 – 98
Sodium Orthophosphate	164	99
Stearic Acid	204	71
Strontium Chloride	158	96
Succinic Acid	118	35
Sucrose	342	99
Sulfuric Acid	98	84
Tetrachloroethylene	165	68 – 80
Tin (II) Sulfate	215	85
Tributyl Phosphate	266	49
Trichloroethylene	131	30 – 43
Trimesic Acid	210	96
Urea	60	70
Zinc Chloride	136	93
Zinc Sulfate	161	98

1. Fluoride rejection is strongly pH dependent (about 75% at pH 5, 50% at pH 4, 30% at pH 3.5 and 0% below pH 3).

Note: FilmTec™ FT30 membranes are available in a wide variety of spiral wound configurations.

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