

# TPE CHEMICAL RESISTANCE



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# INTRODUCTION

Dryflex and Mediprene TPE compounds that are based on SBS and/or SEBS exhibit excellent resistance to water and a wide variety of solutions. However, some degradation in the compounds can be seen at long-term exposure to organic solvents, oils as well as fuels. Therefore tests should be carried out to determine the suitability of TPE in each application that requires chemical resistance.

We recommend that tests are performed under actual service conditions, as the resistance and absorption are highly dependent on the service temperature and other conditions of the end application.

Please [contact us](#) for further information.

# OVERVIEW

This table gives a short overview of the chemical resistance of Dryflex and Mediprene TPE compounds based on SBS and/or SEBS.

CHEMICAL	RESISTANCE
ACIDS (excluding carboxylic acids) Carboxylic acids Bases Tensides	Good Swells Excellent Excellent
FOOD Fatty food Oil in water Water in oil Alcohol	Swells Excellent Swells Good
HYDROCARBONS Aliphatic hydrocarbons Aromatic hydrocarbons Polar hydrocarbons	Swells Dissolves Swells / Dissolves
OIL METHANOL and ETHANOL (moderate concentrations)	Swells Good

# SEBS BASED TPE COMPOUNDS

In the tables on the following pages we give an indication of the chemical resistance of Dryflex and Mediprene grades based on SEBS. The tests were performed by Kraton Polymers. A harder material is in general more resistant than a softer one.

MEDIA	CONDITIONS RT = ROOM TEMPERATURE	Dryflex DFG 7705 47 Shore A			Dryflex DFG 7720 64 Shore A			Dryflex DFG 7820 92 Shore A		
		%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA
		Acetone	7d/RT	-23	-30	35	-15	-19	0	-3
	14d/RT	-22	-29	33	-14	-18	2	-3	-3	-1
	21d/RT	-16	-22	25	-11	-14	1	-1	-1	-1
Formaldehyde	7d/RT	9	11	-13	-	-	-	0.6	0.6	0
	14d/RT	17	19	-18	-	-	-	0.7	0.7	0
	21d/RT	24	26	-20	-	-	-	0.9	0.9	0
Propionaldehyde	7d/RT	-20	-27	7	-17	-22	4	-3	-3	-1
	14d/RT	-16	-21	5	-18	-13	6	-2	-2	-2
	21d/RT	-18	-21	0	-18	-23	6	-2	-3	-3
NaOH. 10%	7d/RT	0.2	0.2	5	-0.2	-0.5	0	0	0	0
	14d/RT	0.2	0.2	5	-0.1	-0.1	-2	0.2	0.2	0
	21d/RT	0.2	0.2	0	0	0	-2	0.2	0.2	0
NaOH. 50%	7d/RT	0.2	0.2	3	-0.2	-0.2	-3	-0.1	-0.1	1
	14d/RT	0	0	3	-0.2	-0.2	-3	0	0	1
	21d/RT	0	0	3	-0.1	-0.1	-2	0	0	1

MEDIA	CONDITIONS RT = ROOM TEMPERATURE	Dryflex DFG 7705 47 Shore A			Dryflex DFG 7720 64 Shore A			Dryflex DFG 7820 92 Shore A		
		%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA
Sulphuric acid. 10 %	7d/RT	0	0	-5	-	-	-	0	0.4	0
	14d/RT	-0.1	-0.5	-3	-	-	-	0	0	0
	21d/RT	0	0	-3	-	-	-	0	0	0
Sulphuric acid. 50%	7d/RT	0.1	0.1	13	-0.1	-0.5	3.4	-0.2	-0.2	0
	14d/RT	0.1	0.1	10	0	0	3.4	-0.2	-0.1	0
	21d/RT	0	0.8	13	0	0.5	3.4	-0.1	-0.1	0
Sulphuric acid. 96%	7d/RT	-0.3	-0.7	-3	-0.2	-0.2	-5	-0.1	-1	0
	14d/RT	0	-0.5	5	0	0.4	-1	0.1	0.1	0
	21d/RT	0.4	-0.1	8	0	0	-4	0.3	0.3	0
Formic acid. 10%	7d/RT	22	26	-15	12	14	-10	4	4	-3
	14d/RT	43	53	-28	25	29	-15	5	6	-7
	21d/RT	64	74	-38	38	44	-19	7	9	-9
Acetic acid. 10%	7d/RT	33	39	-25	21	27	-15	5	7	-3
	14d/RT	66	77	-38	44	53	-18	8	10	-4
	21d/RT	94	110	-43	66	79	-24	10	13	-7
Chlorhydric acid. 10%	7d/RT	0.5	0.5	-5	-	-	-	0	0	0
	14d/RT	1	2	-8	-	-	-	0	0.5	0
	21d/RT	2	1	-13	-	-	-	0.4	0.4	0
Nitric acid. 10%	7d/RT	0.8	0.8	-1	0.4	-0.4	-2	0	0	0
Nitric acid. 50%	7d/RT	15	13	-6	13	11	-6	4	4	-1
Lactic acid. konc.	7d/RT	0.7	-1	1	0.6	0.6	2	0.2	0.2	1
	14d/RT	1.3	-0.1	2	1	0.6	2	0.3	0.3	0
	21d/RT	1.5	-0.2	2	1.3	0.8	2	0.5	0.3	0
Lactic acid. 10%	7d/RT	1.3	0.5	-1	0.6	-1.9	-1	0.2	0.2	-1
	14d/RT	2.1	0.3	-2	1.2	-1.4	-2	0.3	0.3	-1
	21d/RT	2.2	0.5	-2	1.5	-1.1	-3	0.3	0.3	-1

MEDIA	CONDITIONS RT = ROOM TEMPERATURE	Dryflex DFG 7705 47 Shore A			Dryflex DFG 7720 64 Shore A			Dryflex DFG 7820 92 Shore A		
		%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA
Hydroperoxide. 12%	3d/RT	0.2	0.2	-1	0.1	-0.8	-2	0	0	0
Distilled Water	7d/80°C	0.6	0.6	0	0.4	0.4	0	0.6	0.6	0
Sea Water	7d/50°C	0.2	-0.7	0	-0.2	-0.2	0	0.6	0.6	0
Soap solution. 30%	7d/RT	0.5	0.5	-4	0.2	-0.6	-4	-0.3	-0.3	-1
	14d/RT	-2	-4	-2	-3	-5	-1	2	-3	0
	21d/RT	-5	-9	-1	-6	-9	0	-4	-5	1
Soap	7d/RT	-4	-5	-2	-4	-5	-1	-3	-3	0
	14d/RT	-7	-10	0	-7	-10	1	-4	-5	1
	21d/RT	-11	-15	2	-11	-15	3	-5	-8	0
Methanol	7d/RT	-7	-10	15	-2.3	-3.1	0	0.5	1.5	-1
	14d/RT	-7	-9	12	-1.6	-2.5	0	1	1	-1
	21d/RT	-6	-8	18	-1.2	-1.6	-2	2	2	-1
Ethanol	7d/RT	-7	-9	2	-5	-5	1	-0.8	-0.8	0
	14d/RT	-7	-9	2	-5	-5	1	-0.2	-0.2	-1
	21d/RT	-7	-9	1	-5	-5	1	0.6	0.6	-1
Butanol	7d/RT	-25	-33	65	-	-	-	-4	-5	0
	14d/RT	-29	-39	83	-	-	-	-6	-8	1
	21d/RT	-30	-40	83	-	-	-	-6	-8	1
Isopropanol	7d/RT	-25	-35	21	-21	-27	13	-4	-5	0
	14d/RT	-29	-35	27	-23	-30	17	-5	-5	0
	21d/RT	-30	-40	32	-24	-32	21	-5	-6	0
Ethyl acetate	7d/RT	-18	-25	-1	-14	-18	2	-4	-6	0
	14d/RT	-18	-26	-2	-15	-19	4	-5	-7	0
	21d/RT	-19	-26	-4	-15	-20	4	-5	-6	0

MEDIA	CONDITIONS RT = ROOM TEMPERATURE	Dryflex DFG 7705 47 Shore A			Dryflex DFG 7720 64 Shore A			Dryflex DFG 7820 92 Shore A		
		%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA
Ethylene glycol	7d/RT	1	0.2	-1	1	3	0	0	0	0
	14d/RT	2	1.5	-2	1.5	3	-2	0.3	0	0
	21d/RT	3	3	-4	3	5	-3	0.4	0	-1
Formaldehyde	7d/RT	9	11	-5	2.5	3	-9	0.6	0.7	0
	14d/RT	17	19	-7	5	6	-10	0.7	0.7	0
	21d/RT	24	26	-8	7	8	-10	0	0.7	0
Glycerine	7d/RT	-0.1	-0.1	0	-0.1	-0.1	-1	0	0	0
	14d/RT	-0.1	-0.1	-1	0	0	-1	0	0	0
	21d/RT	0	0	-1	-0.1	-0.1	-3	0	0	0
Chlorine water	7d/RT	-0.1	-0.1	0	0	0	0	0.1	-0.1	0
Sodium chloride solution, 10% (NaCl)	7d/RT	0.1	0.1	-1	0	0	0	0	0	0
	14d/RT	0.2	0.2	-1	0.1	0.1	0	0.1	0.1	0
	21d/RT	0.1	0.1	-1	0.1	0.1	0	0.1	0.1	0
Methylene chloride	7d/RT	8	-8	-18	10	-3	-9	9	0	-3
	14d/RT	13	-5	-24	10	-3	-12	7	-3	-5
	21d/RT	13	-4	-28	12	-2	-16	7	-3	-7
MEK (Methyl ethyl ketone)	7d/RT	-20	-26	23	-12.7	-15.6	-2	-6	-6	-1
	14d/RT	-21	-27	33	-13.7	-21.8	3.4	-6	-7	-1
	21d/RT	-21	-27	35	-13.5	-17	3.4	-6	-7	0
Hydraulic brake fluid	7d/RT	-5	-7	-3	-4	-6	0	0.4	0.4	-1
	14d/RT	-7	-10	-2	-5	-7	-1	0	0	0
	21d/RT	-8	-12	-2	-6	-9	-1	0	0	0
	70 hours/120°C	-23	-33	21	-18	-27	15	-6	-6	1
	7d/120°C	-23	-33	21	-19	-28	16	-7	-7	1



MEDIA	CONDITIONS RT = ROOM TEMPERATURE	Dryflex DFG 7705 47 Shore A			Dryflex DFG 7720 64 Shore A			Dryflex DFG 7820 92 Shore A		
		%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA
Petrol A (Isooctane)	7d/RT	4	19	-18	-	-	-	-0.5	6	-6
	14d/RT	5	20	-25	-	-	-	-0.6	6	-6
	21d/RT	4	19	-20	-	-	-	-0.4	6	-7
Petrol B (Isooctane/ toluole) (70/30)	7d/RT	-20	-19	70	0.8	12.1	-93	11	28	-22
	14d/RT	-44	-52	70	-18.5	-16	-74	7	23	-19
	21d/RT	-51	-59	108	-34.7	-38.6	-40	8	28	-22
Petrol C (Isooctane/toluole) (50/50)	7d/RT	-18	-19	-90	-	-	-	-1	18	-15
	14d/RT	-29	-34	-75	-	-	-	-12	8	-15
	21d/RT	-23	-38	-70	-	-	-	-11	6	-20
Petrol (lead-free)	7d/RT	34	57	-100	-	-	-	8	21	-21
	14d/RT	-12	-11	-88	-	-	-	-2	17	-21
	21d/RT	-21	-24	-83	-	-	-	-2	12	-21
ASTM oil #1	7d/100°C	45.5	60.5	-48	26.9	35.5	-33	7.8	9.7	-5
	14d/100°C	58.9	78.6	-55	29.1	39.1	-38	8.5	9.5	-6
	21d/100°C	68.7	91.4	-63	30.4	40.5	-40	9.0	11.4	-5
ASTM oil #3	7d/100°C	18	20	-85	36.2	44.1	-69	37	44.1	-69
	14d/100°C	18	17	-85	26.8	32.4	-76	27	32.4	-76
	21d/100°C	6	2	-85	21.8	25.5	-81	25	25.5	-81
Consistent grease (Shell Retinax A)	7d/40°C	17	21	-15	8.2	9.6	-7	4	5	-1
	14d/40°C	25	30	-18	18	22.1	-17	5	6	-2
	21d/40°C	31	40	-30	21.8	27.1	-19	6	7	-3

# CHEMICAL RESISTANCE OF SEBS RAW MATERIALS

1. Acetaldehyde	R	38. Butane	NR	75. Ferrous chloride	R	111. Molybdenum disulphide	R	148. Sodium ferrocyanide	R
2. Acetates (low mol. weight)	R	39. Butyl acetate	NR	76. Ferrous sulphate	R	112. Monoethanolamine	T	149. Sodium hydrosulfite	R
3. Acetic acid	R	40. Butyl alcohol (butanol)	T	77. Fluoborate salts	R	113. Naphta	NR	150. Sodium hydroxide	R
4. Acetic anhydride	T	41. Butyric acid	R	78. Fluoboric acid	R	114. Natural gas	NR	151. Sodium hypochlorite	R
5. Aceto nitrile	R	42. Calcium oxide (diluted)	R	79. Fluo-cilicic acid	R	115. Nickel salt	R	152. Sodium nitrate	R
6. Acetone	T	43. Calcium salts	R	80. Formaldehyde	R	116. Nitric acid	R	153. Sodium silicate	R
7. Acetyl bromide	R	44. Carbon disulfide	NR	81. Formic acid	R	117. Nitrobenzene	NR	154. Sodium sulphide	R
8. Acetyl chloride	R	45. Carbon dioxide	R	82. Freon	T	118. Nitrogen oxides	R	155. Sodium sulphite	R
9. Air	R	46. Carbon tetrachloride	T	83. Gasoline	NR	119. Nitrous acid	R	156. Steam (up to 0.3 MPa)	T
10. Alcohols	T	47. Chloracetic acid	R	84. Glucose (dextrose)	R	120. Oils, animal	T	157. Stearic acid	R
11. Aliphatic hydrocarbons	NR	48. Chlorine	R	85. Glue (waterbased)	R	121. Oils, mineral	T	158. Styrene	NR
12. Aluminium chloride	R	49. Chlorobenzene	NR	86. Glycerine	T	122. Oils, vegetable	T	159. Sulphur chloride	R
13. Aluminium sulphate	R	50. Chlorobromomethane	NR	87. Hydriodic acid	R	123. Oleic acid	R	160. Sulphur dioxide	R
15. Ammonia	R	51. Chloroform	NR	88. Hydrobromic acid	R	124. Oxalic acid	R	161. Sulphur hexafluoride	R
14. Alums	R	52. Chlorosulfonic acid	R	89. Hydrochloric acid	R	125. Oxygen (gas)	R	162. Sulphur trioxide	R
16. Ammonium acetate	R	53. Chromic acid	R	90. Hydrocyanic acid	R	126. Perchloric acid	R	163. Sulphuric acid	R
17. Ammonium carbonate	R	54. Chromium salts	R	91. Hydrofluoric	R	127. Perchlorethylene	T	164. Sulphurous acid	R
18. Ammonium chloride	R	55. Copper salts	R	92. Hydrogen peroxide	R	128. Phenol	NR	165. Tannic acid	R
19. Ammonium hydroxide	R	56. Cresol	NR	93. Hydrogen sulphide	R	129. Phosphoric acid	R	166. Tanning extracts	R
20. Ammonium nitrate	R	57. Cyclohexane	NR	94. Hydrochlorous acid	R	130. Phtalic acid	NR	167. Tartaric acid	R
21. Ammonium phosphate	R	58. Cyclohexanone	NR	95. Iodine and solutions	T	131. Plating solutions	R	168. Tin salts	R
22. Ammonium sulphate	R	59. Diacetone alcohol	R	96. Kerosene	NR	132. Polyglycol	T	169. Titanium salts	R
23. Aniline	T	60. Dimethyl formamide	R	97. Ketones (watersoluble)	R	133. Potassium carbonate	R	170. Toluene (toluol)	NR
24. Aniline hydrochloride	T	61. Essential oils	R	98. Lacquer solvents	NR	134. Potassium chlorate	R	171. Trichloroacetic acid	R
25. Antimony salts	R	62. Ethers	NR	99. Lactic acids	R	135. Potassium hydroxide	R	172. Trichloroethylene	NR
26. Aqua regia (75% HCl, 25% HNO3)	R	63. Ethyl acetate B	R	100. Lead acetate	R	136. Potassium iodide	R	173. Tri-sodium phosphate	R
27. Aromatic hydrocarbons	NR	64. Ethyl alcohol (ethanol)	T	101. Linseed oil	NR	137. Pyridine	R	174. Turpentine	NR
28. Arsenic salts	R	65. Ethyl bromide	R	102. Lithium hydroxide	R	138. Silicone fluids	R	175. Urea	R
29. Barium salts	R	66. Ethyl choride	R	103. Magnesium chloride	R	139. Silicone oil	R	176. Uric acid	R
30. Benzaldehyde	NR	67. Ethylamine	R	104. Magnesium sulphate	R	140. Silver nitrate	R	177. Vinyl plastisol	NR
31. Benzene	NR	68. Ethylene chlorohydrin	R	105. Maleic acid	R	141. Soap solutions	R	178. Water	R
32. Benzene sulfonic acid	R	69. Ethylene dichloride	R	106. Manganese salts	R	142. Sodium bicarbonate	R	179. Xylene (xylo)	NR
33. Benzoic acid	NR	70. Ethylene glycol	T	107. Mercury salts	R	143. Sodium bisulfate	R	180. Zinc chloride	R
34. Benzyl alcohol	NR	71. Ethylene oxide	R	108. Methane	NR	144. Sodium bisulfite	R		
35. Bleaching liquors (non-aromatic )	R	72. Fatty acids	T	109. Methyl chloride	R	145. Sodium borate	R		
36. Boric acid	R	73. Ferric chloride	R	110. Mixed acid	R	146. Sodium carbonate	R		
37. Bromine	R	74. Ferric sulphate	R	(40% sulphuric, 15% nitric)		147. Sodium chlorate	R		

R = Resistance

NR = Not resistance

T = Must be tested before use

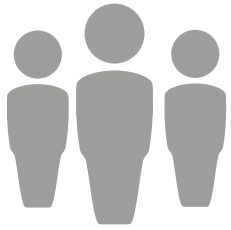


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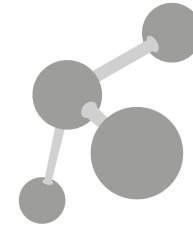
PRODUCTION PLANTS  
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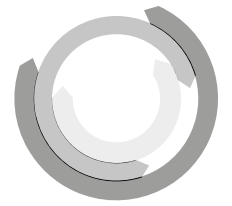
GLOBAL CAPACITY  
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