A Material Difference

TPE Chemical Resistance

HEXPOL® TPE

Introduction

Dryflex and **Mediprene** TPE compounds that are based on SBS and/or SEBS rubbers 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)	**Good**
Carboxylic acids	**Swells**
Bases	**Excellent**
Tensides	**Excellent**
FOOD	
Fatty food	**Swells**
Oil in water	**Excellent**
Water in oil	**Swells**
Alcohol	**Good**
HYDROCARBONS	
Aliphatic hydrocarbons	**Swells**
Aromatic hydrocarbons	**Dissolves**
Polar hydrocarbons	**Swells / Dissolves**
OIL	**Swells**
METHANOL and ETHANOL (moderate concentrations)	**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	-3	-1
	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	7d/RT	4	19	-18	-	-	-	-0.5	6	-6
(Isooctane)	14d/RT	5	20	-25	-	-	-	-0.6	6	-6
	21d/RT	4	19	-20	-	-	-	-0.4	6	-7
Petrol B	7d/RT	-20	-19	70	0.8	12.1	-93	11	28	-22
(Isooctane/ toluole) (70/30)	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	7d/RT	-18	-19	-90	-	-	-	-1	18	-15
(Isooctane/toluole) (50/50)	14d/RT	-29	-34	-75	-	-	-	-12	8	-15
	21d/RT	-23	-38	-70	-	-	-	-11	6	-20
Petrol	7d/RT	34	57	-100	-	-	-	8	21	-21
(lead-free)	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	7d/40°C	17	21	-15	8.2	9.6	-7	4	5	-1
(Shell Retinax A)	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
2. Acetates (low mol. weight)	R
3. Acetic acid	R
4. Acetic anhydride	T
5. Aceto nitrile	R
6. Acetone	T
7. Acetyl bromide	R
8. Acetyl chloride	R
9. Air	R
10. Alcohols	T
11. Aliphatic hydrocarbons	NR
12. Aluminium chloride	R
13. Aluminium sulphate	R
15. Ammonia	R
14. Alums	R
16. Ammonium acetate	R
17. Ammonium carbonate	R
18. Ammonium chloride	R
19. Ammonium hydroxide	R
20. Ammonium nitrate	R
21. Ammonium phosphate	R
22. Ammonium sulphate	R
23. Aniline	T
24. Aniline hydrochloride	T
25. Antimony salts	R
26. Aqua regia (75% HCl, 25% HNO3)	R
27. Aromatic hydrocarbons	NR
28. Arsenic salts	R
29. Barium salts	R
30. Benzaldehyde	NR
31. Benzene	NR
32. Benzene sulfonic acid	R
33. Benzoic acid	NR
34. Benzyl alcohol	NR
35. Bleaching liquors (non-aromatic)	R
36. Boric acid	R
37. Bromine	R
38. Butane	NR
39. Butyl acetate	NR
40. Butyl alcohol (butanol)	T
41. Butyric acid	R
42. Calcium oxide (diluted)	R
43. Calcium salts	R
44. Carbon disulfide	NR
45. Carbon dioxide	R
46. Carbon tetrachloride	T
47. Chloracetic acid	R
48. Chlorine	R
49. Chlorobenzene	NR
50. Chlorobromomethane	NR
51. Chloroform	NR
52. Chlorosulfonic acid	R
53. Chromic acid	R
54. Chromium salts	R
55. Copper salts	R
56. Cresol	NR
57. Cyclohexane	NR
58. Cyclohexanone	NR
59. Diacetone alcohol	R
60. Dimethyl formamide	R
61. Essential oils	R
62. Ethers	NR
63. Ethyl acetate B	R
64. Ethyl alcohol (ethanol)	T
65. Ethyl bromide	R
66. Ethyl choride	R
67. Ethylamine	R
68. Ethylene chlorohydrin	R
69. Ethylene dichloride	R
70. Ethylene glycol	T
71. Ethylene oxide	R
72. Fatty acids	T
73. Ferric chloride	R
74. Ferric sulphate	R
75. Ferrous chloride	R
76. Ferrous sulphate	R
77. Fluoborate salts	R
78. Fluoboric acid	R
79. Fluo-cilicic acid	R
80. Formaldehyde	R
81. Formic acid	R
82. Freon	T
83. Gasoline	NR
84. Glucose (dextrose)	R
85. Glue (waterbased)	R
86. Glycerine	T
87. Hydriodic acid	R
88. Hydrobromic acid	R
89. Hydrochloric acid	R
90. Hydrocyanic acid	R
91. Hydrofluoric	R
92. Hydrogen peroxide	R
93. Hydrogen sulphide	R
94. Hydrochlorous acid	R
95. Iodine and solutions	T
96. Kerosene	NR
97. Ketones (watersoluble)	R
98. Lacquer solvents	NR
99. Lactic acids	R
100. Lead acetate	R
101. Linseed oil	NR
102. Lithium hydroxide	R
103. Magnesium chloride	R
104. Magnesium sulphate	R
105. Maleic acid	R
106. Manganese salts	R
107. Mercury salts	R
108. Methane	NR
109. Methyl chloride	R
110. Mixed acid (40% sulphuric, 15% nitric)	R
111. Molybdenum disulphide	R
112. Monoethanolamine	T
113. Naphta	NR
114. Natural gas	NR
115. Nickel salt	R
116. Nitric acid	R
117. Nitrobenzene	NR
118. Nitrogen oxides	R
119. Nitrous acid	R
120. Oils, animal	T
121. Oils, mineral	T
122. Oils, vegetable	T
123. Oleic acid	R
124. Oxalic acid	R
125. Oxygen (gas)	R
126. Perchloric acid	R
127. Perchlorethylene	T
128. Phenol	NR
129. Phosphoric acid	R
130. Phtalic acid	NR
131. Plating solutions	R
132. Polyglycol	T
133. Potassium carbonate	R
134. Potassium chlorate	R
135. Potassium hydroxide	R
136. Potassium iodide	R
137. Pyridine	R
138. Silicone fluids	R
139. Silicone oil	R
140. Silver nitrate	R
141. Soap solutions	R
142. Sodium bicarbonate	R
143. Sodium bisulfate	R
144. Sodium bisulfite	R
145. Sodium borate	R
146. Sodium carbonate	R
147. Sodium chlorate	R
148. Sodium ferrocyanide	R
149. Sodium hydrosulfite	R
150. Sodium hydroxide	R
151. Sodium hypochlorite	R
152. Sodium nitrate	R
153. Sodium silicate	R
154. Sodium sulphide	R
155. Sodium sulphite	R
156. Steam (up to 0.3 MPa)	T
157. Stearic acid	R
158. Styrene	NR
159. Sulphur chloride	R
160. Sulphur dioxide	R
161. Sulphur hexafluoride	R
162. Sulphur trioxide	R
163. Sulphuric acid	R
164. Sulphurous acid	R
165. Tannic acid	R
166. Tanning extracts	R
167. Tartaric acid	R
168. Tin salts	R
169. Titanium salts	R
170. Toluene (toluol)	NR
171. Trichloracetic acid	R
172. Trichloroethylene	NR
173. Tri-sodium phosphate	R
174. Turpentine	NR
175. Urea	R
176. Uric acid	R
177. Vinyl plastisol	NR
178. Water	R
179. Xylene (xylol)	NR
180. Zinc chloride	R

R = Resistance NR = Not resistance T = Must be tested before use

ABOUT US

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