dryflex®

mediprene®

ELASTO

A HEXPOL COMPANY

CHEMICAL RESISTANCE

Introduction

Dryflex® and Mediprene® compounds 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 the tests to be performed under actual service conditions, as the resistance and absorption are highly dependent on the service temperature and other conditions of the end application.

Overview of the Chemical Resistance

The summary below gives a short overview of the chemical resistance of Dryflex® and Mediprene® compound based on SBS and/or SEBS.

Chemical	Resistance
ACIDS (except of 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

Chemical Resistance – SEBS Based Compounds

In the tables on the coming pages we give an indication of the chemical resistance of Dryflex® and Mediprene® grades based on SEBS.

The tests are performed by Kraton Polymers (former Shell). A harder material is in general more resistant than a softer one.

Media	Conditions RT= Room Temperature	DFG 7705 47 ShoreA SEBS-filled %-weight	%-vol	%-ShA	DFG 7720 64 ShoreA SEBS-filled %-weight	%-vol	%-ShA	DFG 7820 92 ShoreA SEBS-filled %-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
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	-0.4	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
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	-6	-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	0.5	-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

Media	Conditions RT= Room Temperature	DFG 7705 47 ShoreA SEBS-filled			DFG 7720 64 ShoreA SEBS-filled			DFG 7820 92 ShoreA SEBS-filled		
		%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA	%-weight	%-vol	%-ShA
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
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	-11	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
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-material

1. Acetaldehyde	R	63. Dimethyl formamide	R	124. Oils, mineral	T
2. Acetates (low mol. weight)	R	64. Essential oils	R	125. Oils, vegetable	T
3. Acetic acid	R	65. Ethers	NR	126. Oleic acid	R
4. Acetic anhydride	T	66. Ethyl acetate B	R	127. Oxalic acid	R
5. Aceto nitrile	R	67. Ethyl alcohol (ethanol)	T	128. Oxygen (gas)	R
6. Acetone	T	68. Ethyl bromide	R	129. Perchloric acid	R
7. Acetyl bromide	R	69. Ethyl choride	R	130. Perchlorethylene	T
8. Acetyl chloride	R	70. Ethylamine	R	131. Phenol	NR
9. Air	R	71. Ethylene chlorohydrin	R	132. Phosphoric acid	R
10. Alcohols	T	72. Ethylene dichloride	R	133. Phtalic acid	NR
11. Aliphatic hydrocarbons	NR	73. Ethylene glycol	T	134. Plating solutions	R
12. Aluminium chloride	R	74. Ethylene oxide	R	135. Polyglycol	T
13. Aluminium sulphate	R	75. Fatty acids	T	136. Potassium carbonate	R
15. Ammonia	R	76. Ferric chloride	R	137. Potassium chlorate	R
14. Alums	R	77. Ferric sulphate	R	138. Potassium hydroxide	R
16. Ammonium acetate	R	78. Ferrous chloride	R	139. Potassium iodide	R
17. Ammonium carbonate	R	79. Ferrous sulphate	R	140. Pyridine	R
18. Ammonium chloride	R	80. Fluoborate salts	R	141. Silicone fluids	R
19. Ammonium hydroxide	R	81. Fluoboric acid	R	142. Silicone oil	R
20. Ammonium nitrate	R	82. Fluo-cilicic acid	R	143. Silver nitrate	R
21. Ammonium phosphate	R	83. Formaldehyde	R	144. Soap solutions	R
22. Ammonium sulphate	R	84. Formic acid	R	145. Sodium bicarbonate	R
23. Amyl acetate	NR	85. Freon	T	146. Sodium bisulfate	R
24. Amyl alcohol	NR	86. Gasoline	NR	147. Sodium bisulfite	R
25. Amyl chloride	NR	87. Glucose (dextrose)	R	148. Sodium borate	R
26. Aniline	T	88. Glue (waterbased)	R	149. Sodium carbonate	R
27. Aniline hydrochloride	T	89. Glycerine	T	150. Sodium chlorate	R
28. Antimony salts	R	90. Hydriodic acid	R	151. Sodium ferrocyanide	R
29. Aqua regia (75% HCl, 25% HNO3)	R	91. Hydrobromic acid	R	152. Sodium hydrosulfite	R
30. Aromatic hydrocarbons	NR	92. Hydrochloric acid	R	153. Sodium hydroxide	R
31. Arsenic salts	R	93. Hydrocyanic acid	R	154. Sodium hypochlorite	R
32. Barium salts	R	94. Hydrofluoric	R	155. Sodium nitrate	R
33. Benzaldehyde	NR	95. Hydrogen peroxide	R	156. Sodium silicate	R
34. Benzene	NR	96. Hydrogen sulphide	R	157. Sodium sulphide	R
35. Benzene sulfonic acid	R	97. Hydrochlorous acid	R	158. Sodium sulphite	R
36. Benzoic acid	NR	98. Iodine and solutions	T	159. Steam (up to 0.3 MPa)	T
37. Benzyl alcohol	NR	99. Kerosene	NR	160. Stearic acid	R
38. Bleaching liquors (non-aromatic)	R	100. Ketones (watersoluble)	R	161. Styrene	NR
39. Boric acid	R	101. Lacquer solvents	NR	162. Sulphur chloride	R
40. Bromine	R	102. Lactic acids	R	163. Sulphur dioxide	R
41. Butane	NR	103. Lead acetate	R	164. Sulphur hexafluoride	R
42. Butyl acetate	NR	104. Linseed oil	NR	165. Sulphur trioxide	R
43. Butyl alcohol (butanol)	T	105. Lithium hydroxide	R	166. Sulphuric acid	R
44. Butyric acid	R	106. Magnesium chloride	R	167. Sulphurous acid	R
45. Calcium oxide (diluted)	R	107. Magnesium sulphate	R	168. Tannic acid	R
46. Calcium salts	R	108. Maleic acid	R	169. Tanning extracts	R
47. Carbon disulfide	NR	109. Manganese salts	R	170. Tartaric acid	R
48. Carbon dioxide	R	110. Mercury salts	R	171. Tin salts	R
49. Carbon tetrachloride	T	111. Methane	NR	172. Titanium salts	R
50. Chloracetic acid	R	112. Methyl chloride	R	173. Toluene (toluol)	NR
51. Chlorine	R	113. Mixed acid (40% sulphuric, 15% nitric)	R	174. Trichloracetic acid	R
52. Chlorobenzene	NR			175. Trichloroethylene	NR
53. Chlorobromomethane	NR	114. Molybdenum disulphide	R	176. Tri-sodium phosphate	R
54. Chloroform	NR	115. Monoethanolamine	T	177. Turpentine	NR
55. Chlorosulfonic acid	R	116. Naphta	NR	178. Urea	R
56. Chromic acid	R	117. Natural gas	NR	189. Uric acid	R
57. Chromium salts	R	118. Nickel salt	R	180. Vinyl plastisol	NR
58. Copper salts	R	119. Nitric acid	R	181. Water	R
59. Cresol	NR	120. Nitrobenzene	NR	182. Xylene (xylol)	NR
60. Cyclohexane	NR	121. Nitrogen oxides	R	183. Zinc chloride	R
61. Cyclohexanone	NR	122. Nitrous acid	R		
62. Diacetone alcohol	R	123. Oils, animal	T		

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

We provide all the above, written and illustrated information and advice in good faith. This should only be regarded as being advisory, and does not absolve the customer from doing their own trials, to determine the suitability of the material for the intended applications. We retain the right to make changes without prior notice. For further information, please contact us.

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