

Table 3 - Typical Freezing and Boiling Points of Aqueous Solutions of Pipe Mate and Pipe Mate HD*

Freezing Point		Wt % Propylene Glycol	Vol % Propylene Glycol	Vol % Pipe Mate	Vol % Pipe Mate HD	Boiling Point		Degree Brix**	Refractive Index 22°C
						°F @ 760 mm Hg	°C @ 0.96 Barr		
°F	°C								
32.0	0.0	0.0	0.0	0.0	0.0	212	100	0.0	1.3328
29.1	-1.6	5.0	4.8	5.0	5.1	212	100	4.8	1.3383
26.1	-3.3	10.0	9.6	10.0	10.2	212	100	8.4	1.3438
22.9	-5.1	15.0	14.5	15.1	15.4	212	100	12.9	1.3495
19.2	-7.1	20.0	19.4	20.3	20.6	213	101	15.4	1.3555
18.3	-7.6	21.0	20.4	21.3	21.7	213	101	16.0	1.3567
17.6	-8.0	22.0	21.4	22.4	22.8	213	101	16.7	1.3579
16.6	-8.6	23.0	22.4	23.4	23.8	213	101	17.4	1.3591
15.6	-9.1	24.0	23.4	24.5	24.9	213	101	18.4	1.3603
14.7	-9.6	25.0	24.4	25.5	26.0	214	101	19.0	1.3615
13.7	-10.2	26.0	25.3	26.5	26.9	214	101	19.6	1.3627
12.6	-10.8	27.0	26.4	27.6	28.1	214	101	20.2	1.3639
11.5	-11.4	28.0	27.4	28.6	29.1	215	102	20.8	1.3651
10.4	-12.0	29.0	28.4	29.7	30.2	215	102	21.4	1.3663
9.2	-12.7	30.0	29.4	30.7	31.3	216	102	22.0	1.3675
7.9	-13.4	31.0	30.4	31.8	32.3	216	102	22.7	1.3687
6.6	-14.1	32.0	31.4	32.8	33.4	216	102	23.6	1.3698
5.3	-14.8	33.0	32.4	33.9	34.5	216	102	24.4	1.3710
3.9	-15.6	34.0	33.5	35.0	35.6	216	102	25.3	1.3621
2.4	-16.4	35.0	34.4	36.0	36.6	217	103	26.1	1.3733
0.8	-17.3	36.0	35.5	37.1	37.8	217	103	26.9	1.3744
-0.8	-18.2	37.0	36.5	38.2	38.8	217	103	27.5	1.3756
-2.4	-19.1	38.0	37.5	39.2	39.9	218	103	28.0	1.3767
-4.2	-20.1	39.0	38.5	40.3	41.0	218	103	28.5	1.3779
-6.0	-21.1	40.0	39.6	41.4	42.1	219	104	29.1	1.3790
-7.8	-22.1	41.0	40.6	42.4	43.2	219	104	29.6	1.3802
-9.8	-23.2	42.0	41.6	43.5	44.3	219	104	30.2	1.3813
-11.8	-24.3	43.0	42.6	44.5	45.3	219	104	30.7	1.3825
-13.9	-25.5	44.0	43.7	45.7	46.5	219	104	31.3	1.3836
-16.1	-26.7	45.0	44.7	46.7	47.6	220	104	31.8	1.3847
-18.3	-27.9	46.0	45.7	47.8	48.6	220	104	32.4	1.3858
-20.7	-29.3	47.0	46.8	48.9	49.8	220	104	33.0	1.3870
-23.1	-30.6	48.0	47.8	50.0	50.9	221	105	33.5	1.3881
-25.7	-32.1	49.0	48.9	51.1	52.0	221	105	34.1	1.3892
-28.3	-33.5	50.0	49.9	52.2	53.1	222	106	34.7	1.3903
-31.0	-35.0	51.0	50.9	53.2	54.1	222	106	35.5	1.3914
-33.8	-36.6	52.0	51.9	54.3	55.2	222	106	35.9	1.3924
-36.7	-38.2	53.0	53.0	55.4	56.4	223	106	36.6	1.3935
-39.7	-39.8	54.0	54.0	56.5	57.4	223	106	37.2	1.3945
-42.8	-41.6	55.0	55.0	57.5	58.5	223	106	38.0	1.3956
-46.0	-43.3	56.0	56.0	58.5	59.6	223	106	38.5	1.3966
-49.3	-45.2	57.0	57.0	59.6	60.6	224	107	39.0	1.3977
-52.7	-47.1	58.0	58.0	60.6	61.7	224	107	39.6	1.3987
-56.2	-49.0	59.0	59.0	61.7	62.8	224	107	40.1	1.3998
-59.9	-51.1	60.0	60.0	62.7	63.8	225	107	40.6	1.4008
b	b	65.0	65.0	68.0	69.1	227	108	42.1	1.4058
b	b	70.0	70.0	73.2	74.5	230	110	44.1	1.4104
b	b	75.0	75.0	78.4	79.8	237	114	46.1	1.4150
b	b	80.0	80.0	83.6	85.1	245	118	48.0	1.4193
b	b	85.0	85.0	88.9	90.4	257	125	50.0	1.4235
b	b	90.0	90.0	94.1	95.7	270	132	51.4	1.4275
b	b	95.0	95.0	99.3	a	310	154	52.8	1.4315

* Propylene glycol concentrations greater than 94% are not attainable with Pipe Mate HD Fluid.

° Freezing points are below -60°F (-51°C)

* Typical properties, not to be construed as specifications.

** Degree Brix is a measure of the sugar concentration in a fluid and is important in fermentation and syrups applications. Although there is no sugar present in Pipe Mate heat transfer fluids, the glycol affects the refractive index of the fluid in a similar fashion.

NOTE: Generally, for an extended margin of protection, you should select a temperature in this table that is at least 5°F (3°F) lower than the expected lowest ambient temperature. Inhibitor levels in glycol solutions less than 25-30% may not provide adequate corrosion protection. Solutions of glycol less than 25% may be at risk for bacterial contamination.