Dynalene LC-PG

DYNALENE
Tomorrow's Solutions Flow Through Us

Low electrical conductivity, inhibited propylene glycol/water-based coolant

Process Applications

- Coolant for PEM fuel cells
- Computer cooling
- Optical devices
- Electronics cooling
- Process cooling & heating
- Medical devices
- Portable fuel cell systems
- Battery cooling
- Charging stations

Dynalene LC-PG Overview

Dynalene LC-PG (propylene glycol-based) is specially designed for cooling PEM fuel cells, electronics, computers, and other applications requiring low electrical conductivity coolants. It provides efficient heat transfer that prevents your system from overheating while simultaneously acting as an electrical insulator. LC products use a non-ionic corrosion inhibitor package that prevents corrosion and contaminants from degrading your system.

Dynalene LC-PG is a customizable coolant that can be formulated using any concentration of propylene glycol that your system requires. Our LC-PG blends are non-flammable and non-toxic.

Corrosion Protection

Dynalene LC-PG utilizes a non-ionic corrosion inhibitor package that offers superior corrosion protection for most metals, including aluminum, brass, copper, stainless steel, and many other alloys. The inhibitors create a passive layer on metal surfaces in contact with the fluid, preventing corrosion and ion-leaching, which can cause an increase in electrical conductivity.

Benefits of Choosing Dynalene LC-PG

- Maintains low electrical conductivity
- Uses non-ionic corrosion inhibitor package
- Can be used with active deionizing systems
- Non-toxic
- Available worldwide
- Proven performance
- Total fluid care option
- Non-flammable
- Cost-effective
- Enhances fuel cell performance

Dynalene's Fluid Care Program

Coupling our Dynalene fluids with a fluid care program can extend the life of your systems significantly. We offer yearly testing of the heat transfer fluid in your system and can track changes in the fluid year to year so adjustments can be made to keep your systems working at its best.

Recommended Temperature Range:
For closed systems:
-50°C (-58°F) to 93°C (200°F)

Properties of Dynalene LC-PG

A comprehensive list of all thermo-physical properties of Dynalene LC-PG can be found on pages 2-5. For health and safety information or to request a Safety Data Sheet, contact our Dynalene sales representatives.

Composition:	Propylene glycol, water, non-ionic inhibitors
Appearance:	Clear
Odor:	None
pH:	5.0 – 7.0
Electrical conductivity:	< 5 µS/cm
Flash Point:	None*
Autoignition Temp:	None*

* for ≤ 85% concentration

Dynalene's De-ionizing Cartridges

Dynalene recommends using a de-ionizing cartridge with our LC products. Corrosion inhibitors prevent significant corrosion, but cannot guarantee 100% prevention. In a low-conductivity environment, even a small amount of corrosion can generate enough ions to raise the conductivity to unacceptable levels. A de-ionizing cartridge removes these ions to maintain the desired electrical conductivity. Contact Dynalene for information about the de-ionizing cartridges we offer.

Quantity & Availability

Dynalene LC products are offered in 1, 2.5, 5, 30, 55, and 265-gallon containers. Pricing depends on quantity, and Dynalene, Inc. will work with you to try to fit your budget.

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General Properties

Vol. %	Wt .%	Freeze Point		Burst Point		Boiling Point	Specific Gravity
LC-PG	LC-PG	ºF	ºC	ºF	ºC	ºF	22ºC (72ºF)
0	0.0	32	0	32	0.0	212	1.000
5	5.2	29	-1.7	27	-2.7	212	1.005
10	10.5	26	-3.3	22	-5.6	212	1.010
15	15.6	23	-5.0	19	-7.5	212	1.015
20	20.8	19	-7.2	11	-11.8	213	1.020
25	25.9	14	-10.1	-1	-18.4	214	1.025
26	27.0	13	-10.6	-4	-20.1	214	1.026
27	28.0	12	-11.1	-7	-21.8	214	1.027
28	29.0	10	-12.2	-10	-23.6	215	1.028
29	30.1	9	-12.8	-14	-25.5	216	1.029
30	31.1	8	-13.3	-18	-27.5	216	1.030
31	32.1	7	-13.9	-21	-29.6	216	1.031
32	33.1	5	-15.0	-24	-31.1	216	1.032
33	34.1	4	-15.6	-30	-34.4	216	1.032
34	35.1	2	-16.7	-38	-38.9	217	1.033
35	36.1	1	-17.2	-46	-43.3	217	1.034
36	37.2	-1	-18.3	-53	-47.2	217	1.035
37	38.2	-3	-19.4	< -60	< -51.1	218	1.036
38	39.2	-4	-20.0	< -60	< -51.1	218	1.037
39	40.2	-6	-21.1	< -60	< -51.1	219	1.038
40	41.2	-8	-22.2	< -60	< -51.1	219	1.039
41	42.2	-10	-23.3	< -60	< -51.1	219	1.040
42	43.2	-12	-24.4	< -60	< -51.1	219	1.041
43	44.2	-14	-25.5	< -60	< -51.1	219	1.042
44	45.2	-16	-26.7	< -60	< -51.1	220	1.043
45	46.2	-18	-27.8	< -60	< -51.1	220	1.044
46	47.2	-21	-29.4	< -60	< -51.1	220	1.045
47	48.2	-23	-30.6	< -60	< -51.1	221	1.046
48	49.2	-26	-32.2	< -60	< -51.1	221	1.047
49	50.2	-28	-33.3	< -60	< -51.1	222	1.048
50	51.2	-31	-35.0	< -60	< -51.1	222	1.049
55	56.2	-46	-43.3	< -60	< -51.1	223	1.052
60	61.2	< -60	< -51.1	< -60	< -51.1	225	1.055
65	66.1	< -60	< -51.1	< -60	< -51.1	227	1.057
70	71.0	< -60	< -51.1	< -60	< -51.1	230	1.057
80	80.8	< -60	< -51.1	< -60	< -51.1	246	1.059
90	90.4	< -60	< -51.1			270	1.056

Viscosity (cP)

1 cP= 0.001 Pa·s

Temp,˚F	Glycol percent by volume								
	20%	25%	30%	35%	40%	45%	50%	55%	60%
-30									498
-20									299
-10							96.0	140	183
0					40.9	51.1	61.3	88.2	115
10			13.4	20.2	27.0	33.8	40.6	57.4	74.2
20	5.36	7.63	9.89	14.2	18.5	23.2	27.8	38.6	49.3
30	4.23	5.85	7.46	10.3	13.1	16.4	19.7	26.7	33.7
40	3.41	4.58	5.75	7.68	9.60	12.0	14.3	19.0	23.7
50	2.79	3.66	4.52	5.87	7.21	8.96	10.7	13.9	17.1
60	2.32	2.97	3.62	4.59	5.56	6.85	8.13	10.4	12.6
70	1.95	2.45	2.94	3.66	4.38	5.36	6.34	7.93	9.51
80	1.66	2.05	2.43	2.98	3.52	4.28	5.04	6.19	7.34
90	1.43	1.74	2.04	2.46	2.88	3.48	4.08	4.93	5.77
100	1.25	1.49	1.73	2.07	2.4	2.88	3.35	3.99	4.62
120	0.97	1.14	1.30	1.52	1.73	2.05	2.36	2.74	3.11
140	0.78	0.90	1.01	1.16	1.31	1.53	1.75	1.99	2.22
160	0.64	0.73	0.82	0.93	1.04	1.20	1.35	1.51	1.66
180	0.54	0.61	0.68	0.77	0.85	0.97	1.08	1.19	1.29
200	0.46	0.52	0.58	0.65	0.71	0.80	0.88	0.96	1.04
220	0.40	0.45	0.50	0.56	0.61	0.68	0.74	0.80	0.86
240	0.36	0.40	0.44	0.49	0.53	0.59	0.64	0.69	0.73

Thermal Conductivity (Btu/hr·ft·˚F)

1 Btu/hr·ft·°F = 1.73 W/mK

Temp, ˚F	Glycol percent by volume								
	20%	25%	30%	35%	40%	45%	50%	55%	60%
-30									0.171
-20							0.188	0.181	0.174
-10							0.191	0.184	0.176
0					0.211	0.203	0.194	0.186	0.178
10			0.235	0.225	0.215	0.206	0.196	0.188	0.179
20	0.262	0.251	0.239	0.229	0.218	0.209	0.199	0.190	0.181
30	0.267	0.255	0.243	0.233	0.222	0.212	0.201	0.192	0.183
40	0.272	0.260	0.247	0.236	0.225	0.215	0.204	0.194	0.184
50	0.277	0.264	0.251	0.239	0.227	0.217	0.206	0.196	0.186
60	0.281	0.268	0.254	0.242	0.230	0.219	0.208	0.198	0.187
70	0.285	0.272	0.258	0.246	0.233	0.222	0.210	0.199	0.188
80	0.289	0.275	0.261	0.248	0.235	0.223	0.211	0.200	0.189
90	0.292	0.278	0.263	0.250	0.237	0.225	0.213	0.202	0.190
100	0.295	0.281	0.266	0.253	0.239	0.227	0.214	0.203	0.191
120	0.298	0.283	0.268	0.255	0.241	0.228	0.215	0.204	0.192
140	0.306	0.290	0.274	0.260	0.245	0.232	0.218	0.206	0.194
160	0.309	0.293	0.277	0.262	0.247	0.234	0.220	0.207	0.194
180	0.312	0.296	0.279	0.264	0.249	0.235	0.221	0.208	0.195
200	0.314	0.297	0.280	0.265	0.249	0.235	0.221	0.208	0.194
220	0.314	0.297	0.280	0.265	0.249	0.235	0.220	0.207	0.194

Specific Heat (Btu/lb·°F)

1 Btu/lb$_m$·°F = 4,186 J/kg°C

Temp, °F	Glycol percent by volume								
	20%	25%	30%	35%	40%	45%	50%	55%	60%
-30									
-20									0.799
-10									0.804
0							0.855	0.832	0.809
10					0.898	0.879	0.859	0.837	0.814
20			0.936	0.919	0.902	0.883	0.864	0.842	0.82
30	0.966	0.952	0.938	0.922	0.906	0.887	0.868	0.847	0.825
40	0.968	0.955	0.941	0.925	0.909	0.891	0.872	0.851	0.830
50	0.970	0.957	0.944	0.929	0.913	0.895	0.877	0.856	0.835
60	0.972	0.960	0.947	0.932	0.917	0.899	0.881	0.861	0.840
70	0.974	0.962	0.950	0.935	0.920	0.903	0.886	0.866	0.845
80	0.976	0.965	0.953	0.939	0.924	0.907	0.890	0.870	0.850
90	0.979	0.968	0.956	0.942	0.928	0.911	0.894	0.875	0.855
100	0.981	0.970	0.959	0.945	0.931	0.915	0.899	0.880	0.861
120	0.985	0.975	0.965	0.952	0.939	0.924	0.908	0.890	0.871
140	0.989	0.980	0.970	0.958	0.946	0.931	0.916	0.899	0.881
160	0.993	0.985	0.976	0.965	0.953	0.939	0.925	0.908	0.891
180	0.996	0.989	0.982	0.972	0.961	0.948	0.934	0.918	0.902
200	1.000	0.994	0.988	0.978	0.968	0.956	0.943	0.928	0.912
220	1.003	0.999	0.994	0.985	0.975	0.963	0.951	0.937	0.922
240	1.007	1.003	0.999	0.991	0.982	0.971	0.960	0.946	0.932

Density (lb/ft^3)

1 lb$_m$/ft^3= 16 kg/m^3

Temp, °F	Glycol percent by volume								
	20%	25%	30%	35%	40%	45%	50%	55%	60%
-30									67.05
-20							66.46	66.70	66.93
-10							66.35	66.58	66.81
0					65.71	65.97	66.23	66.46	66.68
10			65.00	65.30	65.60	65.86	66.11	66.33	66.54
20	64.23	64.57	64.90	65.19	65.48	65.73	65.97	66.18	66.38
30	64.14	64.47	64.79	65.07	65.35	65.59	65.82	66.02	66.22
40	64.03	64.35	64.67	64.94	65.21	65.44	65.67	65.86	66.05
50	63.92	64.23	64.53	64.80	65.06	65.28	65.50	65.69	65.87
60	63.79	64.09	64.39	64.65	64.90	65.12	65.33	65.51	65.68
70	63.66	63.95	64.24	64.49	64.73	64.94	65.14	65.31	65.47
80	63.52	63.80	64.08	64.32	64.55	64.75	64.95	65.11	65.26
90	63.37	63.64	63.91	64.14	64.36	64.55	64.74	64.89	65.04
100	63.20	63.47	63.73	63.95	64.16	64.35	64.53	64.67	64.81
120	62.85	63.09	63.33	63.54	63.74	63.90	64.06	64.19	64.32
140	62.46	62.68	62.90	63.09	63.27	63.42	63.57	63.68	63.79
160	62.03	62.23	62.43	62.60	62.76	62.90	63.03	63.13	63.22
180	61.56	61.74	61.92	62.07	62.22	62.34	62.45	62.53	62.61
200	61.05	61.21	61.37	61.50	61.63	61.73	61.83	61.90	61.97
220	60.50	60.64	60.78	60.89	61.00	61.09	61.17	61.23	61.28
240	59.91	60.03	60.15	60.25	60.34	60.41	60.47	60.51	60.55

1 psi = 6,895 Pa = 0.069 bar = 0.0681 atm = 51.7 mmHg = 21.7 inH_2O

Vapor Pressure (psia)

Temp, °F	Glycol percent by volume								
	20%	25%	30%	35%	40%	45%	50%	55%	60%
100	0.9	0.9	0.9	0.9	0.9				
110	1.9	1.6	1.2	1.2	1.2	1.2	1.1	1.1	1.0
120	1.7	1.7	1.6	1.5	1.5	1.5	1.5	1.5	1.4
130	2.2	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.8
140	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.4	2.3
150	3.6	3.6	3.5	3.5	3.4	3.4	3.2	3.0	3.0
160	4.6	4.5	4.4	4.4	4.3	4.2	4.1	4.0	3.8
170	5.8	5.8	5.6	5.4	5.4	5.3	5.2	5.0	4.8
180	7.2	7.1	7.0	6.9	6.7	6.6	6.5	6.2	5.9
190	9.0	8.9	8.7	8.5	8.3	8.2	8.1	7.8	7.4
200	11.0	10.9	10.7	10.5	10.2	10.1	9.9	9.5	9.1
210	13.5	13.5	13.1	12.8	12.5	12.3	12.1	11.6	11.1
220	16.4	16.4	15.9	15.6	15.2	15.0	14.8	14.2	13.6
230	19.8	19.5	19.2	18.8	18.4	17.8	17.8	17.1	16.4
240	23.8	23.4	23.0	22.5	22.0	21.7	21.4	20.6	19.7
250	28.4	27.9	27.4	26.9	26.3	26.0	25.6	24.6	23.5

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