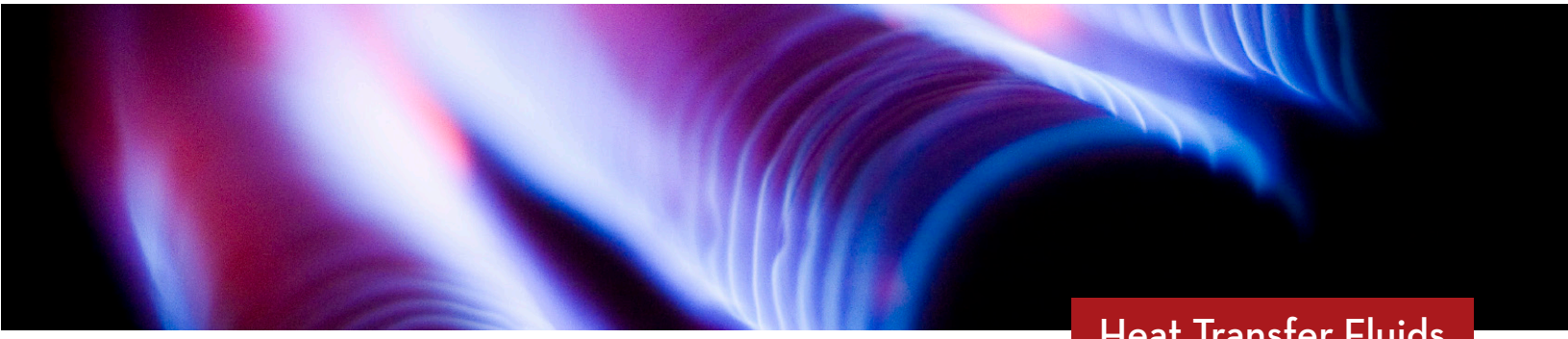
Caldera 4

Heat Transfer Fluid

isel CALDERA® HEAT TRANSFER FLUIDS



Heat Transfer Fluids

Caldera 4 is a high-quality, environmentally-friendly heat transfer fluid designed for systems that require a fluid with stability up to 315°C (600°F). The combination of high-quality base fluids and additives provides excellent resistance to oxidation and thermal degradation. With improved thermal capacity and conductivity, Caldera 4 can increase system performance by enhancing the heat transfer capability.

Applications

- Closed and open loop systems with a maximum bulk temperature of 315°C (600°F)

Performance Advantages

- **Resistant against fluid degradation**
  Contributes to extended fluid life
- **Low varnishing tendencies**
  Allows for clean operation and greater thermal transfer efficiency
- **Low volatility**
  Improves safety and decreases possibility of pump cavitations
- **Easy disposal**
  Can be disposed using mineral oil recycling services
- **Excellent temperature control**
- **Minimal odor**

Temperature Range

Typical Properties	Caldera 4
Minimum Temperature, °C (°F)	-2 (28)
Maximum Film Temperature, °C (°F)	343 (649)
Maximum Bulk Temperature, °C (°F)	315 (600)
Pour Point, °C (°F)	-17 (1.4)
Flash Point, °C (°F)	225 (437)
Fire Point, °C (°F)	240 (464)
Autoignition Point, °C (°F)	360 (680)
Thermal Expansion Coefficient, %/°C	0.1012
Thermal Conductivity @ 38°C, W/m-K	0.138
Thermal Conductivity @ 260°C, W/m-K	0.125
Heat Capacity @ 38°C, kJ/kg-K	1.928
Heat Capacity @ 260°C, kJ/kg-K	2.638
Distillation Range (ASTM D2887), 10% °C	374
Distillation Range (ASTM D2887), 90% °C	481
Average Molecular Weight	394

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All products manufactured in the USA

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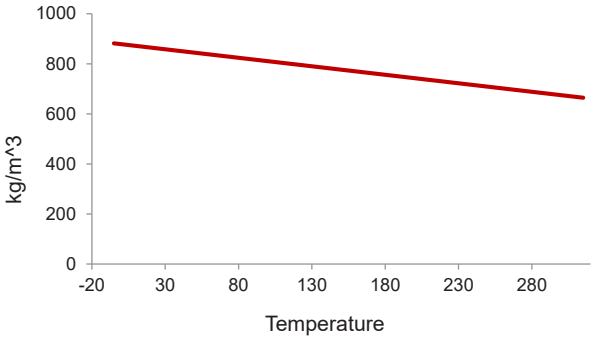
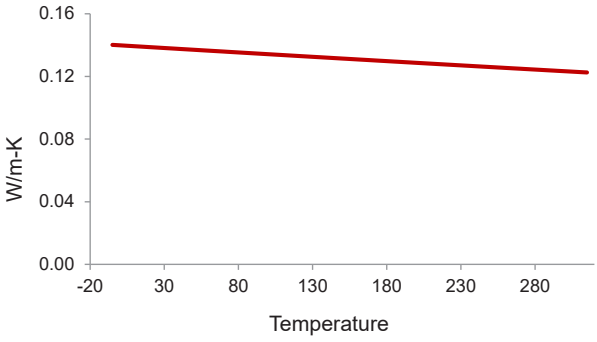
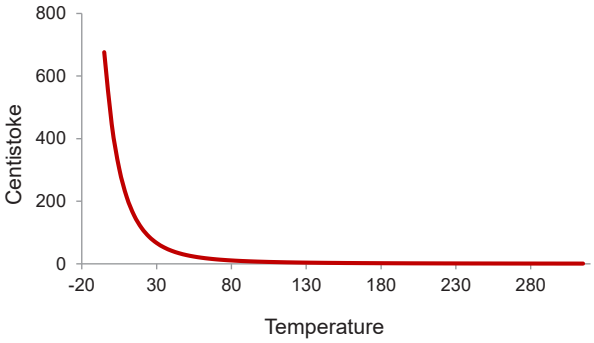
Density



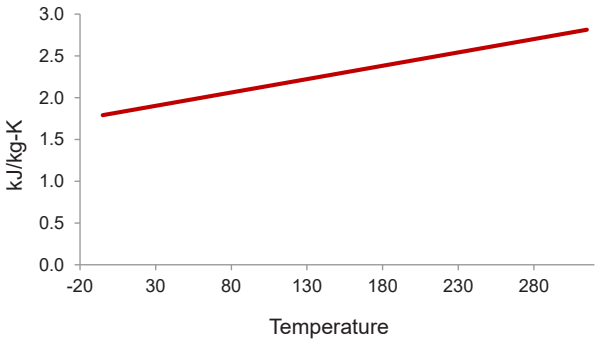
Thermal Conductivity



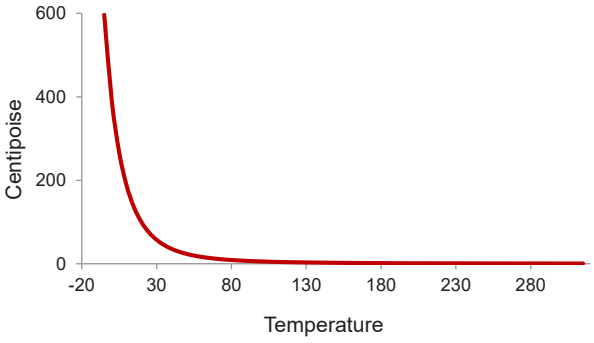
Kinematic Viscosity



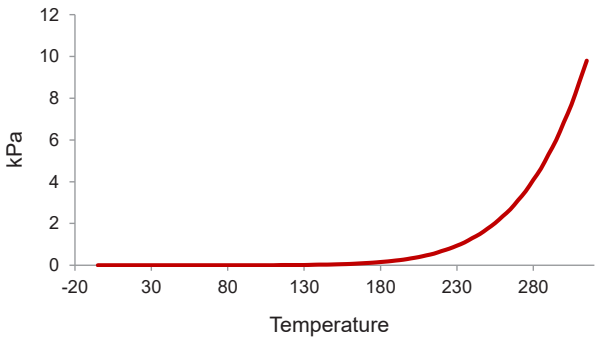
Heat Capacity



Dynamic Viscosity



Vapor Pressure



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Temperature (°C)	Density (kg/m^3)	Kinematic Viscosity (Centistoke)	Dynamic Viscosity (Centipoise)	Thermal Conductivity (W/m-K)	Heat Capacity (kJ/kg-K)	Vapor Pressure (kPa)
-5	881.75	676.33	596.95	0.140	1.791	0.00
0	878.35	446.47	392.55	0.140	1.807	0.00
5	874.96	304.62	266.80	0.140	1.823	0.00
10	871.56	214.11	186.80	0.139	1.839	0.00
15	868.16	154.60	134.35	0.139	1.855	0.00
20	864.77	114.38	99.01	0.139	1.871	0.00
25	861.37	86.50	74.59	0.138	1.887	0.00
30	857.97	66.74	57.32	0.138	1.903	0.00
35	854.58	52.44	44.86	0.138	1.919	0.00
40	851.18	41.89	35.69	0.138	1.935	0.00
45	847.79	33.96	28.82	0.137	1.951	0.00
50	844.39	27.92	23.60	0.137	1.967	0.00
55	840.99	23.24	19.56	0.137	1.983	0.00
60	837.60	19.57	16.40	0.136	1.998	0.00
65	834.20	16.65	13.90	0.136	2.014	0.00
70	830.80	14.30	11.89	0.136	2.030	0.00
75	827.41	12.39	10.26	0.136	2.046	0.00
80	824.01	10.82	8.93	0.135	2.062	0.00
85	820.62	9.53	7.82	0.135	2.078	0.00
90	817.22	8.44	6.90	0.135	2.094	0.00
95	813.82	7.53	6.13	0.134	2.110	0.00
100	810.43	6.75	5.48	0.134	2.126	0.00
105	807.03	6.09	4.92	0.134	2.142	0.00
110	803.64	5.52	4.44	0.134	2.158	0.00
115	800.24	5.03	4.03	0.133	2.174	0.01
120	796.84	4.60	3.67	0.133	2.190	0.01
125	793.45	4.22	3.35	0.133	2.206	0.01
130	790.05	3.89	3.08	0.133	2.222	0.01
135	786.65	3.60	2.84	0.132	2.238	0.02
140	783.26	3.34	2.62	0.132	2.254	0.03
145	779.86	3.11	2.43	0.132	2.270	0.03
150	776.47	2.91	2.26	0.131	2.286	0.04
155	773.07	2.72	2.11	0.131	2.302	0.05
160	769.67	2.55	1.97	0.131	2.318	0.06
165	766.28	2.40	1.84	0.131	2.334	0.08
170	762.88	2.27	1.73	0.130	2.350	0.10
175	759.48	2.14	1.63	0.130	2.366	0.12
180	756.09	2.03	1.54	0.130	2.382	0.15

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Temperature (°C)	Density (kg/m^3)	Kinematic Viscosity (Centistoke)	Dynamic Viscosity (Centipoise)	Thermal Conductivity (W/m-K)	Heat Capacity (kJ/kg-K)	Vapor Pressure (kPa)
185	752.69	1.93	1.45	0.130	2.398	0.19
190	749.30	1.83	1.37	0.129	2.414	0.23
195	745.90	1.74	1.30	0.129	2.430	0.27
200	742.50	1.66	1.24	0.129	2.446	0.33
205	739.11	1.59	1.18	0.128	2.462	0.39
210	735.71	1.52	1.12	0.128	2.478	0.47
215	732.31	1.46	1.07	0.128	2.494	0.56
220	728.92	1.40	1.02	0.128	2.510	0.68
225	725.52	1.35	0.98	0.127	2.526	0.79
230	722.13	1.30	0.94	0.127	2.542	0.94
235	718.73	1.25	0.90	0.127	2.558	1.09
240	715.33	1.20	0.86	0.127	2.574	1.30
245	711.94	1.16	0.83	0.126	2.590	1.49
250	708.54	1.12	0.80	0.126	2.606	1.75
255	705.15	1.09	0.77	0.126	2.622	2.02
260	701.75	1.05	0.74	0.125	2.638	2.35
265	698.35	1.02	0.71	0.125	2.654	2.68
270	694.96	0.99	0.69	0.125	2.670	3.11
275	691.56	0.96	0.67	0.125	2.686	3.54
280	688.16	0.94	0.64	0.124	2.702	4.09
285	684.77	0.91	0.62	0.124	2.718	4.62
290	681.37	0.89	0.60	0.124	2.734	5.31
295	677.98	0.86	0.59	0.124	2.750	5.99
300	674.58	0.84	0.57	0.123	2.766	6.85
305	671.18	0.82	0.55	0.123	2.782	7.69
310	667.79	0.80	0.54	0.123	2.798	8.74
315	664.39	0.78	0.52	0.123	2.813	9.80

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