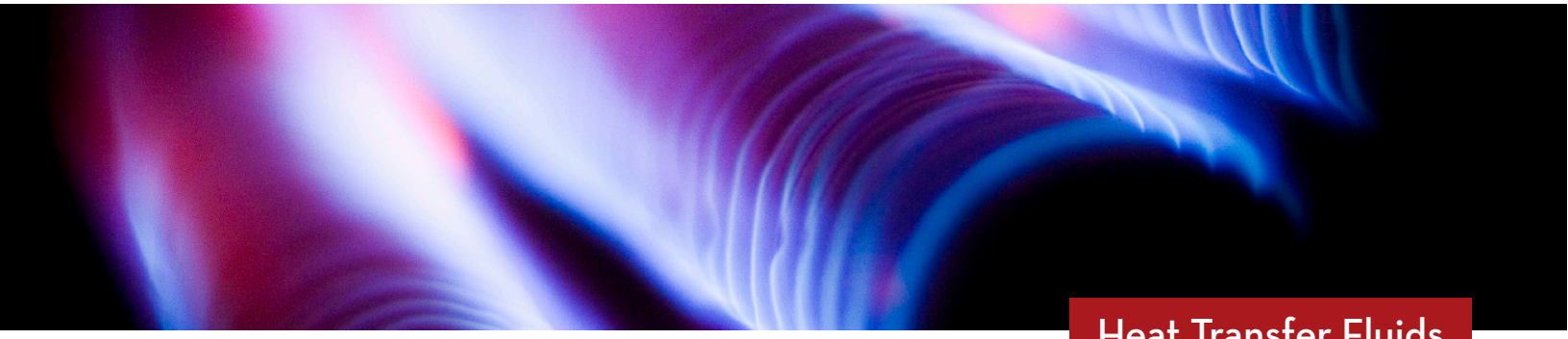
OPTI-THERM® EXR HEAT TRANSFER FLUID

OXIDATION RESISTANT, NON-FOULING, LONGER LASTING FORMULA



Heat Transfer Fluids

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

Applications

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

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, °F (°C)	28 (-2)
Maximum Film Temperature, °F (°C)	649 (343)
Maximum Bulk Temperature, °F (°C)	600 (315)
Pour Point, °F (°C)	1.4 (-17)
Flash Point, °F (°C)	437 (225)
Fire Point, °F (°C)	464 (240)
Autoignition Point, °F (°C)	680 (360)
Thermal Expansion Coefficient, %/°F	0.0562
Thermal Conductivity @ 100°F, BTU/h-ft-F	0.0800
Thermal Conductivity @ 500°F, BTU/h-ft-F	0.0725
Heat Capacity @ 100°F, BTU/lb-F	0.460
Heat Capacity @ 500°F, BTU/lb-F	0.630
Distillation Range (ASTM D2887), 10% °F	705
Distillation Range (ASTM D2887), 90% °F	898
Average Molecular Weight	394

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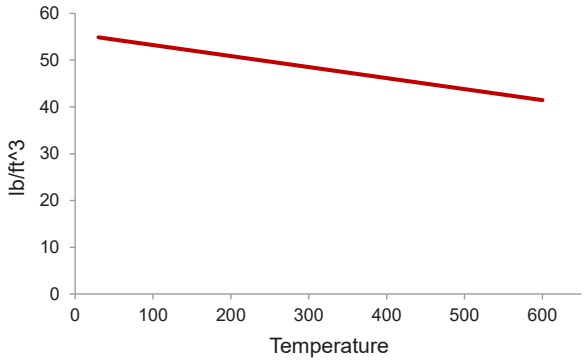
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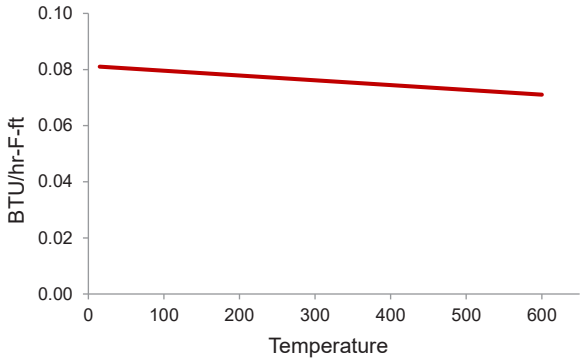
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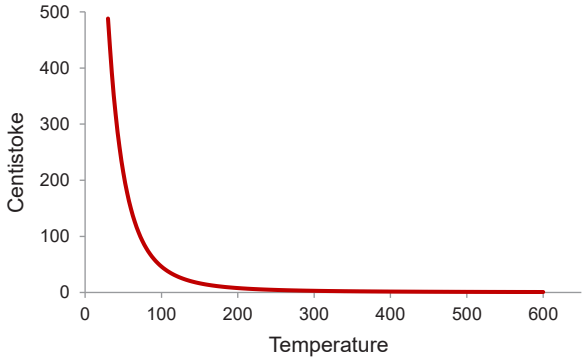
Density



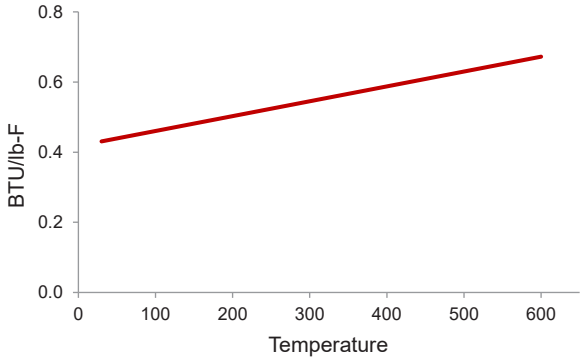
Thermal Conductivity



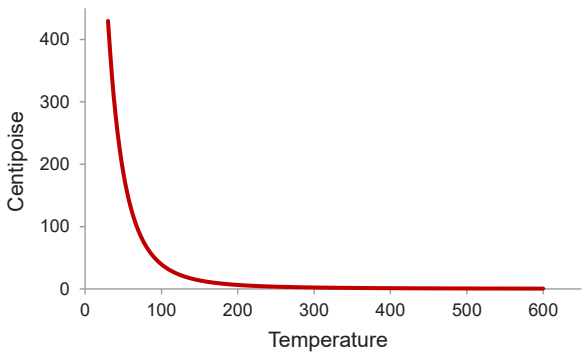
Kinematic Viscosity



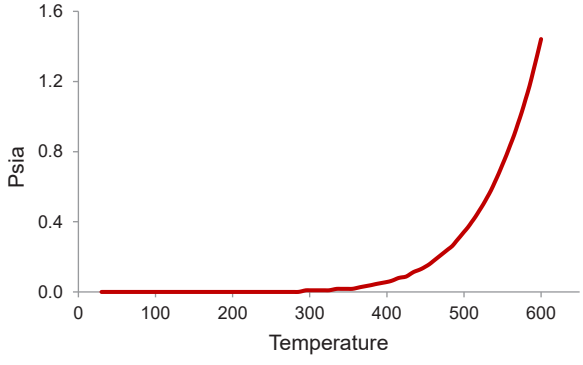
Heat Capacity



Dynamic Viscosity



Vapor Pressure



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Temperature (°F)	Density (lb/ft^3)	Kinematic Viscosity (Centistoke)	Dynamic Viscosity (Centipoise)	Thermal Conductivity (BTU/hr-F-ft)	Heat Capacity (BTU/lb-F)	Vapor Pressure (Psia)
25	55.00	614.84	542.56	0.081	0.429	0.00
30	54.88	488.19	429.87	0.081	0.431	0.00
35	54.76	391.68	344.15	0.081	0.433	0.00
40	54.65	317.35	278.25	0.081	0.435	0.00
45	54.53	259.53	227.06	0.081	0.437	0.00
50	54.41	214.11	186.92	0.080	0.439	0.00
55	54.29	178.11	155.16	0.080	0.441	0.00
60	54.18	149.34	129.80	0.080	0.443	0.00
65	54.06	126.14	109.40	0.080	0.446	0.00
70	53.94	107.30	92.86	0.080	0.448	0.00
75	53.82	91.88	79.34	0.080	0.450	0.00
80	53.70	79.17	68.22	0.080	0.452	0.00
85	53.59	68.63	59.01	0.080	0.454	0.00
90	53.47	59.83	51.33	0.080	0.456	0.00
95	53.35	52.44	44.89	0.080	0.458	0.00
100	53.23	46.20	39.46	0.080	0.460	0.00
105	53.12	40.89	34.85	0.079	0.463	0.00
110	53.00	36.37	30.92	0.079	0.465	0.00
115	52.88	32.48	27.56	0.079	0.467	0.00
120	52.76	29.13	24.66	0.079	0.469	0.00
125	52.64	26.23	22.15	0.079	0.471	0.00
130	52.53	23.70	19.98	0.079	0.473	0.00
135	52.41	21.50	18.08	0.079	0.475	0.00
140	52.29	19.57	16.42	0.079	0.477	0.00
145	52.17	17.86	14.95	0.079	0.479	0.00
150	52.06	16.36	13.66	0.079	0.482	0.00
155	51.94	15.03	12.52	0.079	0.484	0.00
160	51.82	13.84	11.51	0.079	0.486	0.00
165	51.70	12.78	10.60	0.078	0.488	0.00
170	51.58	11.83	9.79	0.078	0.490	0.00
175	51.47	10.98	9.07	0.078	0.492	0.00
180	51.35	10.22	8.42	0.078	0.494	0.00
185	51.23	9.53	7.83	0.078	0.496	0.00
190	51.11	8.90	7.30	0.078	0.499	0.00
195	51.00	8.33	6.82	0.078	0.501	0.00
200	50.88	7.81	6.38	0.078	0.503	0.00

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OXIDATION RESISTANT, NON-FOULING, LONGER LASTING FORMULA

Temperature (°F)	Density (lb/ft^3)	Kinematic Viscosity (Centistoke)	Dynamic Viscosity (Centipoise)	Thermal Conductivity (BTU/hr-F-ft)	Heat Capacity (BTU/lb-F)	Vapor Pressure (Psia)
205	50.76	7.34	5.98	0.078	0.505	0.00
210	50.64	6.91	5.62	0.078	0.507	0.00
215	50.52	6.52	5.28	0.078	0.509	0.00
220	50.41	6.16	4.98	0.078	0.511	0.00
225	50.29	5.83	4.70	0.077	0.513	0.00
230	50.17	5.52	4.44	0.077	0.515	0.00
235	50.05	5.24	4.21	0.077	0.518	0.00
240	49.94	4.98	3.99	0.077	0.520	0.00
245	49.82	4.73	3.78	0.077	0.522	0.00
250	49.70	4.51	3.60	0.077	0.524	0.00
255	49.58	4.30	3.42	0.077	0.526	0.00
260	49.46	4.11	3.26	0.077	0.528	0.00
265	49.35	3.93	3.11	0.077	0.530	0.00
270	49.23	3.76	2.97	0.077	0.532	0.00
275	49.11	3.60	2.84	0.077	0.535	0.00
280	48.99	3.45	2.71	0.077	0.537	0.00
285	48.88	3.31	2.60	0.076	0.539	0.00
290	48.76	3.19	2.49	0.076	0.541	0.00
295	48.64	3.06	2.39	0.076	0.543	0.01
300	48.52	2.95	2.30	0.076	0.545	0.01
305	48.40	2.84	2.21	0.076	0.547	0.01
310	48.29	2.74	2.12	0.076	0.549	0.01
315	48.17	2.64	2.04	0.076	0.552	0.01
320	48.05	2.55	1.97	0.076	0.554	0.01
325	47.93	2.47	1.90	0.076	0.556	0.01
330	47.82	2.39	1.83	0.076	0.558	0.01
335	47.70	2.31	1.77	0.076	0.560	0.02
340	47.58	2.24	1.71	0.075	0.562	0.02
345	47.46	2.17	1.65	0.075	0.564	0.02
350	47.34	2.10	1.60	0.075	0.566	0.02
355	47.23	2.04	1.55	0.075	0.568	0.02
360	47.11	1.98	1.50	0.075	0.571	0.02
365	46.99	1.93	1.45	0.075	0.573	0.03
370	46.87	1.87	1.41	0.075	0.575	0.03
375	46.76	1.82	1.37	0.075	0.577	0.04
380	46.64	1.77	1.33	0.075	0.579	0.04

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Temperature (°F)	Density (lb/ft^3)	Kinematic Viscosity (Centistoke)	Dynamic Viscosity (Centipoise)	Thermal Conductivity (BTU/hr-F-ft)	Heat Capacity (BTU/lb-F)	Vapor Pressure (Psia)
385	46.52	1.73	1.29	0.075	0.581	0.04
390	46.40	1.68	1.25	0.075	0.583	0.05
395	46.28	1.64	1.22	0.075	0.585	0.05
400	46.17	1.60	1.18	0.074	0.588	0.06
405	46.05	1.56	1.15	0.074	0.590	0.06
410	45.93	1.52	1.12	0.074	0.592	0.07
415	45.81	1.49	1.09	0.074	0.594	0.08
420	45.69	1.45	1.07	0.074	0.596	0.08
425	45.58	1.42	1.04	0.074	0.598	0.09
430	45.46	1.39	1.01	0.074	0.600	0.10
435	45.34	1.36	0.99	0.074	0.602	0.11
440	45.22	1.33	0.96	0.074	0.604	0.12
445	45.11	1.30	0.94	0.074	0.607	0.13
450	44.99	1.27	0.92	0.074	0.609	0.14
455	44.87	1.25	0.90	0.074	0.611	0.16
460	44.75	1.22	0.88	0.073	0.613	0.18
465	44.63	1.20	0.86	0.073	0.615	0.19
470	44.52	1.18	0.84	0.073	0.617	0.21
475	44.40	1.15	0.82	0.073	0.619	0.23
480	44.28	1.13	0.80	0.073	0.621	0.25
485	44.16	1.11	0.79	0.073	0.624	0.26
490	44.05	1.09	0.77	0.073	0.626	0.29
495	43.93	1.07	0.76	0.073	0.628	0.32
500	43.81	1.05	0.74	0.073	0.630	0.34
505	43.69	1.04	0.73	0.073	0.632	0.37
510	43.57	1.02	0.71	0.073	0.634	0.40
515	43.46	1.00	0.70	0.072	0.636	0.43
520	43.34	0.98	0.68	0.072	0.638	0.46
525	43.22	0.97	0.67	0.072	0.641	0.50
530	43.10	0.95	0.66	0.072	0.643	0.54
535	42.99	0.94	0.65	0.072	0.645	0.58
540	42.87	0.92	0.64	0.072	0.647	0.63
545	42.75	0.91	0.62	0.072	0.649	0.67
550	42.63	0.90	0.61	0.072	0.651	0.73
555	42.51	0.88	0.60	0.072	0.653	0.78
560	42.40	0.87	0.59	0.072	0.655	0.84

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565	42.28	0.86	0.58	0.072	0.657	0.89
570	42.16	0.85	0.57	0.072	0.660	0.96
575	42.04	0.84	0.56	0.071	0.662	1.03
580	41.93	0.82	0.55	0.071	0.664	1.10
585	41.81	0.81	0.55	0.071	0.666	1.17
590	41.69	0.80	0.54	0.071	0.668	1.26
595	41.57	0.79	0.53	0.071	0.670	1.35
600	41.45	0.78	0.52	0.071	0.672	1.44

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