Relatherm
Heat Transfer Fluids

RELATHERM S-LT

Low Temperature Silicone Heat Transfer Fluid

1-800-387-0406
hello@relatherm.com
www.relatherm.com

Relatherm S-LT

Low Temperature Silicone Heat Transfer Fluid

This engineered thermal fluid is formulated for absolute resistance to fluid degradation in open bath applications, particularly in ultra-low temperature applications. It remains fluid and pumpable down to -100ºC / -148°F. For heating applications, Relatherm S-LT can be used at temperatures as high as 260ºC / 500°F. In a class of its own, Relatherm S-LT boasts of premium performance, and extreme stability in a variety of demanding applications.

PRODUCT SUMMARY

- Oxidation-free thermal fluid great for open baths and other oxidation-prone systems
- Great chiller/cooling fluid down to -100°C / -148°F
- Maximum use temperature: 260ºC / 500°F
- Great pumpability at sub-zero temperatures
- Environmentally Friendly - Contains no PolyFluoroAlkyl Substances (PFAS)

WHY RELATHERM S-LT

Relatherm S-LT boasts of one of the lowest operating temperatures of any thermal fluid in the industry. It is manufactured from a blend of high purity base fluids and proprietary additives that ensure fluidity while preventing sludge formation/coke deposition. In comparison with other industry fluids, it provides for an oxidation-free, non-odorous, safer, cleaner, and trouble-free operation, especially in applicable systems.

NO OXIDATION! NO GUNK!!

Relatherm S-LT is fully resistant to oxidation in open and non-airtight systems. By virtue of its uniquely stable chemistry, it is non-susceptible to oxidative reaction mechanisms. This translates into the absence of sludge and carbon deposits. When used within the specified operating range, **Relatherm S-LT** provides lower maintenance costs, longer uptime and less frequent fluid changeouts.

FLUID PROPERTIES

Minimum Use Temperature	**-100°C**	**-148°F**
Maximum Use Temperature	**260°C**	**500°F**
Dielectric Strength , 0.1" gap	**>35 kV**	
Freeze Point ASTM D97	**-111°C**	**-168°F**
Flash Point (Open Cup)	**54°C**	**130°F**
Autoignition Temperature	**350°C**	**662°F**
Specific Gravity @25°C	**0.85**	
Acid Number	**0.01**	
Heat of Combustion	**14,100 Btu/lb**	
Vapor Pressure @25°C	**0.25 kPa**	
Density @ 25°C	**852 kg/m3**	
Viscosity @-100°C	**78.6 cSt**	
Viscosity @ -50°C	**6.9 cSt**	
Viscosity @ 100°C	**<1 cSt**	
Thermal Conductivity @50°C	**0.1042 W/m.K**	
Critical Pressure, Pc	**12 atm**	
Critical Temperature, Tc	**327°C**	
Specific Volume, Vc	**3.9 l/kg**	
Specific Heat, 25°C	**1.853**	
Color	**Clear**	
Molecular Weight	**317**	

Fluid properties are typical results and should not serve as a sole resource for determining the correct fluid for any application. Please consult a Relatherm representative to ensure that this product is the right choice.

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Table 1 — Physical Properties of Relatherm S-LT Heat Transfer Fluid[1]

Composition:	Polysiloxane Mixtures (Contains no PolyFluoroAlkyl Substances/PFAS)
Color:	Clear Liquid

Property	Standard Units	SI Units
Maximum Use Temperature	500°F	260°C
Minimum Use Temperature	-148°F	-100°C
Viscosity	1.4 cP @ 77°F	1.4 mPa·s @ 25°C
Flash Point[2], Closed Cup	116°F	47°C
Flash Point[3], Open Cup	130°F	54°C
Autoignition Temperature, ASTM D-2155	662°F	350°C
Acid Number, Typical	0.01	
Freeze Point	-168°F	-111°C
Density @ 77°F (25°C)	7.1 lb/gal	852 kg/m^3
Specific Gravity @ 77°F (25°C)	0.85	
Dielectric Strength, 0.1" gap		>35kV
Heat of Combustion	14,100 Btu/lb	32,800 kJ/kg
Global Warming Potential, GWP	<2	
Estimated Critical Constants		
T_c	620°F	327°C
P_c	12atm	12.16 bar
V_c	0.063ft^3/lb	3.9 l/kg

[1]Not to be construed as specifications
[2]ASTM D92
[3]ASTM D93

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Table 2 — Saturated Liquid Properties of Relatherm S-LT Heat Transfer Fluid (Standard Units)

Temp., °F	Specific Heat, Btu/lb°F	Density, lb/ft^3	Therm. Cond., Btu/hr ft^2 (°F/ft)	Viscosity, cPs	Vapor Pressure, psia
-150	0.363	61.23	0.0776	90.2	
-130	0.368	60.52	0.0765	33.7	
-110	0.374	59.80	0.0753	19.0	
-90	0.379	59.09	0.0742	12.3	
-70	0.385	58.38	0.0730	8.4	
-50	0.391	57.66	0.0717	6.0	
-30	0.396	56.95	0.0705	4.5	
-10	0.402	56.24	0.0692	3.4	
10	0.407	55.52	0.0679	2.6	
30	0.413	54.81	0.0666	2.1	
50	0.418	54.10	0.0652	1.7	
70	0.424	53.38	0.0639	1.4	
90	0.430	52.67	0.0625	1.2	
110	0.435	51.96	0.0610	0.99	0.1
130	0.441	51.24	0.0596	0.85	0.2
150	0.446	50.53	0.0581	0.74	0.3
170	0.452	49.82	0.0567	0.65	0.6
190	0.458	49.10	0.0551	0.58	0.9
210	0.463	48.39	0.0536	0.52	1.5
230	0.469	47.68	0.0521	0.47	2.2
250	0.474	46.96	0.0505	0.42	3.2
270	0.480	46.25	0.0489	0.39	4.6
290	0.485	45.54	0.0473	0.35	6.4
310	0.491	44.82	0.0457	0.33	8.7
330	0.497	44.11	0.0441	0.30	11.6
350	0.502	43.40	0.0424	0.28	15.2
370	0.508	42.68	0.0407	0.26	19.6
390	0.513	41.97	0.0390	0.25	25.0
410	0.519	41.26	0.0373	0.23	31.3
430	0.524	40.54	0.0356	0.22	38.8
450	0.530	39.83	0.0339	0.21	47.5
470	0.536	39.12	0.0321	0.20	57.6
490	0.541	38.40	0.0304	0.19	69.1
510	0.547	37.69	0.0286	0.18	82.2
530	0.552	36.98	0.0268	0.17	97.0
550	0.558	36.26	0.0250	0.16	113.6

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Table 3 — Saturated Liquid Properties of Relatherm S-LT Heat Transfer Fluid (SI Units)

Temp. °C	Specific Heat kJ/kg K	Density kg/m³	Therm. Cond. W/m K	Viscosity mPa·s	Vapor Pressure kPa
-100	1.520	978.5	0.1341	78.6	
-90	1.541	968.3	0.1324	33.7	
-80	1.562	958.0	0.1306	20.0	
-70	1.583	947.7	0.1288	13.3	
-60	1.604	937.4	0.1269	9.4	
-50	1.625	927.2	0.1251	6.9	
-40	1.646	916.9	0.1231	5.2	
-30	1.66	906.67	0.1212	4.0	
-20	1.688	896.4	0.1192	3.1	
-10	1.709	886.1	0.1171	2.5	
0	1.730	875.8	0.1150	2.0	
10	1.751	865.5	0.1129	1.7	
20	1.772	855.3	0.1108	1.4	0.2
30	1.793	845.0	0.1086	1.2	0.3
40	1.814	834.7	0.1064	1.0	0.6
50	1.835	824.5	0.1042	0.91	1.1
60	1.856	814.2	0.1019	0.80	1.8
70	1.877	803.9	0.0996	0.70	3.0
80	1.898	793.6	0.0973	0.63	4.7
90	1.919	783.4	0.0949	0.57	7.2
100	1.940	773.1	0.0925	0.51	10.6
110	1.961	762.8	0.0901	0.47	15.3
120	1.982	752.6	0.0877	0.43	21.5
130	2.003	742.3	0.0852	0.39	29.7
140	2.024	732.0	0.0827	0.36	40.1
150	2.045	721.7	0.0802	0.34	53.2
160	2.066	711.5	0.0777	0.31	69.5
170	2.087	701.2	0.0751	0.29	89.4
180	2.108	690.9	0.0725	0.28	113.5
190	2.129	680.7	0.0699	0.26	142.2
200	2.150	670.4	0.0673	0.24	176.2
210	2.171	660.1	0.0646	0.23	215.9
220	2.192	649.8	0.0620	0.22	261.9
230	2.213	639.6	0.0593	0.21	314.8
240	2.234	629.3	0.0566	0.20	375.1
250	2.255	619.0	0.0538	0.19	443.4
260	2.276	608.8	0.0511	0.18	520.3
270	2.297	598.5	0.0483	0.17	606.2
280	2.318	588.2	0.0455	0.17	701.8
290	2.339	577.9	0.0427	0.16	807.4

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Table 4 — Select Saturated Vapor Properties of Relatherm S-LT Heat Transfer Fluid (Standard Units)

Temp. °F	ΔH_{lv} Btu/lb	Z_{vapor}	Cp/Cv	Vapor Molecular Weight
100	106.7	0.9991	1.027	230.1
120	103.7	0.9985	1.026	232.8
140	100.8	0.9976	1.025	235.3
160	98.1	0.9963	1.024	237.7
180	95.4	0.9945	1.024	240.1
200	92.7	0.9921	1.023	242.3
220	90.1	0.9889	1.023	244.6
240	87.6	0.9849	1.023	246.7
260	85.0	0.9798	1.023	248.9
280	82.5	0.9736	1.023	251.1
300	79.9	0.9661	1.023	253.2
320	77.3	0.9572	1.023	255.4
340	74.7	0.9468	1.024	257.6
360	72.0	0.9348	1.025	259.9
380	69.2	0.9210	1.026	262.2
400	66.4	0.9054	1.028	264.6
420	63.4	0.8877	1.030	267.1
440	60.3	0.8678	1.032	269.7
460	57.1	0.8457	1.036	272.4
480	53.7	0.8210	1.041	275.4
500	50.1	0.7935	1.047	278.5
520	46.2	0.7629	1.056	282.0
540	41.9	0.7286	1.069	285.8
560	37.3	0.6901	1.089	290.1
580	32.1	0.6461	1.121	295.1
600	26.1	0.5946	1.181	301.1

Table 5 — Select Saturated Vapor Properties of Relatherm S-LT Heat Transfer Fluid (SI Units)

Temp. °C	ΔH_{lv} kJ/kg	Z_{vapor}	Cp/Cv	Vapor Molecular Weight
45	243.7	0.9987	1.026	231.8
55	237.5	0.9981	1.026	234.2
65	231.6	0.9971	1.025	236.4
75	225.9	0.9957	1.024	238.6
85	220.3	0.9940	1.024	240.7
95	214.8	0.9917	1.023	242.7
105	209.3	0.9887	1.023	244.7
115	204.0	0.9851	1.023	246.6
125	198.6	0.9806	1.023	248.6
135	193.3	0.9753	1.023	250.5
145	187.9	0.9689	1.023	252.5
155	182.5	0.9614	1.023	254.4
165	177.1	0.9528	1.023	256.4
175	171.5	0.9428	1.024	258.4
185	165.8	0.9315	1.025	260.4
195	160.0	0.9188	1.026	262.5
205	154.0	0.9045	1.028	264.7
215	147.8	0.8886	1.030	266.9
225	141.4	0.8710	1.032	269.3
235	134.7	0.8514	1.035	271.7
245	127.7	0.8299	1.039	274.3
255	120.3	0.8062	1.044	277.1
265	112.4	0.7801	1.051	280.0
275	104.0	0.7513	1.060	283.2
285	95.0	0.7194	1.073	286.8
295	85.1	0.6839	1.093	290.8
305	74.1	0.6438	1.123	295.3
315	61.5	0.5975	1.176	300.8

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Figure 1 — Thermal Conductivity of Relatherm S-LT Heat Transfer Fluid (Standard Units)

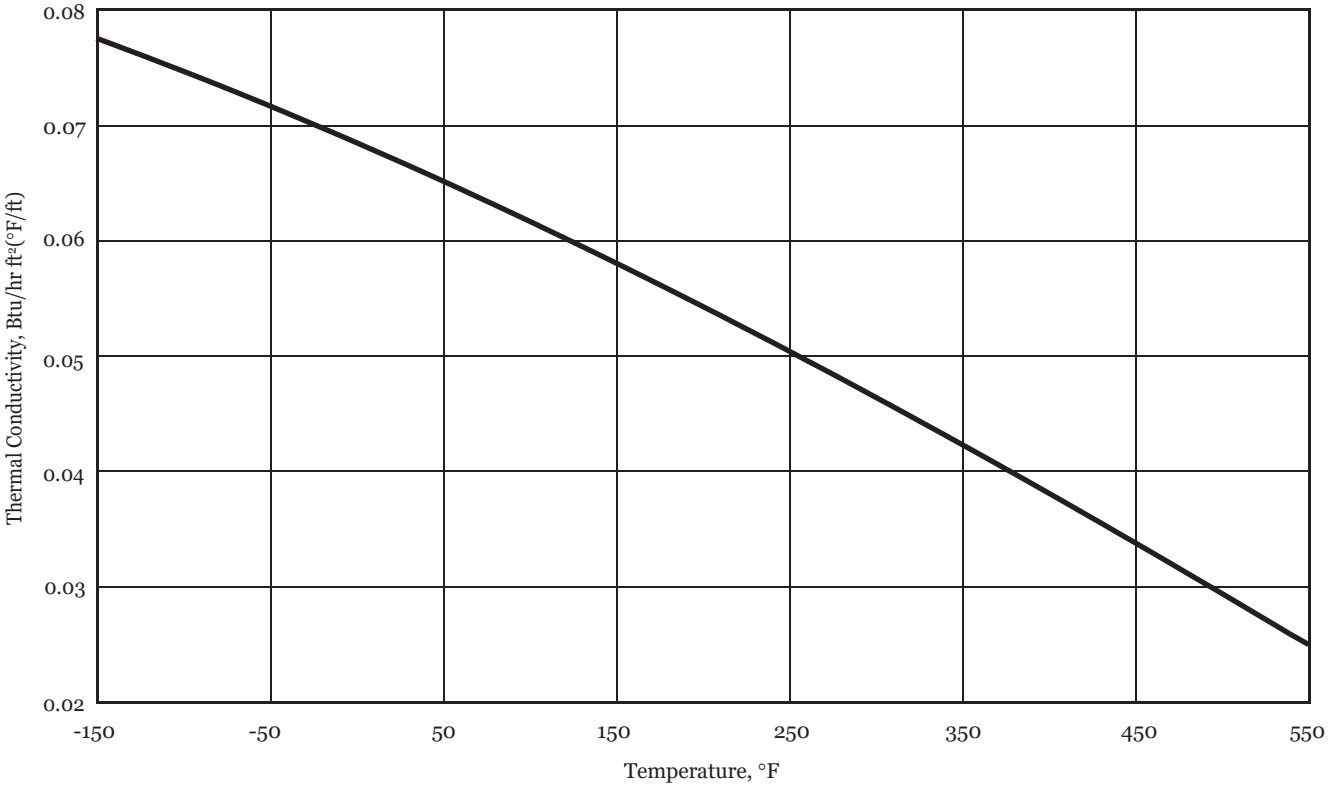

Figure 2 — Thermal Conductivity of Relatherm S-LT Heat Transfer Fluid (SI Units)

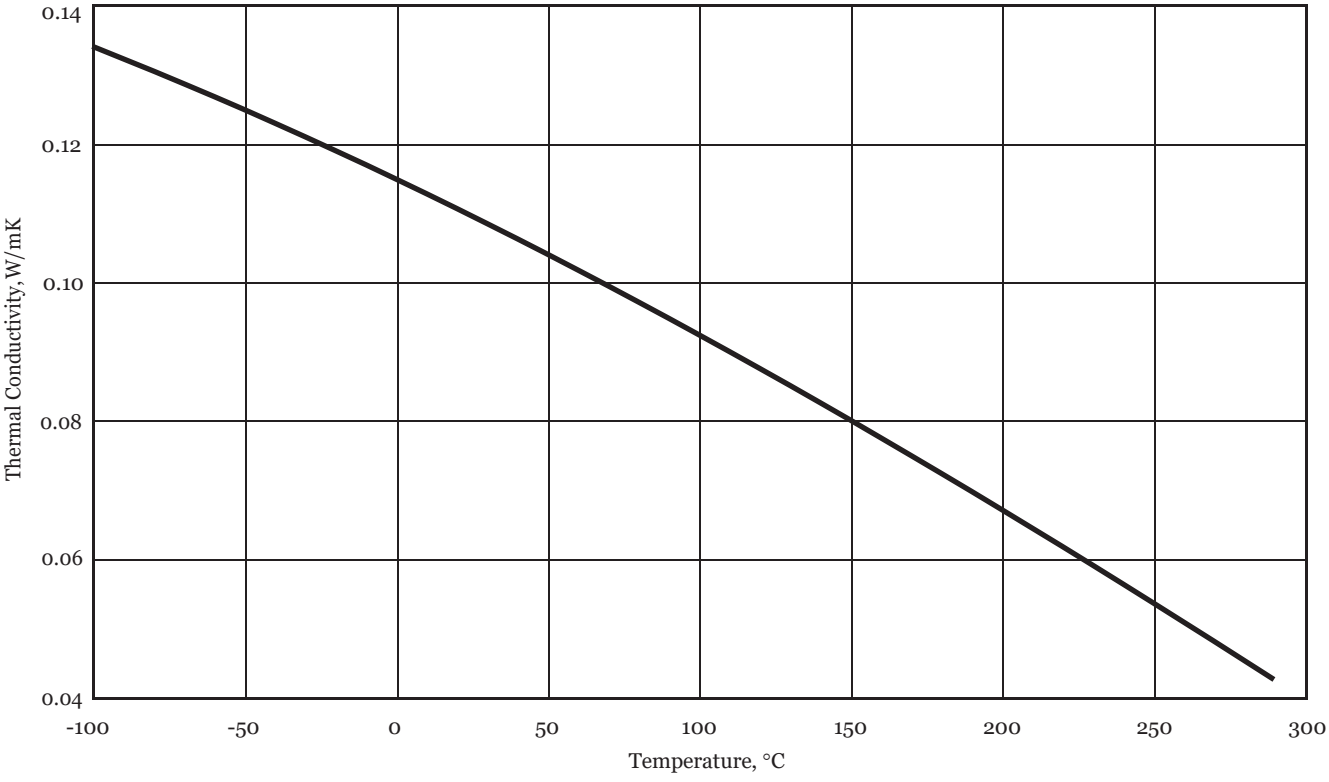

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Figure 3 — Heat of Vaporization of Relatherm S-LT Heat Transfer Fluid (Standard Units)

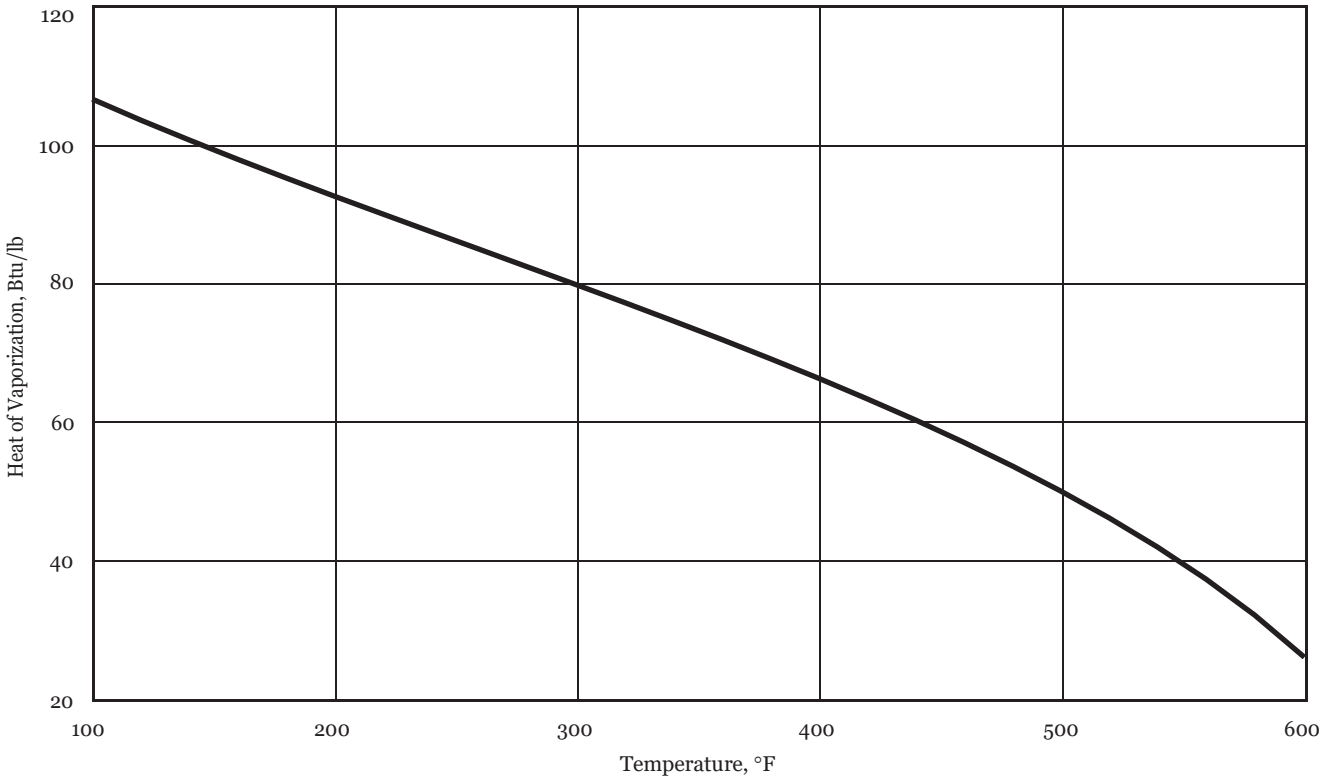

Figure 4 — Heat of Vaporization of Relatherm S-LT Heat Transfer Fluid (SI Units)

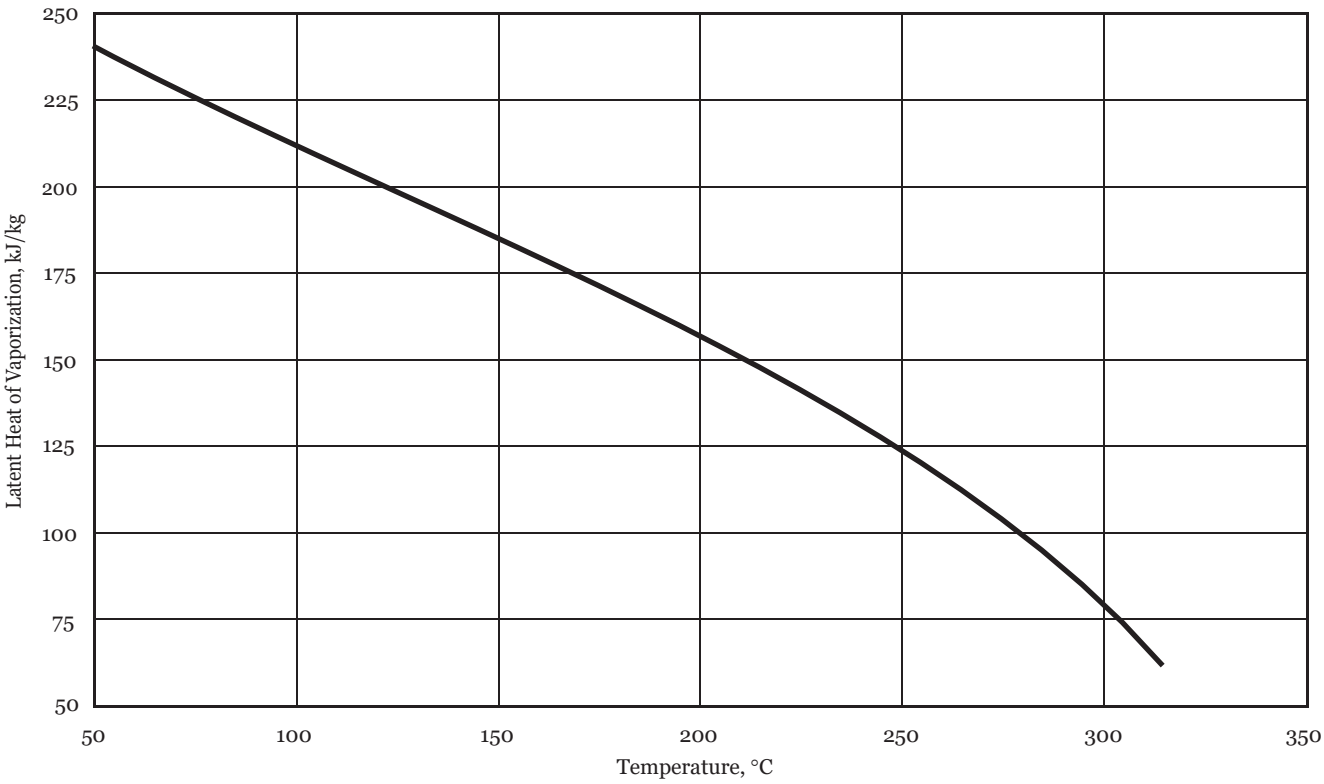

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Figure 5 — Vapor Pressure of Relatherm S-LT Heat Transfer Fluid (Standard Units)

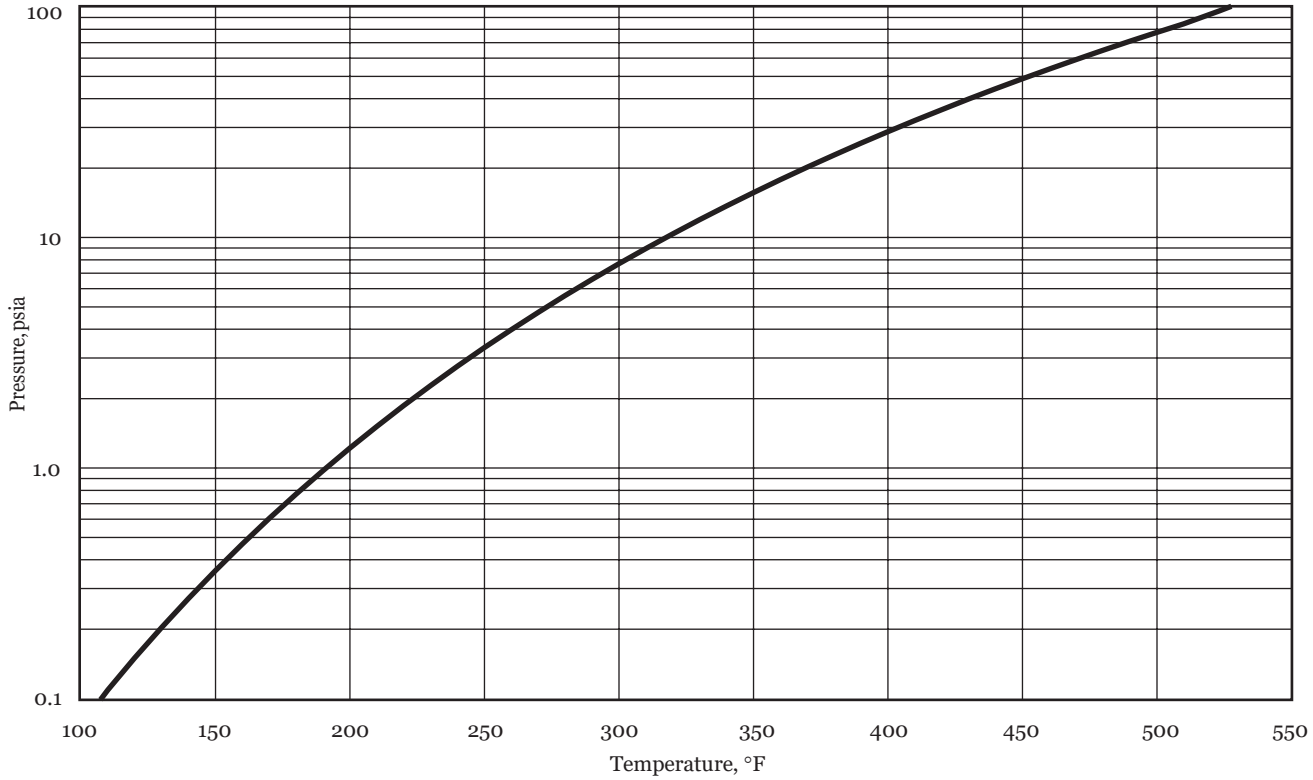

Figure 6 — Vapor Pressure of Relatherm S-LT Heat Transfer Fluid (SI Units)

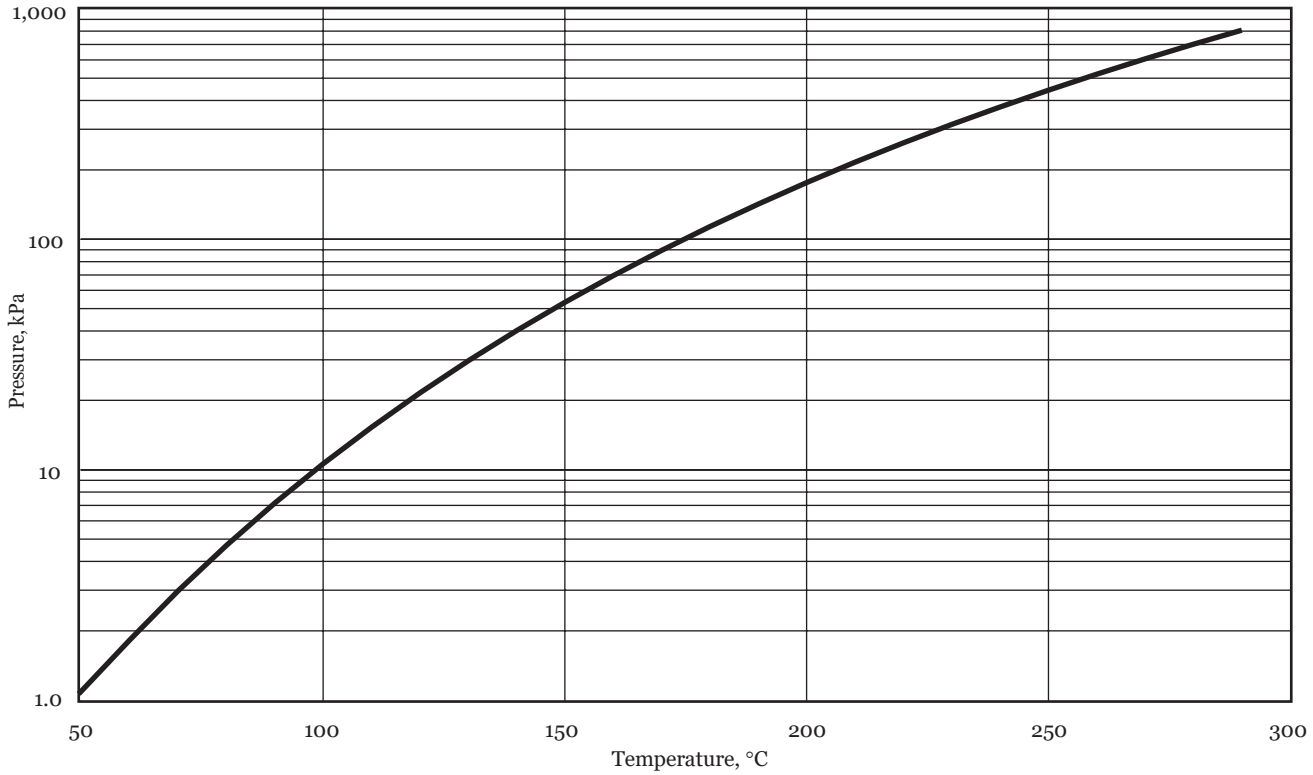

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Figure 7 — Specific Heat of Relatherm S-LT Heat Transfer Fluid (Standard Units)

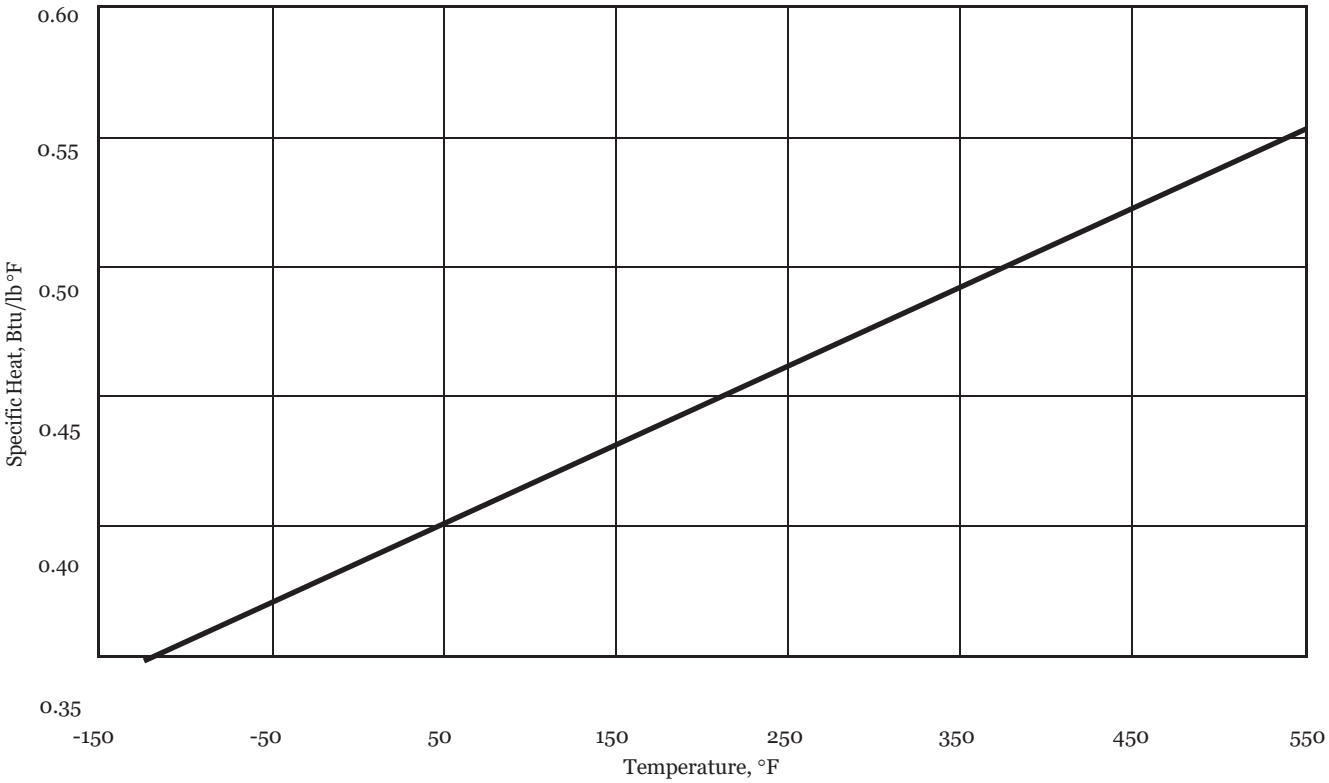

Figure 8 — Specific Heat of Relatherm S-LT Heat Transfer Fluid (SI Units)

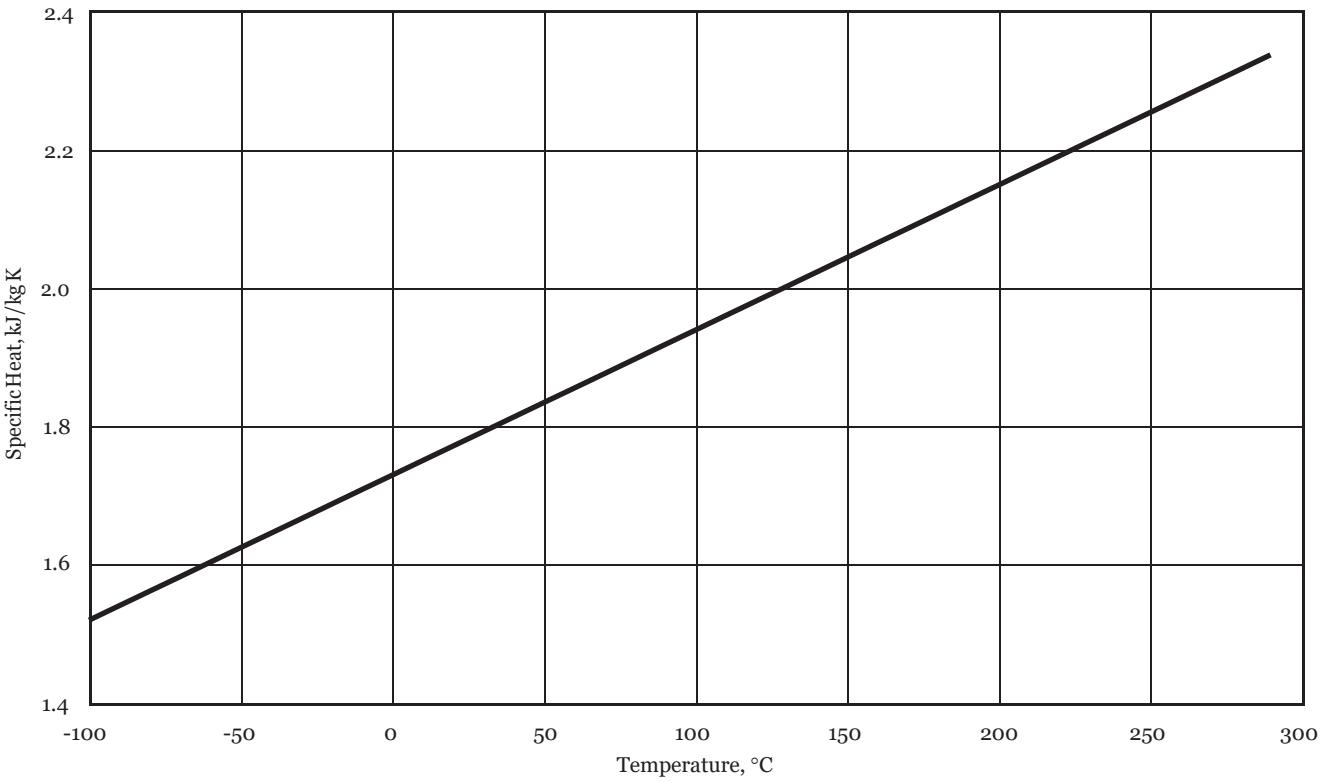

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Figure 9 — Density of Relatherm S-LT Heat Transfer Fluid (Standard Units)

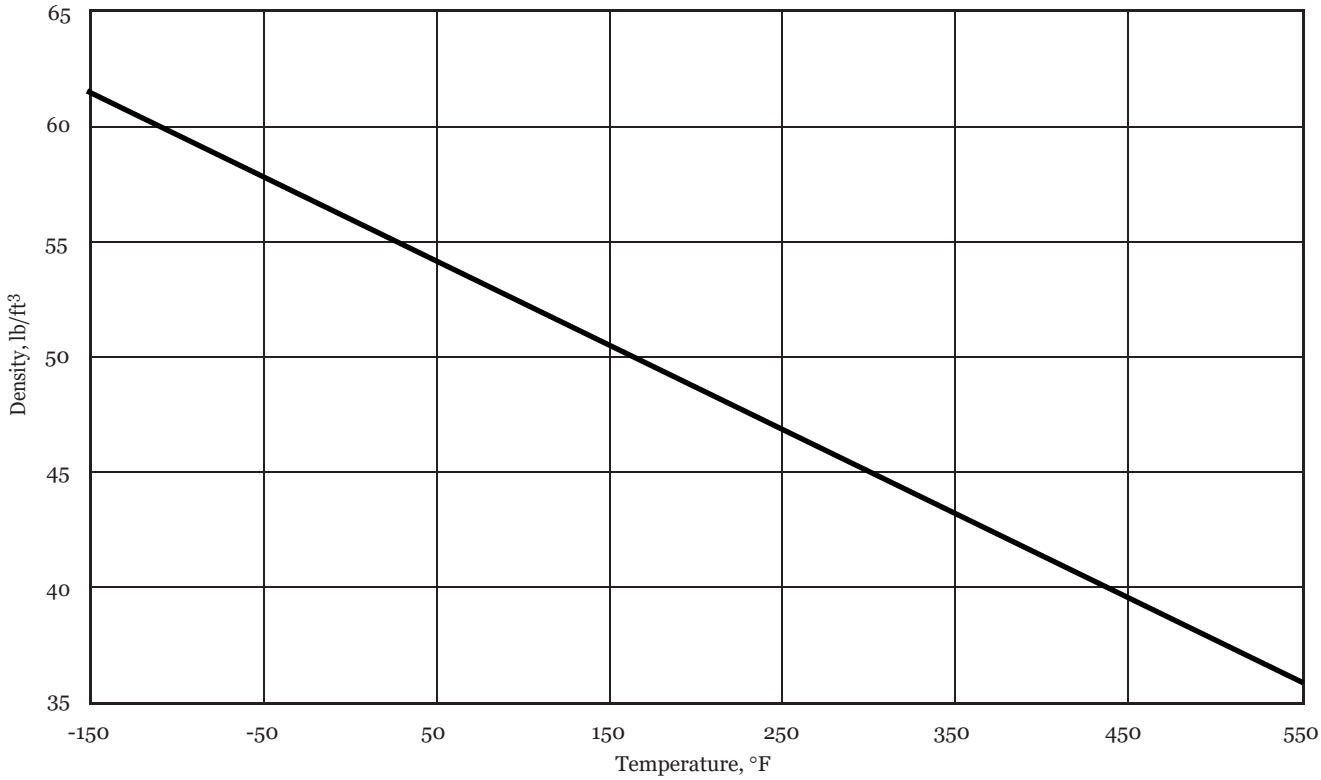

Figure 10 — Density of Relatherm S-LT Heat Transfer Fluid (SI Units)

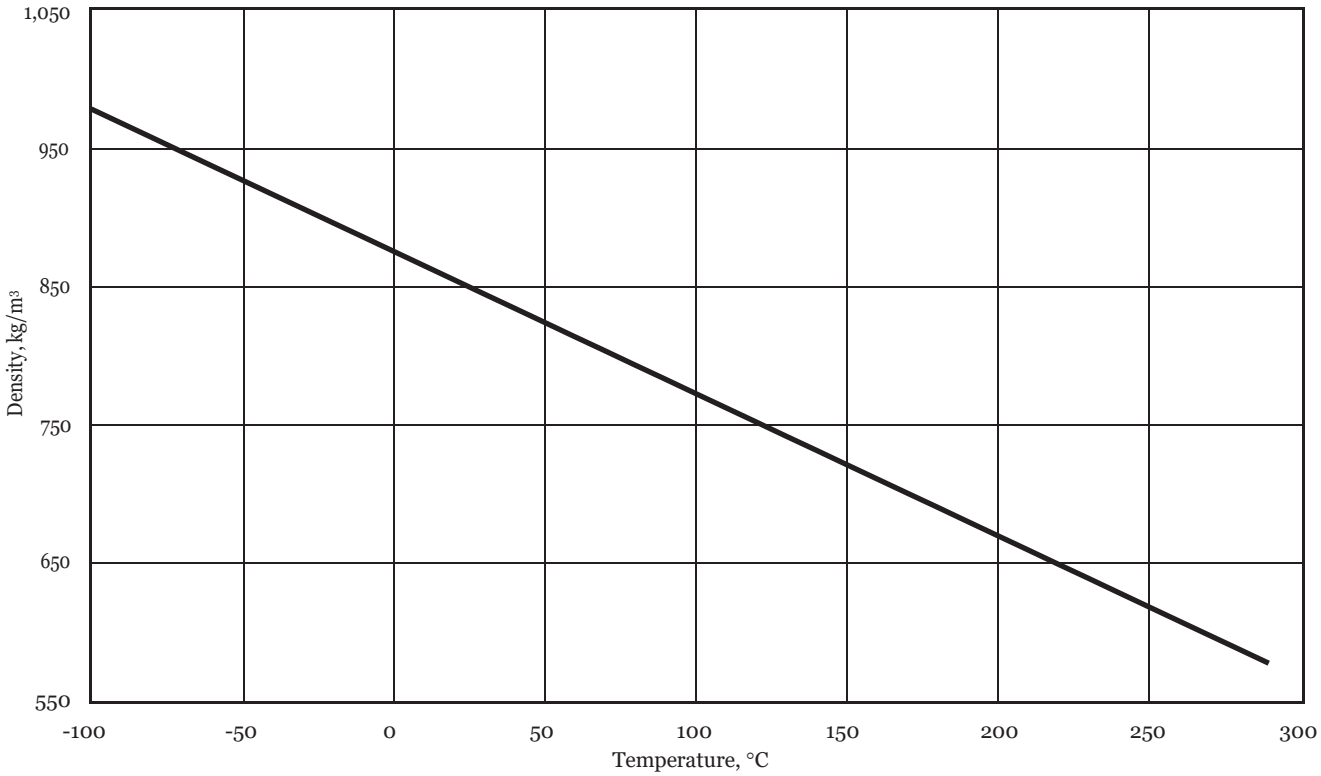

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Figure 11 — Viscosity of Relatherm S-LT Heat Transfer Fluid (Standard Units)

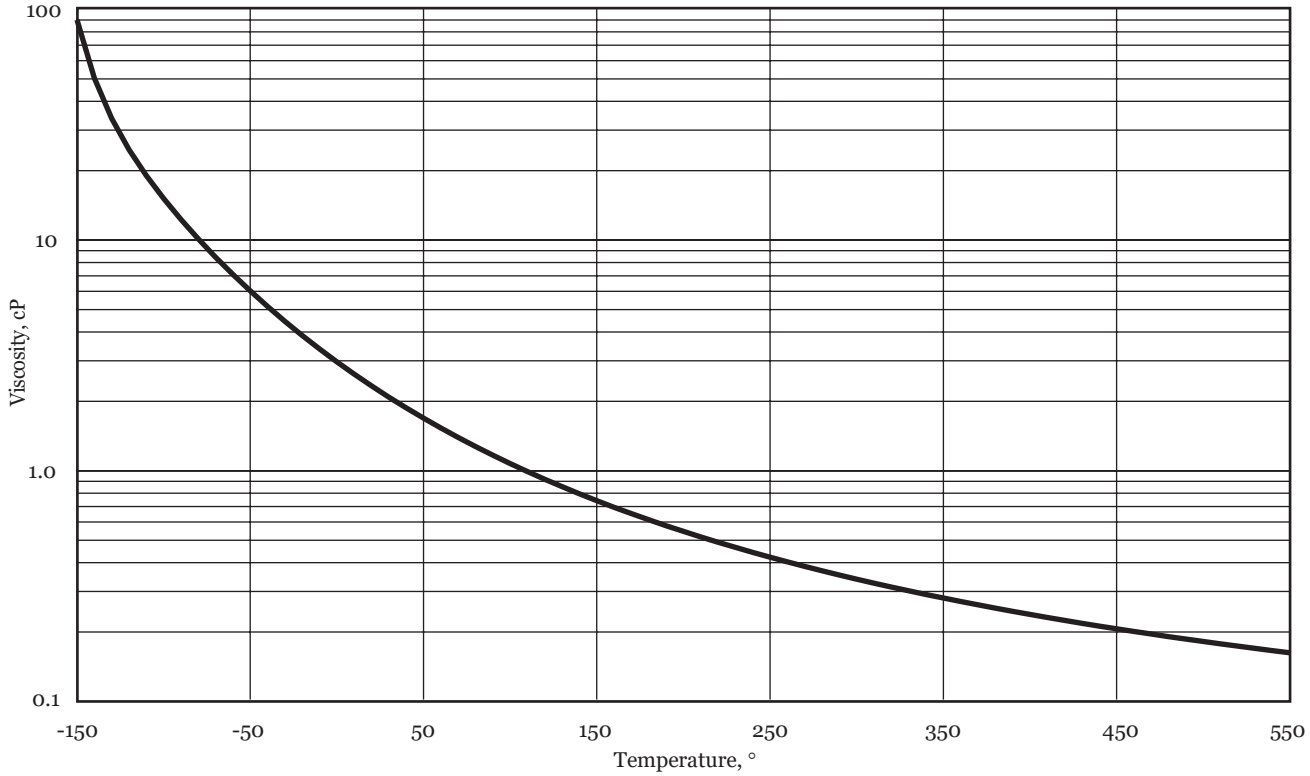
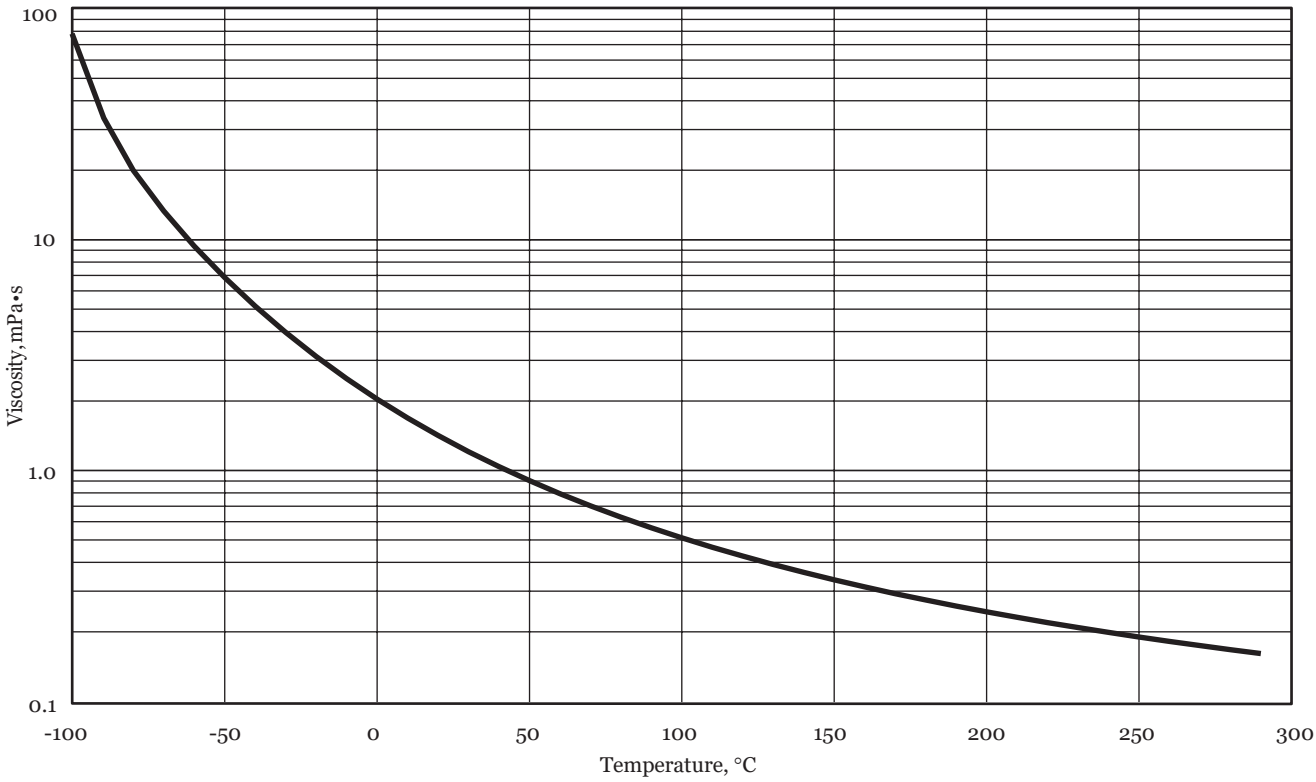


Figure 12 — Viscosity of Relatherm S-LT Heat Transfer Fluid (SI Units)



Temperature, °C x 100

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Figure 13 — Thermal Expansion of Liquid Relatherm S-LT Heat Transfer Fluid (Standard Units)

Basis: 1 gallon @75°F

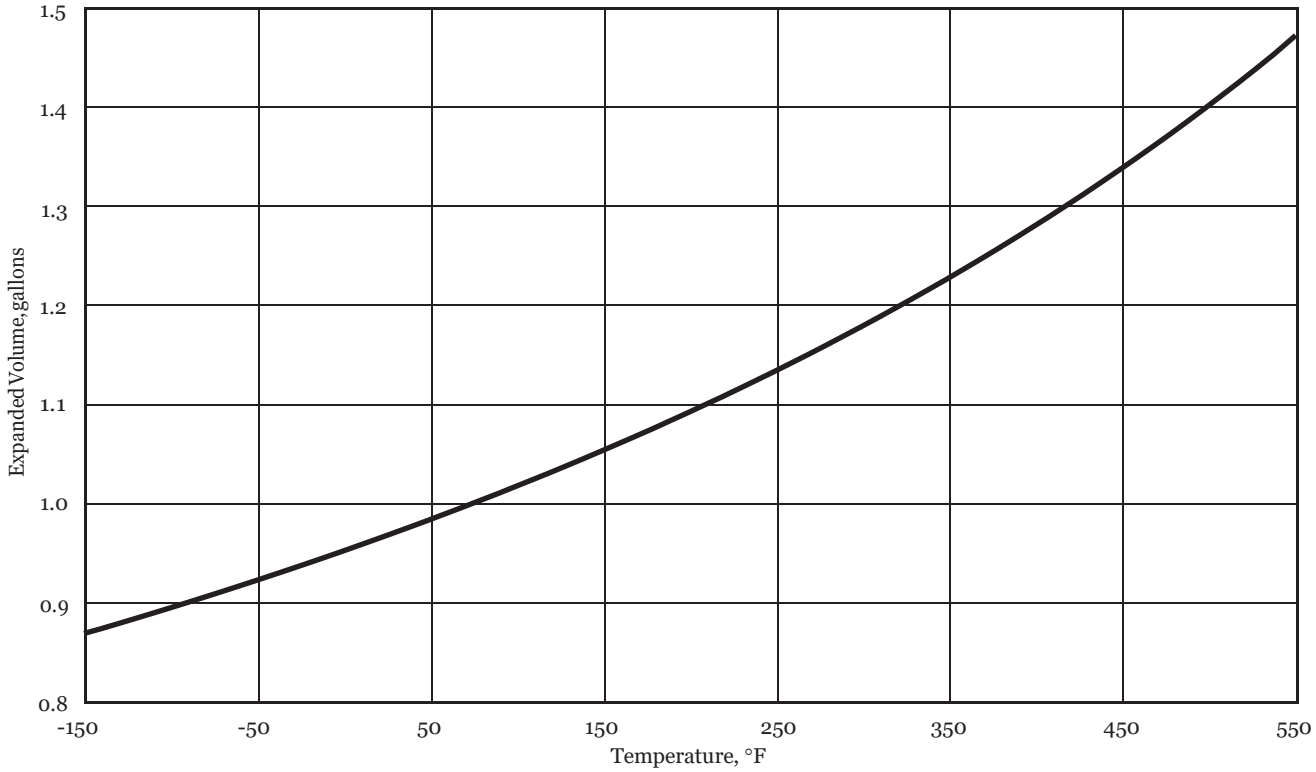
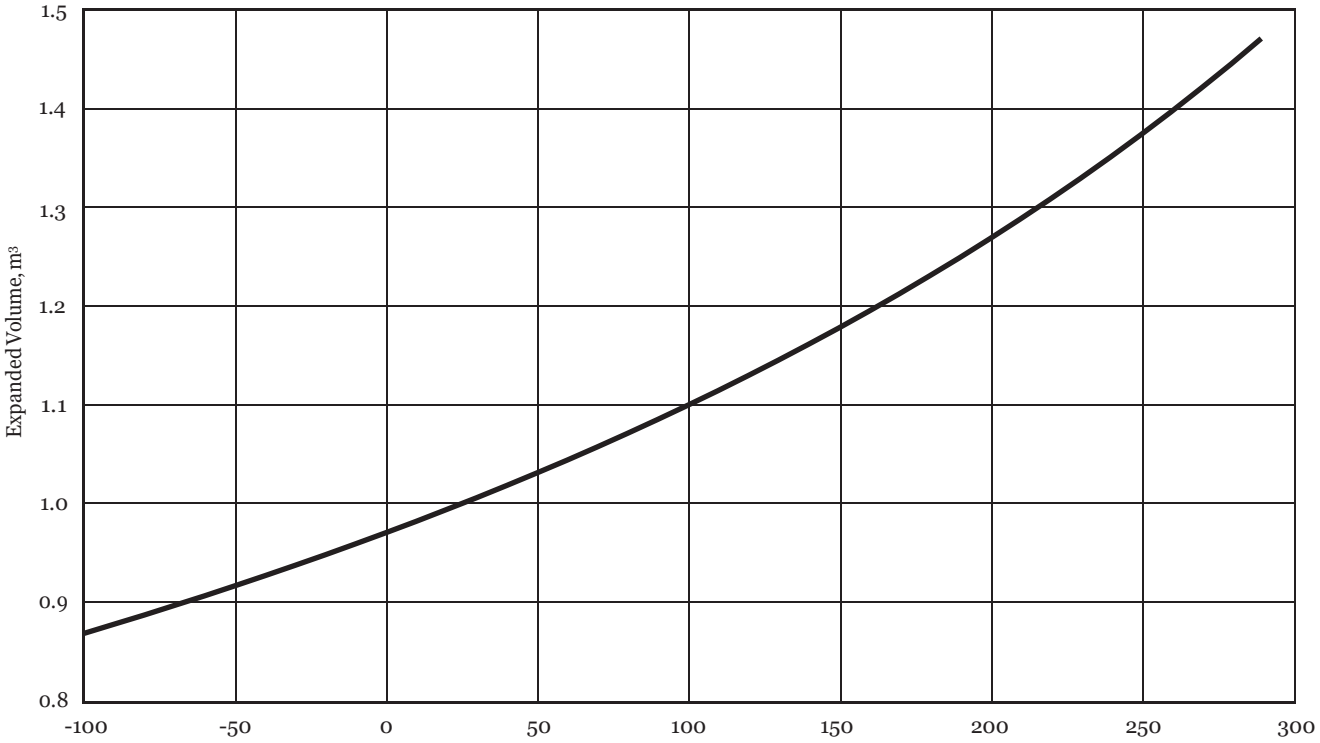


Figure 14 — Thermal Expansion of Liquid Relatherm S-LT Heat Transfer Fluid (SI Units)

Basis: 1 m^3 @25°C



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hello@relatherm.com
www.relatherm.com