



THERMINOL[®] 58

heat transfer fluid

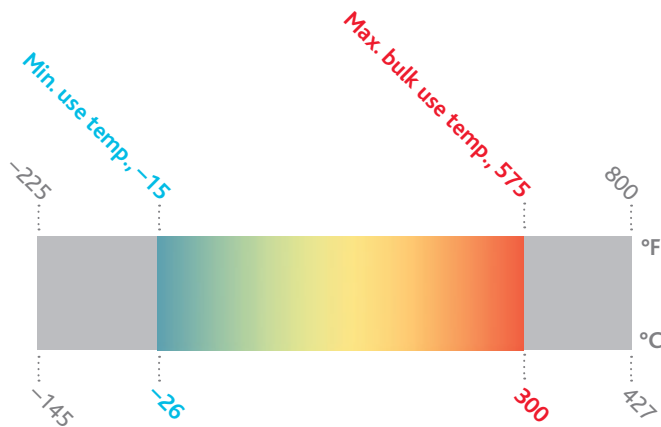
Efficient, reliable
medium-temperature fluid

-26° to 300°C
(-15° to 575°F)

THERMINOL[®]
Heat Transfer Fluids by Eastman

THERMINOL® 58

heat transfer fluid



Eastman Therminol® 58 heat transfer fluid is a synthetic fluid engineered to deliver exceptional heat transfer performance at maximum bulk temperatures up to 300°C (575°F). The benefits of Therminol 58 include:

- Superior life span—Provides excellent performance over the fluid life when compared to common mineral oil-based fluids as well as lower-tier synthetic heat transfer fluids.
- Costs savings—Savings in capital, operations, and maintenance costs are often achieved when used in applications that traditionally use mineral oil as a heating medium.
- Optimal pumpability—Non-sludge-producing chemistry enables pumpability at lower temperatures than the majority of other mineral oil-based heat transfer fluids.

Therminol 58 is available in Europe, the Middle East, and Africa. Contact your local Eastman Therminol sales representative for more information.

Physical and chemical characteristics

Therminol 58 fluid is designed for use in nonpressurized/low-pressure, indirect heating systems. It delivers efficient, dependable, uniform process heat with no need for high pressures. The high boiling point of Therminol 58 helps reduce the volatility and fluid leakage problems that are possible with other fluids.

The recommended maximum bulk and film temperatures for Therminol 58 are based on industry-standard thermal studies. Operation at or below these temperature maximums can provide long service life under most operating conditions.

Actual fluid life is dependent on the total system design and operation and can vary by heat transfer fluid chemistry. As fluid ages, the formation of low- and high-boiling compounds may result. Low-boiling compounds can be vented from the system as necessary to a safe location away from personnel and sources of ignition and in compliance with applicable regulations and laws. The high-boiling compounds can be very soluble in the fluid. Significant overheating or fluid contamination will accelerate decomposition and may result in increased high-boiler and solids concentrations. Excess solids can typically be filtered for removal.

Therminol 58 has been shown to be significantly less sensitive than mineral oils to the negative consequences (sludging, fouling) of thermal oxidation. Eastman recommends that systems utilizing Therminol 58 fluid should be blanketed with an atmosphere of inert gas to protect against the effects of fluid oxidation on its performance and life expectancy. Pressure relief device(s) should be installed where required.

Therminol 58 is noncorrosive to metals commonly used in the construction of heat transfer systems.

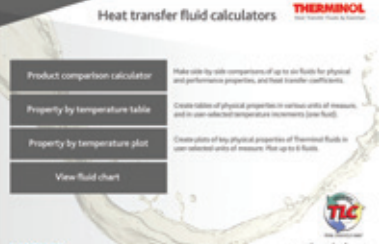
While Therminol 58 has a relatively high flash point, it is not classified as a fire-resistant heat transfer fluid. Consequently, the use of protective devices may be required to minimize fire risk and users of Therminol 58 should check with their safety and risk management experts for specific guidance.

Typical properties^a

Appearance	Clear, yellow liquid
Composition	Synthetic hydrocarbon mixture
Maximum bulk temperature	300°C (575°F)
Maximum film temperature	339°C (642°F)
Normal boiling point	352°C (665°F)
Pumpability, at 300 mm ² /s (cSt)	-6°C (21°F)
Pumpability, at 2000 mm ² /s (cSt)	-26°C (-15°F)
Flash point, COC (ASTM D-92)	195°C (383°F)
Autoignition temperature (ASTM E-659)	351°C (664°F)
Pour point (ISO 3016)	-54°C (-65°F)
Minimum liquid temperatures for fully developed turbulent flow ($N_{Re} > 10,000$)	
10 ft/s, 1-in. tube (3.048 m/s, 2.54-cm tube)	69°C (156°F)
20 ft/s, 1-in. tube (6.096 m/s, 2.54-cm tube)	47°C (117°F)
Minimum liquid temperatures for transitional region flow ($N_{Re} > 2000$)	
10 ft/s, 1-in. tube (3.048 m/s, 2.54-cm tube)	26°C (79°F)
20 ft/s, 1-in. tube (6.096 m/s, 2.54-cm tube)	14°C (57°F)
Coefficient of thermal expansion @ 200°C	0.000975/°C (0.000542/°F)
Heat of vaporization at maximum use temperature	248.1 kJ/kg (107.1 Btu/lb)
Average molecular weight	312
Pseudocritical temperature	496°C (925°F)
Pseudocritical pressure	13.07 bar (189.6 psia)
Pseudocritical density	261.3 kg/m ³ (16.31 lb/ft ³)
Moisture content, maximum (ASTM E-203)	150 ppm
Dielectric constant @ 23°C (ASTM D-924)	2.4

^aThese data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications for Therminol 58 fluid. Does not constitute an express warranty. See disclaimer on the back page of this bulletin.

Heat transfer fluid calculators **THERMINOL**
The Performance Advantage



To create your own customized table

with preferred properties, units of measure,
and temperature intervals, visit
www.therminol.com/resources
and download the Therminol heat transfer fluid calculator.

For the technical service contact in your region,
visit the **CONTACT US** page on our website, www.therminol.com.

Liquid properties of Therminol® 58 heat transfer fluid by temperature^a (SI units)

Temperature		Liquid density	Liquid heat capacity	Liquid enthalpy ^b	Heat of vaporization	Liquid thermal conductivity	Liquid viscosity ^c		Vapor pressure ^d
°C	°F	kg/m ³	kJ/(kg·K)	kJ/kg	kJ/kg	W/(m·K)	cSt (mm ² /s)	cP (mPa·s)	kPa
-30	-22	915	1.80	-22.2	402.7	0.1311	3410	3120	—
-20	-4	909	1.83	-4.1	397.2	0.1304	1110	1010	—
-10	14	902	1.87	14.4	391.8	0.1296	430	388	—
0	32	896	1.91	33.4	386.4	0.1289	192	172	—
10	50	889	1.95	52.7	381.2	0.1281	96.1	85.5	—
20	68	883	1.99	72.3	376.1	0.1274	53.2	46.9	—
30	86	876	2.03	92.4	371.0	0.1266	31.9	28.0	0.011
40	104	870	2.06	112.8	366.0	0.1257	20.5	17.8	0.016
50	122	863	2.10	133.7	361.1	0.1249	14.0	12.1	0.023
60	140	856	2.14	154.9	356.3	0.1241	10.0	8.57	0.034
70	158	850	2.18	176.5	351.5	0.1232	7.46	6.34	0.048
80	176	843	2.22	198.5	346.8	0.1223	5.76	4.86	0.068
90	194	836	2.26	220.8	342.2	0.1214	4.58	3.83	0.096
100	212	830	2.30	243.6	337.7	0.1205	3.73	3.10	0.135
110	230	823	2.33	266.7	333.1	0.1196	3.11	2.56	0.187
120	248	816	2.37	290.3	328.7	0.1186	2.64	2.15	0.258
130	266	809	2.41	314.2	324.2	0.1176	2.27	1.84	0.354
140	284	802	2.45	338.5	319.8	0.1167	1.98	1.59	0.482
150	302	795	2.49	363.3	315.5	0.1156	1.75	1.39	0.653
160	320	788	2.53	388.4	311.1	0.1146	1.56	1.23	0.878
170	338	781	2.57	413.9	306.8	0.1136	1.40	1.09	1.18
180	356	774	2.61	439.8	302.5	0.1125	1.26	0.975	1.56
190	374	767	2.65	466.1	298.2	0.1115	1.14	0.877	2.07
200	392	759	2.69	492.8	293.8	0.1104	1.04	0.792	2.72
210	410	752	2.73	519.9	289.5	0.1093	0.956	0.718	3.57
220	428	744	2.77	547.4	285.1	0.1081	0.878	0.653	4.65
230	446	736	2.81	575.3	280.7	0.1070	0.809	0.596	6.02
240	464	729	2.85	603.6	276.3	0.1058	0.747	0.544	7.77
250	482	721	2.89	632.4	271.8	0.1047	0.690	0.498	9.98
260	500	713	2.93	661.5	267.2	0.1035	0.639	0.456	12.8
270	518	705	2.98	691.0	262.6	0.1023	0.593	0.418	16.2
280	536	696	3.02	721.0	257.8	0.1010	0.550	0.383	20.6
290	554	688	3.06	751.4	253.0	0.0998	0.511	0.351	26.0
300	572	679	3.10	782.2	248.1	0.0985	0.474	0.322	32.6
310	590	670	3.14	813.4	243.0	0.0972	0.441	0.295	40.9
320	608	661	3.19	845.0	237.8	0.0959	0.410	0.271	51.0

These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications for Therminol 58 fluid.

^aMaximum recommended bulk temperature 300°C (572°F)

^bLiquid enthalpy basis is -17.8°C (0°F).

^c1 cSt = 1 mm²/s and 1 mPa·s = 1 cP

^d100 kPa = 1 bar

Liquid properties of Therminol® 58 heat transfer fluid by temperature^a (English units)

Temperature		Liquid density		Liquid heat capacity	Liquid enthalpy ^b	Heat of vaporization	Liquid thermal conductivity	Liquid viscosity ^c		Vapor pressure ^d
°F	°C	lb/gal	lb/ft ³	Btu/(lb·°F)	Btu/lb	Btu/lb	Btu/(ft·h·°F)	lb/(ft·h)	cSt (mm ² /s)	psia
-25	-32	57.2	7.64	0.428	-10.9	173.7	0.0759	9280	4190	—
-20	-29	57.1	7.63	0.430	-8.7	173.0	0.0757	6600	2980	—
0	-18	56.6	7.57	0.440	0.0	170.4	0.0753	1950	888	—
20	-7	56.2	7.51	0.451	8.9	167.8	0.0748	705	324	—
40	4	55.7	7.45	0.461	18.0	165.2	0.0743	301	139	—
60	16	55.3	7.39	0.471	27.3	162.8	0.0738	147	68.4	—
80	27	54.8	7.33	0.481	36.9	160.3	0.0733	79.7	37.5	0.0014
100	38	54.4	7.27	0.491	46.6	157.9	0.0728	47.4	22.5	0.0021
120	49	53.9	7.21	0.501	56.5	155.6	0.0723	30.4	14.6	0.0032
140	60	53.5	7.15	0.512	66.6	153.3	0.0717	20.7	10.0	0.0049
160	71	53.0	7.09	0.522	77.0	151.0	0.0712	14.9	7.24	0.0072
180	82	52.5	7.02	0.532	87.5	148.8	0.0706	11.1	5.46	0.011
200	93	52.1	6.96	0.542	98.2	146.6	0.0700	8.61	4.27	0.016
220	104	51.6	6.90	0.553	109.2	144.4	0.0694	6.87	3.43	0.023
240	116	51.1	6.84	0.563	120.4	142.2	0.0688	5.61	2.83	0.032
260	127	50.7	6.77	0.574	131.7	140.1	0.0682	4.68	2.38	0.046
280	138	50.2	6.71	0.584	143.3	138.0	0.0676	3.97	2.04	0.065
300	149	49.7	6.64	0.594	155.1	135.9	0.0669	3.41	1.77	0.092
320	160	49.2	6.58	0.605	167.1	133.9	0.0663	2.96	1.56	0.127
340	171	48.7	6.51	0.615	179.3	131.8	0.0656	2.60	1.38	0.176
360	182	48.2	6.44	0.626	191.7	129.7	0.0649	2.30	1.23	0.241
380	193	47.7	6.38	0.637	204.3	127.6	0.0642	2.05	1.11	0.329
400	204	47.2	6.31	0.647	217.2	125.6	0.0635	1.83	1.00	0.446
420	216	46.7	6.24	0.658	230.2	123.5	0.0628	1.65	0.911	0.599
440	227	46.1	6.17	0.669	243.5	121.4	0.0621	1.49	0.831	0.801
460	238	45.6	6.10	0.679	257.0	119.3	0.0613	1.34	0.760	1.07
480	249	45.1	6.02	0.690	270.7	117.1	0.0606	1.22	0.696	1.41
500	260	44.5	5.95	0.701	284.6	114.9	0.0598	1.10	0.639	1.85
520	271	43.9	5.87	0.712	298.7	112.7	0.0590	1.00	0.588	2.42
540	282	43.3	5.79	0.723	313.1	110.5	0.0583	0.908	0.541	3.14
560	293	42.7	5.71	0.734	327.6	108.1	0.0575	0.825	0.498	4.07
580	304	42.1	5.63	0.746	342.4	105.8	0.0566	0.750	0.459	5.23
600	316	41.5	5.55	0.757	357.5	103.3	0.0558	0.681	0.423	6.71

These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications for Therminol 58 fluid.

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^bLiquid enthalpy basis is -17.8°C (0°F).

^c1 cSt = 1 mm²/s and 1 mPa·s = 1 cP

^d100 kPa = 1 bar

TLC Total Lifecycle Care[®]

In-service heat transfer fluid sample analysis

When Therminol heat transfer fluids are used within suggested temperature limits, they may provide years of trouble-free service. To help users get maximum life, Eastman offers testing of in-service heat transfer fluids to detect contamination, moisture, thermal degradation, and other conditions that may impact system performance. This comprehensive analysis includes acid number, kinematic viscosity, insoluble solids, low boilers, high boilers, and moisture content. Additional special analyses are available on request. Sample analysis includes sample collection kits that are easy to use. Most systems should be sampled annually. Users should also sample anytime a fluid-related problem is suspected.

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Results of the test are presented in a detailed report that provides suggestions for corrective action. Test results are stored in a database for future reference. Customers can access their specific test information via my.therminol.com.

Technical service hotline

Experienced technical service specialists can help answer your questions regarding heat transfer fluid selection, system start-ups, system design, and operational issues.

System design support

Eastman regularly assists some of the world's largest engineering, chemical, and equipment manufacturing companies on the design and operation of heat transfer systems. Our liquid phase and vapor phase design guide information and system design data have been field tested in numerous installations. Eastman also

conducts engineering seminars for customers, engineering firms, and equipment manufacturers to cover a wide range of heat transfer fluid system design and operation issues. Customers can request a technical service visit to audit heat transfer systems for fluid loss and leak prevention opportunities.

Operational training

Eastman believes that by sharing our experience with customers, we can help improve system design, promote safety, and reduce overall cost. Customers can take advantage of Eastman's heat transfer system operation and product training programs. These programs are customized to suit the varied needs of frontline technicians, operations supervisors, and maintenance technicians to design engineers. Customers can also receive training assistance for dealing with important topics like fluid safety and handling.

Safety awareness training

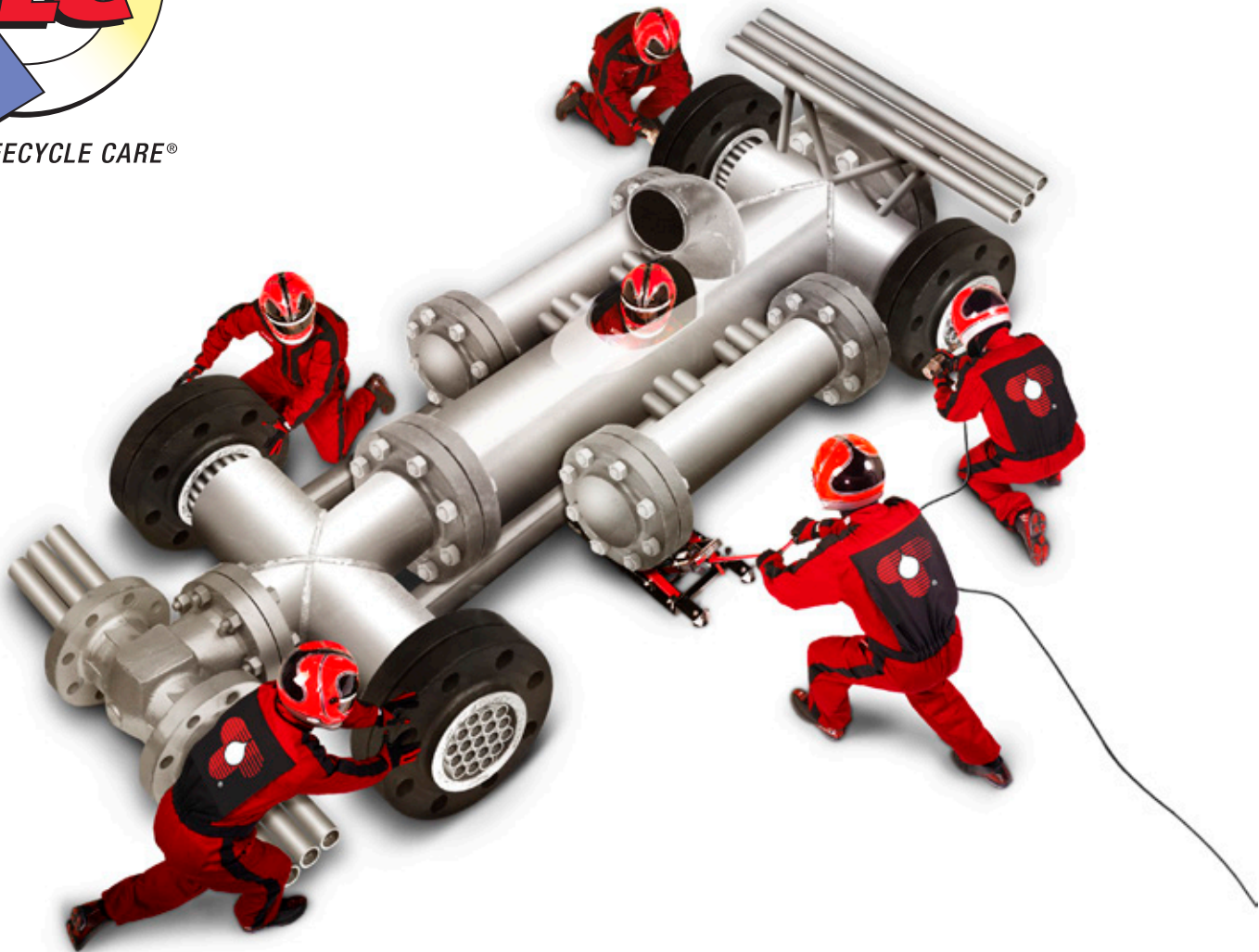
At Eastman, we're "All in for Safety." We provide our customers safety awareness training that focuses on the design, start-up, operation, and maintenance of heat transfer fluid systems.

Start-up assistance

Eastman provides start-up assistance by reviewing procedures and offering suggestions to reduce typical problems. Customers can also receive help by calling their local Eastman technical specialist or through on-site assistance.

Flush fluid and fluid refill

Liquid phase heat transfer systems can be cleaned with Therminol[®] FF flushing fluid. After the system is flushed, the appropriate liquid phase Therminol heat transfer fluid can be added.



Eastman's TLC Total Lifecycle Care® program is designed to support Therminol customers throughout their systems' life cycle. This comprehensive program includes system design support, start-up assistance, training, sample analysis, flush and refill fluids, and our fluid trade-in program. For more information, contact your local sales or technical representative.

For more information or to find the sales or technical contact nearest you, visit the "Contact us" page on our website:
www.therminol.com.

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