



THERMINOL[®] 68

heat transfer fluid

High-temperature,
low-viscosity fluid

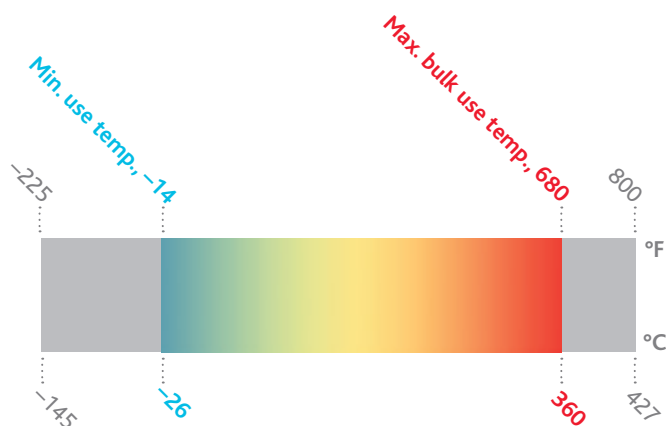
-26° to 360°C
(-14° to 680°F)

THERMINOL

Heat Transfer Fluids by Eastman

THERMINOL® 68

heat transfer fluid



Eastman Therminol® 68 heat transfer fluid is a high-temperature fluid with excellent thermal stability. Therminol 68 was developed for use at temperatures up to 360°C (680°F) in liquid phase heat transfer systems. Static pressure of about 2 bar should maintain the liquid phase at high temperatures.

Therminol 68 is available in Europe, the Middle East, Africa, and CIS. Contact your local Eastman Therminol sales representative for more information.

Physical and chemical characteristics

Therminol 68 fluid is designed for use in nonpressurized/low-pressure, indirect heating systems. While Therminol 68 has a relatively high normal boiling point (308°C/586°F), the recommended maximum bulk (360°C/680°F) and film (390°C/735°F) temperatures are greater. Therefore, proper care should be taken in the design of the system to minimize leakage, especially when operating above a bulk fluid temperature of 360°C (680°F).

The recommended maximum bulk and film temperatures for Therminol 68 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 should 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.

Eastman recommends that systems utilizing Therminol 68 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 68 is noncorrosive to metals commonly used in the construction of heat transfer systems.

While Therminol 68 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 68 should check with their safety and risk management experts for specific instructions.

Typical properties^a

Appearance	Clear, pale yellow liquid
Composition	Mixture of synthetic aromatics
Maximum bulk temperature	360°C (680°F)
Maximum film temperature	390°C (735°F)
Normal boiling point	308°C (586°F)
Pumpability, at 300 mm ² /s (cSt)	−10°C (14°F)
Pumpability, at 2000 mm ² /s (cSt)	−26°C (−14°F)
Flash point, COC (ASTM D-92)	155°C (311°F)
Autoignition temperature (DIN 51794)	400°C (752°F)
Pour point (ISO 3016)	−33°C (−27°F)
Total acidity (ASTM D-664)	<0.2 mg KOH/g
Average molecular weight	226
Copper corrosion (ASTM D-130)	<<1a
Moisture content, maximum (ASTM E-203)	200 ppm
Dielectric constant @ 23°C (ASTM D-924)	2.8

^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 68 fluid. Does not constitute an express warranty. See disclaimer on the back page of this bulletin.

Heat transfer fluid calculators

Product comparison calculator

Property by temperature table

Property by temperature plot

View fluid chart

www.therminol.com

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® 68 heat transfer fluid by temperature^a (SI units)

Temperature		Liquid density	Liquid heat capacity	Liquid thermal conductivity	Liquid viscosity ^b		Vapor pressure ^c
°C	°F	kg/m ³	kJ/(kg·K)	W/(m·K)	cP (mPa·s)	cSt (mm ² /s)	kPa
-20	-4	1056	1.495	0.127	959	908	—
-10	14	1049	1.527	0.126	314	299	—
0	32	1042	1.559	0.125	130	125	—
10	50	1034	1.592	0.124	63.3	61.2	—
20	68	1027	1.624	0.124	34.9	34.0	—
30	86	1020	1.656	0.123	21.1	20.7	—
40	104	1013	1.688	0.122	13.8	13.6	—
50	122	1006	1.721	0.121	9.51	9.45	—
60	140	998	1.753	0.120	6.88	6.89	0.033
70	158	991	1.785	0.120	5.17	5.22	0.057
80	176	983	1.817	0.119	4.01	4.08	0.094
90	194	976	1.849	0.118	3.20	3.27	0.151
100	212	969	1.882	0.117	2.60	2.69	0.237
110	230	962	1.914	0.116	2.16	2.25	0.365
120	248	955	1.946	0.116	1.83	1.91	0.551
130	266	947	1.978	0.115	1.56	1.65	0.814
140	284	940	2.011	0.114	1.36	1.44	1.18
150	302	933	2.043	0.113	1.19	1.27	1.69
160	320	926	2.075	0.112	1.05	1.14	2.38
170	338	919	2.107	0.112	0.94	1.02	3.30
180	356	911	2.140	0.111	0.85	0.927	4.52
190	374	904	2.172	0.110	0.77	0.846	6.10
200	392	898	2.204	0.109	0.70	0.777	8.15
210	410	890	2.236	0.108	0.64	0.718	10.8
220	428	883	2.269	0.107	0.59	0.666	14.0
230	446	876	2.301	0.107	0.55	0.622	18.1
240	464	869	2.333	0.106	0.51	0.582	23.2
250	482	862	2.365	0.105	0.47	0.547	29.5
260	500	854	2.398	0.104	0.44	0.516	37.1
270	518	847	2.430	0.103	0.41	0.489	46.3
280	536	840	2.462	0.103	0.39	0.464	57.3
290	554	833	2.494	0.102	0.37	0.441	70.5
300	572	826	2.527	0.101	0.35	0.421	86.1
310	590	818	2.559	0.100	0.33	0.403	104
320	608	811	2.591	0.099	0.31	0.386	126
330	626	804	2.623	0.099	0.30	0.371	151
340	644	797	2.655	0.098	0.28	0.357	180
350	662	790	2.688	0.097	0.27	0.344	213
360	680	782	2.720	0.096	0.26	0.332	251

^aMaximum recommended bulk temperature 360°C (680°F). 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 68 fluid. ^b1 cSt = 1 mm²/s and 1 mPa·s = 1 cP. ^c100 kPa = 1 bar

Liquid properties of Therminol® 68 heat transfer fluid by temperature^a (English units)

Temperature		Liquid density		Liquid heat capacity	Liquid thermal conductivity	Liquid viscosity ^b		Vapor pressure ^c
°F	°C	lb/gal	lb/ft³	Btu/(lb·°F)	Btu/(ft·h·°F)	lb/(ft·h)	cSt (mm²/s)	psia
-14	-26	8.85	66.2	0.353	0.0736	4950	1930	—
0	-18	8.80	65.8	0.359	0.0732	1770	692	—
20	-7	8.73	65.3	0.368	0.0727	553	219	—
40	4	8.66	64.8	0.376	0.0722	224	89.2	—
60	16	8.60	64.3	0.385	0.0716	109	43.5	0.0003
80	27	8.53	63.8	0.393	0.0711	59.9	24.2	0.0006
100	38	8.46	63.3	0.402	0.0706	36.5	14.9	0.0013
120	49	8.40	62.8	0.410	0.0701	23.9	9.82	0.0026
140	60	8.33	62.3	0.419	0.0696	16.6	6.89	0.0048
160	71	8.26	61.8	0.427	0.0691	12.1	5.07	0.0087
180	82	8.19	61.3	0.436	0.0685	9.20	3.87	0.0151
200	93	8.13	60.8	0.445	0.0680	7.20	3.06	0.0255
220	104	8.06	60.3	0.453	0.0675	5.79	2.48	0.0418
240	116	7.99	59.8	0.462	0.0670	4.75	2.05	0.0667
260	127	7.93	59.3	0.470	0.0665	3.98	1.73	0.104
280	138	7.86	58.8	0.479	0.0659	3.38	1.48	0.158
300	149	7.79	58.3	0.487	0.0654	2.92	1.29	0.236
320	160	7.73	57.8	0.496	0.0649	2.55	1.14	0.345
340	171	7.66	57.3	0.505	0.0644	2.25	1.01	0.496
360	182	7.59	56.8	0.513	0.0639	2.00	0.91	0.701
380	193	7.53	56.3	0.522	0.0634	1.79	0.82	0.976
400	204	7.46	55.8	0.530	0.0628	1.62	0.75	1.34
420	216	7.39	55.3	0.539	0.0623	1.48	0.69	1.81
440	227	7.33	54.8	0.547	0.0618	1.35	0.64	2.42
460	238	7.26	54.3	0.556	0.0613	1.24	0.59	3.19
480	249	7.19	53.8	0.564	0.0608	1.15	0.55	4.17
500	260	7.13	53.3	0.573	0.0602	1.07	0.52	5.38
520	271	7.06	52.8	0.582	0.0597	0.99	0.49	6.88
540	282	6.99	52.3	0.590	0.0592	0.93	0.46	8.71
560	293	6.92	51.8	0.599	0.0587	0.87	0.43	10.9
580	304	6.86	51.3	0.607	0.0582	0.82	0.41	13.6
600	316	6.79	50.8	0.616	0.0577	0.78	0.39	16.8
620	327	6.72	50.3	0.624	0.0571	0.73	0.38	20.6
640	338	6.66	49.8	0.633	0.0566	0.69	0.36	25.1
660	349	6.59	49.3	0.642	0.0561	0.66	0.35	30.4
680	360	6.52	48.8	0.650	0.0556	0.63	0.33	36.5

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.



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.

Fluid trade-in program*

As part of our commitment to sustainability and the environment, Eastman offers a trade-in program for used Therminol and competitive heat transfer fluids. Depending on the fluid and its condition, it may be turned in for potential credit towards the purchase of new Therminol heat transfer fluid.



*Available in North America. Contact your local sales representative for more information.



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. In North America, call our hotline at 1-800-433-6997 or 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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