THERMINOL® 72

heat transfer fluid

High temperature,
excellent stability
at medium pressure

–14°C to 380°C

(7° to 715°F)

THERMINOL®

Heat transfer fluids by Eastman

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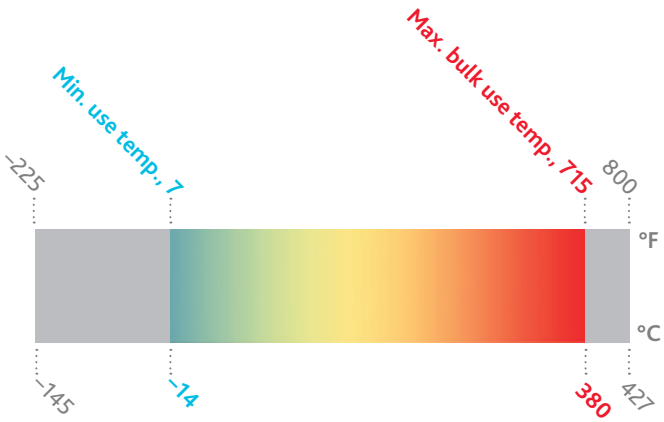


Eastman Therminol® 72 heat transfer fluid offers outstanding high-temperature performance up to 380°C (715°F) with excellent thermal stability in systems at medium pressures. Static pressure of about 6 bar should maintain the liquid phase at high temperatures. When operating in a well-maintained and operated heat transfer system, Therminol 72 can provide reliable, consistent performance over long periods of time.

Therminol 72 is available globally. Contact your local Eastman Therminol sales representative for more information.

Physical and chemical characteristics

Therminol 72 is ideally suited for high-temperature heat recovery applications that also require low-temperature fluidity. The use of Therminol 72 in high-temperature heat transfer systems can result in a significant reduction in capital investment due to reduced freeze protection requirements and lower pumping energy costs at low temperatures compared to other very high-temperature alternatives.

The recommended maximum bulk and film temperatures for Therminol 72 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 using Therminol 72 fluid 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.

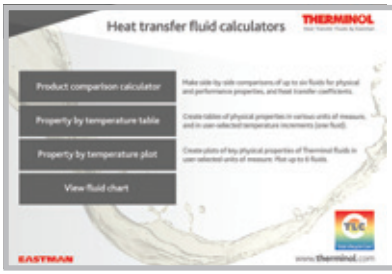
Therminol 72 is noncorrosive to metals commonly used in the construction of heat transfer systems.

While Therminol 72 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 72 should check with their safety and risk management experts for specific instructions.

Typical properties[a]

Appearance	Clear, amber liquid
Composition	Mixture of synthetic aromatics
Maximum bulk temperature	380°C (715°F)
Maximum film temperature	400°C (750°F)
Normal boiling point	271°C (520°F)
Pumpability, at 300 mm^2/s (cSt)	–10°C (16°F)
Pumpability, at 2000 mm^2/s (cSt)	–14°C (7°F)
Flash point, COC (ASTM D92)	132°C (270°F)
Autoignition temperature (ASTM E659)	603°C (1117°F)
Pour point (ISO 3016)	–18°C (0°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)	32°C (89°F)
20 ft/s, 1-in. tube (6.096 m/s, 2.54-cm tube)	17°C (63°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)	3°C (38°F)
20 ft/s, 1-in. tube (6.096 m/s, 2.54-cm tube)	–3°C (27°F)
Coefficient of thermal expansion at 200°C	0.00113/°C (0.00628/°F)
Total acidity (ASTM D664)	<0.2 mg KOH/g
Average molecular weight	190
Pseudocritical temperature	527°C (980°F)
Pseudocritical pressure	32.4 bar (470 psia)
Pseudocritical density	335 kg/m^3 (20.9 lb/ft^3)
Chlorine content (DIN 51577)	<10 ppm
Copper corrosion (ASTM D130)	<<1a
Moisture content, maximum (ASTM E203)	200 ppm
Dielectric constant @ 23°C (ASTM D924)	3.12

[a]*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 72 fluid. Does not constitute an express warranty. See disclaimer on the back page of this bulletin.*



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 technical service, visit the contact page of our website, **Therminol.com.**

Liquid properties of Therminol® 72 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/m³	kJ/(kg·K)	W/(m·K)	cP (mPa·s)	cSt (mm²/s)	kPa
–14	7	1110	1.460	0.144	3971	3580	—
–10	14	1106	1.471	0.143	383	346	—
0	32	1097	1.498	0.142	59.2	54.0	—
10	50	1088	1.525	0.141	24.4	22.4	—
20	68	1079	1.552	0.140	13.5	12.5	0.001
30	86	1070	1.579	0.138	8.68	8.11	0.002
40	104	1061	1.606	0.137	6.09	5.74	0.006
50	122	1052	1.634	0.136	4.52	4.30	0.013
60	140	1043	1.661	0.135	3.50	3.35	0.028
70	158	1034	1.688	0.134	2.79	2.70	0.056
80	176	1025	1.715	0.132	2.28	2.23	0.105
90	194	1016	1.742	0.131	1.90	1.87	0.189
100	212	1007	1.769	0.130	1.61	1.60	0.326
110	230	997	1.796	0.129	1.38	1.39	0.545
120	248	988	1.823	0.127	1.20	1.21	0.879
130	266	979	1.850	0.126	1.05	1.07	1.38
140	284	970	1.877	0.125	0.93	0.96	2.10
150	302	961	1.905	0.124	0.83	0.86	3.12
160	320	952	1.932	0.123	0.74	0.78	4.54
170	338	943	1.959	0.121	0.66	0.70	6.47
180	356	934	1.986	0.120	0.60	0.64	9.04
190	374	925	2.013	0.119	0.55	0.59	12.4
200	392	916	2.040	0.118	0.50	0.54	16.8
210	410	906	2.067	0.117	0.46	0.50	22.3
220	428	898	2.094	0.115	0.42	0.47	29.3
230	446	889	2.121	0.114	0.39	0.43	38.0
240	464	880	2.148	0.113	0.36	0.40	48.6
250	482	871	2.176	0.112	0.33	0.38	61.6
260	500	862	2.203	0.111	0.31	0.36	77.1
270	518	853	2.230	0.109	0.28	0.33	95.7
280	536	844	2.257	0.108	0.27	0.31	118
290	554	834	2.284	0.107	0.25	0.30	143
300	572	825	2.311	0.106	0.23	0.28	173
310	590	816	2.338	0.104	0.22	0.27	208
320	608	807	2.365	0.103	0.20	0.25	248
330	626	798	2.392	0.102	0.19	0.24	293
340	644	789	2.419	0.101	0.18	0.23	345
350	662	780	2.447	0.100	0.17	0.22	403
360	680	771	2.474	0.098	0.16	0.21	469
370	698	762	2.501	0.097	0.15	0.20	542
380	716	753	2.528	0.096	0.14	0.19	623

[a]Maximum recommended bulk temperature 380°C (715°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 72 fluid. *[b]1 cSt = 1 mm²/s and 1 mPa•s = 1 cP.* *[c]100 kPa = 1 bar*

Liquid properties of Therminol® 72 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
7		9.26	69.3	0.349	0.0831	8480	3160	—
20	–7	9.21	68.9	0.354	0.0826	393	147	—
40	4	9.13	68.3	0.361	0.0818	91.3	34.5	—
60	16	9.04	67.6	0.368	0.0810	41.5	15.8	—
80	27	8.96	67.0	0.375	0.0802	24.1	9.26	0.0003
100	38	8.88	66.4	0.382	0.0795	15.8	6.16	0.0007
120	49	8.78	65.7	0.390	0.0787	11.3	4.43	0.0018
140	60	8.70	65.1	0.397	0.0779	8.46	3.35	0.0041
160	71	8.62	64.5	0.404	0.0771	6.60	2.64	0.0087
180	82	8.54	63.9	0.411	0.0763	5.30	2.14	0.0174
200	93	8.45	63.2	0.418	0.0756	4.35	1.78	0.0330
220	104	8.37	62.6	0.426	0.0748	3.64	1.50	0.0597
240	116	8.29	62.0	0.433	0.0740	3.09	1.29	0.103
260	127	8.19	61.3	0.440	0.0732	2.65	1.12	0.173
280	138	8.11	60.7	0.447	0.0724	2.31	0.98	0.278
300	149	8.03	60.1	0.454	0.0717	2.02	0.87	0.434
320	160	7.94	59.4	0.462	0.0709	1.78	0.78	0.659
340	171	7.86	58.8	0.469	0.0701	1.59	0.70	0.975
360	182	7.78	58.2	0.476	0.0693	1.42	0.63	1.41
380	193	7.70	57.6	0.483	0.0685	1.28	0.57	1.99
400	204	7.61	56.9	0.490	0.0678	1.16	0.52	2.77
420	216	7.53	56.3	0.498	0.0670	1.05	0.48	3.77
440	227	7.45	55.7	0.505	0.0662	0.96	0.44	5.06
460	238	7.35	55.0	0.512	0.0654	0.88	0.41	6.68
480	249	7.27	54.4	0.519	0.0646	0.80	0.38	8.70
500	260	7.19	53.8	0.526	0.0639	0.74	0.36	11.2
520	271	7.11	53.2	0.534	0.0631	0.68	0.33	14.2
540	282	7.02	52.5	0.541	0.0623	0.63	0.31	17.8
560	293	6.94	51.9	0.548	0.0615	0.59	0.29	22.2
580	304	6.86	51.3	0.555	0.0607	0.54	0.27	27.3
600	316	6.76	50.6	0.562	0.0600	0.51	0.26	33.3
620	327	6.68	50.0	0.570	0.0592	0.47	0.24	40.3
640	338	6.60	49.4	0.577	0.0584	0.44	0.23	48.3
660	349	6.52	48.8	0.584	0.0576	0.41	0.22	57.5
680	360	6.43	48.1	0.591	0.0568	0.39	0.21	68.0
700	371	6.35	47.5	0.598	0.0561	0.36	0.20	79.9
715	379	6.28	47.0	0.604	0.0555	0.35	0.19	89.7

[a]Maximum recommended bulk temperature 380°C (715°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 72 fluid. *[b]1 cSt = 1 mm²/s and 1 mPa•s = 1 cP.* *[c]100 kPa = 1 bar*

TLC Total Lifecycle Care®

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.

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.

FLUID GENIUS

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 also access their specific test information via our new, advanced heat transfer fluid management platform, Fluid Genius™. It's a revolutionary patent-pending digital service that gives engineers and operations managers predictive insights to optimize heat transfer fluid performance—providing the ultimate edge. From sampling kits to expert guidance, our comprehensive service keeps you on track. Contact your account manager to get started on Fluid Genius—and keep your system up and running. To conduct your sample analysis, you will be provided with an all-inclusive, easy-to-use sample kit. Kit design may vary depending on fluid and shipping and lab requirements within the region. To learn more and request access to Fluid Genius, visit fluidgenius.net.

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, maintenance technicians, and 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 toward the purchase of new Therminol heat transfer fluid.

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

For more information, visit Therminol.com.

EASTMAN

The results of **insight**™

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