THERMINOL® RD

heat transfer fluid

Low-viscosity,
medium-temperature fluid

–36°C to 270°C

(–33°F to 520°F)

THERMINOL®

Heat Transfer Fluids by Eastman

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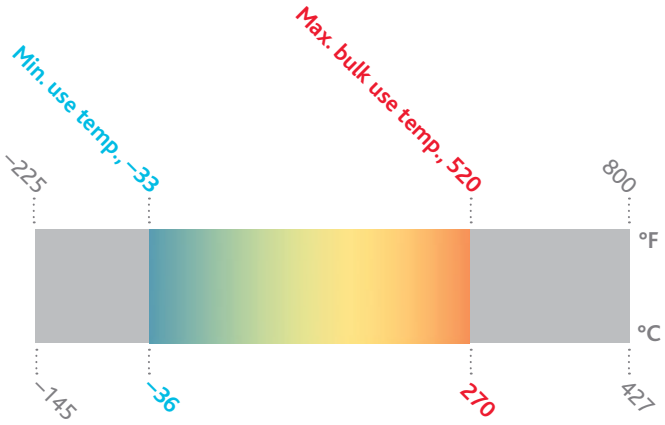


Eastman Therminol® RD heat transfer fluid is a low-viscosity fluid that is particularly recommended for indirect process heating at medium temperatures up to 270°C (520°F). Low-temperature pumpability is excellent down to –20°C (–4°F).

Therminol RD 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 RD 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 RD helps reduce the volatility and fluid leakage problems associated with other fluids.

The recommended maximum bulk and film temperatures for Therminol RD 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 RD 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.

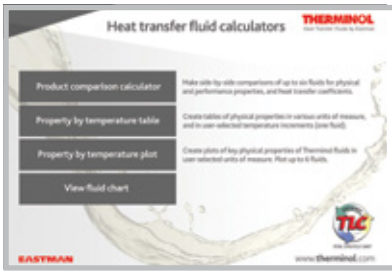
Therminol RD is noncorrosive to metals commonly used in the construction of heat transfer systems.

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

Typical properties[a]

Appearance	Clear liquid
Composition	Synthetic hydrocarbon mixture
Maximum bulk temperature	270°C (520°F)
Maximum film temperature	300°C (570°F)
Normal boiling point	283°C (541°F)
Pumpability, at 300 mm^2/s (cSt)	–25°C (–12°F)
Pumpability, at 2000 mm^2/s (cSt)	–36°C (–33°F)
Flash point, COC (ASTM D-92)	120°C (248°F)
Autoignition temperature (DIN 51794)	395°C (743°F)
Pour point (ISO 3016)	–55°C (–67°F)
Average molecular weight	240
Moisture content, maximum (ASTM E-203)	250 ppm
Dielectric constant @ 23°C (ASTM D-924)	2.28

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

Liquid properties of Therminol® RD 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
–36	–33	908	1.59	0.125	1499	1650	—
–30	–22	904	1.61	0.124	560	619	—
–20	–4	897	1.65	0.123	159	178	—
–10	14	890	1.69	0.122	62.4	70.1	—
0	32	883	1.73	0.121	30.2	34.2	—
10	50	876	1.77	0.120	16.9	19.3	—
20	68	869	1.81	0.119	10.5	12.1	—
30	86	862	1.85	0.118	7.07	8.2	0.001
40	104	855	1.90	0.117	5.06	5.91	0.002
50	122	848	1.94	0.116	3.79	4.47	0.005
60	140	841	1.98	0.115	2.95	3.51	0.010
70	158	834	2.02	0.114	2.37	2.84	0.020
80	176	826	2.07	0.113	1.95	2.36	0.037
90	194	819	2.11	0.112	1.64	2.00	0.068
100	212	812	2.15	0.111	1.40	1.72	0.119
110	230	805	2.20	0.110	1.21	1.51	0.202
120	248	797	2.24	0.109	1.07	1.34	0.336
130	266	790	2.28	0.108	0.95	1.20	0.545
140	284	782	2.33	0.107	0.85	1.09	0.862
150	302	775	2.37	0.106	0.77	0.99	1.34
160	320	767	2.42	0.105	0.70	0.91	2.03
170	338	760	2.46	0.103	0.64	0.84	3.02
180	356	752	2.51	0.102	0.59	0.79	4.42
190	374	744	2.55	0.101	0.55	0.74	6.37
200	392	736	2.60	0.100	0.51	0.69	9.03
210	410	728	2.65	0.099	0.48	0.65	12.6
220	428	719	2.69	0.098	0.45	0.62	17.4
230	446	711	2.74	0.097	0.42	0.59	23.7
240	464	703	2.79	0.096	0.39	0.56	31.9
250	482	694	2.83	0.095	0.37	0.54	42.5
260	500	685	2.88	0.094	0.35	0.51	55.9
270	518	676	2.93	0.093	0.33	0.49	72.8

[a]Maximum recommended bulk temperature 270°C (518°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 RD fluid. *[b]1 cSt = 1 mm²/s and 1 mPa•s = 1 cP.* *[c]100 kPa = 1 bar*

Liquid properties of Therminol® RD 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
–33	–36	7.58	56.7	0.379	0.0720	3700	1680	—
–20	–29	7.54	56.4	0.386	0.0716	1150	528	—
0	–18	7.47	55.9	0.397	0.0710	306	141	—
20	–7	7.41	55.4	0.407	0.0703	116	54.1	—
40	4	7.34	54.9	0.418	0.0697	55.5	26.1	—
60	16	7.27	54.4	0.429	0.0691	31.0	14.7	—
80	27	7.22	54.0	0.440	0.0684	19.4	9.26	—
100	38	7.15	53.5	0.451	0.0678	13.1	6.33	—
120	49	7.09	53.0	0.462	0.0671	9.44	4.60	0.001
140	60	7.02	52.5	0.473	0.0664	7.14	3.51	0.001
160	71	6.95	52.0	0.484	0.0658	5.60	2.78	0.003
180	82	6.88	51.5	0.496	0.0651	4.53	2.27	0.006
200	93	6.82	51.0	0.507	0.0645	3.75	1.90	0.012
220	104	6.75	50.5	0.519	0.0638	3.17	1.62	0.022
240	116	6.68	50.0	0.530	0.0631	2.73	1.41	0.039
260	127	6.62	49.5	0.542	0.0624	2.38	1.24	0.068
280	138	6.54	48.9	0.554	0.0618	2.10	1.11	0.113
300	149	6.47	48.4	0.566	0.0611	1.88	1.00	0.185
320	160	6.40	47.9	0.578	0.0604	1.69	0.91	0.294
340	171	6.34	47.4	0.590	0.0597	1.54	0.84	0.458
360	182	6.26	46.8	0.602	0.0590	1.40	0.77	0.697
380	193	6.19	46.3	0.614	0.0583	1.29	0.72	1.04
400	204	6.11	45.7	0.626	0.0576	1.19	0.67	1.52
420	216	6.03	45.1	0.639	0.0569	1.11	0.63	2.19
440	227	5.96	44.6	0.651	0.0562	1.03	0.60	3.11
460	238	5.88	44.0	0.663	0.0555	0.97	0.57	4.34
480	249	5.80	43.4	0.676	0.0548	0.91	0.54	5.97
500	260	5.72	42.8	0.689	0.0541	0.85	0.51	8.11
520	271	5.64	42.2	0.701	0.0534	0.80	0.49	10.9

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.

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.*

THERMINOL® 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.

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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