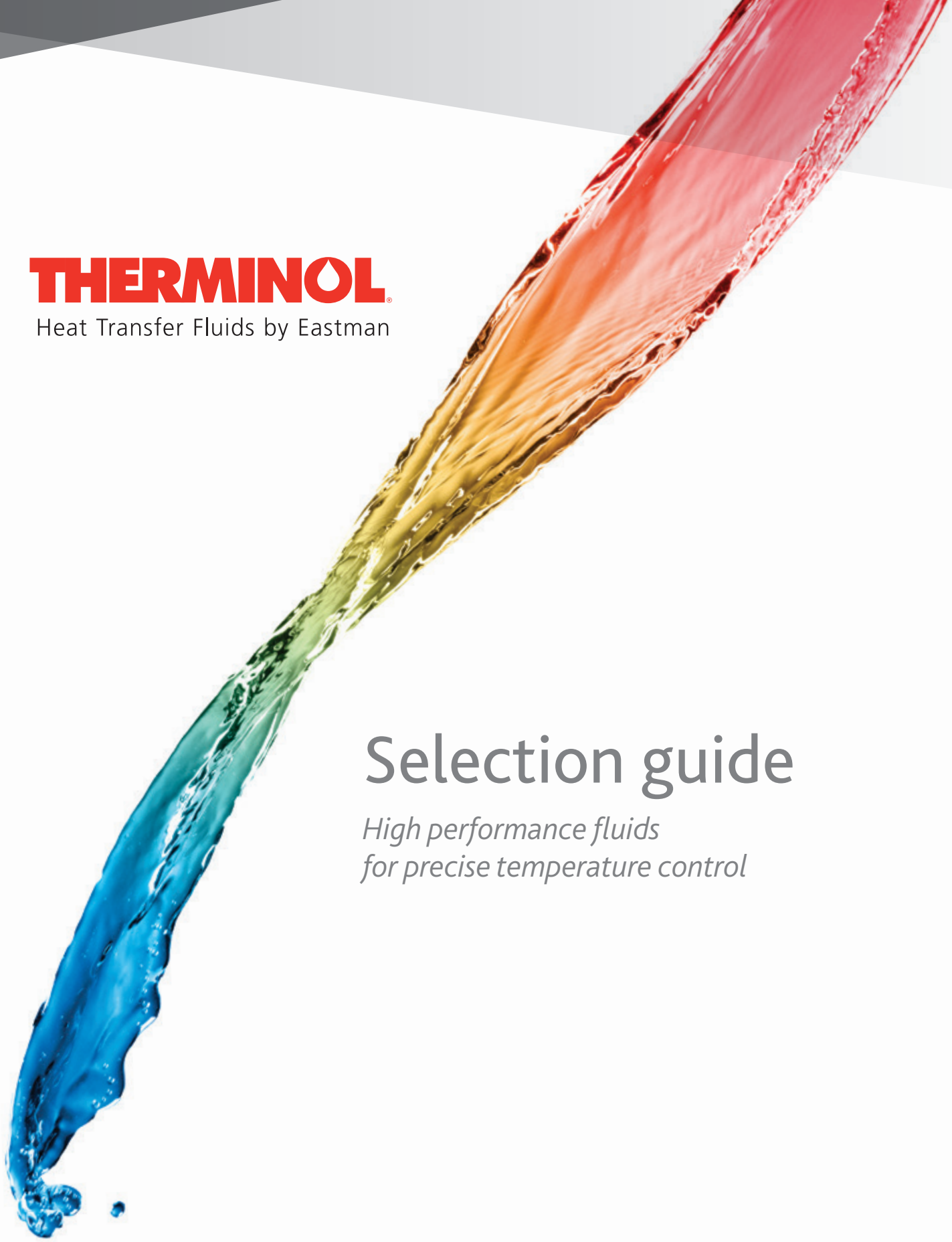
THERMINOL®

Heat Transfer Fluids by Eastman

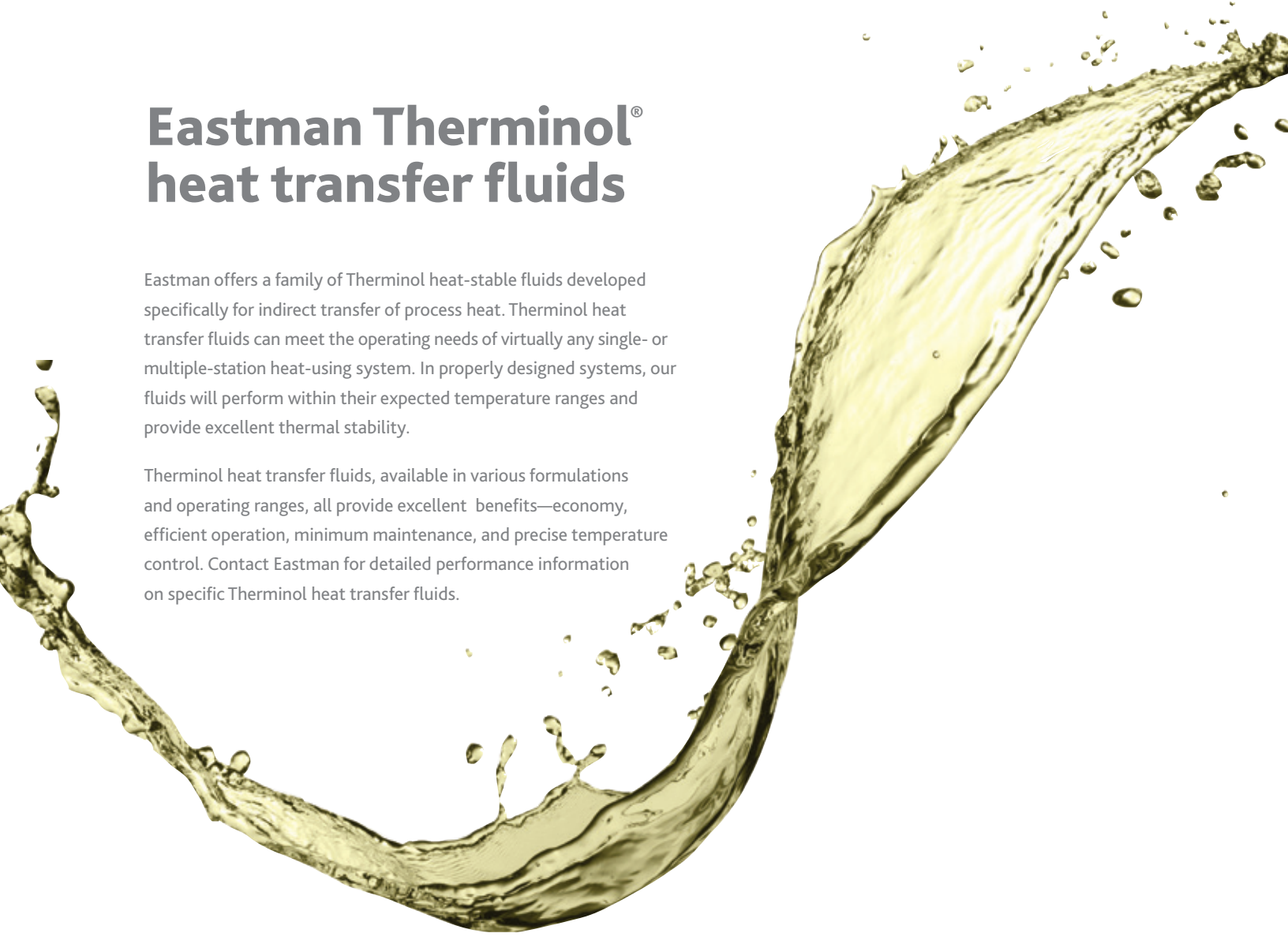


Selection guide

High performance fluids
for precise temperature control

EASTMAN

Eastman Therminol® heat transfer fluids



Eastman offers a family of Therminol heat-stable fluids developed specifically for indirect transfer of process heat. Therminol heat transfer fluids can meet the operating needs of virtually any single- or multiple-station heat-using system. In properly designed systems, our fluids will perform within their expected temperature ranges and provide excellent thermal stability.

Therminol heat transfer fluids, available in various formulations and operating ranges, all provide excellent benefits—economy, efficient operation, minimum maintenance, and precise temperature control. Contact Eastman for detailed performance information on specific Therminol heat transfer fluids.

Liquid phase heat transfer fluids

Therminol liquid phase heat transfer fluids operate over a broad temperature range of –175° to 750°F (–115° to 400°C) and most can be used in nonpressurized systems. A major advantage of liquid heat transfer is lower-cost installation and operation. Capital cost is reduced by elimination of large-diameter piping, safety valves, steam traps, and water treatment facilities. Operating cost is reduced by low maintenance requirements and reduced makeup. All Eastman Therminol heat transfer fluids can provide effective operations in liquid phase. When above their normal boiling points, Therminol D-12, LT, 59, 68, 72, 75, VP-1, and VP-3 fluids require system pressures to be greater than their vapor pressures for liquid phase operation to their recommended bulk temperature ratings.

Liquid/vapor phase heat transfer fluids

Therminol LT, VP-1, and VP-3 are Eastman's liquid/vapor phase heat transfer fluids. They offer a broad operating temperature range and uniform heat transfer. Other major benefits include precise temperature control and low mechanical maintenance costs. Also, a heat transfer system that utilizes a vapor phase medium requires less fluid than a comparable liquid phase system because the equipment fills with vapor instead of liquid.

Specialty and customized heat transfer fluids

In addition to our basic liquid phase and liquid/vapor phase heat transfer fluids, Eastman offers a number of specialty fluids. We also would be happy to work with you in developing a customized fluid for your application.

THERMINOL
Heat Transfer Fluids by Eastman

TLC Total Lifecycle Care® program

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.

myTHERMINOL

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, 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 towards the purchase of new Therminol heat transfer fluid.

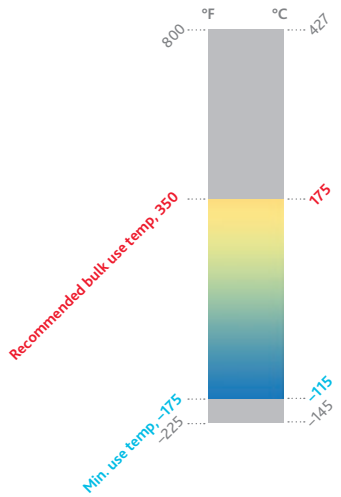
**Available in North America. Contact your local sales representative for more information.*

English units

Liquid phase heat transfer

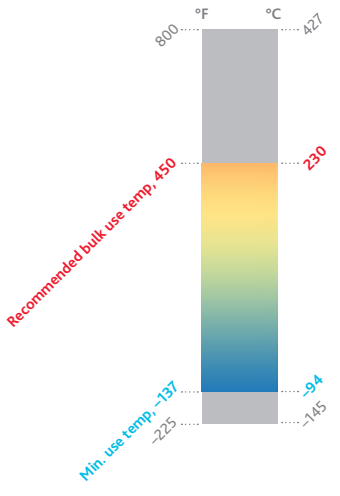
THERMINOL VLT

Very low-temperature coolant/heat transfer fluid



THERMINOL D-12

Low-temperature coolant/heat transfer fluid[e]



Typical properties[a]

	VLT	D-12
Appearance	Water-white liquid	Clear, water-white liquid
Composition	Methylcyclohexane/trimethylpentane mixture	Synthetic hydrocarbons
Recommended bulk temperature	350°F	450°F
Maximum film temperature	410°F	475°F
Normal boiling point	211°F	378°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –195°F	 –116°F[d] –137°F[d]
Pour point	–211°F	–148°F
Flash point, COC	20°F (Tag closed cup)	144°F (Pensky-Martens)
Fire point, COC	20°F (ASTM D-1310)	175°F
Autoignition temperature[b]	562°F (DIN 51794)	531°F (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	–105°F	–35°F
Kinematic viscosity, cSt (mm^2/s)	**–175°F** 53 **–100°F** 5.7 **100°F** 0.72 **350°F** 0.24	**–50°F** 11.5 **100°F** 1.26 **300°F** 0.44 **450°F** 0.26
Density at 75°F (lb/gal)	6.22	6.34
Density, various temperatures	**–175°F** 7.19 lb/gal 53.8 lb/ft^3 **–100°F** 6.90 lb/gal 51.6 lb/ft^3 **100°F** 6.12 lb/gal 45.8 lb/ft^3 **350°F** 4.97 lb/gal 37.2 lb/ft^3	**–50°F** 6.75 lb/gal 50.5 lb/ft^3 **100°F** 6.26 lb/gal 46.8 lb/ft^3 **300°F** 5.53 lb/gal 41.4 lb/ft^3 **450°F** 4.86 lb/gal 36.3 lb/ft^3
Heat capacity, Btu/(lb•°F)	**–175°F** 0.328 **–100°F** 0.372 **100°F** 0.485 **350°F** 0.626	**–50°F** 0.440 **100°F** 0.517 **300°F** 0.626 **450°F** 0.715
Thermal conductivity, Btu/(h•ft•°F)	**–175°F** 0.0754 **–100°F** 0.0708 **100°F** 0.0577 **350°F** 0.0382	**–50°F** 0.0690 **100°F** 0.0620 **300°F** 0.0505 **450°F** 0.0404
Vapor pressure	**100°F** 91.5 mmHg 1.77 psia **200°F** 643 mmHg 12.4 psia **350°F** 4,430 mmHg 85.7 psia	**200°F** 32.7 mmHg 0.632 psia **300°F** 241 mmHg 4.66 psia **450°F** 1,800 mmHg 34.8 psia
Geographic availability[c]	Globally	Globally

[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*

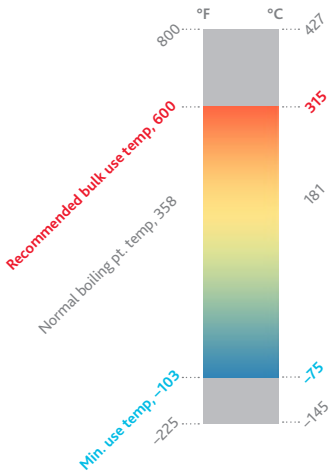
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability by country.*

[d] *–50°F for efficient heat transfer* [e] *Therminol D-12 outperforms FDA specifications for use in food contact applications.*

THERMINOL

LT

Wide-range liquid/ vapor heat transfer fluid

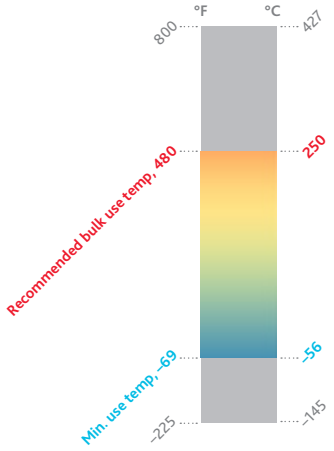


Clear, light yellow liquid	
Alkyl substituted aromatic	
600°F	
650°F	
358°F	
–103°F (crystallizing point)	
NA	
134°F (Pensky-Martens)	
150°F	
804°F (DIN 51794)	
193°F	
–100°F 10.8 **100°F** 0.83 **300°F** 0.35 **600°F** 0.19	
7.20	
–100°F 7.83 lb/gal 58.6 lb/ft³ **100°F** 7.11 lb/gal 53.2 lb/ft³ **300°F** 6.31 lb/gal 47.2 lb/ft³ **600°F** 4.66 lb/gal 34.8 lb/ft³	
–100°F 0.344 **100°F** 0.446 **300°F** 0.542 **600°F** 0.719	
–100°F 0.0825 **100°F** 0.0701 **300°F** 0.0573 **600°F** 0.0374	
200°F 41 mmHg 0.79 psia **400°F** 1,370 mmHg 26.5 psia **600°F** 11,800 mmHg 228 psia	
Globally	

THERMINOL

ADX-10

Low-temperature pumpability, medium-temperature fluid



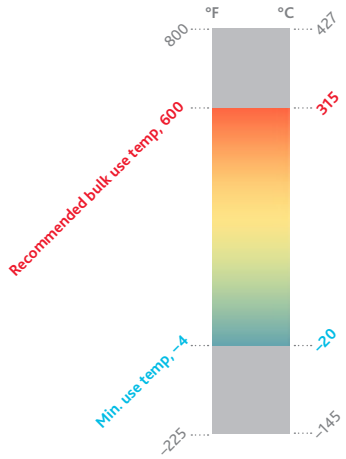
Clear, pale yellow liquid	
Synthetic aromatic hydrocarbon mixture	
480°F	
535°F	
559°F	
–41°F –69°F	
–112°F	
277°F	
284°F	
621°F (DIN 51794)	
66°F	
–50°F 508 **200°F** 1.49 **400°F** 0.531 **480°F** 0.403	
7.13	
–50°F 7.53 lb/gal 56.3 lb/ft³ **200°F** 6.72 lb/gal 50.3 lb/ft³ **400°F** 6.04 lb/gal 45.2 lb/ft³ **480°F** 5.73 lb/gal 42.9 lb/ft³	
–50°F 0.395 **200°F** 0.523 **400°F** 0.615 **480°F** 0.649	
–50°F 0.0764 **200°F** 0.0660 **400°F** 0.0565 **480°F** 0.0523	
200°F 0.36 mmHg 0.007 psia **400°F** 72.4 mmHg 1.40 psia **480°F** 266 mmHg 5.15 psia	
Europe/Middle East/Africa	

English units

Liquid phase heat transfer

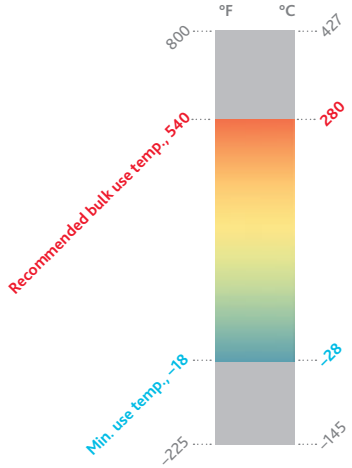
THERMINOL XP

High-purity heat transfer fluid with NSF HT1 incidental food contact registration



THERMINOL 54

Economical, medium-temperature-range fluid



Typical properties[a]

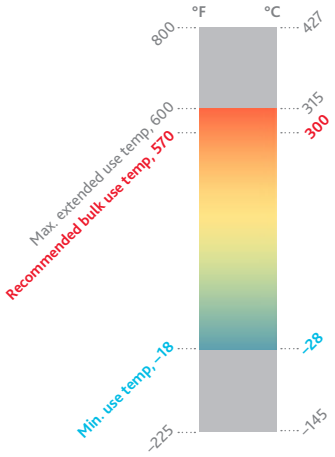
	THERMINOL XP	THERMINOL 54
Appearance	Colorless, odorless liquid	Clear, yellow liquid
Composition	White mineral oil	Synthetic hydrocarbon mixture
Recommended bulk temperature	600°F	540°F
Maximum film temperature	650°F	590°F
Normal boiling point	676°F	664°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 30°F –4°F	 17°F –18°F
Pour point	–20°F	<–50°F
Flash point, COC	390°F	> 340°F
Fire point, COC	450°F	> 410°F
Autoignition temperature[b]	685°F (DIN 51794)	> 625°F
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	162°F	152°F
Kinematic viscosity, cSt (mm^2/s)	**0°F** 1,560 **200°F** 4.7 **400°F** 1.06 **600°F** 0.50	**0°F** 683 **200°F** 4.03 **400°F** 0.96 **540°F** 0.56
Density at 75°F (lb/gal)	7.31	7.25
Density, various temperatures	**0°F** 7.53 lb/gal 56.3 lb/ft^3 **200°F** 6.94 lb/gal 51.9 lb/ft^3 **400°F** 6.33 lb/gal 47.3 lb/ft^3 **600°F** 5.66 lb/gal 42.3 lb/ft^3	**0°F** 7.49 lb/gal 56.0 lb/ft^3 **200°F** 6.86 lb/gal 51.3 lb/ft^3 **400°F** 6.22 lb/gal 46.5 lb/ft^3 **540°F** 5.73 lb/gal 42.8 lb/ft^3
Heat capacity, Btu/(lb•°F)	**0°F** 0.389 **200°F** 0.515 **400°F** 0.625 **600°F** 0.718	**0°F** 0.42 **200°F** 0.52 **400°F** 0.61 **540°F** 0.68
Thermal conductivity, Btu/(h•ft•°F)	**0°F** 0.0681 **200°F** 0.0635 **400°F** 0.0571 **600°F** 0.0490	**0°F** 0.077 **200°F** 0.069 **400°F** 0.062 **540°F** 0.057
Vapor pressure	**200°F** 0.09 mmHg 0.002 psia **300°F** 15.0 mmHg 0.289 psia **600°F** 318 mmHg 6.16 psia	**200°F** — — **400°F** 18.6 mmHg 0.36 psia **540°F** 169 mmHg 3.27 psia
Geographic availability[c]	Globally	Europe/Middle East/Africa

[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by country.*

THERMINOL

55

Trusted, medium-temperature-range fluid

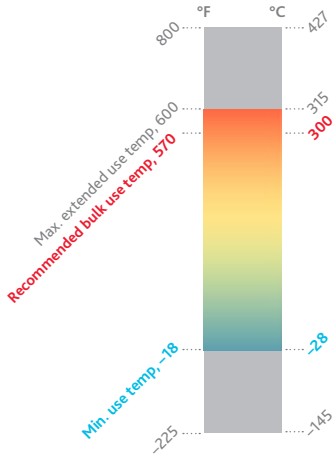


Clear, yellow liquid	
Synthetic hydrocarbon mixture	
570°F	
635°F	
664°F	
17°F –18°F	
–65°F	
350°F	
425°F	
719°F (DIN 51794)	
152°F	
0°F 683 **200°F** 4.03 **400°F** 0.964 **550°F** 0.536	
7.26	
0°F 7.49 lb/gal 56.0 lb/ft³ **200°F** 6.86 lb/gal 51.3 lb/ft³ **400°F** 6.22 lb/gal 46.5 lb/ft³ **550°F** 5.69 lb/gal 42.6 lb/ft³	
0°F 0.423 **200°F** 0.518 **400°F** 0.612 **550°F** 0.682	
0°F 0.0768 **200°F** 0.0693 **400°F** 0.0618 **550°F** 0.0561	
200°F 0.16 mmHg 0.003 psia **400°F** 18.6 mmHg 0.360 psia **550°F** 193 mmHg 3.74 psia	
Americas/Asia Pacific	

THERMINOL

SP

Trusted, medium-temperature-range fluid



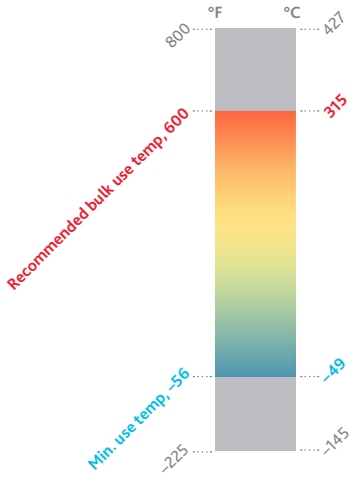
Clear, yellow liquid	
Synthetic hydrocarbon mixture	
570°F	
635°F	
664°F	
17°F –18°F	
–65°F	
350°F	
425°F	
719°F (DIN 51794)	
152°F	
0°F 683 **200°F** 4.03 **400°F** 0.964 **550°F** 0.536	
7.26	
0°F 7.49 lb/gal 56.0 lb/ft³ **200°F** 6.86 lb/gal 51.3 lb/ft³ **400°F** 6.22 lb/gal 46.5 lb/ft³ **550°F** 5.69 lb/gal 42.6 lb/ft³	
0°F 0.423 **200°F** 0.518 **400°F** 0.612 **550°F** 0.682	
0°F 0.0768 **200°F** 0.0693 **400°F** 0.0618 **550°F** 0.0561	
200°F 0.16 mmHg 0.003 psia **400°F** 18.6 mmHg 0.360 psia **550°F** 193 mmHg 3.74 psia	
Europe/Middle East/Africa	

English units

Liquid phase heat transfer

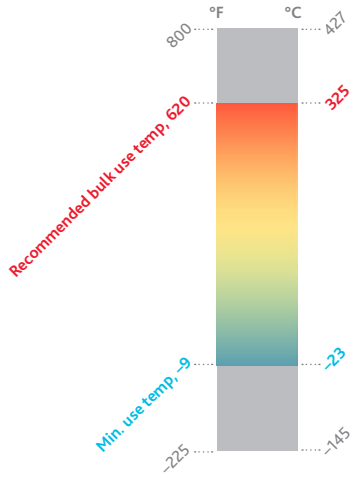
THERMINOL 59

Economical, wide-temperature-range fluid



THERMINOL 62

High-performance, low-pressure fluid



Typical properties[a]

	59	62
Appearance	Clear, yellow to dark amber liquid	Water-white liquid
Composition	Alkyl substituted aromatic	Isopropyl biphenyl mixture
Recommended bulk temperature	600°F	620°F
Maximum film temperature	650°F	670°F
Normal boiling point	553°F	631°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –35°F –56°F	 12°F –9°F
Pour point	–90°F (ISO 3016)	–44°F
Flash point, COC	295°F	340°F
Fire point, COC	310°F	385°F
Autoignition temperature[b]	760°F (DIN 51794)	813°F (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	63°F	122°F
Kinematic viscosity, cSt (mm^2/s)	**0°F** 45 **200°F** 1.57 **400°F** 0.55 **600°F** 0.31	**0°F** 843 **200°F** 2.83 **400°F** 0.69 **620°F** 0.28
Density at 75°F (lb/gal)	8.11	7.96
Density, various temperatures	**0°F** 8.36 lb/gal 62.5 lb/ft^3 **200°F** 7.68 lb/gal 57.5 lb/ft^3 **400°F** 6.98 lb/gal 52.2 lb/ft^3 **600°F** 6.18 lb/gal 46.2 lb/ft^3	**0°F** 8.19 lb/gal 61.3 lb/ft^3 **200°F** 7.53 lb/gal 56.3 lb/ft^3 **400°F** 6.81 lb/gal 50.9 lb/ft^3 **620°F** 5.87 lb/gal 43.9 lb/ft^3
Heat capacity, Btu/(lb•°F)	**0°F** 0.373 **200°F** 0.459 **400°F** 0.547 **600°F** 0.640	**0°F** 0.440 **200°F** 0.509 **400°F** 0.565 **620°F** 0.617
Thermal conductivity, Btu/(h•ft•°F)	**0°F** 0.0716 **200°F** 0.0668 **400°F** 0.0600 **600°F** 0.0513	**0°F** 0.0729 **200°F** 0.0673 **400°F** 0.0610 **620°F** 0.0518
Vapor pressure	**200°F** 19.5 mmHg 0.036 psia **400°F** 111 mmHg 2.14 psia **600°F** 1,220 mmHg 23.6 psia	**200°F** 0.29 mmHg 0.006 psia **400°F** 30.2 mmHg 0.584 psia **620°F** 670 mmHg 13.0 psia
Geographic availability[c]	Globally	Contact your Eastman representative.

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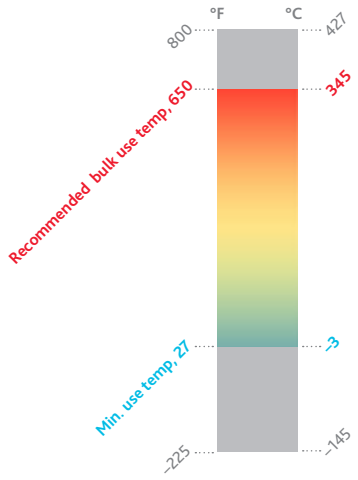
THERMINOL 66

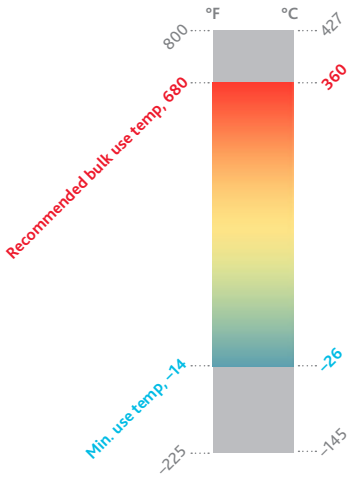
High-temperature, high-stability, low-pressure fluid



Clear, pale yellow liquid		
Modified terphenyl		
650°F		
705°F		
678°F		
52°F 27°F		
–25°F		
363°F		
414°F		
750°F (DIN 51794)		
162°F		
50°F **300°F** **500°F** **650°F**	339 1.68 0.63 0.43	
8.39		
50°F **300°F** **500°F** **650°F**	8.47 lb/gal 7.69 lb/gal 7.01 lb/gal 6.44 lb/gal	63.4 lb/ft³ 57.5 lb/ft³ 52.5 lb/ft³ 48.2 lb/ft³
50°F **300°F** **500°F** **650°F**	0.365 0.480 0.578 0.655	
50°F **300°F** **500°F** **650°F**	0.0682 0.0636 0.0574 0.0514	
300°F **500°F** **650°F**	2.9 mmHg 90 mmHg 570 mmHg	0.056 psia 1.7 psia 11 psia
Globally		

THERMINOL 68

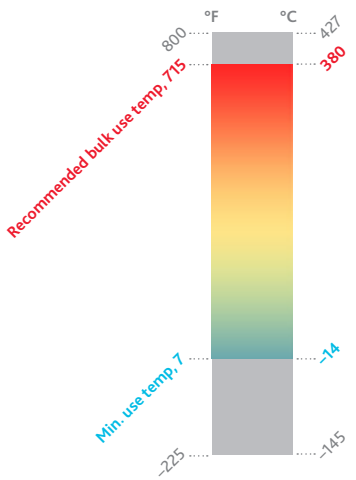
High-temperature, low-viscosity fluid



Clear, pale yellow liquid		
Mixture of synthetic aromatics		
680°F		
735°F		
586°F		
14°F –14°F		
–27°F		
311°F		
345°F		
752°F (DIN 51794)		
135°F		
20°F **300°F** **500°F** **680°F**	219 1.29 0.516 0.332	
8.56		
20°F **300°F** **500°F** **680°F**	8.73 lb/gal 7.79 lb/gal 7.13 lb/gal 6.52 lb/gal	65.3 lb/ft³ 58.3 lb/ft³ 53.3 lb/ft³ 48.8 lb/ft³
20°F **300°F** **500°F** **680°F**	0.368 0.487 0.573 0.650	
20°F **300°F** **500°F** **680°F**	0.0727 0.0654 0.0602 0.0556	
300°F **500°F** **680°F**	12.2 mmHg 278 mmHg 1,888 mmHg	0.236 psia 5.38 psia 36.5 psia
Europe/Middle East/Africa		

THERMINOL 72

High-temperature, medium-pressure fluid



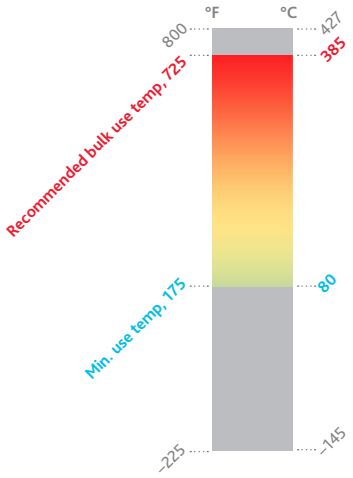
Clear, amber liquid		
Mixture of synthetic aromatics		
715°F		
750°F		
520°F		
16°F 7°F		
0°F		
270°F		
290°F		
1,117°F (ASTM E-659)		
86°F		
15°F **300°F** **500°F** **715°F**	291 0.868 0.355 0.19	
8.98		
15°F **300°F** **500°F** **715°F**	9.23 lb/gal 8.03 lb/gal 7.19 lb/gal 6.29 lb/gal	69.0 lb/ft³ 60.1 lb/ft³ 53.8 lb/ft³ 47.0 lb/ft³
15°F **300°F** **500°F** **715°F**	0.352 0.454 0.526 0.604	
15°F **300°F** **500°F** **715°F**	0.0828 0.0717 0.0639 0.0555	
300°F **500°F** **715°F**	22.4 mmHg 579 mmHg 4,640 mmHg	0.43 psia 11.2 psia 89.8 psia
Globally		

English units

Liquid phase heat transfer

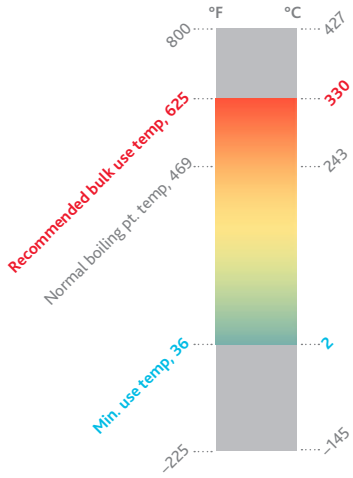
THERMINOL 75

Ultrahigh-temperature, low-pressure fluid



THERMINOL VP-3

High-temperature, liquid/vapor phase fluid



Typical properties[a]

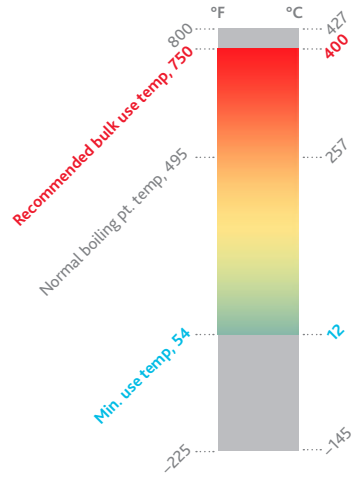
	THERMINOL 75	THERMINOL VP-3
Appearance	Soft solid melting to yellow liquid	Above 2.4°C (36°F) clear, sediment-free liquid
Composition	Terphenyl/quaterphenyl	Phenylcyclohexane + bicyclohexyl
Recommended bulk temperature	725°F	625°F
Maximum film temperature	770°F	675°F
Normal boiling point	649°F	469°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	175°F (slurry point)	36°F (crystallizing point)
Pour point	NA	NA
Flash point, COC	365°F	219°F
Fire point, COC	440°F	235°F
Autoignition temperature[b]	1,052°F (ASTM E-659)	680°F (ASTM E-659)
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	209°F	36°F
Kinematic viscosity, cSt (mm^2/s)	**175°F** 4.16 **400°F** 0.85 **600°F** 0.39 **725°F** 0.28	**100°F** 2.12 **300°F** 0.64 **500°F** 0.35 **625°F** 0.25
Density at 75°F (lb/gal)	8.69 (175°F)	7.77
Density, various temperatures	**175°F** 8.69 lb/gal 65.0 lb/ft^3 **400°F** 7.93 lb/gal 59.3 lb/ft^3 **600°F** 7.17 lb/gal 53.6 lb/ft^3 **725°F** 6.62 lb/gal 49.6 lb/ft^3	**100°F** 7.71 lb/gal 57.7 lb/ft^3 **300°F** 7.08 lb/gal 52.9 lb/ft^3 **500°F** 6.16 lb/gal 46.1 lb/ft^3 **625°F** 5.36 lb/gal 40.1 lb/ft^3
Heat capacity, Btu/(lb•°F)	**175°F** 0.408 **400°F** 0.492 **600°F** 0.552 **725°F** 0.584	**100°F** 0.403 **300°F** 0.514 **500°F** 0.611 **625°F** 0.715
Thermal conductivity, Btu/(h•ft•°F)	**175°F** 0.0756 **400°F** 0.0699 **600°F** 0.0640 **725°F** 0.0596	**100°F** 0.0666 **300°F** 0.0582 **500°F** 0.0494 **625°F** 0.0437
Vapor pressure	**300°F** 3.9 mmHg 0.075 psia **500°F** 125 mmHg 2.42 psia **725°F** 1,610 mmHg 31.1 psia	**300°F** 38 mmHg 0.73 psia **500°F** 1,170 mmHg 22.6 psia **625°F** 5,140 mmHg 99.4 psia
Geographic availability[c]	Globally	Globally

[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by country.*

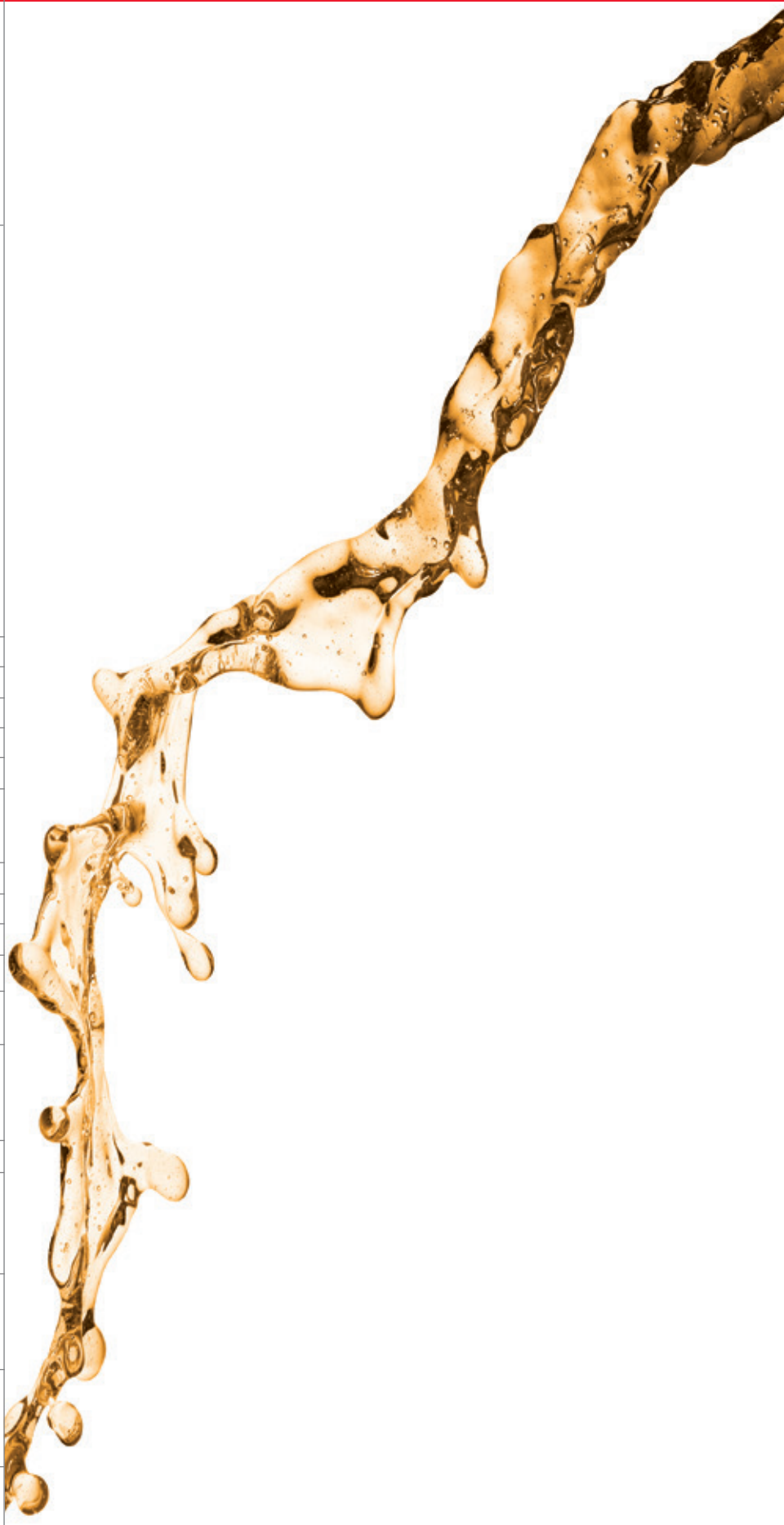
THERMINOL

VP-1

Ultrahigh-temperature, liquid/vapor phase fluid



Clear, water-white liquid		
Biphenyl/diphenyl oxide (DPO) eutectic mixture		
750°F		
800°F		
495°F		
54°F (crystallizing point)		
NA		
255°F		
260°F		
1,150°F (DIN 51794)		
54°F		
100°F **300°F** **500°F** **750°F**	2.60 0.62 0.32 0.21	
8.85		
100°F **300°F** **500°F** **750°F**	8.76 lb/gal 7.99 lb/gal 7.16 lb/gal 5.81 lb/gal	65.5 lb/ft^3 59.8 lb/ft^3 53.5 lb/ft^3 43.4 lb/ft^3
100°F **300°F** **500°F** **750°F**	0.382 0.457 0.528 0.627	
100°F **300°F** **500°F** **750°F**	0.0778 0.0701 0.0600 0.0439	
300°F **500°F** **750°F**	32 mmHg 810 mmHg 8,060 mmHg	0.62 psia 15.7 psia 156 psia
Globally		

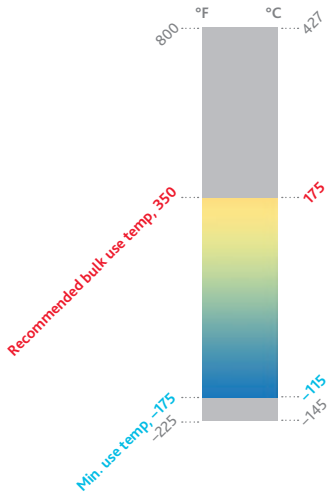


SI units

Liquid phase heat transfer

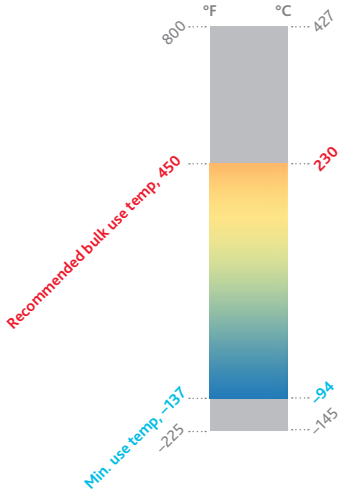
THERMINOL VLT

Very low-temperature coolant/heat transfer fluid



THERMINOL D-12

Low-temperature coolant/heat transfer fluid[e]



Typical properties[a]

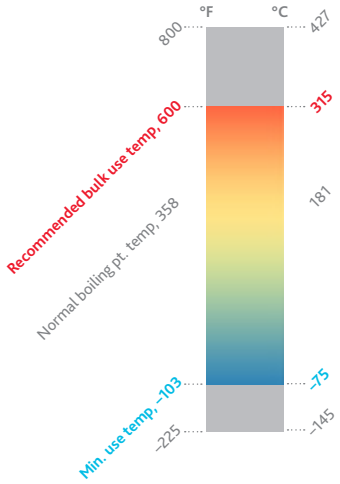
	VLT	D-12
Appearance	Water-white liquid	Clear, water-white liquid
Composition	Methylcyclohexane/trimethylpentane mixture	Synthetic hydrocarbons
Recommended bulk temperature	175°C	230°C
Maximum film temperature	210°C	245°C
Normal boiling point	99°C	192°C
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	–126°C	–82°C[d] –94°C[d]
Pour point	–135°C	–100°C
Flash point, COC	–7°C (Tag closed cup)	62°C (Pensky-Martens)
Fire point, COC	71°C	71°C
Autoignition temperature[b]	294°C (DIN 51794)	277°C (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	–76°C	–37°C
Viscosity, mPa·s (cP)	**–115°C** 45 **0°C** 0.88 **100°C** 0.28 **175°C** 0.14	**–50°C** 12.0 **100°C** 0.46 **200°C** 0.19 **230°C** 0.16
Density at 25°C (kg/m^3)	744	759
Density, kg/m^3	**–115°C** 862 **0°C** 766 **100°C** 676 **175°C** 598	**–50°C** 811 **100°C** 703 **200°C** 616 **230°C** 584
Heat capacity, kJ/(kg·K)	**–115°C** 1.37 **0°C** 1.87 **100°C** 2.29 **175°C** 2.61	**–50°C** 1.82 **100°C** 2.41 **200°C** 2.84 **230°C** 2.98
Thermal conductivity, W/(m·K)	**–115°C** 0.130 **0°C** 0.108 **100°C** 0.086 **175°C** 0.067	**–50°C** 0.120 **100°C** 0.097 **200°C** 0.077 **230°C** 0.071
Vapor pressure, kPa	**0°C** 1.9 **100°C** 104 **175°C** 573	**50°C** 0.48 **150°C** 33.2 **230°C** 229
Geographic availability[c]	Globally	Globally

[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability by country.*
[d] *–50°F for efficient heat transfer* [e] *Therminol D-12 outperforms FDA specifications for use in food contact applications.*

THERMINOL

LT

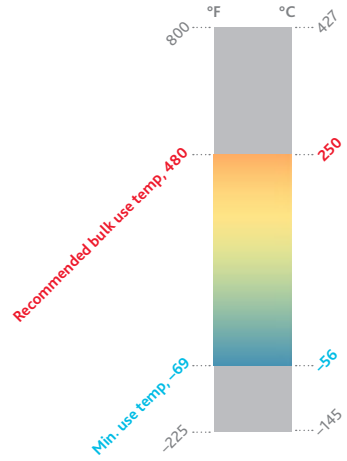
Wide-range liquid/ vapor heat transfer fluid



THERMINOL

ADX-10

Low-temperature pumpability, medium-temperature fluid



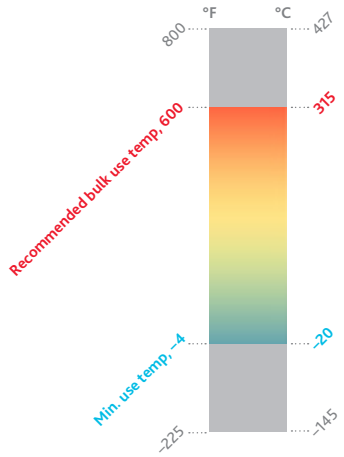
Clear, light yellow liquid	Clear, pale yellow liquid
Alkyl substituted aromatic	Synthetic aromatic hydrocarbon mixture
315°C	250°C
345°C	280°C
181°C	293°C
–75°C (crystallizing point)	–41°C –56°C
NA	–80°C
58°C (Pensky-Martens)	136°C
66°C	140°C
429°C (DIN 51794)	327°C (DIN 51794)
–66°C	19°C
–50°C 3.8 **100°C** 0.38 **200°C** 0.19 **315°C** 0.11	**–25°C** 66.3 **100°C** 1.09 **200°C** 0.40 **250°C** 0.28
862	853
–50°C 920 **100°C** 800 **200°C** 707 **315°C** 559	**–25°C** 887 **100°C** 801 **200°C** 727 **250°C** 686
–50°C 1.53 **100°C** 2.09 **200°C** 2.45 **315°C** 3.00	**–25°C** 1.74 **100°C** 2.21 **200°C** 2.56 **250°C** 2.72
–50°C 0.138 **100°C** 0.109 **200°C** 0.089 **315°C** 0.065	**–25°C** 0.130 **100°C** 0.113 **200°C** 0.099 **250°C** 0.090
100°C 7.1 **200°C** 164 **315°C** 1,560	**100°C** 0.07 **200°C** 8.31 **250°C** 36.6
Globally	Europe/Middle East/Africa

SI units

Liquid phase heat transfer

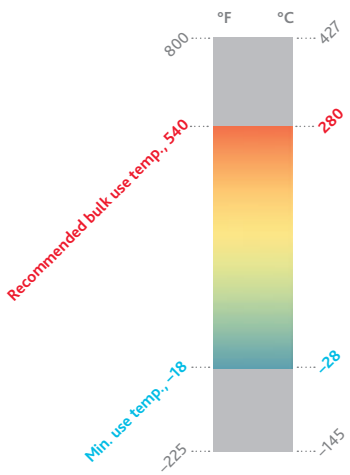
THERMINOL XP

High-purity heat transfer fluid with NSF HT1 incidental food contact registration



THERMINOL 54

Economical, medium-temperature-range fluid



Typical properties[a]

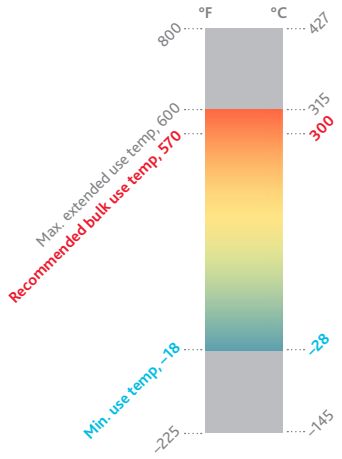
	XP	54
Appearance	Colorless, odorless liquid	Clear, yellow liquid
Composition	White mineral oil	Synthetic hydrocarbon mixture
Recommended bulk temperature	315°C	280°C
Maximum film temperature	345°C	310°C
Normal boiling point	358°C	351°C
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –1°C –20°C	 –8°C –28°C
Pour point	–29°C	< –45°C
Flash point, COC	199°C	>170°C
Fire point, COC	232°C	>210°C
Autoignition temperature[b]	363°C (DIN 51794)	> 330°C
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	72°C	67°C
Viscosity, mPa·s (cP)	**0°C** 238 **100°C** 3.4 **200°C** 0.84 **315°C** 0.34	**–25°C** 1,250 **100°C** 2.88 **200°C** 0.75 **280°C** 0.39
Density at 25°C (kg/m^3)	875	868
Density, kg/m^3	**0°C** 891 **100°C** 827 **200°C** 761 **315°C** 678	**–25°C** 902 **100°C** 818 **200°C** 748 **280°C** 688
Heat capacity, kJ/(kg·K)	**0°C** 1.72 **100°C** 2.18 **200°C** 2.60 **315°C** 3.00	**–25°C** 1.74 **100°C** 2.19 **200°C** 2.54 **280°C** 2.83
Thermal conductivity, W/(m·K)	**0°C** 0.117 **100°C** 0.109 **200°C** 0.099 **315°C** 0.085	**–25°C** 0.134 **100°C** 0.119 **200°C** 0.107 **280°C** 0.098
Vapor pressure, kPa	**100°C** 0.018 **200°C** 1.7 **315°C** 42	**100°C** 0.03 **200°C** 2.15 **280°C** 21.3
Geographic availability[c]	Globally	Europe/Middle East/Africa

[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability by country.*

THERMINOL

55

Trusted, medium-temperature-range fluid

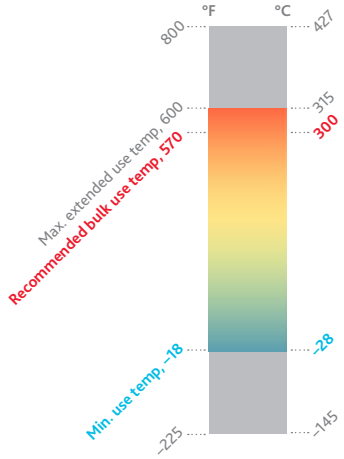


Clear, yellow liquid	
Synthetic hydrocarbon mixture	
300°C	
335°C	
351°C	
–8°C –28°C	
–54°C	
177°C	
218°C	
382°C (DIN 51794)	
67°C	
–25°C **100°C** **200°C** **290°C**	1,250 2.88 0.75 0.36
868	
–25°C **100°C** **200°C** **290°C**	902 818 748 680
–25°C **100°C** **200°C** **290°C**	1.74 2.19 2.54 2.86
–25°C **100°C** **200°C** **290°C**	0.134 0.119 0.107 0.097
100°C **200°C** **290°C**	0.032 2.15 27.2
Americas/Asia Pacific	

THERMINOL

SP

Trusted, medium-temperature-range fluid



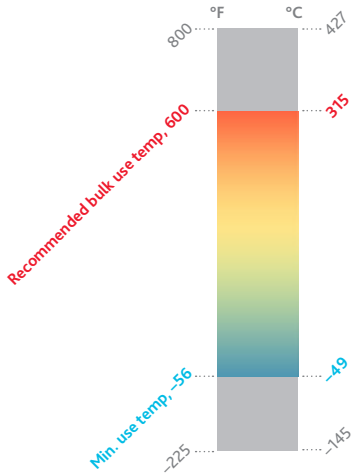
Clear, yellow liquid	
Synthetic hydrocarbon mixture	
300°C	
335°C	
351°C	
–8°C –28°C	
–54°C	
177°C	
218°C	
382°C (DIN 51794)	
67°C	
–25°C **100°C** **200°C** **290°C**	1,250 2.88 0.75 0.36
868	
–25°C **100°C** **200°C** **290°C**	902 818 748 680
–25°C **100°C** **200°C** **290°C**	1.74 2.19 2.54 2.86
–25°C **100°C** **200°C** **290°C**	0.134 0.119 0.107 0.097
100°C **200°C** **290°C**	0.032 2.15 27.2
Europe/Middle East/Africa	

SI units

Liquid phase heat transfer

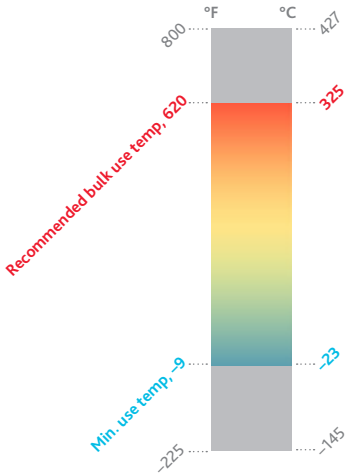
THERMINOL 59

Economical, wide-temperature-range fluid



THERMINOL 62

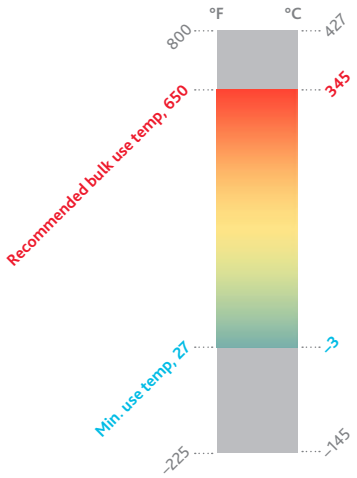
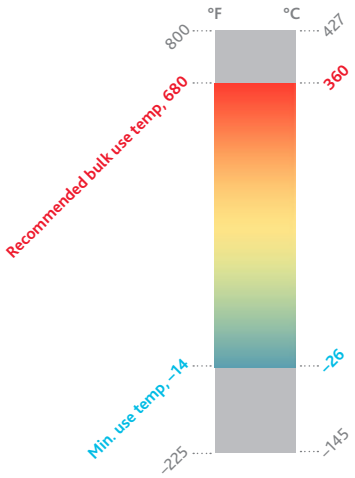
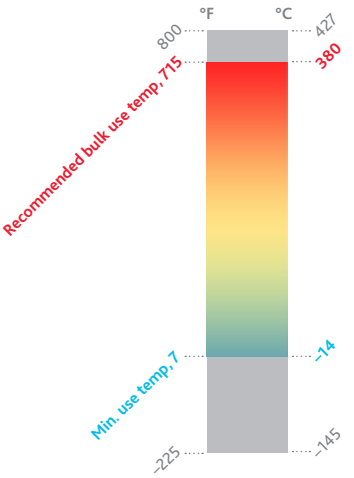
High-performance, low-pressure fluid



Typical properties[a]

	59		62	
Appearance	Clear, yellow to dark amber liquid		Water-white liquid	
Composition	Alkyl substituted aromatic		Isopropyl biphenyl mixture	
Recommended bulk temperature	315°C		325°C	
Maximum film temperature	345°C		355°C	
Normal boiling point	289°C		333°C	
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –37°C –49°C		 –11°C –23°C	
Pour point	–68°C (ISO 3016)		–42°C	
Flash point, COC	146°C		171°C	
Fire point, COC	154°C		196°C	
Autoignition temperature[b]	404°C (DIN 51794)		433°C (DIN 51794)	
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	17°C		50°C	
Viscosity, mPa·s (cP)	**–25°C** **100°C** **200°C** **315°C**	81.4 1.32 0.48 0.23	**0°C** **100°C** **200°C** **325°C**	99.4 2.26 0.59 0.20
Density at 25°C (kg/m^3)	971		951	
Density, kg/m^3	**–25°C** **100°C** **200°C** **315°C**	1,007 916 840 741	**0°C** **100°C** **200°C** **325°C**	968 897 820 705
Heat capacity, kJ/(kg·K)	**–25°C** **100°C** **200°C** **315°C**	1.54 1.94 2.27 2.67	**0°C** **100°C** **200°C** **325°C**	1.89 2.14 2.36 2.58
Thermal conductivity, W/(m·K)	**–25°C** **100°C** **200°C** **315°C**	0.124 0.115 0.104 0.089	**0°C** **100°C** **200°C** **325°C**	0.125 0.116 0.106 0.090
Vapor pressure, kPa	**100°C** **200°C** **315°C**	0.35 13.1 161	**100°C** **200°C** **325°C**	0.056 3.5 86
Geographic availability[c]	Globally		Contact your Eastman representative.	

[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by country.*

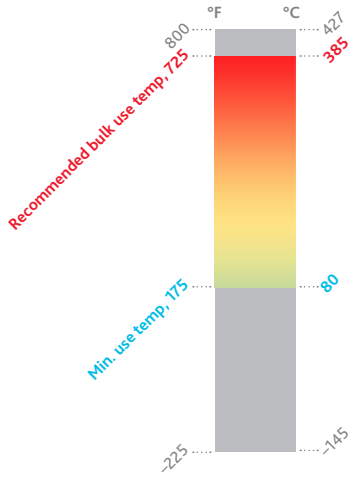
THERMINOL 66 High-temperature, high-stability, low-pressure fluid	THERMINOL 68 High-temperature, low-viscosity fluid	THERMINOL 72 High-temperature, medium-pressure fluid
		
Clear, pale yellow liquid	Clear, pale yellow liquid	Clear, amber liquid
Modified terphenyl	Mixture of synthetic aromatics	Mixture of synthetic aromatics
345°C	360°C	380°C
375°C	390°C	400°C
359°C	308°C	271°C
11°C –3°C	–10°C –26°C	–10°C –14°C
–32°C	–33°C	–18°C
184°C	155°C	132°C
212°C	174°C	143°C
399°C (DIN 51794)	400°C (DIN 51794)	603°C (ASTM E-659)
72°C	57°C	
0°C 1,320 **100°C** 3.6 **200°C** 0.86 **345°C** 0.33	**0°C** 130 **100°C** 2.60 **200°C** 0.70 **360°C** 0.26	**0°C** 59.2 **100°C** 1.61 **250°C** 0.329 **380°C** 0.143
1,005	1,020	1,075
0°C 1,021 **100°C** 955 **200°C** 885 **345°C** 770	**0°C** 1,040 **100°C** 969 **200°C** 898 **360°C** 782	**0°C** 1,100 **100°C** 1,007 **250°C** 871 **380°C** 753
0°C 1.49 **100°C** 1.84 **200°C** 2.19 **345°C** 2.75	**0°C** 1.56 **100°C** 1.88 **200°C** 2.20 **360°C** 2.72	**0°C** 1.50 **100°C** 1.77 **250°C** 2.18 **380°C** 2.53
0°C 0.118 **100°C** 0.114 **200°C** 0.106 **345°C** 0.089	**0°C** 0.125 **100°C** 0.117 **200°C** 0.109 **360°C** 0.096	**0°C** 0.142 **100°C** 0.130 **250°C** 0.112 **380°C** 0.096
100°C 0.048 **200°C** 2.2 **345°C** 78	**100°C** 0.237 **200°C** 8.15 **360°C** 251	**100°C** 0.33 **250°C** 61.6 **380°C** 623
Globally	Europe/Middle East/Africa	Globally

SI units

Liquid phase heat transfer

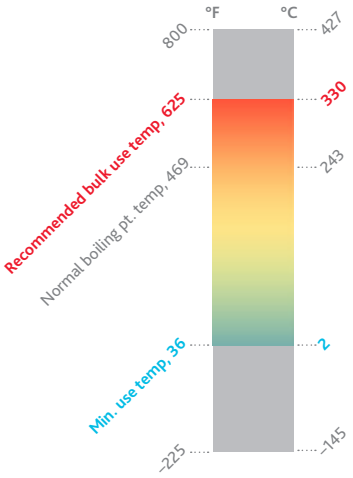
THERMINOL 75

Ultrahigh-temperature, low-pressure fluid



THERMINOL VP-3

High-temperature, liquid/vapor phase fluid



Typical properties[a]

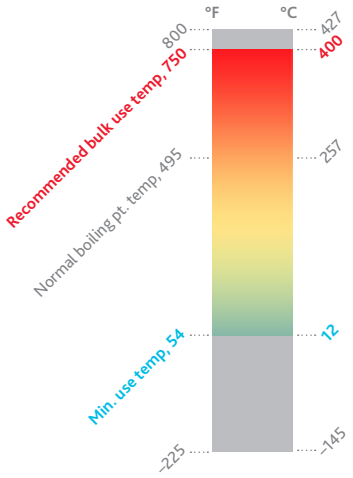
	75		VP-3	
Appearance	Soft solid melting to yellow liquid		Above 2.4°C (36°F) clear, sediment-free liquid	
Composition	Terphenyl/quaterphenyl		Phenylcyclohexane + bicyclohexyl	
Recommended bulk temperature	385°C		330°C	
Maximum film temperature	410°C		360°C	
Normal boiling point	343°C		243°C	
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	80°C (slurry point)		2.4°C (crystallizing point)	
Pour point	NA		NA	
Flash point, COC	185°C		104°C	
Fire point, COC	227°C		113°C	
Autoignition temperature[b]	567°C (ASTM E-659)		360°C (ASTM E-659)	
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	98°C		2.4°C	
Viscosity, mPa·s (cP)	**80°C** **200°C** **300°C** **385°C**	4.3 0.85 0.37 0.22	**25°C** **150°C** **250°C** **330°C**	2.6 0.54 0.28 0.16
Density at 25°C (kg/m^3)	1,041 (80°C)		930	
Density, kg/m^3	**80°C** **200°C** **300°C** **385°C**	1,040 953 873 794	**25°C** **150°C** **250°C** **330°C**	930 847 750 641
Heat capacity, kJ/(kg·K)	**80°C** **200°C** **300°C** **385°C**	1.71 2.05 2.28 2.44	**25°C** **150°C** **250°C** **330°C**	1.63 2.16 2.52 3.00
Thermal conductivity, W/(m·K)	**80°C** **200°C** **300°C** **385°C**	0.131 0.121 0.112 0.103	**25°C** **150°C** **250°C** **330°C**	0.117 0.101 0.087 0.076
Vapor pressure, kPa	**150°C** **250°C** **385°C**	0.55 12.9 215	**150°C** **250°C** **330°C**	5.3 121 693
Geographic availability[c]	Globally		Globally	

[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by country.*

THERMINOL

VP-1

Ultrahigh-temperature, liquid/vapor phase fluid



Clear, water-white liquid	
Biphenyl/diphenyl oxide (DPO) eutectic mixture	
400°C	
430°C	
257°C	
12°C (crystallizing point)	
NA	
124°C	
127°C	
621°C (DIN 51794)	
12°C	
25°C	3.7
150°C	0.59
250°C	0.29
400°C	0.15
1,060	
25°C	1,060
150°C	957
250°C	867
400°C	694
25°C	1.56
150°C	1.91
250°C	2.18
400°C	2.63
25°C	0.136
150°C	0.121
250°C	0.106
400°C	0.076
150°C	4.5
250°C	86
400°C	1,090
Globally	

For more information, visit **Therminol.com**

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Eastman Corporate Headquarters
P.O. Box 431
Kingsport, TN 37662-5280 U.S.A.

U.S.A. and Canada, 800-EASTMAN (800-327-8626)
Other locations, +(1) 423-229-2000

www.eastman.com/locations

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