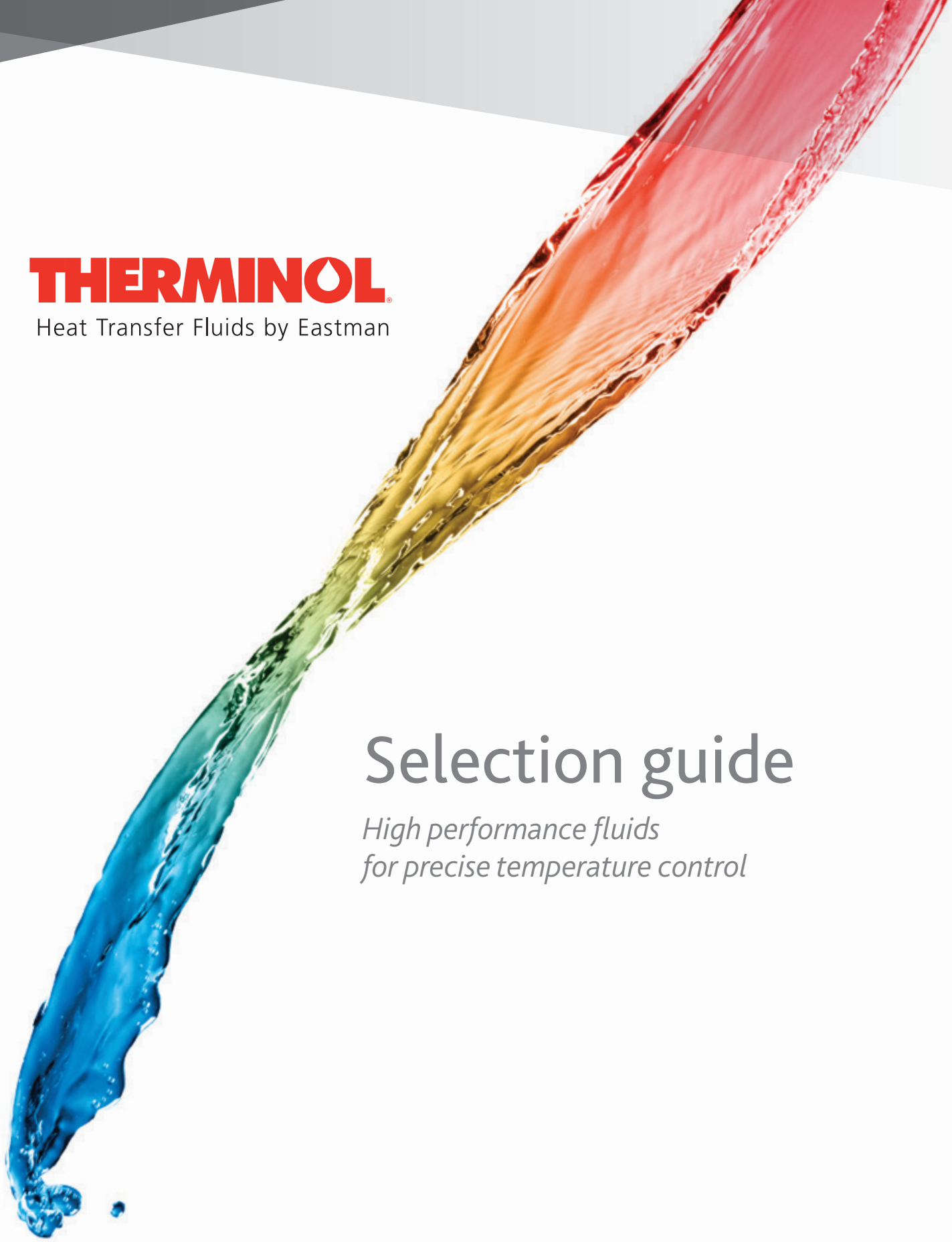
THERMINOL®

Heat Transfer Fluids by Eastman

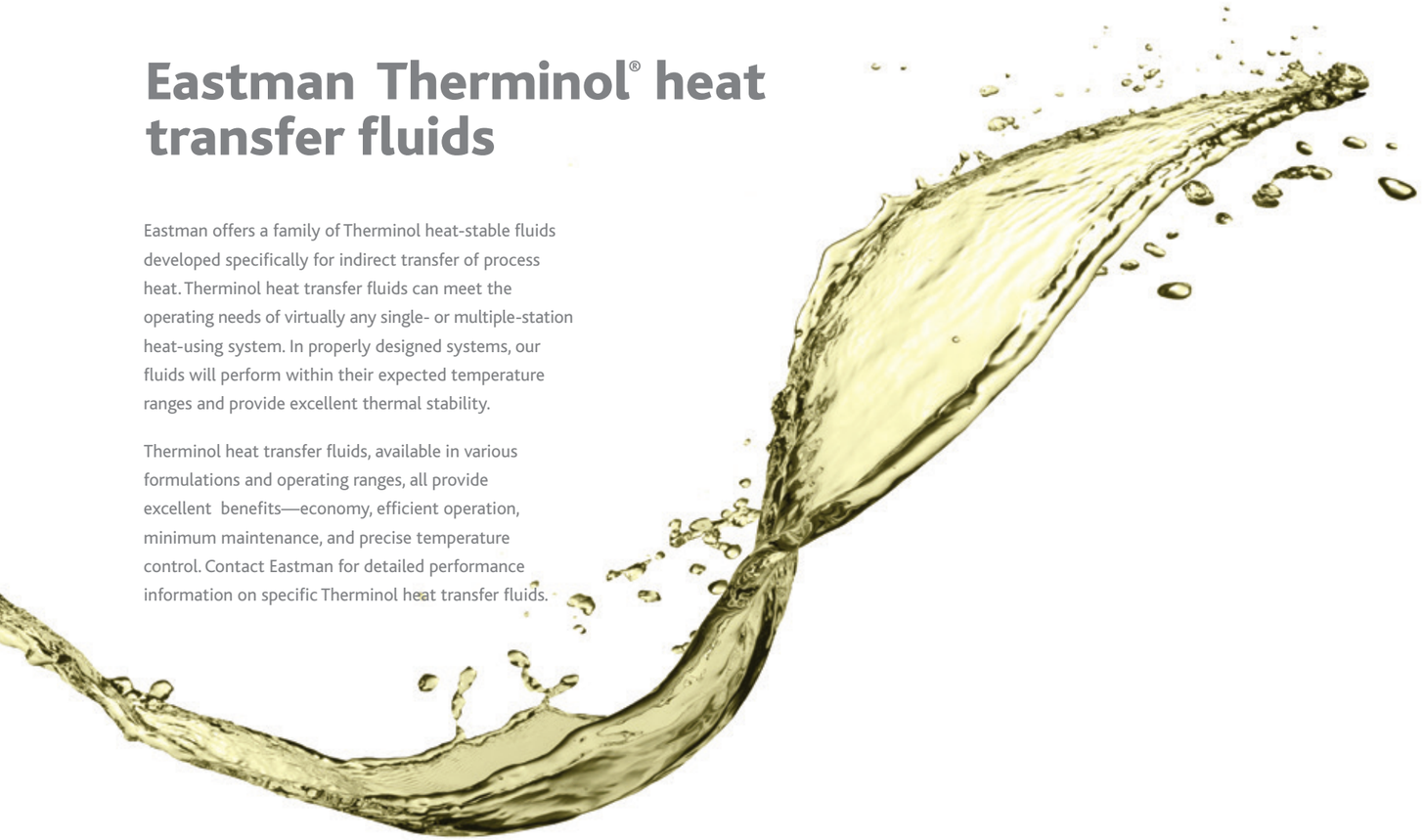


Selection guide

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 maximum 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

Our TLC Total Lifecycle Care program is designed to support Therminol heat transfer fluid customers throughout their systems' lifecycle. This comprehensive program includes system design support, start-up assistance, training, sample analysis, flush and refill fluids, and more. In North America, call our hotline at 1-800-433-6997 or contact your local sales or technical representative found in the "Contact us" section of our website.

In-service heat transfer fluid sample analysis

To help users get maximum fluid life, Eastman offers testing of in-service heat transfer fluids to detect contamination, moisture, thermal degradation, and other conditions that may impact system performance. Customers can access their specific test information via the myTherminol site portal. Sample analysis includes all-inclusive sample kits that are easy to use.

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.

Operational training

Eastman customers can take advantage of our heat transfer system operation and product training programs. These programs are customized to suit the varied needs of front-line technicians, operations supervisors, and maintenance technicians to design engineers.

Safety awareness training

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 flush fluid. Therminol FF can be circulated at temperatures up to 350°F (177°C) and is compatible with mechanical system components and perfluoroelastomer O-rings found in heat transfer systems.

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.

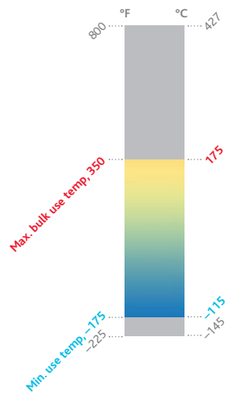
**Fluid trade-in program available in North America.*

English units

Liquid phase heat transfer

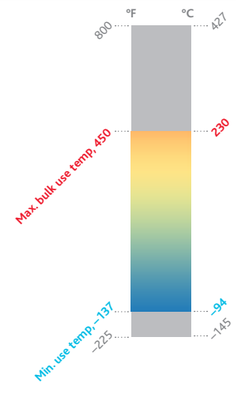
THERMINOL VLT

Very low-temperature coolant/heat transfer fluid



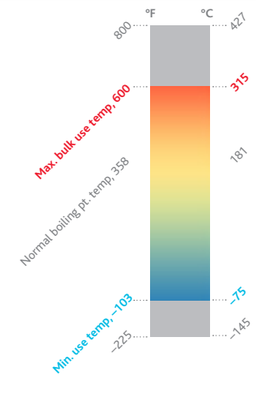
THERMINOL D-12

Low-temperature coolant/heat transfer fluid



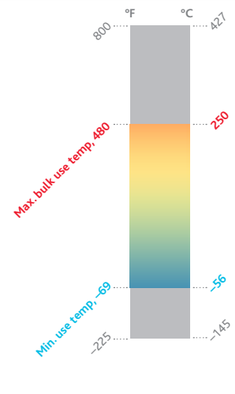
THERMINOL LT

Wide-range liquid/vapor heat transfer fluid



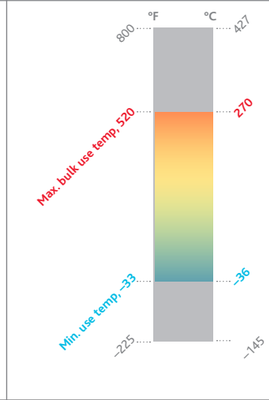
THERMINOL ADX-10

Low-temperature pumpability, medium-temperature fluid



THERMINOL RD

Low-viscosity, medium-temperature fluid



Typical properties[a]

	VLT	D-12	LT	ADX-10	RD
Appearance	Water-white liquid	Clear, water-white liquid	Clear, light yellow liquid	Clear, pale yellow liquid	Clear liquid
Composition	Methylcyclohexane/trimethylpentane mixture	Synthetic hydrocarbons	Alkyl substituted aromatic	Synthetic aromatic hydrocarbon mixture	Synthetic hydrocarbon mixture
Maximum bulk temperature	350°F	450°F	600°F	480°F	520°F
Maximum film temperature	410°F	475°F	650°F	535°F	570°F
Normal boiling point	211°F	378°F	358°F	559°F	541°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	–195°F	–116°F[d] –137°F[d]	–103°F (crystallizing point)	–41°F –69°F	–12°F –33°F
Pour point	–211°F	–148°F	n/a	–112°F	–67°F
Flash point, COC	20°F (Tag closed cup)	144°F (Pensky-Martens)	134°F (Pensky-Martens)	277°F	248°F
Fire point, COC	20°F (ASTM D-1310)	175°F	150°F	284°F	257°F
Autoignition temperature[b]	562°F (DIN 51794)	531°F (DIN 51794)	804°F (DIN 51794)	621°F (DIN 51794)	743°F (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	–105°F	–35°F	193°F	66°F	90°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	**–100°F** 10.8 **100°F** 0.83 **300°F** 0.35 **600°F** 0.19	**–50°F** 508 **200°F** 1.49 **400°F** 0.531 **480°F** 0.403	**0°F** 141 **200°F** 1.90 **400°F** 0.673 **520°F** 0.492
Density at 75°F (lb/gal)	6.22	6.34	7.20	7.13	7.23
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	**–100°F** 7.83 lb/gal 58.6 lb/ft^3 **100°F** 7.11 lb/gal 53.2 lb/ft^3 **300°F** 6.31 lb/gal 47.2 lb/ft^3 **600°F** 4.66 lb/gal 34.8 lb/ft^3	**–50°F** 7.53 lb/gal 56.3 lb/ft^3 **200°F** 6.72 lb/gal 50.3 lb/ft^3 **400°F** 6.04 lb/gal 45.2 lb/ft^3 **480°F** 5.73 lb/gal 42.9 lb/ft^3	**0°F** 7.47 lb/gal 55.9 lb/ft^3 **200°F** 6.82 lb/gal 51.0 lb/ft^3 **400°F** 6.11 lb/gal 45.7 lb/ft^3 **520°F** 5.64 lb/gal 42.2 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	**–100°F** 0.344 **100°F** 0.446 **300°F** 0.542 **600°F** 0.719	**–50°F** 0.395 **200°F** 0.523 **400°F** 0.615 **480°F** 0.649	**0°F** 0.397 **200°F** 0.507 **400°F** 0.626 **520°F** 0.701
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	**–100°F** 0.0825 **100°F** 0.0701 **300°F** 0.0573 **600°F** 0.0374	**–50°F** 0.0764 **200°F** 0.0660 **400°F** 0.0565 **480°F** 0.0523	**0°F** 0.0710 **200°F** 0.0645 **400°F** 0.0576 **520°F** 0.0534
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	**200°F** 41 mmHg 0.79 psia **400°F** 1,370 mmHg 26.5 psia **600°F** 11,800 mmHg 228 psia	**200°F** 0.36 mmHg 0.007 psia **400°F** 72.4 mmHg 1.40 psia **480°F** 266 mmHg 5.15 psia	**200°F** 0.62 mmHg 0.012 psia **400°F** 78.6 mmHg 1.52 psia **520°F** 564 mmHg 10.9 psia
Geographic availability[c]	Globally	Globally	Globally	Europe/Middle East/Africa	Europe/Middle East/Africa

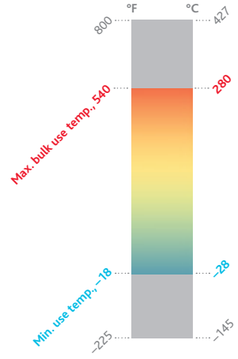
[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability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

English units

Liquid phase heat transfer

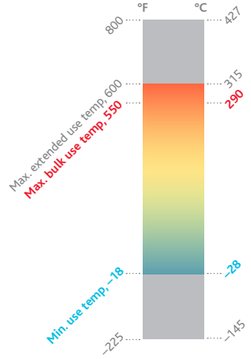
THERMINOL 54

Economical, medium-temperature-range fluid



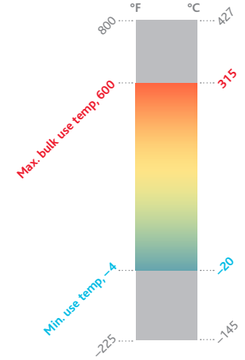
THERMINOL 55

Economical, medium-temperature-range fluid



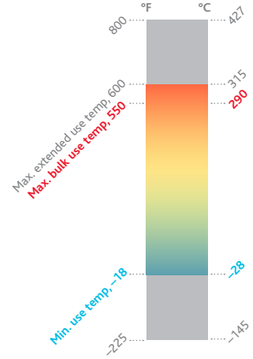
THERMINOL XP

Heat transfer fluid with FDA/NF status



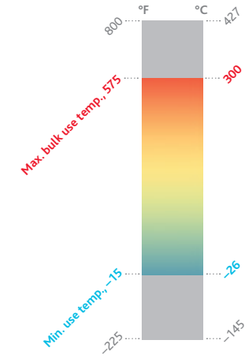
THERMINOL SP

Economical, medium-temperature-range fluid



THERMINOL 58

Economical, medium-temperature-range fluid



Typical properties[a]

	54	55	XP	SP	58
Appearance	Clear, yellow liquid	Clear, yellow liquid	Colorless, odorless liquid	Clear, yellow liquid	Clear, yellow liquid
Composition	Synthetic hydrocarbon mixture	Synthetic hydrocarbon mixture	White mineral oil	Synthetic hydrocarbon mixture	Synthetic hydrocarbon mixture
Maximum bulk temperature	540°F	550°F	600°F	550°F	575°F
Maximum film temperature	590°F	635°F	625°F	635°F	642°F
Normal boiling point	664°F	664°F	676°F	664°F	665°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 17°F –18°F	 17°F –18°F	 30°F –4°F	 17°F –18°F	 21°F –15°F
Pour point	<–50°F	–65°F	–20°F	–65°F	–65°F
Flash point, COC	> 340°F	350°F	390°F	350°F	383°F
Fire point, COC	> 410°F	425°F	450°F	425°F	430°F
Autoignition temperature[b]	> 625°F	719°F (DIN 51794)	685°F (DIN 51794)	719°F (DIN 51794)	664°F
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	152°F	152°F	162°F	152°F	156°F
Kinematic viscosity, cSt (mm^2/s)	**0°F** 683 **200°F** 4.03 **400°F** 0.96 **540°F** 0.56	**0°F** 683 **200°F** 4.03 **400°F** 0.964 **550°F** 0.536	**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** 0.964 **550°F** 0.536	**0°F** 888 **200°F** 4.27 **400°F** 1.00 **580°F** 0.459
Density at 75°F (lb/gal)	7.25	7.26	7.31	7.26	7.34
Density, various temperatures	**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	**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 **550°F** 5.69 lb/gal 42.6 lb/ft^3	**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 **550°F** 5.69 lb/gal 42.6 lb/ft^3	**0°F** 7.57 lb/gal 56.6 lb/ft^3 **200°F** 6.96 lb/gal 52.1 lb/ft^3 **400°F** 6.31 lb/gal 47.2 lb/ft^3 **580°F** 5.63 lb/gal 42.1 lb/ft^3
Heat capacity, Btu/(lb•°F)	**0°F** 0.42 **200°F** 0.52 **400°F** 0.61 **540°F** 0.68	**0°F** 0.423 **200°F** 0.518 **400°F** 0.612 **550°F** 0.682	**0°F** 0.389 **200°F** 0.515 **400°F** 0.625 **600°F** 0.718	**0°F** 0.423 **200°F** 0.518 **400°F** 0.612 **550°F** 0.682	**0°F** 0.440 **200°F** 0.542 **400°F** 0.647 **580°F** 0.746
Thermal conductivity, Btu/(h•ft•°F)	**0°F** 0.077 **200°F** 0.069 **400°F** 0.062 **540°F** 0.057	**0°F** 0.0768 **200°F** 0.0693 **400°F** 0.0618 **550°F** 0.0561	**0°F** 0.0681 **200°F** 0.0635 **400°F** 0.0571 **600°F** 0.0490	**0°F** 0.0768 **200°F** 0.0693 **400°F** 0.0618 **550°F** 0.0561	**0°F** 0.0753 **200°F** 0.0700 **400°F** 0.0635 **580°F** 0.0566
Vapor pressure	**200°F** — — **400°F** 18.6 mmHg 0.36 psia **540°F** 169 mmHg 3.27 psia	**200°F** 0.16 mmHg 0.003 psia **400°F** 18.6 mmHg 0.360 psia **550°F** 193 mmHg 3.74 psia	**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** 0.16 mmHg 0.003 psia **400°F** 18.6 mmHg 0.360 psia **550°F** 193 mmHg 3.74 psia	**200°F** 0.83 mmHg 0.016 psia **400°F** 23.1 mmHg 0.446 psia **580°F** 270 mmHg 5.23 psia
Geographic availability[c]	Europe/Middle East/Africa	Americas/Asia Pacific	Globally	Europe/Middle East/Africa	Europe/Middle East/Africa

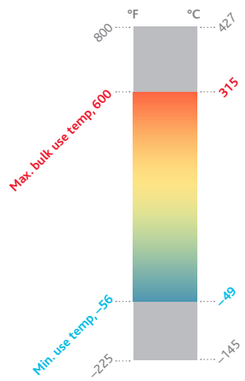
[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by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

English units

Liquid phase heat transfer

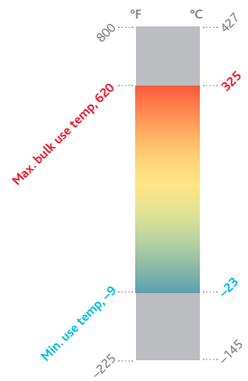
THERMINOL 59

Economical, wide-temperature-range fluid



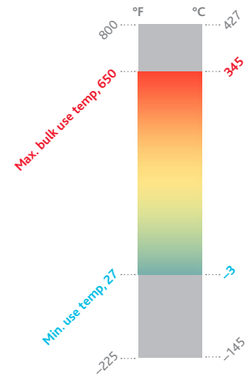
THERMINOL 62

High-performance, low-pressure fluid



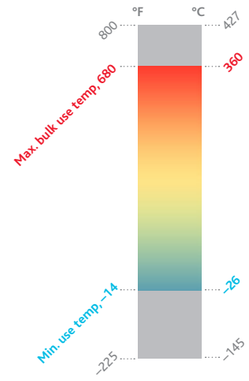
THERMINOL 66

High-temperature, low-pressure fluid



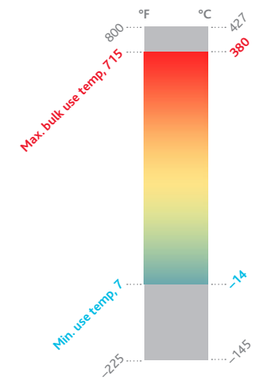
THERMINOL 68

High-temperature, low-viscosity fluid



THERMINOL 72

High-temperature, medium-pressure fluid



Typical properties[a]

	59	62	66	68	72
Appearance	Clear, yellow to dark amber liquid	Water-white liquid	Clear, pale yellow liquid	Clear, pale yellow liquid	Clear, amber liquid
Composition	Alkyl substituted aromatic	Isopropyl biphenyl mixture	Modified terphenyl	Mixture of synthetic aromatics	Mixture of synthetic aromatics
Maximum bulk temperature	600°F	620°F	650°F	680°F	715°F
Maximum film temperature	650°F	670°F	705°F	735°F	750°F
Normal boiling point	553°F	631°F	678°F	586°F	520°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –35°F –56°F	 12°F –9°F	 52°F 27°F	 14°F –14°F	 16°F 7°F
Pour point	–90°F (ISO 3016)	–44°F	–25°F	–27°F	0°F
Flash point, COC	295°F	340°F	363°F	311°F	270°F
Fire point, COC	310°F	385°F	414°F	345°F	290°F
Autoignition temperature[b]	760°F (DIN 51794)	813°F (DIN 51794)	750°F (DIN 51794)	752°F (DIN 51794)	1,117°F (ASTM E-659)
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	63°F	122°F	162°F	135°F	86°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	**50°F** 339 **300°F** 1.68 **500°F** 0.63 **650°F** 0.43	**20°F** 219 **300°F** 1.29 **500°F** 0.516 **680°F** 0.332	**15°F** 291 **300°F** 0.868 **500°F** 0.355 **715°F** 0.19
Density at 75°F (lb/gal)	8.11	7.96	8.39	8.56	8.98
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	**50°F** 8.47 lb/gal 63.4 lb/ft^3 **300°F** 7.69 lb/gal 57.5 lb/ft^3 **500°F** 7.01 lb/gal 52.5 lb/ft^3 **650°F** 6.44 lb/gal 48.2 lb/ft^3	**20°F** 8.73 lb/gal 65.3 lb/ft^3 **300°F** 7.79 lb/gal 58.3 lb/ft^3 **500°F** 7.13 lb/gal 53.3 lb/ft^3 **680°F** 6.52 lb/gal 48.8 lb/ft^3	**15°F** 9.23 lb/gal 69.0 lb/ft^3 **300°F** 8.03 lb/gal 60.1 lb/ft^3 **500°F** 7.19 lb/gal 53.8 lb/ft^3 **715°F** 6.29 lb/gal 47.0 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	**50°F** 0.365 **300°F** 0.480 **500°F** 0.578 **650°F** 0.655	**20°F** 0.368 **300°F** 0.487 **500°F** 0.573 **680°F** 0.650	**15°F** 0.352 **300°F** 0.454 **500°F** 0.526 **715°F** 0.604
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	**50°F** 0.0682 **300°F** 0.0636 **500°F** 0.0574 **650°F** 0.0514	**20°F** 0.0727 **300°F** 0.0654 **500°F** 0.0602 **680°F** 0.0556	**15°F** 0.0828 **300°F** 0.0717 **500°F** 0.0639 **715°F** 0.0555
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	**300°F** 2.9 mmHg 0.056 psia **500°F** 90 mmHg 1.7 psia **650°F** 570 mmHg 11 psia	**300°F** 12.2 mmHg 0.236 psia **500°F** 278 mmHg 5.38 psia **680°F** 1,888 mmHg 36.5 psia	**300°F** 22.4 mmHg 0.43 psia **500°F** 579 mmHg 11.2 psia **715°F** 4,640 mmHg 89.8 psia
Geographic availability[c]	Globally	Globally	Globally	Europe/Middle East/Africa	Globally

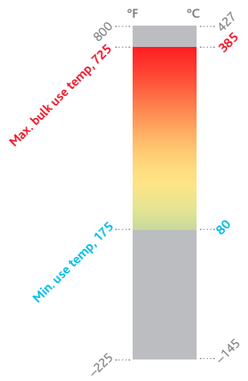
[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability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

English units

Liquid phase heat transfer

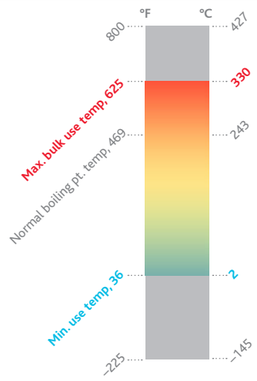
THERMINOL 75

Ultrahigh-temperature, low-pressure fluid



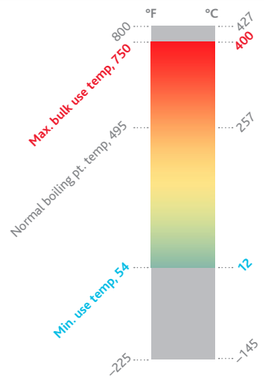
THERMINOL VP-3

High-temperature, liquid/vapor phase fluid



THERMINOL VP-1

Ultrahigh-temperature, liquid/vapor phase fluid



Typical properties[a]

	THERMINOL 75	THERMINOL VP-3	THERMINOL VP-1
Appearance	Soft solid melting to yellow liquid	Above 2.4°C (36°F) clear, sediment-free liquid	Clear, water-white liquid
Composition	Terphenyl/quaterphenyl	Phenylcyclohexane + bicyclohexyl	Biphenyl/diphenyl oxide (DPO) eutectic mixture
Maximum bulk temperature	725°F	625°F	750°F
Maximum film temperature	770°F	675°F	800°F
Normal boiling point	649°F	469°F	495°F
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	175°F (slurry point)	36°F (crystallizing point)	54°F (crystallizing point)
Pour point	n/a	n/a	n/a
Flash point, COC	365°F	219°F	255°F
Fire point, COC	440°F	235°F	260°F
Autoignition temperature[b]	1,052°F (ASTM E-659)	680°F (ASTM E-659)	1,150°F (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 10 ft/s, 1-in. tube)	209°F	36°F	54°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	**100°F** 2.60 **300°F** 0.62 **500°F** 0.32 **750°F** 0.21
Density at 75°F (lb/gal)	8.69 (175°F)	7.77	8.85
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	**100°F** 8.76 lb/gal 65.5 lb/ft^3 **300°F** 7.99 lb/gal 59.8 lb/ft^3 **500°F** 7.16 lb/gal 53.5 lb/ft^3 **750°F** 5.81 lb/gal 43.4 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	**100°F** 0.382 **300°F** 0.457 **500°F** 0.528 **750°F** 0.627
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	**100°F** 0.0778 **300°F** 0.0701 **500°F** 0.0600 **750°F** 0.0439
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	**300°F** 32 mmHg 0.62 psia **500°F** 810 mmHg 15.7 psia **750°F** 8,060 mmHg 156 psia
Geographic availability[c]	Globally	Globally	Globally

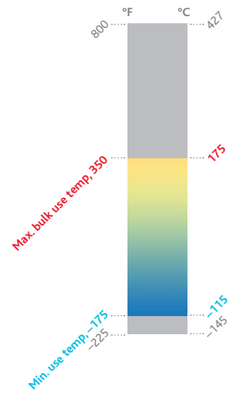
[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by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

SI units

Liquid phase heat transfer

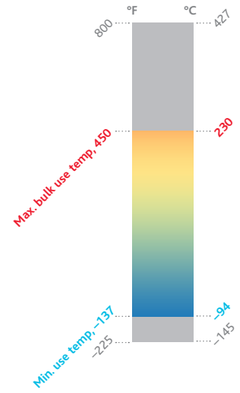
THERMINOL VLT

Very low-temperature coolant/heat transfer fluid



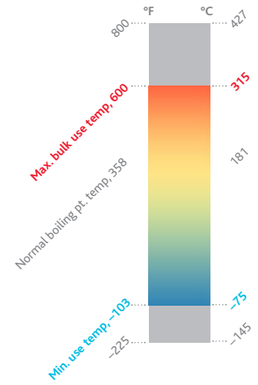
THERMINOL D-12

Low-temperature coolant/heat transfer fluid



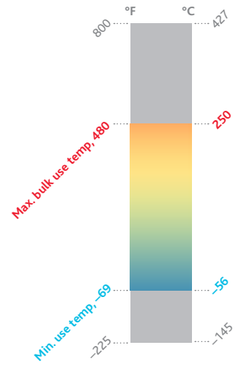
THERMINOL LT

Wide-range liquid/vapor heat transfer fluid



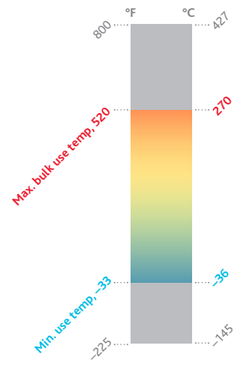
THERMINOL ADX-10

Low-temperature pumpability, medium-temperature fluid



THERMINOL RD

Low-viscosity, medium-temperature fluid



Typical properties[a]

	VLT	D-12	LT	ADX-10	RD
Appearance	Water-white liquid	Clear, water-white liquid	Clear, light yellow liquid	Clear, pale yellow liquid	Clear liquid
Composition	Methylcyclohexane/trimethylpentane mixture	Synthetic hydrocarbons	Alkyl substituted aromatic	Synthetic aromatic hydrocarbon mixture	Synthetic hydrocarbon mixture
Maximum bulk temperature	175°C	230°C	315°C	250°C	270°C
Maximum film temperature	210°C	245°C	345°C	280°C	300°C
Normal boiling point	99°C	192°C	181°C	293°C	283°C
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	–126°C	–82°C[d] –94°C[d]	–75°C (crystallizing point)	–41°C –56°C	–25°C –36°C
Pour point	–135°C	–100°C	n/a	–80°C	–55°C
Flash point, COC	–7°C (Tag closed cup)	62°C (Pensky-Martens)	58°C (Pensky-Martens)	136°C	120°C
Fire point, COC	71°C	71°C	66°C	140°C	125°C
Autoignition temperature[b]	294°C (DIN 51794)	277°C (DIN 51794)	429°C (DIN 51794)	327°C (DIN 51794)	395°C (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	–76°C	–37°C	–66°C	19°C	32°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	**–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	**–20°C** 159 **100°C** 1.40 **200°C** 0.51 **270°C** 0.33
Density at 25°C (kg/m^3)	744	759	862	853	865
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	**–50°C** 920 **100°C** 800 **200°C** 707 **315°C** 559	**–25°C** 887 **100°C** 801 **200°C** 727 **250°C** 686	**–20°C** 897 **100°C** 812 **200°C** 736 **270°C** 676
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	**–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	**–20°C** 1.65 **100°C** 2.15 **200°C** 2.60 **270°C** 2.93
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	**–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	**–20°C** 0.123 **100°C** 0.111 **200°C** 0.100 **270°C** 0.093
Vapor pressure, kPa	**0°C** 1.9 **100°C** 104 **175°C** 573	**50°C** 0.48 **150°C** 33.2 **230°C** 229	**100°C** 7.1 **200°C** 164 **315°C** 1,560	**100°C** 0.07 **200°C** 8.31 **250°C** 36.6	**100°C** 0.12 **200°C** 9.03 **270°C** 72.8
Geographic availability[c]	Globally	Globally	Globally	Europe/Middle East/Africa	Europe/Middle East/Africa

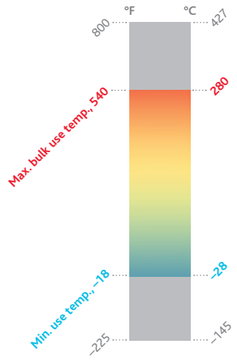
[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability by country.* [d] *–45°C for efficient heat transfer*

SI units

Liquid phase heat transfer

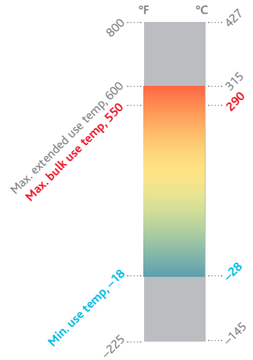
THERMINOL 54

Economical, medium-temperature-range fluid



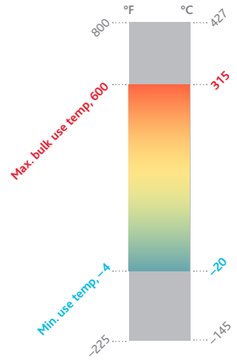
THERMINOL 55

Economical, medium-temperature-range fluid



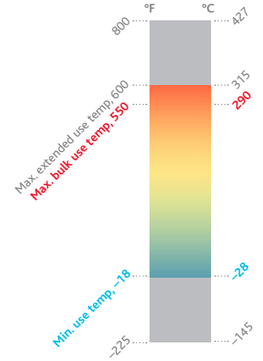
THERMINOL XP

Heat transfer fluid with FDA/NF status



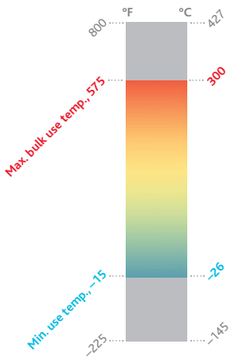
THERMINOL SP

Economical, medium-temperature-range fluid



THERMINOL 58

Economical, medium-temperature-range fluid



Typical properties[a]

	54	55	XP	SP	58
Appearance	Clear, yellow liquid	Clear, yellow liquid	Colorless, odorless liquid	Clear, yellow liquid	Clear, yellow liquid
Composition	Synthetic hydrocarbon mixture	Synthetic hydrocarbon mixture	White mineral oil	Synthetic hydrocarbon mixture	Synthetic hydrocarbon mixture
Maximum bulk temperature	280°C	290°C	315°C	290°C	300°C
Maximum film temperature	310°C	335°C	330°C	335°C	339°C
Normal boiling point	351°C	351°C	358°C	351°C	352°C
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –8°C –28°C	 –8°C –28°C	 –1°C –20°C	 –8°C –28°C	 –6°C –26°C
Pour point	< –45°C	–54°C	–29°C	–54°C	–54°C
Flash point, COC	>170°C	177°C	199°C	177°C	195°C
Fire point, COC	>210°C	218°C	232°C	218°C	221°C
Autoignition temperature[b]	> 330°C	382°C (DIN 51794)	363°C (DIN 51794)	382°C (DIN 51794)	351°C
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	67°C	67°C	72°C	67°C	69°C
Viscosity, mPa·s (cP)	**–25°C** 1,250 **100°C** 2.88 **200°C** 0.75 **280°C** 0.39	**–25°C** 1,250 **100°C** 2.88 **200°C** 0.75 **290°C** 0.36	**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 **290°C** 0.36	**0°C** 172 **100°C** 3.10 **200°C** 0.792 **300°C** 0.322
Density at 25°C (kg/m^3)	868	868	875	868	880
Density, kg/m^3	**–25°C** 902 **100°C** 818 **200°C** 748 **280°C** 688	**–25°C** 902 **100°C** 818 **200°C** 748 **290°C** 680	**0°C** 891 **100°C** 827 **200°C** 761 **315°C** 678	**–25°C** 902 **100°C** 818 **200°C** 748 **290°C** 680	**0°C** 896 **100°C** 830 **200°C** 759 **300°C** 679
Heat capacity, kJ/(kg·K)	**–25°C** 1.74 **100°C** 2.19 **200°C** 2.54 **280°C** 2.83	**–25°C** 1.74 **100°C** 2.19 **200°C** 2.54 **290°C** 2.86	**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 **290°C** 2.86	**0°C** 1.91 **100°C** 2.30 **200°C** 2.69 **300°C** 3.10
Thermal conductivity, W/(m·K)	**–25°C** 0.134 **100°C** 0.119 **200°C** 0.107 **280°C** 0.098	**–25°C** 0.134 **100°C** 0.119 **200°C** 0.107 **290°C** 0.097	**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 **290°C** 0.097	**0°C** 0.129 **100°C** 0.120 **200°C** 0.110 **300°C** 0.098
Vapor pressure, kPa	**100°C** 0.03 **200°C** 2.15 **280°C** 21.3	**100°C** 0.032 **200°C** 2.15 **290°C** 27.2	**100°C** 0.018 **200°C** 1.7 **315°C** 42	**100°C** 0.032 **200°C** 2.15 **290°C** 27.2	**100°C** 0.135 **200°C** 2.72 **300°C** 32.6
Geographic availability[c]	Europe/Middle East/Africa	Americas/Asia Pacific	Globally	Europe/Middle East/Africa	Europe/Middle East/Africa

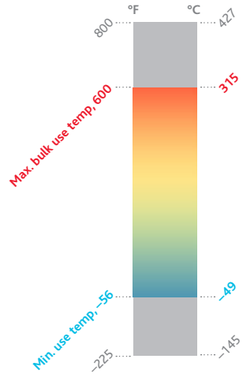
[a] These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.
[b] Visit www.therminol.com for additional typical properties and test values. *[c] Check with your local sales office to determine exact availability by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

SI units

Liquid phase heat transfer

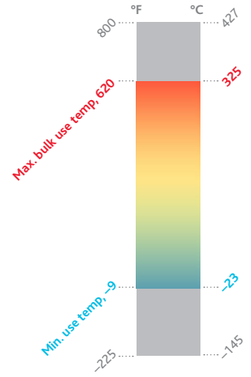
THERMINOL 59

Economical, wide-temperature-range fluid



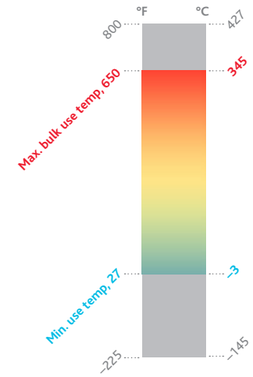
THERMINOL 62

High-performance, low-pressure fluid



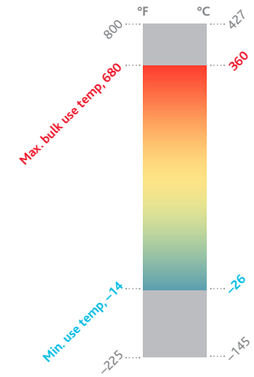
THERMINOL 66

High-temperature, low-pressure fluid



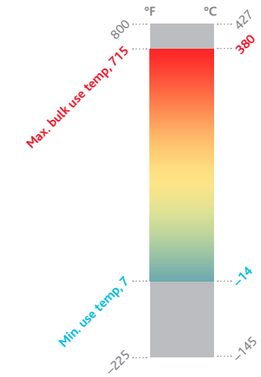
THERMINOL 68

High-temperature, low-viscosity fluid



THERMINOL 72

High-temperature, medium-pressure fluid



Typical properties[a]

	59	62	66	68	72
Appearance	Clear, yellow to dark amber liquid	Water-white liquid	Clear, pale yellow liquid	Clear, pale yellow liquid	Clear, amber liquid
Composition	Alkyl substituted aromatic	Isopropyl biphenyl mixture	Modified terphenyl	Mixture of synthetic aromatics	Mixture of synthetic aromatics
Maximum bulk temperature	315°C	325°C	345°C	360°C	380°C
Maximum film temperature	345°C	355°C	375°C	390°C	400°C
Normal boiling point	289°C	333°C	359°C	308°C	271°C
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	 –37°C –49°C	 –11°C –23°C	 11°C –3°C	 –10°C –26°C	 –10°C –14°C
Pour point	–68°C (ISO 3016)	–42°C	–32°C	–33°C	–18°C
Flash point, COC	146°C	171°C	184°C	155°C	132°C
Fire point, COC	154°C	196°C	212°C	174°C	143°C
Autoignition temperature[b]	404°C (DIN 51794)	433°C (DIN 51794)	399°C (DIN 51794)	400°C (DIN 51794)	603°C (ASTM E-659)
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	17°C	50°C	72°C	57°C	
Viscosity, mPa·s (cP)	**–25°C** 81.4 **100°C** 1.32 **200°C** 0.48 **315°C** 0.23	**0°C** 99.4 **100°C** 2.26 **200°C** 0.59 **325°C** 0.20	**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
Density at 25°C (kg/m^3)	971	951	1,005	1,020	1,075
Density, kg/m^3	**–25°C** 1,007 **100°C** 916 **200°C** 840 **315°C** 741	**0°C** 968 **100°C** 897 **200°C** 820 **325°C** 705	**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
Heat capacity, kJ/(kg·K)	**–25°C** 1.54 **100°C** 1.94 **200°C** 2.27 **315°C** 2.67	**0°C** 1.89 **100°C** 2.14 **200°C** 2.36 **325°C** 2.58	**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
Thermal conductivity, W/(m·K)	**–25°C** 0.124 **100°C** 0.115 **200°C** 0.104 **315°C** 0.089	**0°C** 0.125 **100°C** 0.116 **200°C** 0.106 **325°C** 0.090	**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
Vapor pressure, kPa	**100°C** 0.35 **200°C** 13.1 **315°C** 161	**100°C** 0.056 **200°C** 3.5 **325°C** 86	**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
Geographic availability[c]	Globally	Globally	Globally	Europe/Middle East/Africa	Globally

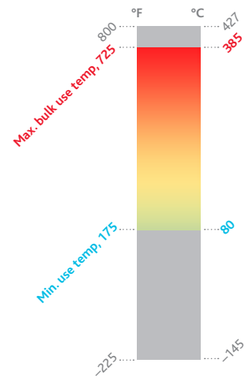
[a] *These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications.*
[b] *Visit www.therminol.com for additional typical properties and test values.* [c] *Check with your local sales office to determine exact availability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

SI units

Liquid phase heat transfer

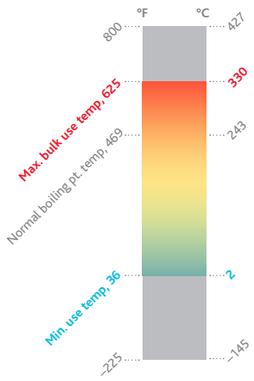
THERMINOL 75

Ultrahigh-temperature, low-pressure fluid



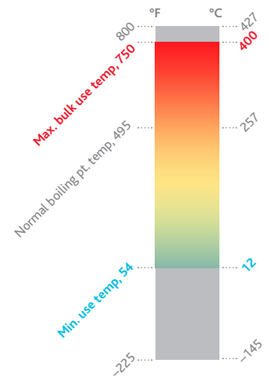
THERMINOL VP-3

High-temperature, liquid/vapor phase fluid



THERMINOL VP-1

Ultrahigh-temperature, liquid/vapor phase fluid



Typical properties[a]

	75	VP-3	VP-1
Appearance	Soft solid melting to yellow liquid	Above 2.4°C (36°F) clear, sediment-free liquid	Clear, water-white liquid
Composition	Terphenyl/quaterphenyl	Phenylcyclohexane + bicyclohexyl	Biphenyl/diphenyl oxide (DPO) eutectic mixture
Maximum bulk temperature	385°C	330°C	400°C
Maximum film temperature	410°C	360°C	430°C
Normal boiling point	343°C	243°C	257°C
Pumpability: at 300 cSt (mm^2/s) at 2000 cSt (mm^2/s)	80°C (slurry point)	2.4°C (crystallizing point)	12°C (crystallizing point)
Pour point	n/a	n/a	n/a
Flash point, COC	185°C	104°C	124°C
Fire point, COC	227°C	113°C	127°C
Autoignition temperature[b]	567°C (ASTM E-659)	360°C (ASTM E-659)	621°C (DIN 51794)
Fully developed turbulent flow (Re = 10,000, 3.05 m/s, 2.54 cm tube)	98°C	2.4°C	12°C
Viscosity, mPa·s (cP)	**80°C** 4.3 **200°C** 0.85 **300°C** 0.37 **385°C** 0.22	**25°C** 2.6 **150°C** 0.54 **250°C** 0.28 **330°C** 0.16	**25°C** 3.7 **150°C** 0.59 **250°C** 0.29 **400°C** 0.15
Density at 25°C (kg/m^3)	1,041 (80°C)	930	1,060
Density, kg/m^3	**80°C** 1,040 **200°C** 953 **300°C** 873 **385°C** 794	**25°C** 930 **150°C** 847 **250°C** 750 **330°C** 641	**25°C** 1,060 **150°C** 957 **250°C** 867 **400°C** 694
Heat capacity, kJ/(kg·K)	**80°C** 1.71 **200°C** 2.05 **300°C** 2.28 **385°C** 2.44	**25°C** 1.63 **150°C** 2.16 **250°C** 2.52 **330°C** 3.00	**25°C** 1.56 **150°C** 1.91 **250°C** 2.18 **400°C** 2.63
Thermal conductivity, W/(m·K)	**80°C** 0.131 **200°C** 0.121 **300°C** 0.112 **385°C** 0.103	**25°C** 0.117 **150°C** 0.101 **250°C** 0.087 **330°C** 0.076	**25°C** 0.136 **150°C** 0.121 **250°C** 0.106 **400°C** 0.076
Vapor pressure, kPa	**150°C** 0.55 **250°C** 12.9 **385°C** 215	**150°C** 5.3 **250°C** 121 **330°C** 693	**150°C** 4.5 **250°C** 86 **400°C** 1,090
Geographic availability[c]	Globally	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.*

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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