

**THERMINOL<sup>®</sup>**  
from Eastman

# THERMINOL<sup>®</sup> 72

heat transfer fluid

High temperature, excellent stability  
at medium pressure

**-14° to 380°C**  
(7° to 715°F)



# THERMINOL<sup>®</sup> 72

heat transfer fluid

## Physical and chemical characteristics

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

The recommended maximum bulk and film temperatures for Therminol 72 are based on industry-standard thermal studies. Operation at or below these temperature maximums can provide long service life under most operating conditions.

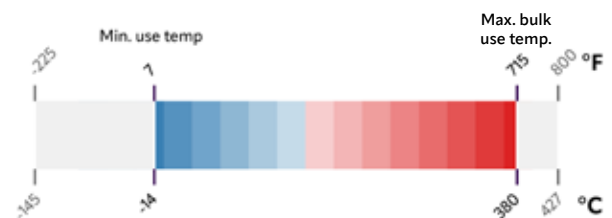
Actual fluid life is dependent on the total system design and operation and can vary by heat transfer fluid chemistry. As fluid ages, the formation of low- and high-boiling compounds may result. Low-boiling compounds should be vented from the system as necessary to a safe location away from personnel and sources of ignition and in compliance with applicable regulations and laws. The high-boiling compounds can be very soluble in the fluid. Significant overheating or fluid contamination will accelerate decomposition and may result in increased high-boiler and solids concentrations. Excess solids can typically be filtered for removal.

Eastman recommends that systems using Therminol 72 fluid be blanketed with an atmosphere of inert gas to protect against the effects of fluid oxidation on its performance and life expectancy. Pressure relief device(s) should be installed where required.

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

While Therminol 72 has a relatively high flash point, it is not classified as a fire-resistant heat transfer fluid. Consequently, the use of protective devices may be required to minimize fire risk, and users of Therminol 72 should check with their safety and risk management experts for specific instructions.

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



## Typical properties<sup>a</sup>

|  |  |
|--|--|
| Appearance   | Clear, amber liquid                              |
| Composition  | Mixture of synthetic aromatics                   |
| Maximum bulk temperature   | 380°C (715°F)                                    |
| Maximum film temperature   | 400°C (750°F)                                    |
| Normal boiling point   | 271°C (520°F)                                    |
| Pumpability, at 300 mm <sup>2</sup> /s (cSt)   | -10°C (16°F)                                     |
| Pumpability, at 2000 mm <sup>2</sup> /s (cSt)  | -14°C (7°F)                                      |
| Flash point, COC (ASTM D92)  | 132°C (270°F)                                    |
| Autoignition temperature (ASTM E659)   | 603°C (1117°F)                                   |
| Pour point (ISO 3016)  | -18°C (0°F)                                      |
| Minimum liquid temperatures for fully developed turbulent flow ( $N_{Re} > 10,000$ ) |  |
| 10 ft/s, 1-in. tube (3.048 m/s, 2.54-cm tube)  | 32°C (89°F)                                      |
| 20 ft/s, 1-in. tube (6.096 m/s, 2.54-cm tube)  | 17°C (63°F)                                      |
| Minimum liquid temperatures for transitional region flow ( $N_{Re} > 2,000$ )        |  |
| 10 ft/s, 1-in. tube (3.048 m/s, 2.54-cm tube)  | 3°C (38°F)                                       |
| 20 ft/s, 1-in. tube (6.096 m/s, 2.54-cm tube)  | -3°C (27°F)                                      |
| Coefficient of thermal expansion at 200°C  | 0.00113/°C (0.00628/°F)                          |
| Total acidity (ASTM D664)  | <0.2 mg KOH/g                                    |
| Average molecular weight   | 190  |
| Pseudocritical temperature   | 527°C (980°F)                                    |
| Pseudocritical pressure  | 32.4 bar (470 psia)                              |
| Pseudocritical density   | 335 kg/m <sup>3</sup> (20.9 lb/ft <sup>3</sup> ) |
| Chlorine content (DIN 51577)   | <10 ppm  |
| Copper corrosion (ASTM D130)   | <<1a   |
| Moisture content, maximum (ASTM E203)  | 200 ppm  |
| Dielectric constant @ 23°C (ASTM D924)   | 3.12   |

<sup>a</sup>These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications for Therminol 72 fluid. Does not constitute an express warranty. See disclaimer on the back page of this brochure.



To create your own customized table  
with preferred properties, units of measure  
and temperature intervals, visit  
[therminol.com/resources](http://therminol.com/resources)  
and download the Therminol heat transfer fluid calculator.

# Liquid properties of Therminol 72 heat transfer fluid by temperature<sup>a</sup> (SI units)

| Temperature |     | Liquid density<br>kg/m <sup>3</sup> | Liquid heat capacity<br>kJ/(kg·K) | Liquid thermal conductivity<br>W/(m·K) | Liquid viscosity <sup>b</sup> |                          | Vapor pressure <sup>c</sup><br>kPa |
|-------------|-----|-------------------------------------|-----------------------------------|--|-------------------------------|--------------------------|------------------------------------|
| °C          | °F  |                                     |                                   |  | cP (mPa·s)                    | cSt (mm <sup>2</sup> /s) |                                    |
| -14         | 7   | 1,110                               | 1.460                             | 0.144                                  | 3,971                         | 3,580                    | —                                  |
| -10         | 14  | 1,106                               | 1.471                             | 0.143                                  | 383                           | 346                      | —                                  |
| 0           | 32  | 1,097                               | 1.498                             | 0.142                                  | 59.2                          | 54.0                     | —                                  |
| 10          | 50  | 1,088                               | 1.525                             | 0.141                                  | 24.4                          | 22.4                     | —                                  |
| 20          | 68  | 1,079                               | 1.552                             | 0.140                                  | 13.5                          | 12.5                     | 0.001                              |
| 30          | 86  | 1,070                               | 1.579                             | 0.138                                  | 8.68                          | 8.11                     | 0.002                              |
| 40          | 104 | 1,061                               | 1.606                             | 0.137                                  | 6.09                          | 5.74                     | 0.006                              |
| 50          | 122 | 1,052                               | 1.634                             | 0.136                                  | 4.52                          | 4.30                     | 0.013                              |
| 60          | 140 | 1,043                               | 1.661                             | 0.135                                  | 3.50                          | 3.35                     | 0.028                              |
| 70          | 158 | 1,034                               | 1.688                             | 0.134                                  | 2.79                          | 2.70                     | 0.056                              |
| 80          | 176 | 1,025                               | 1.715                             | 0.132                                  | 2.28                          | 2.23                     | 0.105                              |
| 90          | 194 | 1,016                               | 1.742                             | 0.131                                  | 1.90                          | 1.87                     | 0.189                              |
| 100         | 212 | 1,007                               | 1.769                             | 0.130                                  | 1.61                          | 1.60                     | 0.326                              |
| 110         | 230 | 997                                 | 1.796                             | 0.129                                  | 1.38                          | 1.39                     | 0.545                              |
| 120         | 248 | 988                                 | 1.823                             | 0.127                                  | 1.20                          | 1.21                     | 0.879                              |
| 130         | 266 | 979                                 | 1.850                             | 0.126                                  | 1.05                          | 1.07                     | 1.38                               |
| 140         | 284 | 970                                 | 1.877                             | 0.125                                  | 0.93                          | 0.96                     | 2.10                               |
| 150         | 302 | 961                                 | 1.905                             | 0.124                                  | 0.83                          | 0.86                     | 3.12                               |
| 160         | 320 | 952                                 | 1.932                             | 0.123                                  | 0.74                          | 0.78                     | 4.54                               |
| 170         | 338 | 943                                 | 1.959                             | 0.121                                  | 0.66                          | 0.70                     | 6.47                               |
| 180         | 356 | 934                                 | 1.986                             | 0.120                                  | 0.60                          | 0.64                     | 9.04                               |
| 190         | 374 | 925                                 | 2.013                             | 0.119                                  | 0.55                          | 0.59                     | 12.4                               |
| 200         | 392 | 916                                 | 2.040                             | 0.118                                  | 0.50                          | 0.54                     | 16.8                               |
| 210         | 410 | 906                                 | 2.067                             | 0.117                                  | 0.46                          | 0.50                     | 22.3                               |
| 220         | 428 | 898                                 | 2.094                             | 0.115                                  | 0.42                          | 0.47                     | 29.3                               |
| 230         | 446 | 889                                 | 2.121                             | 0.114                                  | 0.39                          | 0.43                     | 38.0                               |
| 240         | 464 | 880                                 | 2.148                             | 0.113                                  | 0.36                          | 0.40                     | 48.6                               |
| 250         | 482 | 871                                 | 2.176                             | 0.112                                  | 0.33                          | 0.38                     | 61.6                               |
| 260         | 500 | 862                                 | 2.203                             | 0.111                                  | 0.31                          | 0.36                     | 77.1                               |
| 270         | 518 | 853                                 | 2.230                             | 0.109                                  | 0.28                          | 0.33                     | 95.7                               |
| 280         | 536 | 844                                 | 2.257                             | 0.108                                  | 0.27                          | 0.31                     | 118                                |
| 290         | 554 | 834                                 | 2.284                             | 0.107                                  | 0.25                          | 0.30                     | 143                                |
| 300         | 572 | 825                                 | 2.311                             | 0.106                                  | 0.23                          | 0.28                     | 173                                |
| 310         | 590 | 816                                 | 2.338                             | 0.104                                  | 0.22                          | 0.27                     | 208                                |
| 320         | 608 | 807                                 | 2.365                             | 0.103                                  | 0.20                          | 0.25                     | 248                                |
| 330         | 626 | 798                                 | 2.392                             | 0.102                                  | 0.19                          | 0.24                     | 293                                |
| 340         | 644 | 789                                 | 2.419                             | 0.101                                  | 0.18                          | 0.23                     | 345                                |
| 350         | 662 | 780                                 | 2.447                             | 0.100                                  | 0.17                          | 0.22                     | 403                                |
| 360         | 680 | 771                                 | 2.474                             | 0.098                                  | 0.16                          | 0.21                     | 469                                |
| 370         | 698 | 762                                 | 2.501                             | 0.097                                  | 0.15                          | 0.20                     | 542                                |
| 380         | 716 | 753                                 | 2.528                             | 0.096                                  | 0.14                          | 0.19                     | 623                                |

<sup>a</sup>Maximum recommended bulk temperature 380°C (715°F). These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications for Therminol 72 fluid. <sup>b</sup>1 cSt = 1 mm<sup>2</sup>/s and 1 mPa·s = 1 cP. <sup>c</sup>100 kPa = 1 bar

# Liquid properties of Therminol 72 heat transfer fluid by temperature<sup>a</sup> (English units)

| Temperature |     | Liquid density |                    | Liquid heat capacity | Liquid thermal conductivity | Liquid viscosity <sup>b</sup> |                          | Vapor pressure <sup>c</sup> |
|-------------|-----|----------------|--------------------|----------------------|-----------------------------|-------------------------------|--------------------------|-----------------------------|
| °F          | °C  | lb/gal         | lb/ft <sup>3</sup> | Btu/(lb·°F)          | Btu/(ft·h·°F)               | lb/(ft·h)                     | cSt (mm <sup>2</sup> /s) | psia                        |
| 7           |     | 9.26           | 69.3               | 0.349                | 0.0831                      | 8,480                         | 3,160                    | —                           |
| 20          | -7  | 9.21           | 68.9               | 0.354                | 0.0826                      | 393                           | 147                      | —                           |
| 40          | 4   | 9.13           | 68.3               | 0.361                | 0.0818                      | 91.3                          | 34.5                     | —                           |
| 60          | 16  | 9.04           | 67.6               | 0.368                | 0.0810                      | 41.5                          | 15.8                     | —                           |
| 80          | 27  | 8.96           | 67.0               | 0.375                | 0.0802                      | 24.1                          | 9.26                     | 0.0003                      |
| 100         | 38  | 8.88           | 66.4               | 0.382                | 0.0795                      | 15.8                          | 6.16                     | 0.0007                      |
| 120         | 49  | 8.78           | 65.7               | 0.390                | 0.0787                      | 11.3                          | 4.43                     | 0.0018                      |
| 140         | 60  | 8.70           | 65.1               | 0.397                | 0.0779                      | 8.46                          | 3.35                     | 0.0041                      |
| 160         | 71  | 8.62           | 64.5               | 0.404                | 0.0771                      | 6.60                          | 2.64                     | 0.0087                      |
| 180         | 82  | 8.54           | 63.9               | 0.411                | 0.0763                      | 5.30                          | 2.14                     | 0.0174                      |
| 200         | 93  | 8.45           | 63.2               | 0.418                | 0.0756                      | 4.35                          | 1.78                     | 0.0330                      |
| 220         | 104 | 8.37           | 62.6               | 0.426                | 0.0748                      | 3.64                          | 1.50                     | 0.0597                      |
| 240         | 116 | 8.29           | 62.0               | 0.433                | 0.0740                      | 3.09                          | 1.29                     | 0.103                       |
| 260         | 127 | 8.19           | 61.3               | 0.440                | 0.0732                      | 2.65                          | 1.12                     | 0.173                       |
| 280         | 138 | 8.11           | 60.7               | 0.447                | 0.0724                      | 2.31                          | 0.98                     | 0.278                       |
| 300         | 149 | 8.03           | 60.1               | 0.454                | 0.0717                      | 2.02                          | 0.87                     | 0.434                       |
| 320         | 160 | 7.94           | 59.4               | 0.462                | 0.0709                      | 1.78                          | 0.78                     | 0.659                       |
| 340         | 171 | 7.86           | 58.8               | 0.469                | 0.0701                      | 1.59                          | 0.70                     | 0.975                       |
| 360         | 182 | 7.78           | 58.2               | 0.476                | 0.0693                      | 1.42                          | 0.63                     | 1.41                        |
| 380         | 193 | 7.70           | 57.6               | 0.483                | 0.0685                      | 1.28                          | 0.57                     | 1.99                        |
| 400         | 204 | 7.61           | 56.9               | 0.490                | 0.0678                      | 1.16                          | 0.52                     | 2.77                        |
| 420         | 216 | 7.53           | 56.3               | 0.498                | 0.0670                      | 1.05                          | 0.48                     | 3.77                        |
| 440         | 227 | 7.45           | 55.7               | 0.505                | 0.0662                      | 0.96                          | 0.44                     | 5.06                        |
| 460         | 238 | 7.35           | 55.0               | 0.512                | 0.0654                      | 0.88                          | 0.41                     | 6.68                        |
| 480         | 249 | 7.27           | 54.4               | 0.519                | 0.0646                      | 0.80                          | 0.38                     | 8.70                        |
| 500         | 260 | 7.19           | 53.8               | 0.526                | 0.0639                      | 0.74                          | 0.36                     | 11.2                        |
| 520         | 271 | 7.11           | 53.2               | 0.534                | 0.0631                      | 0.68                          | 0.33                     | 14.2                        |
| 540         | 282 | 7.02           | 52.5               | 0.541                | 0.0623                      | 0.63                          | 0.31                     | 17.8                        |
| 560         | 293 | 6.94           | 51.9               | 0.548                | 0.0615                      | 0.59                          | 0.29                     | 22.2                        |
| 580         | 304 | 6.86           | 51.3               | 0.555                | 0.0607                      | 0.54                          | 0.27                     | 27.3                        |
| 600         | 316 | 6.76           | 50.6               | 0.562                | 0.0600                      | 0.51                          | 0.26                     | 33.3                        |
| 620         | 327 | 6.68           | 50.0               | 0.570                | 0.0592                      | 0.47                          | 0.24                     | 40.3                        |
| 640         | 338 | 6.60           | 49.4               | 0.577                | 0.0584                      | 0.44                          | 0.23                     | 48.3                        |
| 660         | 349 | 6.52           | 48.8               | 0.584                | 0.0576                      | 0.41                          | 0.22                     | 57.5                        |
| 680         | 360 | 6.43           | 48.1               | 0.591                | 0.0568                      | 0.39                          | 0.21                     | 68.0                        |
| 700         | 371 | 6.35           | 47.5               | 0.598                | 0.0561                      | 0.36                          | 0.20                     | 79.9                        |
| 715         | 379 | 6.28           | 47.0               | 0.604                | 0.0555                      | 0.35                          | 0.19                     | 89.7                        |

<sup>a</sup>Maximum recommended bulk temperature 380°C (715°F). These data are based on samples tested in the laboratory and are not guaranteed for all samples. Contact us for complete sales specifications for Therminol 72 fluid. <sup>b</sup>1 cSt = 1 mm<sup>2</sup>/s and 1 mPa·s = 1 cP. <sup>c</sup>100 kPa = 1 bar

# Total Lifecycle Care™

Total Lifecycle Care is a comprehensive service that uses analytics, sampling and training to prevent heat transfer system failures, ensuring safe, efficient and uninterrupted operations.

- Offers industry-leading technical support
- Provides data through Fluid Genius™ for informed decision-making
- Helps minimize unexpected downtime and maintenance costs
- Assists in maximizing fluid life
- Enables safe working environments through tailored safety training
- Helps keep systems running smoothly



## Comprehensive support services

- **In-service heat transfer fluid sample analysis**

Eastman provides comprehensive testing services to extend heat transfer fluid life and ensure system performance by detecting contamination, moisture and degradation through key tests like acid number, viscosity, insoluble solids and moisture content.



- **Fluid Genius™**

Fluid Genius is a web-based portal and sampling service that simplifies fluid sample management by providing expert analysis, fluid condition monitoring, lifespan prediction, early maintenance alerts, technical support and access to a comprehensive knowledge base. Learn more at [fluidgenius.net](http://fluidgenius.net).



## Operational efficiency

- **System design support**

Eastman collaborates with leading manufacturers to provide expert support in heat transfer system design, performance, fluid selection, and compliance, offering seminars, technical visits, and on-site audits to improve system reliability and efficiency.



- **Start-up assistance**

Eastman offers start-up assistance by reviewing procedures and recommending improvements to streamline systems and reduce common issues, with support available from local technical specialists or on-site visits.



- **Flush and refill guidance**

Therminol FF is specially formulated to clean liquid-phase heat transfer systems. After flushing with Therminol FF, refill the system with the appropriate Eastman heat transfer fluid to ensure optimal performance. Contact your local Eastman technical specialist to learn more and get expert guidance.



- **Compliance support**

Our team provides guidance to help you achieve and maintain regulatory compliance related to safety, health and environmental standards, ensuring your operations meet the necessary requirements.



- **Environmental impact**

Eastman supports your sustainability goals by advising on waste heat recovery and water-lean utility deployments using Therminol products to reduce CO<sub>2</sub> emissions and water consumption.



## Operational and safety awareness training

- **Operational training**

Eastman's customized training programs improve expertise in fluid selection and heat transfer system operation for technicians, supervisors, maintenance staff and engineers through core and specialized sessions to enhance design, improve safety and reduce costs.



- **Safety awareness training**

At Eastman, we approach safety with a zero-incident mindset. We offer our customers safety awareness training that focuses on the design start-up, operation and maintenance of heat transfer fluid systems to help ensure safe, efficient operations.



- **Expert global assistance**

Get direct access to experienced technical service specialists who can help answer questions regarding heat transfer fluid selection, system start-ups, system design and operational issues.



For more information, visit [therminol.com](http://therminol.com).

## **EASTMAN**

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