

THERMINOL® 72

Heat Transfer Fluids By

SOLUTIA

Applied Chemistry. Creative Solutions

High Temperature
Excellent Stability
Heat Transfer Fluid

-10°C to

380°C



+400°C

+350°C

+300°C

+250°C

+200°C

+150°C

+100°C

+50°C

+0°C

-50°C

-100°C

Therminol 72 is a high temperature liquid phase heat transfer fluid with excellent thermal stability.

Therminol 72 was developed for use at temperatures up to 380°C in liquid phase heat transfer systems. Static pressure of about 6 bar should maintain the liquid phase at high temperatures.

The properties of Therminol 72 make it ideally suited for high temperature applications in process and refinery operations, such as providing indirect heat to chemical process, heat recovery from stack gases and as a coolant to remove heat from exothermic reactions.

The use of Therminol 72 in 360°C-380°C heat transfer systems can result in a significant reduction in capital investment, and reduced utility and maintenance costs when compared with other pressurised systems using more volatile high melting transfer media.

Thermal Stability

The thermal stability of a heat transfer fluid is one of the most important considerations in the selection of a fluid for operation under specific heat transfer conditions.

Fluid decomposition, for both mineral oil and synthetic hydrocarbon based heat transfer fluids, generally results in the formation of volatile products (low boilers) and polymeric high viscosity fractions (high boilers). The relative proportion of low and high boiler formation, and the solubility of the high boiling fraction, may vary widely and are critical factors when evaluating fluid performance, predicting top-up costs, and the overall risk of deposits or coking.

The chemical composition of Therminol 72 has been carefully selected to minimise the formation of low boilers and eliminate the risk of insoluble high boiler formation and fouling, provided proper attention is given to system design and operation within the maximum bulk and film temperatures specified below.

Typical Physical, Chemical and Thermal Properties of Therminol 72

Composition		Mixture of synthetic aromatics
Appearance		Clear amber liquid
Max. bulk temperature		380°C
Max. film temperature		400°C
Kinematic viscosity @ 40°C	DIN 51562 - 1	5.74 mm ² /s (cSt)
Density @ 15°C	DIN 51757	1084 kg/m ³
Flash point	DIN 51376	132°C
Fire point	ISO 2592	143°C
Autoignition temperature	DIN 51794	585°C
Pour point	ISO 3016	-18°C
Boiling point @ 1013 mbar		271°C
Coefficient of thermal expansion		0.00113/°C
Moisture content	DIN 51777 - 1	< 220 ppm
Total acidity	DIN 51558 - 1	< 0.2 mg KOH/g
Chlorine content	DIN 51577 - 3	< 10 ppm
Copper corrosion	EN ISO 2160	<< 1a
Average molecular weight		190

Note: Values quoted are typical values obtained in the laboratory from production samples. Other samples might exhibit slightly different data. Specifications are subject to change. Write to Solutia for current sales specifications.

Properties of Therminol® 72 vs Temperatures

Temperature °C	Density kg/m³	Thermal Conductivity W/m.K	Heat Capacity kJ/kg.K	Viscosity		Vapour pressure (absolute) kPa*
				Dynamic mPa.s	Kinematic mm²/s**	
-10	1106	0.143	1.471	383.03	346.32	0.96
0	1097	0.142	1.498	59.23	53.99	1.14
10	1088	0.141	1.525	24.37	22.40	1.35
20	1079	0.140	1.552	13.52	12.53	1.60
30	1070	0.138	1.579	8.69	8.12	1.89
40	1061	0.137	1.606	6.09	5.74	2.24
50	1052	0.136	1.633	4.52	4.30	2.65
60	1043	0.135	1.661	3.50	3.36	3.14
70	1034	0.134	1.688	2.79	2.70	3.71
80	1025	0.132	1.715	2.29	2.23	4.39
90	1016	0.131	1.742	1.91	1.88	5.18
100	1007	0.130	1.769	1.61	1.60	6.12
110	998	0.129	1.796	1.39	1.39	7.23
120	989	0.127	1.823	1.20	1.21	8.54
130	979	0.126	1.850	1.05	1.07	10.08
140	970	0.125	1.877	0.93	0.96	11.89
150	961	0.124	1.905	0.83	0.86	14.03
160	952	0.123	1.932	0.74	0.78	16.54
170	943	0.121	1.959	0.66	0.70	19.50
180	934	0.120	1.986	0.60	0.64	22.98
190	925	0.119	2.013	0.55	0.59	27.07
200	916	0.118	2.040	0.49	0.54	31.88
210	907	0.117	2.067	0.45	0.50	37.54
220	898	0.115	2.094	0.42	0.47	44.18
230	889	0.114	2.121	0.38	0.43	51.98
240	880	0.113	2.148	0.35	0.40	61.14
250	871	0.112	2.176	0.33	0.38	71.88
260	862	0.110	2.203	0.30	0.35	84.49
270	853	0.109	2.230	0.28	0.33	99.29
280	844	0.108	2.257	0.26	0.31	116.63
290	834	0.107	2.284	0.25	0.30	136.96
300	825	0.106	2.311	0.23	0.28	160.79
310	816	0.104	2.338	0.22	0.27	188.70
320	807	0.103	2.365	0.20	0.25	221.38
330	798	0.102	2.392	0.19	0.24	259.65
340	789	0.101	2.419	0.18	0.23	304.44
350	780	0.100	2.446	0.17	0.22	356.85
360	771	0.098	2.474	0.16	0.21	418.15
370	762	0.097	2.501	0.15	0.20	489.83
380	753	0.096	2.528	0.14	0.19	573.63

* 1 bar = 100 kPa - ** 1 mm²/s = 1 cSt

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Physical Property Formulae

$$\text{Density (kg/m}^3\text{)} = -0.9065 * T(\text{°C}) + 1097.33$$

$$\text{Heat Capacity (kJ/kg.K)} = 0.00271 * T(\text{°C}) + 1.498$$

$$\text{Thermal Conductivity (W/m.K)} = -1.2133 * 10^{-4} * T(\text{°C}) + 0.142$$

$$\text{Kinematic Viscosity (mm}^2\text{/s)} = e^{\left(\ln\left(\frac{1}{T(\text{°C})+16} + \frac{1}{(T(\text{°C})+16)^2}\right) * 1.73 + 8.68\right)}$$

$$\text{Vapour Pressure (kPa)} = 100 * e^{\left(\frac{-1699810}{T(\text{°C})+10000} + 165.505\right)}$$

The Therminol® Range

Therminol 72 is one of the Solutia synthetic heat transfer fluids covering an operating range from -85°C to +400°C, suitable for most process heating or waste heat recovery applications, and capable of operation at or near atmospheric pressure within their recommended operating temperature range.

As a user's process temperature demands change there is always a Therminol fluid capable of meeting the new requirements. In addition, Therminol fluids are often interchangeable allowing conversion by a simple top-up procedure where this is preferred.

Solutia also has a standard DP-DPO eutectic, Therminol VP-1.

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Quality Management

All our manufacturing units have obtained ISO 9002 quality control certification. This registration means that plant procedures, quality control systems, material sampling, product storage, handling, packaging, shipping, product literature and characteristic data, record keeping and other company procedures are in line with the quality requirements of the ISO 9002 standards and its other national equivalents.

This is your quality assurance.

Health, Safety and Environmental Information

Please contact the Solutia Europe/Africa HQ for the Material Safety Data Sheet, or if any other information concerning health, safety and environmental issues is required during filling or operation of your heat transfer system with this product.



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Therminol is a trademark of Solutia. Therminol has now been adopted as a world-wide brand for the Solutia Heat Transfer Fluid range. Fluids known previously under the Santotherm and Gilotherm brands are identical in composition and performance to the corresponding Therminol brand fluids.

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