

THERMINOL® 59

Heat Transfer Fluids By

SOLUTIA™

Applied Chemistry, Creative Solutions

Thermal Stability
Excellent Pumpability
Heat Transfer Fluid

-39°C to

315°C



+400°C

+350°C

+300°C

+250°C

+200°C

+150°C

+100°C

+50°C

+0°C

-50°C

-100°C

Therminol 59 is a synthetic, organic liquid phase heat transfer fluid with excellent low temperature pumping characteristics and with sufficient thermal stability to allow prolonged satisfactory operation at fluid bulk temperatures up to 315°C.

Therminol 59 is designed for use in indirect heating systems, and is able to deliver efficient, dependable, uniform process heating or cooling without the need for system pressurisation beyond the normal static head requirements of the main circulation pump.

Its excellent characteristics at low temperatures down to -39°C and even below recommend this heat transfer fluid for systems which otherwise would require steam or electric heat tracing.

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, both for 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 59 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.

Thermal Stability

Typical Physical, Chemical and Thermal Properties of Therminol 59

Composition	Alkyl substituted aromatic	
Appearance	Light clear yellow liquid	
Max. bulk temperature	315°C	
Max. film temperature	340°C	
Kinematic viscosity @ 40°C	DIN 51562 - 1	4.04 mm ² /s (cSt)
Density @ 15°C	DIN 51757	978 kg/m ³
Flash point	DIN EN 22719	132°C
Fire point	ISO 2592	163°C
Autoignition temperature	DIN 51794	404°C
Pour point	ISO 3016	-61°C
Boiling point @ 1013 mbar	289°C	
Coefficient of thermal expansion	0.000946/°C	
Moisture content	DIN 51777 - 1	< 200 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	207	

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® 59 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**	
-50	1025	0.126	1.46	2504.31	2443.23	-
-40	1017	0.125	1.49	453.99	446.40	-
-30	1010	0.125	1.52	132.55	131.24	-
-20	1003	0.124	1.55	53.25	53.09	-
-10	996	0.123	1.58	26.52	26.63	-
0	988	0.123	1.62	15.33	15.52	-
10	981	0.122	1.65	9.87	10.06	-
20	974	0.121	1.68	6.86	7.04	-
30	967	0.121	1.71	5.05	5.22	-
40	959	0.120	1.75	3.87	4.04	-
50	952	0.119	1.78	3.07	3.23	-
60	945	0.118	1.81	2.50	2.65	-
70	937	0.118	1.84	2.09	2.23	-
80	930	0.117	1.88	1.77	1.90	-
90	923	0.116	1.91	1.51	1.64	-
100	915	0.115	1.94	1.32	1.44	-
110	908	0.114	1.97	1.15	1.27	-
120	900	0.113	2.01	1.03	1.14	-
130	893	0.112	2.04	0.91	1.02	1
140	885	0.111	2.07	0.81	0.92	2
150	878	0.110	2.11	0.74	0.84	3
160	870	0.109	2.14	0.67	0.77	4
170	862	0.108	2.17	0.61	0.71	5
180	855	0.107	2.21	0.56	0.66	7
190	847	0.106	2.24	0.52	0.61	10
200	839	0.104	2.27	0.48	0.57	13
210	831	0.103	2.31	0.44	0.53	17
220	823	0.102	2.34	0.41	0.50	22
230	815	0.101	2.38	0.38	0.47	28
240	807	0.099	2.41	0.35	0.44	36
250	798	0.098	2.44	0.34	0.42	45
260	790	0.097	2.48	0.32	0.40	56
270	781	0.095	2.51	0.30	0.38	69
280	772	0.094	2.55	0.28	0.36	85
290	763	0.092	2.58	0.27	0.35	103
300	754	0.091	2.62	0.25	0.33	124
310	745	0.090	2.66	0.24	0.32	148
320	735	0.088	2.69	0.23	0.31	176

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

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Physical Property Formulae

$$\text{Density (kg/m}^3\text{)} = 989.086 - 0.692391 * T(^{\circ}\text{C}) - 0.000300218 * T^2(^{\circ}\text{C})$$

$$\text{Heat Capacity (kJ/kg.K)} = 1.61665 + 0.00318359 * T(^{\circ}\text{C}) + 5.46009 * 10^{-7} * T^2(^{\circ}\text{C})$$

$$\text{Thermal Conductivity (W/m.K)} = 0.122684 - 6.47634 * 10^{-5} * T(^{\circ}\text{C}) - 1.36278 * 10^{-7} * T^2(^{\circ}\text{C})$$

$$\text{Kinematic Viscosity (mm}^2\text{/s)} = e^{\left(\frac{503.471}{T(^{\circ}\text{C})+100} - 2.25076\right)}$$

$$\text{Vapour Pressure (kPa)} = 100 * e^{\left(\frac{-5143.72}{T(^{\circ}\text{C})+230} + 9.9246\right)}$$

The Therminol® Range

Therminol 59 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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Please contact us for more information :



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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