THERMINOL® 68

Heat Transfer Fluids By SOLUTIA™

Applied Chemistry, Creative Solutions

Highly Stable Low Viscosity Heat Transfer Fluid

-10°C to 360°C

+400°C
+350°C
+300°C
+250°C
+200°C
+150°C
+100°C
+50°C
+0°C
-50°C
-100°C

TM

Therminol 68 is a high temperature liquid phase heat transfer fluid with excellent thermal stability.

Therminol 68 was developed for use at temperatures up to 360°C in liquid phase heat transfer systems. Static pressure of about 2 bar should maintain the liquid phase at high temperatures.

This product is non-corrosive to typical heat transfer system materials of construction, has low odour and good handling characteristics.

The properties of Therminol 68 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, as a coolant to remove heat from exothermic reactions and for indirect heating of distillation processes.

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, 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 68 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 68

Composition		Mixture of synthetic aromatics
Appearance		Clear pale yellow liquid
Max. bulk temperature		360°C
Max. film temperature		390°C
Kinematic viscosity @ 40°C	DIN 51562 - 1	13.74 mm^2/s (cSt)
Density @ 15°C	DIN 51757	1030 kg/m^3
Flash point	DIN 51376	155°C
Fire point	ISO 2592	165°C
Autoignition temperature	DIN 51794	400°C
Pour point	ISO 3016	-33°C
Boiling point @ 1013 mbar		308°C
Coefficient of thermal expansion		0.00091/°C
Moisture content	DIN 51777 - 1	< 200 ppm
Total acidity	DIN 51558 - 1	< 0.2 mg KOH/g
Chlorine content	DIN 51577 - 3	< 20 ppm
Copper corrosion	EN ISO 2160	<< 1a
Average molecular weight		226

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® 68 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**	
-20	1056.0	0.127	1.495	940.73	890.80	-
-10	1048.8	0.126	1.527	322.42	307.40	-
0	1041.6	0.125	1.559	134.34	128.97	-
10	1034.4	0.124	1.591	65.20	63.03	-
20	1027.2	0.123	1.624	35.68	34.73	-
30	1020.0	0.123	1.656	21.46	21.04	-
40	1012.8	0.122	1.688	13.92	13.74	0.01
50	1005.6	0.121	1.720	9.58	9.53	0.02
60	998.4	0.120	1.753	6.94	6.95	0.03
70	991.2	0.120	1.785	5.22	5.27	0.05
80	984.0	0.119	1.817	4.07	4.13	0.08
90	976.8	0.118	1.849	3.25	3.33	0.14
100	969.6	0.117	1.882	2.66	2.74	0.22
110	962.4	0.116	1.914	2.22	2.31	0.35
120	955.2	0.116	1.946	1.88	1.97	0.53
130	948.0	0.115	1.978	1.62	1.71	0.79
140	940.8	0.114	2.011	1.41	1.50	1.16
150	933.6	0.113	2.043	1.24	1.33	1.67
160	926.4	0.112	2.075	1.10	1.19	2.37
170	919.2	0.112	2.107	0.98	1.07	3.30
180	912.0	0.111	2.140	0.88	0.97	4.54
190	904.8	0.110	2.172	0.80	0.88	6.16
200	897.6	0.109	2.204	0.73	0.81	8.24
210	890.4	0.108	2.236	0.66	0.74	10.90
220	883.2	0.107	2.268	0.61	0.69	14.25
230	876.0	0.107	2.301	0.56	0.64	18.44
240	868.8	0.106	2.333	0.51	0.59	23.61
250	861.6	0.105	2.365	0.48	0.55	29.96
260	854.4	0.104	2.397	0.44	0.52	37.67
270	847.2	0.103	2.430	0.41	0.49	46.07
280	840.0	0.103	2.462	0.38	0.46	58.10
290	832.8	0.102	2.494	0.36	0.43	71.33
300	825.6	0.101	2.526	0.34	0.41	86.94
310	818.4	0.100	2.559	0.32	0.39	105.26
320	811.2	0.100	2.591	0.30	0.37	126.61
330	804.0	0.099	2.623	0.28	0.35	151.37
340	796.8	0.098	2.655	0.26	0.33	179.92
350	789.6	0.097	2.688	0.25	0.32	212.67
360	782.4	0.096	2.720	0.24	0.30	250.06
370	775.2	0.096	2.752	0.23	0.29	292.54

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

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Physical Property Formulae

Density (kg/m³) = -0.72 * T(°C) + 1041.6

Heat Capacity (kJ/kg.K) = 0.003224 * T(°C) + 1.5593

Thermal Conductivity (W/m.K) = $-8.065 * 10^{-5} * T(°C) + 0.12517$

Kinematic Viscosity (mm²/s) = $e^{\left(\frac{716.301}{T(°C)+95.5} - 2.6761\right)}$

Vapour Pressure (kpa) = $100 * e^{\left(\frac{-7073.24}{T(°C)+300} + 11.639\right)}$

The Therminol® Range

Therminol 68 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.

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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