

THERMINOL[®] XP

Heat Transfer Fluid by **Solutia**

Heat Transfer Fluid
With
FDA/USP/NF/NSF
Status

0 °F to
600 °F



-50 °F
-50 °C

0 °F
0 °C

50 °F
50 °C

100 °F
50 °C

150 °F

200 °F
100 °C

250 °F

300 °F
150 °C

Pour Point
-20 °F (-29 °C)

Min. Use Temp.
0 °F (-20 °C)

O P T I M U M

U S E R A N G E *

0 °F TO 600 °F (-20 °C TO 315 °C)

Therminol® XP heat transfer fluid provides for reliable heat transfer to 600 °F. This material has outstanding regulatory status for those seeking heat transfer fluids which have minimum environmental reporting requirements.

THERMINOL® XP
Heat Transfer Fluid by **Solutia**

XP

350 °F

400 °F
200 °C

450 °F

500 °F
250 °C

550 °F

600 °F
300 °CMax. Bulk Temp.
600 °F (315 °C)Max. Film Temp.
625 °F (330 °C)

650 °F

350 °C

700 °F

750 °F
400 °C

TYPICAL PROPERTIES^{*†}

Appearance	Colorless, odorless liquid
Composition	White mineral oil, USP/NF/NSF
Flash Point (ASTM D-92)	199 °C (390 °F)
Fire Point (ASTM D-92)	232 °C (450 °F)
Autoignition Temperature (ASTM E-659)	346 °C (655 °F)
Kinematic Viscosity, at 40 °C	23.7 mm ² /s (cSt)
at 100 °C	4.06 mm ² /s (cSt)
Density at 25 °C	875 kg/m ³ (7.30 lb/gal)
Specific Gravity (60 °F/60 °F)	0.882
Coefficient of Thermal Expansion at 200 °C	0.000892/°C (0.000495/°F)
Average Molecular Weight	350
Pour Point	-29 °C (-20 °F)
Pumpability, at 2000 mm²/s (cSt)	-20 °C (-4 °F)
at 300 mm²/s (cSt)	-1 °C (30 °F)
Minimum Temperatures for Fully Developed Turbulent Flow (Re = 10000)	
10 ft/sec, 1-in tube	72 °C (162 °F)
20 ft/sec, 1-in tube	51 °C (123 °F)
Transition Region Flow (Re = 2000)	
10 ft/sec, 1-in tube	30 °C (85 °F)
20 ft/sec, 1-in tube	17 °C (63 °F)
Boiling Range, 10%	332 °C (630 °F)
90%	416 °C (780 °F)
Normal Boiling Point	358 °C (676 °F)
Heat of Vaporization at Maximum Use Temperature 315 °C	214 kJ/kg (91.9 Btu/lb)
Optimum Use Range	-20 °C to 315 °C (0 °F to 600 °F)
Maximum Film Temperature	330 °C (625 °F)
Pseudocritical Temperature	542 °C (1007 °F)
Pseudocritical Pressure	15.2 bar (220 psia)
Pseudocritical Density	280 kg/m ³ (17.5 lb/ft ³)

* These data are based upon samples tested in the laboratory and are not guaranteed for all samples.

Write us for complete sales specifications for Therminol XP fluid.

† Does not constitute an express warranty. See NOTICE on back page.

P R O P E R T I E S O F T H E R M I N O L[®] X P

Temperature		Liquid Density			Liquid Heat Capacity		Liquid Enthalpy**		Heat of Vaporization	
°F	°C	lb/gal	lb/ft ³	kg/m ³	Btu/(lb•°F) [cal/(g•°C)]	kJ/(kg•K)	Btu/lb	kJ/kg	Btu/lb	kJ/kg
-20	-29	7.59	56.8	909	0.376	1.57	-7.7	-17.8	193.4	449.6
0	-18	7.53	56.3	902	0.389	1.63	0.0	0.0	190.4	442.5
20	-7	7.47	55.9	895	0.403	1.68	7.9	18.4	187.3	435.4
40	4	7.41	55.4	888	0.416	1.74	16.1	37.4	184.2	428.2
60	16	7.35	55.0	881	0.429	1.79	24.6	57.0	181.1	421.0
80	27	7.29	54.6	874	0.442	1.85	33.3	77.3	178.0	413.7
100	38	7.24	54.1	867	0.454	1.90	42.2	98.1	174.8	406.4
120	49	7.18	53.7	860	0.467	1.95	51.4	119.5	171.7	399.0
140	60	7.12	53.2	853	0.479	2.00	60.9	141.5	168.5	391.6
160	71	7.06	52.8	846	0.491	2.06	70.6	164.0	165.3	384.2
180	82	7.00	52.4	839	0.503	2.11	80.5	187.2	162.1	376.7
200	93	6.94	51.9	832	0.515	2.16	90.7	210.8	158.8	369.2
220	104	6.88	51.5	824	0.527	2.20	101.1	235.1	155.6	361.7
240	116	6.82	51.0	817	0.538	2.25	111.8	259.8	152.3	354.1
260	127	6.76	50.6	810	0.550	2.30	122.7	285.1	149.1	346.5
280	138	6.70	50.1	803	0.561	2.35	133.8	310.9	145.8	338.9
300	149	6.64	49.7	796	0.572	2.39	145.1	337.3	142.5	331.3
320	160	6.58	49.2	788	0.583	2.44	156.7	364.1	139.2	323.6
340	171	6.52	48.7	781	0.594	2.48	168.4	391.5	135.9	315.9
360	182	6.45	48.3	773	0.604	2.53	180.4	419.3	132.6	308.2
380	193	6.39	47.8	766	0.614	2.57	192.6	447.6	129.3	300.5
400	204	6.33	47.3	758	0.625	2.61	205.0	476.4	125.9	292.7
420	216	6.27	46.9	751	0.635	2.66	217.6	505.7	122.6	284.9
440	227	6.20	46.4	743	0.645	2.70	230.4	535.5	119.2	277.1
460	238	6.14	45.9	735	0.654	2.74	243.4	565.7	115.8	269.3
480	249	6.07	45.4	728	0.664	2.78	256.5	596.3	112.4	261.4
500	260	6.01	44.9	720	0.673	2.82	269.9	627.4	109.0	253.5
520	271	5.94	44.4	712	0.683	2.86	283.5	658.9	105.6	245.5
540	282	5.87	43.9	703	0.692	2.89	297.2	690.8	102.2	237.6
560	293	5.80	43.4	695	0.701	2.93	311.1	723.2	98.7	229.5
580	304	5.73	42.9	687	0.709	2.97	325.2	756.0	95.3	221.4
600	316	5.66	42.3	678	0.718	3.00	339.5	789.2	91.8	213.3
620	327	5.58	41.8	669	0.726	3.04	354.0	822.7	88.2	205.1

* Maximum recommended bulk temperature 600 °F (315 °C).

† These data are based upon samples tested in the laboratory and are not guaranteed for all samples. Write us for complete sales specifications for Therminol XP fluid.

** The liquid enthalpy basis is zero at 0 °F.

H E A T T R A N S F E R F L U I D * †

Liquid Thermal Conductivity			Liquid Viscosity			Vapor Pressure				Temperature	
Btu/ (ft·hr·°F)	kcal/ (m·hr·°C)	W/(m·K)	lb/(ft·hr)	cSt [mm ² /s]	cP [mPa·s]	psia	mm Hg	kgf/cm ²	kPa	°F	°C
0.0726	0.1080	0.1255	14700	6670	6070					-20	-29
0.0724	0.1077	0.1252	3400	1558	1406					0	-18
0.0722	0.1074	0.1249	1050	484	433					20	-7
0.0720	0.1071	0.1245	402	187.0	166.1					40	4
0.0717	0.1068	0.1241	182.7	85.7	75.5					60	16
0.0715	0.1064	0.1237	94.9	44.9	39.2					80	27
0.0712	0.1060	0.1232	54.8	26.1	22.7					100	38
0.0709	0.1056	0.1227	34.4	16.55	14.23					120	49
0.0706	0.1051	0.1222	23.1	11.21	9.56					140	60
0.0703	0.1046	0.1216	16.42	8.02	6.79					160	71
0.0700	0.1041	0.1210	12.18	6.01	5.04					180	82
0.0696	0.1036	0.1204	9.38	4.66	3.88	0.0018	0.091	0.00012	0.012	200	93
0.0692	0.1030	0.1198	7.43	3.73	3.07	0.0034	0.18	0.00024	0.023	220	104
0.0688	0.1025	0.1191	6.04	3.06	2.50	0.0063	0.33	0.00044	0.043	240	116
0.0684	0.1018	0.1184	5.02	2.56	2.07	0.011	0.58	0.00079	0.077	260	127
0.0680	0.1012	0.1176	4.23	2.18	1.750	0.019	1.0	0.0014	0.13	280	138
0.0676	0.1005	0.1169	3.63	1.885	1.500	0.032	1.7	0.0023	0.22	300	149
0.0671	0.0999	0.1161	3.15	1.650	1.301	0.053	2.7	0.0037	0.36	320	160
0.0666	0.0992	0.1153	2.76	1.460	1.140	0.084	4.3	0.0059	0.58	340	171
0.0661	0.0984	0.1144	2.44	1.303	1.008	0.129	6.7	0.0091	0.89	360	182
0.0656	0.0977	0.1135	2.17	1.172	0.898	0.196	10.1	0.0137	1.35	380	193
0.0651	0.0969	0.1126	1.948	1.062	0.805	0.289	15.0	0.0203	2.00	400	204
0.0646	0.0960	0.1116	1.757	0.967	0.726	0.420	21.7	0.0296	2.90	420	216
0.0640	0.0952	0.1107	1.592	0.886	0.658	0.600	31.0	0.0422	4.13	440	227
0.0634	0.0944	0.1097	1.449	0.815	0.599	0.841	43.5	0.0592	5.80	460	238
0.0628	0.0935	0.1086	1.324	0.752	0.547	1.16	60.1	0.0817	8.01	480	249
0.0622	0.0926	0.1076	1.214	0.697	0.502	1.58	81.9	0.111	10.9	500	260
0.0616	0.0916	0.1065	1.116	0.648	0.461	2.13	110	0.150	14.7	520	271
0.0609	0.0906	0.1053	1.028	0.604	0.425	2.82	146	0.198	19.5	540	282
0.0602	0.0896	0.1042	0.950	0.565	0.393	3.70	191	0.259	25.5	560	293
0.0596	0.0886	0.1030	0.879	0.529	0.363	4.80	248	0.337	33.1	580	304
0.0588	0.0876	0.1018	0.815	0.497	0.337	6.16	318	0.433	42.5	600	316
0.0581	0.0865	0.1005	0.757	0.468	0.313	7.82	405	0.550	54.0	620	327

TECHNICAL SERVICE HOTLINE (800) 433-6997



PHYSICAL AND CHEMICAL CHARACTERISTICS

As an indicator of purity, Therminol XP meets FDA specifications defined in 21 CFR 172.878, requirements of United States Pharmacopeia (USP) and National Formulary (NF) and is registered with the NSF (HT-1). Also, a user should carefully review the information contained in a properly prepared Material Safety Data Sheet prior to making a fluid decision.

Solutia recommends that systems utilizing Therminol XP fluid should be blanketed with an inert atmosphere. Inert gas blanketing minimizes fluid oxidation and helps maximize fluid life. A system pressure relief device also should be provided.

THERMINOL[®] XP

Heat Transfer Fluid by **Solutia**

While Therminol XP 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. The insurer of your property should be consulted relative to this matter.

Therminol XP is non-corrosive to metals commonly used in the design of heat transfer systems.

The recommended maximum bulk (600 °F/315 °C) and film (625 °F/330 °C) temperatures are based on detailed thermal studies. Operation at or below these temperature maximums will provide long service life under most operating conditions.

SAFETY AND HANDLING

Material Safety Data Sheets may be obtained through www.Therminol.com or from Environmental Operations, Solutia Inc. Heat transfer fluids are intended only for indirect heating purposes. Under no circumstances should this product contact or in any way contaminate food, animal feed, food products, food packaging materials, food chemicals, pharmaceuticals or any items which may directly or indirectly be ultimately ingested by humans. Any contact may contaminate these items to the extent that their destruction may be required. Precautions against ignitions and fires should be taken with this product.

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REGIONAL SALES OFFICES

NORTH AMERICA

Solutia, Inc. - Headquarters
P.O. Box 66760
St. Louis, Missouri 63166-6760
Customer Service (800) 426-2463
Technical Service (800) 433-6997
Fax: (314) 674-7907

SOUTH AMERICA

Solutia Brazil Ltda.
Rua Gomes de Carvalho
1306-6 andar 04547-005
Sao Paulo, SP, Brazil
Tel: +55-11-3146-1800
Fax: +55-11-3146-1818

EUROPE/AFRICA/ MIDDLE EAST

Solutia Europe N.V./S.A.
Rue Laid Burniat, 3
Parc Scientifique – Fleming
B-1348 Louvain-la-Neuve (Sud)
Belgium
Tel: +32.10.48.12.11
Fax: +32.10.48.12.12

ASIA/PACIFIC

China

Solutia International Trading Co. Ltd.
Unit 1018, Ocean Towers,
No. 550 Yan'an Road (E),
Shanghai, P. R. China 200001
Tel: +86-21-6361-2266
Fax: +86-21-6361-7708

India

Solutia Chemicals India Pvt Ltd.
205-207, Midas Building, 2nd Floor
Sahar-Plaza Complex
Andheri-Kurla Road
Andheri East
Mumbai-400059 India
Tel: +91-22-2830-2860
Fax: +91-22-2830-2859

Japan

Solutia Japan Ltd.
Shinkawa Sanko Building
Second Floor
1-3-17, Shinkawa, Chuo-ku
Tokyo 104-0033, Japan
Tel: +81-3-3523-2080
Fax: +81-3-3523-2070

Singapore

Solutia Singapore Pte. Ltd.
101 Thomson Road
#19-01/02 United Square
Singapore 307591
Tel: +65-6357-6100
Fax: +65-6357-6201

A complete list of worldwide Therminol sales offices can be found in the “Contact us” section of our website, www.therminol.com.

Visit our Web site at
www.therminol.com.



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FOR YOUR FACILITY

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Therminol TLC Total Lifecycle Care is a complete program of products and services from Solutia designed to keep your heat transfer system in top operating condition through its entire lifecycle.

*Available only in North America



Solutia
P.O. Box 66760
St. Louis, MO 63166-6760
Tel: (314) 674-1000

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