Monsanto

THERMINOL® 88

HIGH TEMPERATURE
HEAT TRANSFER FLUID

...for use in liquid phase between 300° and 800°F

TYPICAL PROPERTIES OF THERMINOL® 88

Composition	Mixed terphenyls
Appearance	Crumbly wax-like flakes at room temperature. Light amber liquid above Melt Point.
Color	Yellow to light amber
Odor	Faint, pleasant
Melt Point begins to soften completely liquid	 140°F (60°C) 293°F (145°C)
Flash Point	375°F (191°C)
Flame Point	460°F (238°C)
Autoignition Temperature	>1000°F
Coefficient of Expansion	0.00047 cc/cc/°F
Latent Heat of Fusion	5.0-5.1 K Cal/mole
Molecular Weight	230
Boiling Range	687°-784°F (364°-418°C)

The information contained in this bulletin is, to our best knowledge, true and accurate, but all recommendations or suggestions are made without guarantee since the conditions of use are beyond our control. The Monsanto Company disclaims any liability incurred in connection with the use of these data or suggestions. Furthermore nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use.

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PHYSICAL PROPERTIES - THERMINOL 88

Temp. °F	Density gm/cc	Kinematic Viscosity cs	Specific Heat BTU/# °F	Thermal Conductivity BTU/hr-ft-°F	Vapor Pressure mm Hg
77	1.133	-	-	-	-
200	-	-	-	-	-
300	1.01	1.57	0.467	0.0738	1.2
400	0.96	0.87	0.497	0.0712	11
500	0.92	0.55	0.525	0.0686	65
600	0.88	0.38	0.554	0.0660	260
700	0.83	0.29	0.584	0.0634	800
800	0.79	0.23	0.613	0.0608	1500
900	0.74	0.19	0.642	0.0581	3000

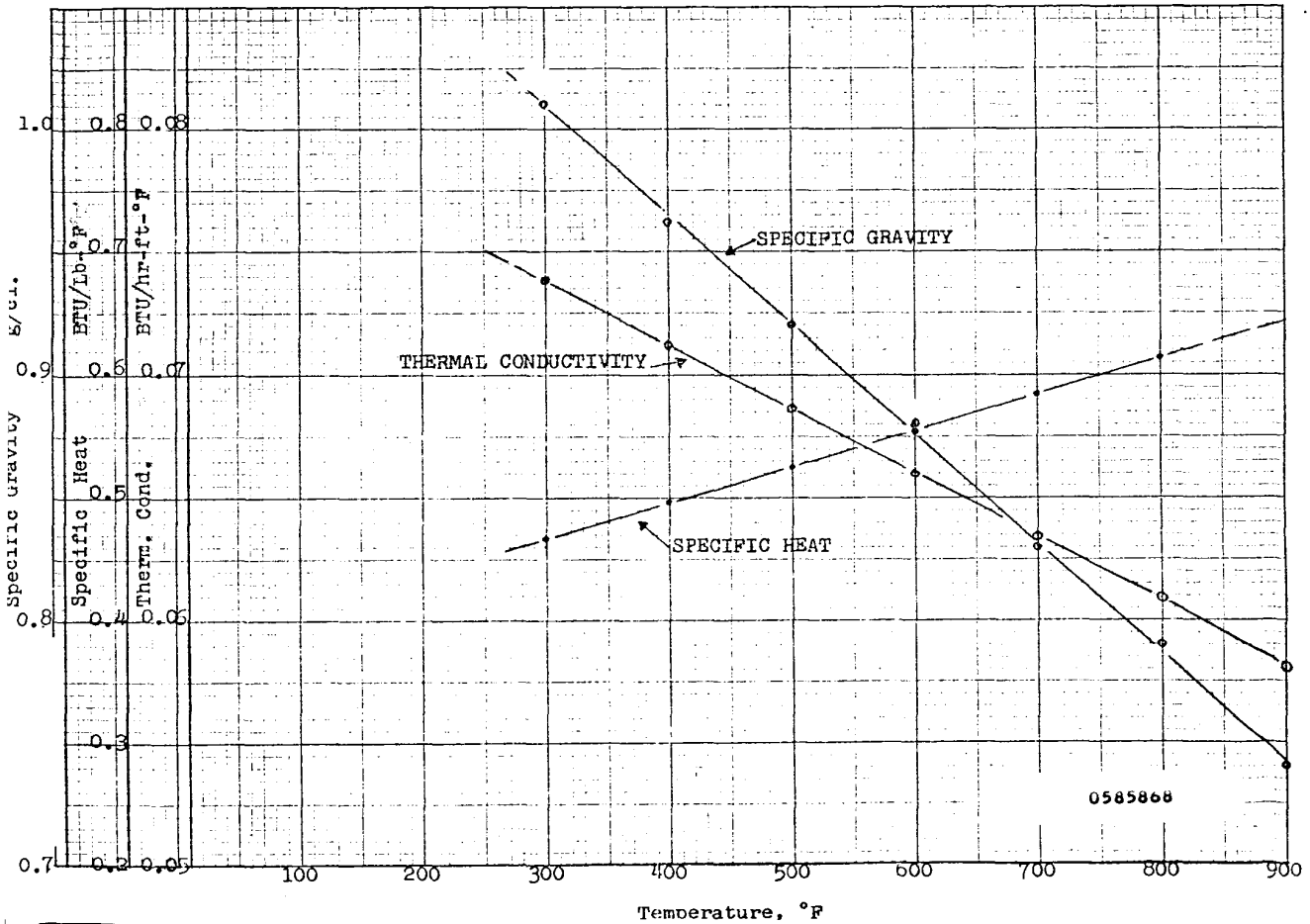
THERMAL DECOMPOSITION

Temperature, °F	% Polymerized/Hr.
700	0.000065
800	0.0048
900	0.32

Therminol 88 is usable with as much as 30% polymer content which affect properties as follows:

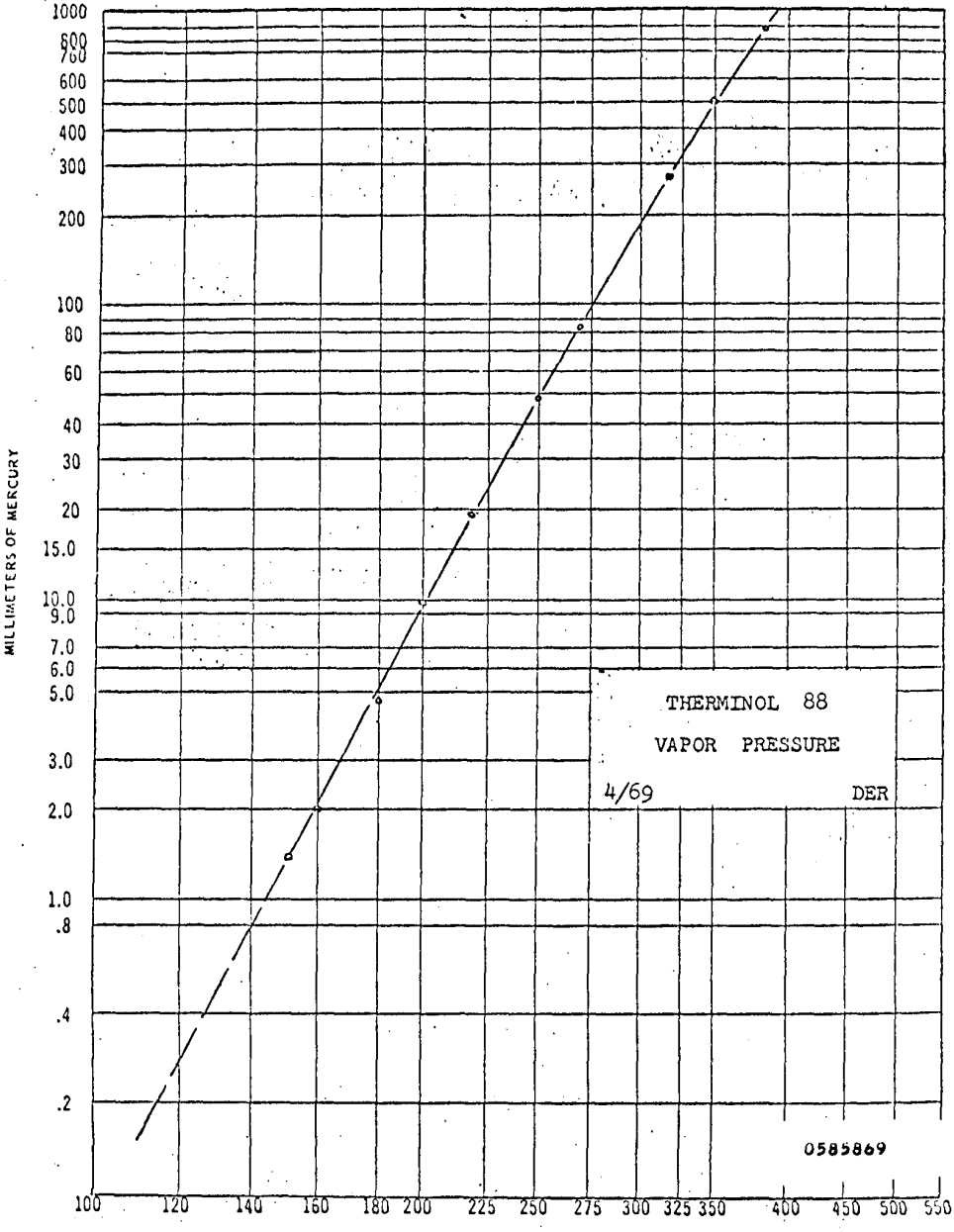
Melt Point	293° to 276°F
Flash & Flame Point, AIT	No appreciable change
Specific Gravity	+ 7% at 800°F
Viscosity	+35% at 800°F
Specific Heat	- 1% at 800°F
Thermal Conductivity	-13% at 800°F

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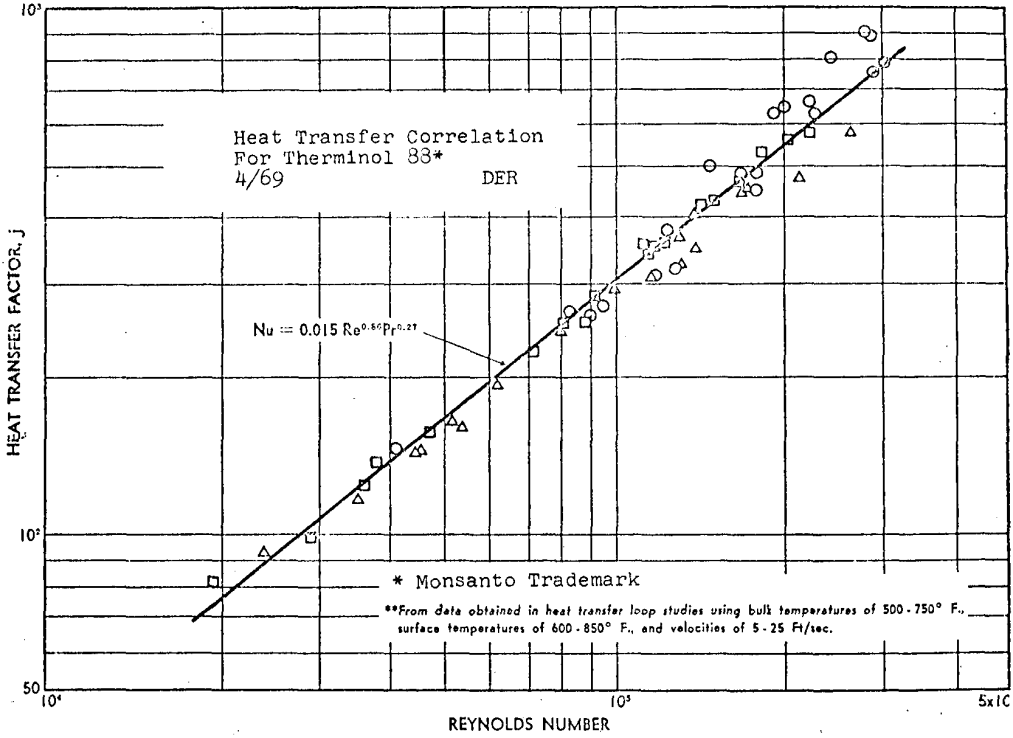
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THERMINOL 88
Heat Transfer Correlation

This equation and j-factor plot is adequate to approximately plus/minus 7% and was developed for polyphenyls by A.I.

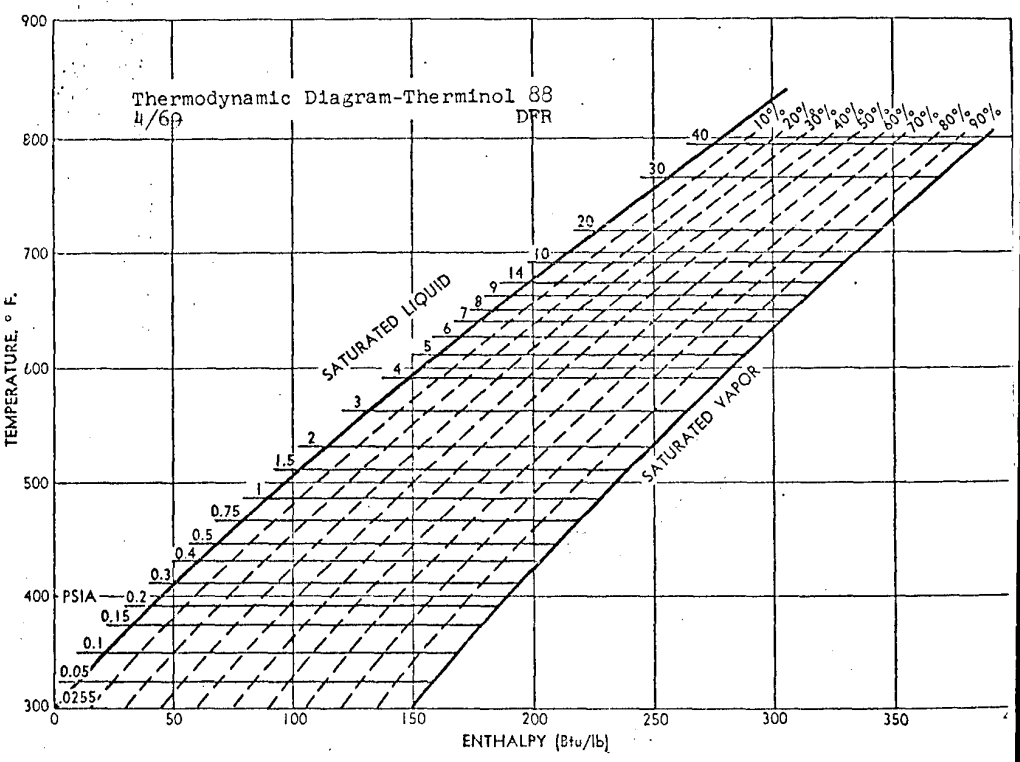


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THERMINOL 88
Thermodynamic Diagram

While we do not propose that Therminol 88 be used as a vapor phase heat transfer medium, we often are requested to provide a thermodynamic network--which appears below.



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TYPICAL ELECTRICAL PROPERTIES THERMINOL 88

Dielectric Constant at 77°F	2.58 at 60 cps
Volume Resistivity	
at 212°F	140,000 x 10^9 ohm-cm
at 275°F	35,000 x 10^9 ohm-cm
at 311°F	550 x 10^9 ohm-cm

SOLUBILITY OF THERMINOL 88 IN MISCELLANEOUS SOLVENTS

Solvent	Grms. Therminol 88 per 100 ml. of solvent	
	25° C.	75° C.
3A Alcohol	0.008	0.6
Turpentine	1.2	9.0
Fuel Oil, API 36°, 38 S.U.S. at 100° F	1.66	8.4
Benzene	6.0	42.0
Trichlorobenzene	9.0	45.0
Stoddard's Solvent	0.7	8.0
Nitromethane	0.2	7.5
Nitroethane	2.0	15.0
1-Nitropropane	2.0	20.0
2-Nitropropane	2.0	20.0
(See also Figs. 1 and 2.)		

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SOLUBILITY OF THERMINOL 88 IN COMMON SOLVENTS

Fig. 1 - Solubility of Therminol 88 in Four Common Solvents

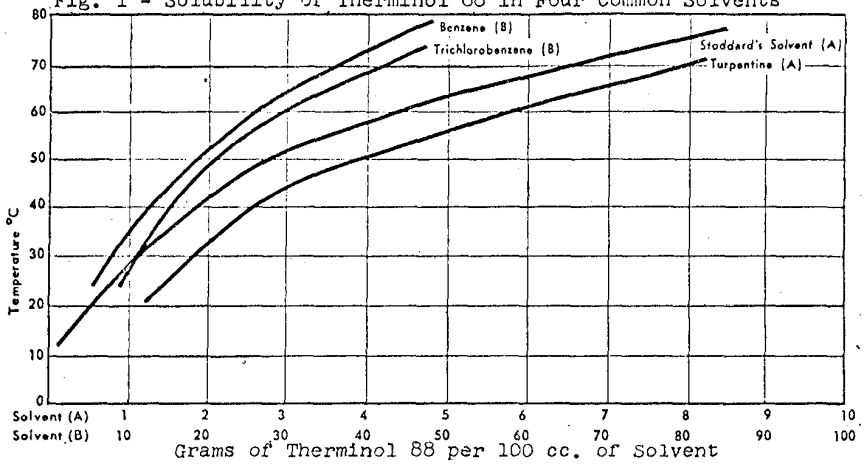
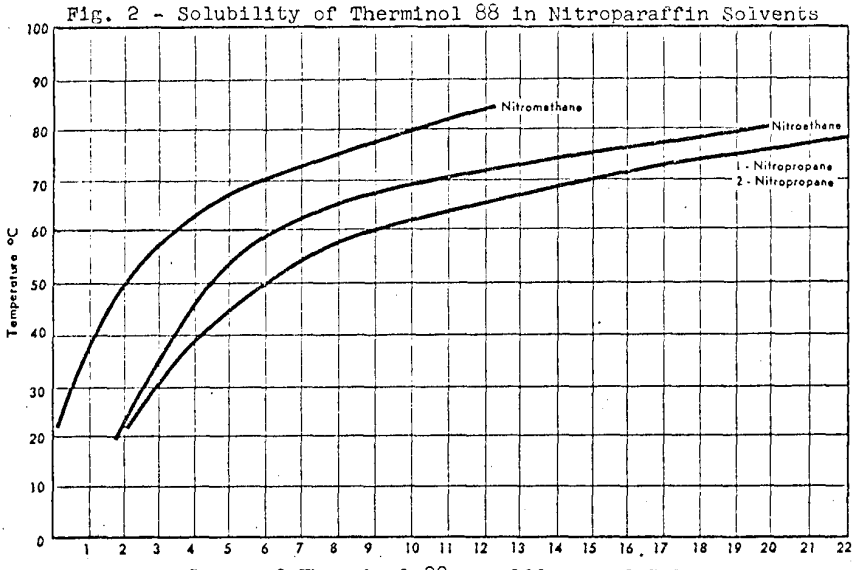


Fig. 2 - Solubility of Therminol 88 in Nitroparaffin Solvents



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