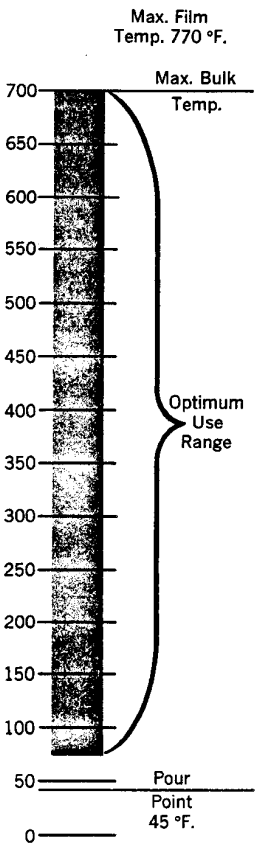
Therminol 77 IC/FF-77



. . . high-temperature liquid phase heat transfer fluid for non-pressurized indirect heating to 700° F.

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, 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.

Monsanto

"Nothing contained herein is to be construed as a recommendation to use any product in conflict with any patent. MONSANTO MAKES NO WARRANTIES AS TO THE FITNESS OR MERCHANTABILITY OF ANY PRODUCT REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations, and disclaims all liability for any resulting loss or damage."

FUNCTIONAL PRODUCTS / Monsanto Industrial Chemicals Co.
800 North Lindbergh Blvd., St. Louis, Missouri 63166

0085684

TOWOLDMON0021943

Therminol 77 ... Typical Properties

is a high-performance synthetic heat transfer fluid offering extended high-temperature performance — up to 700°F. This fluid finds application in paint and resin manufacture, high-temperature plastics extrusion, chemical processing, thermostatic devices, plastics lamination, and many others.

Therminol 77 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.

This fluid is designed for use in non-pressurized indirect heating systems. It delivers efficient, dependable process heat with no need for high pressures, costly "extra" equipment, or continuous supervision.

Although Therminol 77 does degrade (thermally) at temperatures above 700°F., it offers outstanding service life and thermal stability below this upper temperature limit. Therminol 77 has been used in some commercial heat transfer systems up to 830°F., since its degradation products are primarily polymers which are soluble in the bulk fluid and do not form insulating deposits in the system. For optimum performance, however, Therminol 77 should not be used in applications exceeding 700°F.

Composition	Aromatic Ether
Appearance	Light amber oily liquid
Odor	Faint, characteristic
Pour Point	45°F.
Density @ 75°F.	9.67
Flash Point	450°F.
Fire Point	500°F.
AIT	1115°F.
Coefficient of Expansion	0.00061 cc/cc/°C.
Boiling Range:	
10%	705°F.
90%	900°F.
Average Molecular Weight	330

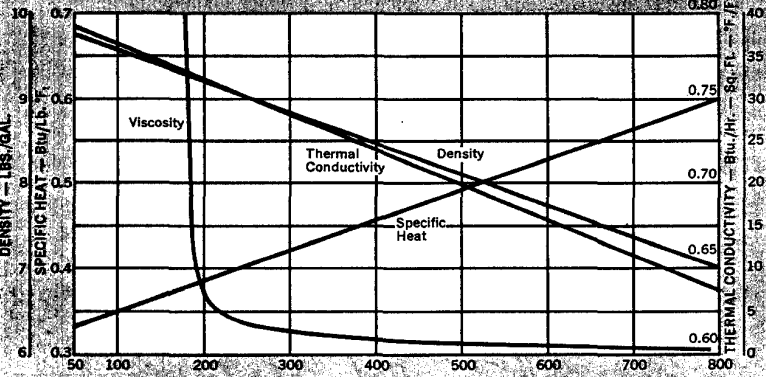
Variations of Properties With Temperature

Temperature		Density			Specific Heat		Thermal Conductivity		Viscosity		Vapor Pressure	
°F	°C	lbs./gal.	lb./ft.³	Kg./m.³	BTU/lb. °F	Kcal./Kg. °C	BTU/ft. hr. °F	Kcal./m. hr. °C	lb./hr. ft.	cs	mmHg. absolute	Kg./cm.²
100	38	9.60	70.3	1152	0.350	0.350	0.0781	0.1163	445	181	—	—
200	93	9.26	69.0	1106	0.375	0.375	0.0760	0.1132	20.8	7.78	—	—
300	149	8.94	66.6	1070	0.420	0.420	0.0739	0.1100	6.89	2.65	0.27	0.0003
400	204	8.58	64.2	1029	0.455	0.455	0.0719	0.1070	3.72	1.50	1.03	0.0014
500	260	8.16	61.2	981	0.495	0.495	0.0698	0.1040	2.28	0.96	9.2	0.0125
600	316	7.76	58.0	931	0.530	0.530	0.0680	0.1012	1.48	0.66	44	0.06
700	371	7.38	55.2	885	0.560	0.560	0.0658	0.0981	1.07	0.50	168	0.229
800	426	7.05	52.7	845	0.600	0.600	0.0638	0.0948	0.84	0.41	530	0.722

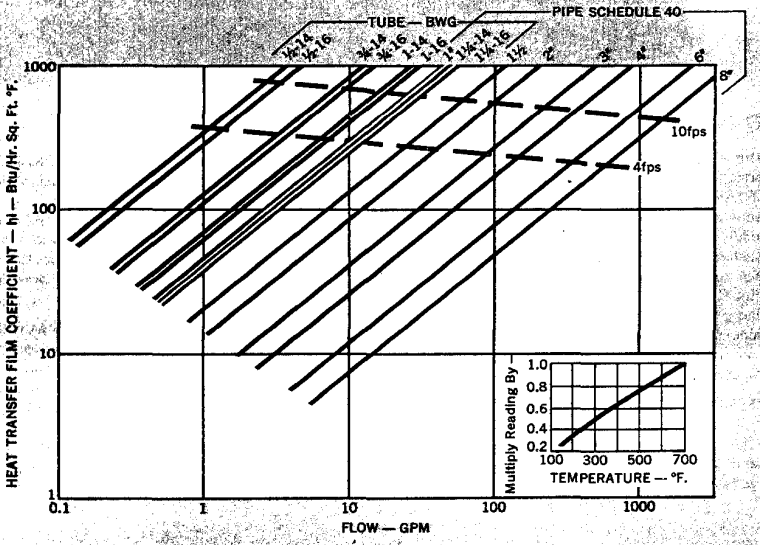
0085685

TOWOLDMON0021944

Therminol 77—Physical Properties

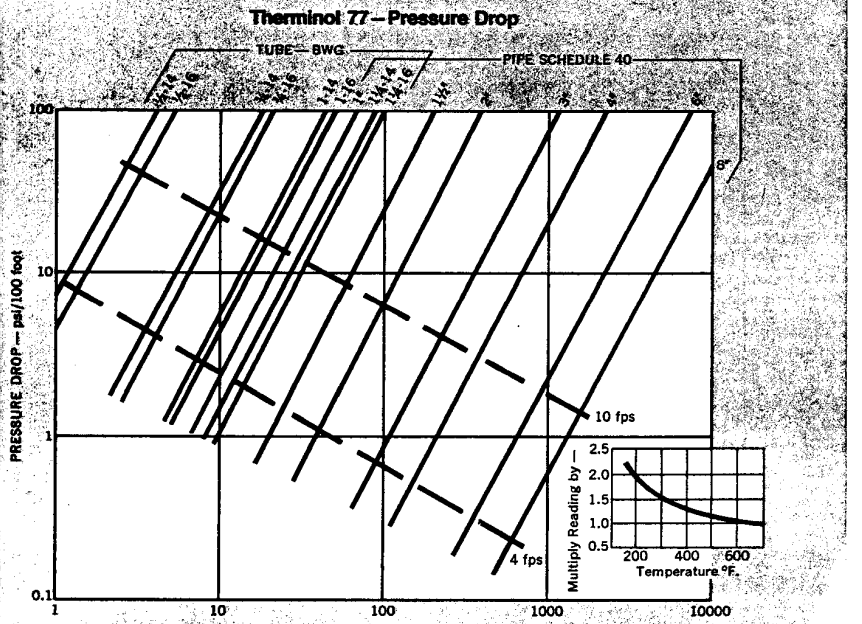


Therminol 77—Heat Transfer Coefficients



0085686

TOWOLDMON0021945



Therminol 77—Safety of Handling

Therminol 77 is virtually non-toxic and non-irritating, posing no special handling problems. It is not absorbed through the unbroken skin in significant quantities, is non-irritating to the skin and only mildly irritating if eye contact occurs. Immediate flushing of the eye with copious amounts of water will avoid irritation or after-effects. It is suggested that Therminol 77 be washed off the skin with soap and water as soon as possible after contact, but no serious irritation should be observed. Handled like any other industrial chemical, Therminol 77 is quite safe to store and use.

Therminol 77 vapors are not toxic, but may cause discomfort if coming off of heated fluid. There is no vapor exposure problem when transferring the fluid from its shipping container to the heat transfer system. On the other hand, vapors emitted by Therminol 77 heated to elevated temperatures may be mildly irritating upon prolonged exposure. In heat transfer installations, the fluid is used in a closed, non-pressurized system free from leaks and with the expansion tank vent trapped so as to condense any vapors. Consequently, there should be little or no opportunity for workers to come in contact with vapors.

While Therminol 77 poses no serious problems with respect to the environment, as a concerned supplier to industry, Monsanto urges the user to maintain a tight system, to correct leakage promptly, and to exercise care in the handling and disposal of this and all other such products. A tight maintenance program not only protects the environment, but keeps employes comfortable, the working area clean, and the system running smoothly.

0085687

2-3267-04-72-6 LITHO IN U.S.A.

TOWOLDMON0021946