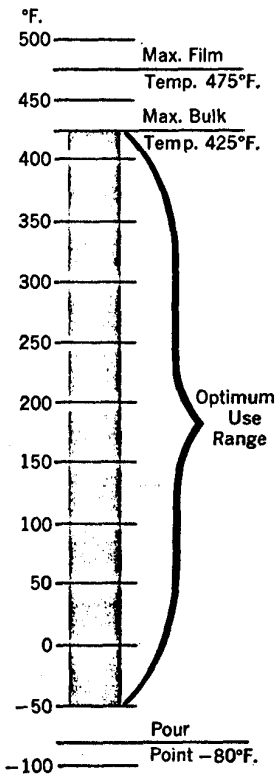
Therminol® 44

IC/FF-32



. . . low-temperature liquid phase heat transfer fluid for non-pressurized indirect heating and cooling from −50° to 425°F. Especially suited for low ambient temperature applications.

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

Box

NOTICE: 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 FOR A PARTICULAR PURPOSE 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

Use Current MIC Address Line

0615980

®Registered Trademark of Monsanto Company

*In certain countries of Western Europe and the Far East, Monsanto sells Therminol Heat Transfer Fluids under the brand name "Santotherm® Heat Transfer Fluids". Corresponding Therminol and Santotherm fluids are identical in composition.

TOWOLDMON0039382

Therminol® 44 . . .

is a specially formulated synthetic heat transfer fluid offering outstanding low-temperature pumpability for use in cold ambient environments. It can be used to 425°F bulk temperatures and is liquid over its use range.

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

Therminol 44 is not classified as a fire-resistant heat transfer fluid. The use of protection devices may be required to minimize fire risk.

Therminol 44 may oxidize on air contact when hot. Inert gas blanketing is suggested for hot system expansion tanks. Therminol 44 is compatible with metals normally used in high-temperature heat transfer systems.

Typical Properties*

Composition	Modified Ester Based Fluid
Appearance	Clear yellow liquid
Odor	Faint
Pour Point	−80° to −90°F. (−62° to −68°C.)
Density @ 75°F.	7.67 lbs./gal.
Flash Point, coc.	405°F. (207°C.)
Fire Point, coc.	438°F. (225°C.)
AIT	705°F. (374°C.)
Coefficient of Expansion	0.0008 cc/cc/°C.
Boiling Range:	
10%	638°F. (337°C.)
90%	734°F. (390°C.)
Average Molecular Weight	367

*This data is based upon samples tested in the laboratory and is not guaranteed for all samples. Write us for complete sales specifications for Therminol 44 heat transfer fluid.

Variations of Properties With Temperature

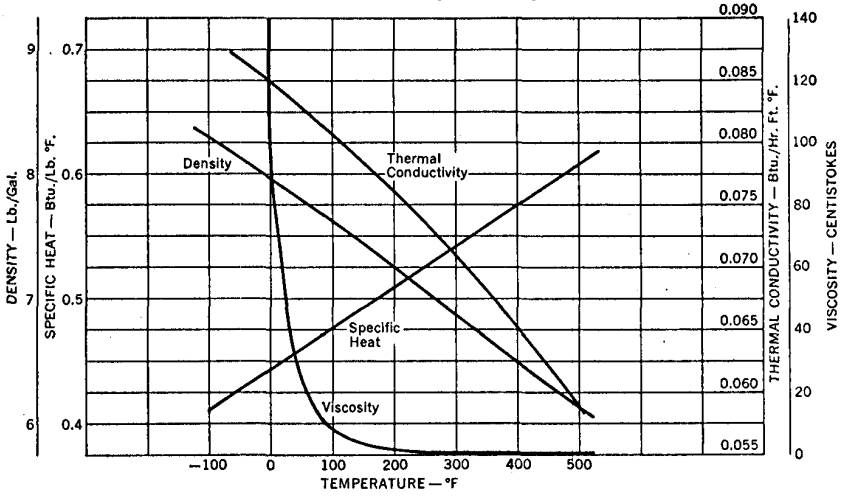
Temperature		Density			Specific Heat		Thermal Conductivity		Viscosity		Vapor Pressure	
°F	°C	lbs./gal.	lb./ft.³	Kg./m.³	BTU/lb. °F	Kcal./Kg. °C	BTU/ft. hr. °F	Kcal./m. hr. °C	lb./hr. ft.	cs	mmHg. absolute	Kg./cm.²
−65	−53.8	8.18	61.2	980	0.421	0.421	0.0874	0.1301	6321	6450	—	—
−50	−45.6	8.13	60.8	974	0.426	0.426	0.0866	0.1290	1948	2000	—	—
0	−17.8	7.95	59.5	953	0.443	0.443	0.0847	0.1261	119	125	—	—
50	10.0	7.78	58.2	932	0.459	0.459	0.0828	0.1233	22.8	24.5	—	—
100	37.8	7.63	57.1	915	0.476	0.476	0.0806	0.1200	8.05	8.80	—	—
150	66	7.43	55.6	890	0.492	0.492	0.0782	0.1164	3.92	4.40	—	—
200	93	7.23	54.1	867	0.508	0.508	0.0760	0.1132	2.34	2.70	—	—
250	121	7.05	52.8	845	0.524	0.524	0.0736	0.1096	1.54	1.82	<0.2	—
300	149	6.88	51.5	825	0.542	0.542	0.0709	0.1056	1.07	1.30	0.6	—
350	177	6.69	50.1	802	0.558	0.558	0.0680	0.1013	0.84	1.05	2.0	0.0027
400*	204	6.51	48.7	780	0.574	0.574	0.0651	0.0969	0.66	0.85	5.5	0.0075
450	232	6.32	47.3	757	0.590	0.590	0.0620	0.0923	0.52	0.69	20	0.027
500	260	6.14	46.0	736	0.607	0.607	0.0587	0.0874	0.42	0.57	47	0.064

*Maximum Recommended Bulk Temperature: 425°F.

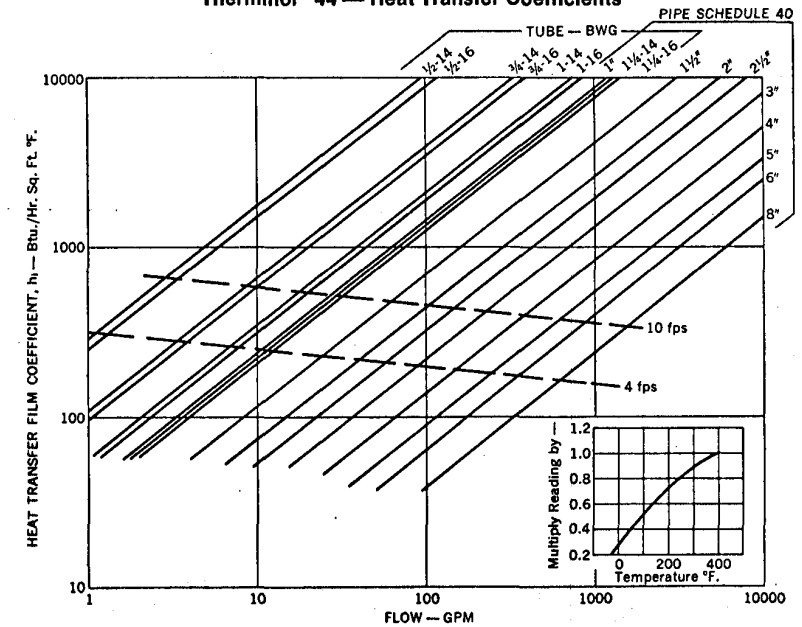
0615981

TOWOLDMON0039383

Therminol® 44 — Physical Properties



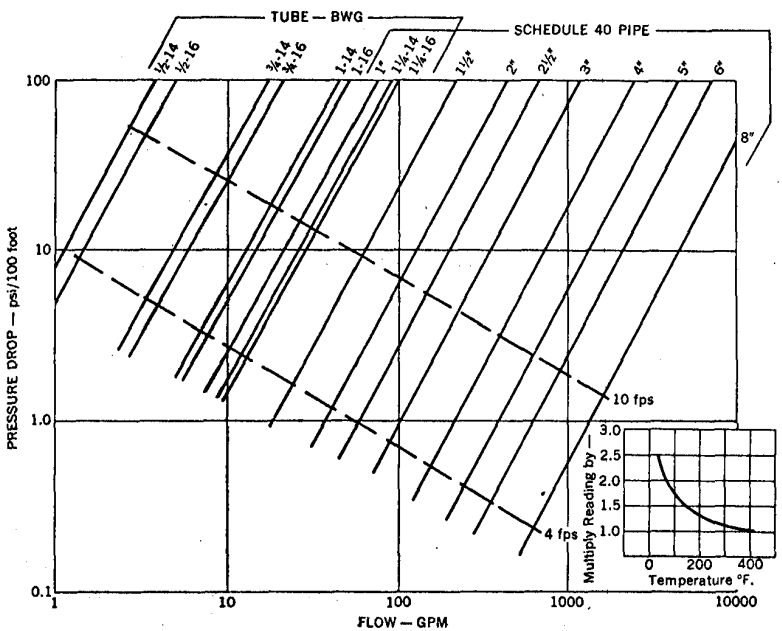
Therminol® 44 — Heat Transfer Coefficients



0615982

TOWOLDMON0039384

Therminol® 44 — Pressure Drop



Therminol 44 — Safety of Handling

Therminol 44 is essentially non-toxic and non-irritating, posing no special handling problems. It is not absorbed through unbroken skin in significant quantities, but may be mildly irritating to the skin on prolonged exposure. It is suggested that Therminol 44 be washed off skin and from clothing with soap and water soon after contact. Therminol 44 is a slight irritant should eye contact occur. Immediate flushing of the eye with copious amounts of water will avoid irritation or after-effects. Handled like any other industrial chemical, Therminol 44 is quite safe to store and use.

Therminol 44 vapors are not toxic, but may cause discomfort if coming off of heated fluid. There is no vapor exposure when transferring cold fluid from shipping container to the heat transfer system. Vapors emitted by Therminol 44 heated to elevated temperatures may be mildly irritating on prolonged exposure. In heat transfer installations, the fluid is used in a closed, nonpressurized system free from leaks and with 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 heated vapors.

While Therminol 44 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.

0615983

TOWOLDMON0039385