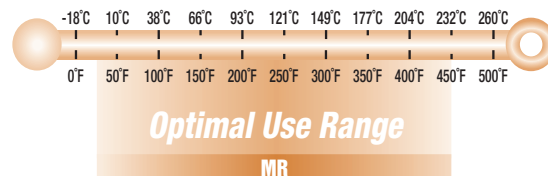


Paratherm-MR™

Heat Transfer Fluid



Single-Fluid Heating/Cooling • Non-Toxic

ENGINEERING BULLETIN MR 909

Paratherm MR® heat transfer fluid is a fully saturated hydrocarbon-based heat transfer fluid formulated for use in standard hot-oil units for heating to 480°F and cooling to 25°F.

Applications include:

- Injection blow-molding machines
- Laminating lines
- Pilot-plant reactor temperature control

Expanded operating range

The low range viscosity of Paratherm MR can expand the operating range of any standard hot-oil temperature-control unit. This eliminates the need to flush equipment, molds and lines between low- and high-temperature production runs.

Low odor, exceptional stability

Because it's not an aromatic-based fluid, Paratherm MR can be used in portable temperature control without producing any of the annoying smells characteristic of synthetics. Also unlike synthetics, it has excellent resistance to sludging so fluid replacement can occur on your schedule.

Fluid storage

Drums should be stored inside to prevent water from getting into the heat transfer fluid. If sealed drums must be left outdoors, they should be stored on their sides. While unopened totes are weatherproof, they should not be stacked if left outdoors. If the fluid is to be stored outside below its minimum pumpable temperature, the containers should be moved indoors to warm up before charging the fluid into the system.

Replacing existing fluid

In many cases, changing fluid involves a straightforward drain and fill. There are very few fluids

Typical Properties*

Chemical Name	Linear Alkene
Appearance	Water White Liquid
Odor	Slight Odor
Maximum Recommended Film Temperature	500°F/260°C
Maximum Recommended Operating Temperature - Fired Heaters	450°F/232°C
Maximum Recommended Operating Temperature - All Others	480°F/249°C
Minimum Operating Temperature 20 cPs (20 mPa-s)	25°F/-4°C
Minimum Start-up Temperature 300 cPs (300 mPa-s)	-47°F/-44°C
Viscosity at 60°F/15.5°C cSt (mm ² /sec)	10
Density at 60°F/15.5°C lb/gal (kg/m ³)	6.7 (802)
Flash Point Cleveland Open Cup (D92)	>320°F/160°C
Flash Point Pensky-Martens Close Cup (D93)	>275°F/135°C
Vapor Pressure @ maximum operating temperature psia (kPa)	1.3 (9)
Average Volume Expansion, %/100°F (°C)	4.4 (7.9)
Average Molecular Weight	300
Dielectric Breakdown voltage D1816-04 (kV, 0.1" gap)	28.57
Dielectric Constant (1 KHz) D924-04	2.078
Dissipation Factor (1 KHz) D924-04	0.000008
Volume Resistivity at 100V (0-cm) D257-07	3.04X10 ¹⁴
Heat of Combustion (approximate) BTU/lb (kJ/kg)	20,000 (46,300)
Heat of Vaporization (approximate) BTU/lb (kJ/kg)	115 (266)
Pour point D97	<-50°F/-45°C

* These are typical laboratory values, and are not guaranteed for all samples.

that are so incompatible that 10-15% residue will affect the new Paratherm. If you have any questions, contact us.

Charging new systems

Unless required for product-quality reasons, new systems do not need to be cleaned before Paratherm is charged. The amount of chemical coatings, oils, and other manufacturing residues are usually not enough to affect the fluid life. All that is necessary is to install a Y-strainer with a minimum 60-mesh screen upstream of the pump to catch any metal or welding residue. The screen can be removed once the system has been cycled twice through its operating temperature.

Fluid analysis

The fluid in new systems should be tested within the 9 to 12 months of start-up. New fluid in existing systems should be tested within the first month of operation to establish a baseline for future testing.



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Paratherm MR™ Heat Transfer Fluid

Physical Properties

°F	°C	Viscosity			Relative Density	Weight		Thermal Conductivity BTU/hr-ft-°F	Specific Heat BTU/lb-°F	Vapor Pressure	
		cSt	cPs	lb/(ft-hr)		lb/gal	lb/ft ³			mm HG	psia
-50	-46	377	330	799	0.87	7.3	54.6	0.077	0.54		
-25	-32	106	91	220	0.86	7.2	53.5	0.077	0.54		
0	-18	48	40	98	0.84	7.0	52.5	0.077	0.55		
25	-4	24	19	47	0.82	6.9	51.5	0.077	0.56		
50	10	13	11	26	0.81	6.8	50.6	0.077	0.56		
75	24	8.0	6.4	15	0.80	6.6	49.7	0.077	0.57		
100	38	5.5	4.3	10	0.78	6.5	48.8	0.077	0.58		
125	52	4.0	3.1	7.4	0.77	6.4	48.0	0.077	0.58		
150	66	3.0	2.3	5.5	0.76	6.3	47.2	0.076	0.59		
175	79	2.3	1.7	4.1	0.75	6.2	46.5	0.076	0.60		
200	93	1.7	1.3	3.0	0.73	6.1	45.9	0.076	0.60		
225	107	1.4	1.0	2.5	0.72	6.1	45.3	0.075	0.61		
250	121	1.2	0.87	2.1	0.72	6.0	44.7	0.075	0.61		
275	135	1.1	0.76	1.8	0.71	5.9	44.2	0.074	0.62	1.8	
300	149	0.95	0.66	1.6	0.70	5.8	43.7	0.073	0.63	3.4	
325	163	0.85	0.59	1.4	0.69	5.8	43.3	0.073	0.63	6.1	
350	177	0.77	0.53	1.3	0.69	5.7	42.9	0.072	0.64	11	
375	191	0.71	0.48	1.2	0.68	5.7	42.5	0.071	0.65	18	
400	204	0.65	0.44	1.1	0.68	5.6	42.3	0.070	0.65	28	
425	218	0.60	0.40	1.0	0.67	5.6	42.0	0.069	0.66	44	0.9
450	232	0.56	0.37	0.90	0.67	5.6	41.8	0.068	0.67	67	1.3
475	246	0.52	0.35	0.84	0.67	5.6	41.7	0.067	0.67	100	1.9
500	260	0.50	0.33	0.80	0.67	5.6	41.6	0.066	0.68	146	2.8
525	274	0.48	0.32	0.77	0.66	5.5	41.5	0.064	0.69	210	4.1

Note: The information and recommendations in this literature are made in good faith and are believed to be correct as of the below date. You, the user or specifier, should independently determine the suitability and fitness of Paratherm heat transfer fluids for use in your specific application. We warrant that the fluids conform to the specifications in Paratherm literature. Because we have no control over the fluid's end use or the conditions under which it will be used, we make no other warranties—expressed or implied, including the warranties of merchantability or fitness for a particular use or purpose (recommendations in this bulletin are not intended nor should be construed as approval to infringe on any existing patent). The user's exclusive remedy, and Paratherm's sole liability is limited to refund of the purchase price or replacement of any product proven to be otherwise than as warranted. Paratherm Corporation will not be liable for incidental or consequential damages of any kind.