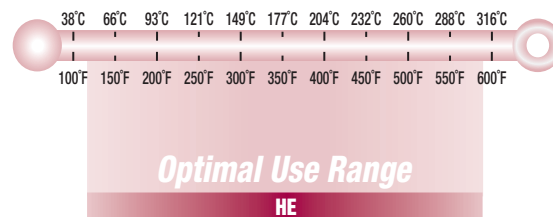


Paratherm-HE®

Heat Transfer Fluid



Economical Continuous Service

ENGINEERING BULLETIN HE 713

Paratherm HE® heat transfer fluid is an economical, highly-refined, mineral-oil based heat transfer fluid formulated for service in closed-loop heat transfer systems to 590°F.

Applications include:

- Municipal sludge dryers
- Thermal oil heated laundries
- Asphalt plants and terminals
- Continuous chemical processing
- Paper and pulp

Lack of color does make a difference

As shown by its almost water-white appearance, Paratherm HE has an extremely low level of impurities. This is the result of the extended processing required to achieve its HT1 Rating—approved for incidental food contact by NSF—which removes the impurities that can catalyze fluid degradation. These impurities (such as aromatics, asphaltenes and sulfur bearing compounds) give lesser quality mineral-oil based fluids a slight to moderate yellow color.

Low vapor pressure equals greater stability in vented expansion tanks

Any vapors that are given off by a heat transfer fluid inside a vented expansion tank will react with air to produce the acids that eventually can cause sludge formation and fluid gelling. The higher the vapor pressure, the more vapor is produced and the greater the rate of oxidation. Paratherm HE has a negligible vapor pressure that produces almost no reaction with air in vented expansion tanks.

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

Typical Properties*

Chemical Name	Hydrotreated heavy paraffinic distillate
Appearance	Almost water white liquid
Odor	Odorless
Maximum Recommended Film Temperature	650°F/343°C
Maximum Recommended Operating Temperature	590°F/310°C
Minimum Operating Temperature 20 cPs (20 mPa-s)	127°F/53°C
Minimum Start-up Temperature 300 cPs (300 mPa-s)	37°F/3°C
Viscosity cSt:	
40°C (104°F)	40
100°C (212°F)	6.4
310°C (590°F)	0.72
Density at 60°F/15.5°C lb/gal (kg/m ³)	7.3 (866)
Flash Point Pensky-Martens Closed Cup (D93)	>410°F/210°C
Boiling Point (14.7 psia/101 kPa)	>700°F/371°C
Vapor Pressure @ maximum operating temperature psia (kPa)	1.0 (7.0)
% Volume expansion over recommended operating temperature per 100°F (°C)	5.2 (9.4)
Average Molecular Weight	445
Heat of combustion (approximate) BTU/lb (kJ/kg)	20,000 (46,300)
Heat of vaporization (approximate) BTU/lb (kJ/kg)	77 (178)

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

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 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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Visit <http://paracalc.paratherm.com> for detailed properties in a choice of temperature increments.

Paratherm HE® Heat Transfer Fluid

Physical Properties

Temperature °F	Temperature °C	Viscosity cPs	Viscosity cSt	Viscosity lb/ft-hr	Density g/cc	Density lb/gal	Density lb/ft³	Thermal Conductivity BTU/hr-ft-°F	Specific Heat BTU/lb-°F	Vapor Pressure mmhg	Vapor Pressure psia
35	2	325	373	786	0.87	7.3	55	0.076	0.43		
50	10	189	218	458	0.87	7.3	55	0.076	0.44		
75	24	73	84	176	0.86	7.2	54	0.075	0.45		
100	38	38	45	93	0.85	7.1	53	0.075	0.47		
125	52	21	25	50	0.84	7.0	52	0.074	0.48		
150	66	13	16	31	0.83	6.9	52	0.074	0.49		
175	79	9	10	21	0.82	6.8	51	0.073	0.50		
200	93	6	7.4	15	0.82	6.8	51	0.073	0.51		
225	107	4.4	5.5	11	0.81	6.8	51	0.072	0.53		
250	121	3.4	4.2	8.2	0.80	6.7	50	0.072	0.54		
275	135	2.7	3.4	6.6	0.79	6.6	49	0.071	0.55		
300	149	2.2	2.9	5.4	0.78	6.5	49	0.071	0.56		
325	163	1.9	2.4	4.5	0.77	6.4	48	0.070	0.57		
350	177	1.6	2.1	3.8	0.76	6.3	47	0.070	0.59		
375	191	1.4	1.8	3.3	0.75	6.3	47	0.069	0.60		
400	204	1.2	1.6	2.8	0.74	6.2	46	0.069	0.61		
425	218	1.0	1.4	2.5	0.74	6.2	46	0.068	0.62		
450	232	0.9	1.2	2.2	0.73	6.1	46	0.068	0.63		
475	246	0.8	1.1	1.9	0.72	6.0	45	0.067	0.65		
500	260	0.71	1.0	1.7	0.71	5.9	44	0.067	0.66		
525	274	0.64	0.91	1.50	0.70	5.8	43	0.066	0.67		
550	288	0.57	0.83	1.40	0.69	5.8	43	0.066	0.68	21	0.4
575	302	0.52	0.76	1.30	0.68	5.7	43	0.065	0.69	33	0.6
600	316	0.47	0.70	1.10	0.67	5.6	42	0.065	0.71	52	1.0
625	329	0.43	0.65	1.00	0.66	5.5	41	0.064	0.72	79	1.5

Visit <http://paracalc.paratherm.com> for detailed properties in a choice of temperature increments.

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.