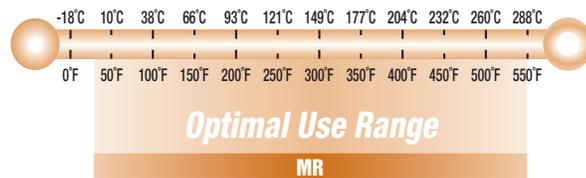


Paratherm-MR™

Heat Transfer Fluid



Low-Temperature Start-Up • Heat/Cool

ENGINEERING BULLETIN MR 613

Paratherm MR® heat transfer fluid is a food grade, aliphatic-hydrocarbon based heat transfer fluid formulated for use in closed-loop liquid-phase heat transfer systems to 550°F in fired heaters, and to 580°F in full-convection heaters and electric immersion units.

Applications include:

- Chemical batch reactors
- Food processing
- Multiple-loop continuous chemical processing
- Plastic processing

Lower viscosity offers true cooling versus mineral oils

Even the lowest viscosity mineral oils can't efficiently cool equipment or product down to ambient temperature because the viscosity is too high. Low viscosity Paratherm MR can achieve 45°F when cooled with chilled water or can achieve an 8°F temperature differential with tower water.

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

Typical Properties*

Chemical Name	Linear Alkene
Appearance	Water White Liquid
Odor	Slight Odor
Maximum Recommended Film Temperature	600°F/316°C
Maximum Recommended Operating Temperature - Fired Heaters	550°F/288°C
Maximum Recommended Operating Temperature - All Others	580°F/304°C
Minimum Operating Temperature 20 cPs (20 mPa-s)	38°F/3°C
Minimum Start-up Temperature 300 cPs (300 mPa-s)	-37°F/-38°C
Viscosity cSt:	
40°C (104°F)	6.5
100°C (212°F)	2.1
288°C (550°F)	0.48
Density at 60°F/15.5°C lb/gal (kg/m³)	6.7 (804)
Flash Point Pensky-Martens Closed Cup (D93)	>300°F/149°C
Boiling Point (14.7 psia/101 kPa)	>650°F/343°C
Vapor Pressure @ maximum operating temperature psia (kPa)	8.4 (61)
% Volume expansion over recommended operating temperature per 100 °F (°C)	4.4 (7.9)
Average Molecular Weight	300
Heat of Combustion (approximate) BTU/lb (kJ/kg)	20,000 (46,300)
Heat of Vaporization (approximate) BTU/lb (kJ/kg)	115 (266)

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

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.