EASTMAN

Technical Data Sheet

Therminol® VP1 Heat Transfer Fluid

Applications

- Adhesives
- Calendar roll heating
- Chemicals & petrochemicals
- Distillation
- Extruding
- Fatty acid
- Fibers
- Formaldehyde
- Gas to liquid (gtl)
- Gas treatment / sweetening / desulpheriz
- Htf - fine chemicals
- Htf - production of bioalcohol
- Htf - production of biodiesel
- Lube oil refining
- Methyl methyl acrylate (mma)
- Polyester (pet)
- Refining
- Resins
- Solar csp
- Specialty and batch chemical production
- Specialty chemicals
- Styrene
- Tall oil
- Terephthalic acid (pta)
- Waste heat recover + orc

Key Attributes

- Low Viscosity
- Precise Temperature Control
- Superb Heat Transfer Properties
- Vapor Phase Heat Transfer Fluid

Product Description

Therminol VP-1 heat transfer fluid is an ultra-high temperature synthetic heat transfer fluid designed to meet the demanding requirements of vapor phase systems or liquid phase systems.

Performance Benefits

- **Superb Heat Transfer Properties—**Therminol VP-1 is a synthetic heat transfer fluid which combines exceptional thermal stability and low viscosity for efficient, dependable, uniform performance in a wide optimum use range of 12° to 400°C (54° to 750°F). Therminol VP-1 has the highest thermal stability of all organic heat transfer fluids.
- **Low Viscosity—**Therminol VP-1 has a low viscosity to 12°C (54°F). Because of its crystallization point of 12°C (54°F), this fluid may require tracing in colder climates to avoid operational problems.
- **Vapor Phase Heat Transfer Fluid—**Therminol VP-1 is a eutectic mixture of diphenyl oxide (DPO) and biphenyl. It can be used as a liquid heat transfer fluid or as a boiling-condensing heat transfer medium up to its maximum use temperature. It is miscible and interchangeable (for top-up or design purposes) with other similarly constituted diphenyl-oxide (DPO)/biphenyl fluids.
- **Precise Temperature Control—**Due to its ability to operate as a vapor-phase heat transfer fluid, Therminol VP-1 is excellent for use in heat transfer fluid systems requiring very precise temperature control.

Typical Properties

Property	Test Method	Typical Value, Units
General		

Appearance		Clear, water white liquid
Composition		Biphenyl/diphenyl oxide (DPO) eutectic mixture
Maximum bulk temperature		400 °C (750 °F)
Maximum film temperature		430 °C (800 °F)
Normal Boiling Point		257 °C (495 °F)
Crystallization Point		12 °C (54 °F)
Flash Point		
COC	ASTM D92	124 °C (255 °F)
PMCC	ASTM D93	110 °C (230 °F)
Autoignition Temperature	ASTM E659	601 °C (1114 °F)
	DIN 51794	621 °C (1150 °F)
Coefficient of thermal expansion		
@ 200°C		0.000979 /°C (0.000544 /°F)
Heat of Vaporization[a]		206 kJ/kg (88.7 Btu/lb)
Viscosity, Kinematic		
@ 100°C	ASTM D 445	0.99 cSt, mm^2/s
@ 40°C	ASTM D 445	2.48 cSt, mm^2/s
Liquid Density		
@ 15°C	ASTM D 4052	1068 kg/m^3 (8.91 lb/gal)
@ 25°C	ASTM D 4052	1060 kg/m^3 (8.85 lb/gal)
Acidity	ASTM D 664	<0.2 mg KOH/g
Molecular Weight (Average)		166
Pseudocritical temperature		499 °C (930 °F)
Pseudocritical pressure		33.1 bar (480 psia)
Pseudocritical density		327 kg/m^3 (20.4 lb/ft^3)
Sulfur Content	ASTM D-7691	<10 ppm
Copper Corrosion	ASTM D 130	<<1a
Moisture Content, maximum	ASTM E-203	300 ppm
Volume contraction upon freezing		6.27 %
Volume expansion upon melting		6.69 %
Surface Tension[b]		
@ 25°C		36.6 dynes/cm
Dielectric Constant		
@ 23°C	ASTM D-924	3.35

[a] *at maximum use temperature*
[b] *in air*

Comments

Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.