

3M Novec™ 649 Engineered Fluid

Category : Fluid

Material Notes:

3M™ Novec™ 649 Engineered Fluid is a clear, colorless and low odor fluid, one in a line of 3M products designed as replacements for ozone depleting substances (ODSs) and compounds with high global warming potentials (GWPs) such as sulfur hexafluoride (SF6) and hydrofluorocarbons (HFCs), such as HFC-134a and HFC 245fa. 3M Novec 649 Engineered Fluid is an advanced heat transfer fluid, balancing customer needs for physical, thermal and electrical properties, with desirable environmental properties. Typical Applications Novec 649 fluid is an effective heat transfer fluid with a boiling point of 49°C. Novec 649 fluid is useful in heat transfer particularly where non-flammability or environmental factors are a consideration. Examples of systems which benefit from use Novec 649 fluid include: Electronics Cooling (Single or Dual Phase): Power Electronics such as IGBTs or inverters Transformers and other equipment (SF6 replacement) Computer/Data Center Cooling Organic Rankine Cycle: Diesel Engines Generators Geothermal Applications Solar Applications Information provided by 3M

Order this product through the following link:

http://www.lookpolymers.com/polymer_3M-Novec-649-Engineered-Fluid.php

Physical Properties	Metric	English	Comments
Density	1.60 g/cc	0.0578 lb/in ³	Liquid
	1.56 g/cc	0.0564 lb/in ³	
	@Temperature 40.0 °C	@Temperature 104 °F	
	1.79 g/cc	0.0647 lb/in ³	
Viscosity	@Temperature -40.0 °C	@Temperature -40.0 °F	Absolute
	1.96 g/cc	0.0708 lb/in ³	
Kinematic Viscosity	@Temperature -100 °C	@Temperature -148 °F	Absolute
	0.64 cP	0.64 cP	
Viscosity Measure	0.40 cSt	0.40 cSt	Absolute
	0.35 cSt	0.35 cSt	
	@Temperature 30.0 °C	@Temperature 86.0 °F	
	0.60 cSt	0.60 cSt	
Kinematic Viscosity	@Temperature -10.0 °C	@Temperature 14.0 °F	Absolute
	1.75 cSt	1.75 cSt	
Viscosity Measure	@Temperature -60.0 °C	@Temperature -76.0 °F	Absolute
	20 cSt	20 cSt	
Kinematic Viscosity	@Temperature -105 °C	@Temperature -157 °F	Absolute
	0.60 cSt	0.60 cSt	

Molecular Weight Physical Properties	316 g/mol Metric	316 g/mol English	Comments
Vapor Pressure	0.400 bar	300 torr	
Surface Tension	10.8 dynes/cm	10.8 dynes/cm	

Thermal Properties	Metric	English	Comments
Heat of Vaporization	88.0 J/g	37.9 BTU/lb	
CTE, linear	1800 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	1000 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
Specific Heat Capacity	1.103 J/g- $^{\circ}\text{C}$	0.2636 BTU/lb- $^{\circ}\text{F}$	
Thermal Conductivity	0.0590 W/m-K	0.409 BTU-in/hr-ft 2 - $^{\circ}\text{F}$	
	0.0570 W/m-K @Temperature 40.0 $^{\circ}\text{C}$	0.396 BTU-in/hr-ft 2 - $^{\circ}\text{F}$ @Temperature 104 $^{\circ}\text{F}$	
	0.0710 W/m-K @Temperature -40.0 $^{\circ}\text{C}$	0.493 BTU-in/hr-ft 2 - $^{\circ}\text{F}$ @Temperature -40.0 $^{\circ}\text{F}$	
	0.0820 W/m-K @Temperature -100 $^{\circ}\text{C}$	0.569 BTU-in/hr-ft 2 - $^{\circ}\text{F}$ @Temperature -148 $^{\circ}\text{F}$	
Boiling Point	49.0 $^{\circ}\text{C}$	120 $^{\circ}\text{F}$	
Pour Point	-108 $^{\circ}\text{C}$	-162 $^{\circ}\text{F}$	

Electrical Properties	Metric	English	Comments
Volume Resistivity	1.00e+12 ohm-cm	1.00e+12 ohm-cm	
Dielectric Constant	1.8 @Frequency 1000 Hz	1.8 @Frequency 1000 Hz	
Dielectric Strength	\geq 1.57 kV/mm	\geq 40.0 kV/in	0.1" gap

Chemical Properties	Metric	English	Comments
Critical Pressure	18.8 bar	14100 torr	
Critical Temperature	169 $^{\circ}\text{C}$	336 $^{\circ}\text{F}$	

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