TCLAD

單相型絕緣冷卻液
Single-Phase Dielectric Coolant ICE-5

Product Description

TCLAD ICE-5 is a non-halogenated, eco-friendly fluid suitable for immersion cooling electrical systems. Its distinctive features allow it to offer excellent heat transfer performance, superior dielectric properties, and compatibility with electrical insulating materials. TCLAD ICE-5 is also suitable for single-phase immersion heat transfer applications, which don't require complex systems such as evaporators and condensers. It also provides a precise, stable, uniform thermal management system.

Key Feature

- Excellent heat transfer performance
- Superior dielectric properties
- Low viscosity
- Exceptional material compatibility
- Outstanding anti-corrosion
- High thermal stability
- Non-volatile
- Readily biodegradable
- Non-toxic and halogen-free
- GWP<1

Applications

- Aerospace/Military
- EV transmission fluid
- Charging station heat dissipation system
- High-performance computing liquid cooling
- Data center immersion cooling
- Immersion coolant for EV batter
- Servers and ASIC mining device

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Dielectric Coolant ICE-5

Characteristics

Item	Unit	Typical value	Test method
Color	APHA	50	ASTM D1209
Acid Value	mg KOH/g	0.01	ASTM D974
Water Content	ppm	50	ASTM D1533
Kinematic Viscosity	cSt@20°C	5.2	ASTM D445
	cSt@40°C	3.3	ASTM D445
	cSt@100°C	1.3	ASTM D445
Viscosity Index	-	177	ASTM D2270
Coefficient of Expansion	1/°C	0.00087	ASTM D1903
Pour Point	°C	<-60	ASTM D97
Flash Point C.O.C	°C	160	ASTM D92
Fire Point, °C	°C	176	ASTM D92
Auto Ignition, °C	°C	>300	ASTM E659

The values above are typical and do not constitute a contractual commitment. The present technical data sheet replaces all previous editions.

Heat Transfer Properties

Item	Unit	Typical value	Test method
Thermal Conductivity	W/m*K@20°C	0.141	ASTM D7896
	W/m*K@40°C	0.137	ASTM D7896
	W/m*K@100°C	0.124	ASTM D7896

Item	Unit	Typical value	Test method
Heat Capacity	kJ/kg*K@20°C	2.173	ASTM D7896
	kJ/Kg*K@40°C	2.246	ASTM D7896
	kJ/kg*K@100°C	2.436	ASTM D7896

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Item	Unit	Typical value	Test method
Density	kg/m^3@20°C	861	ASTM D4052
	kg/m^3@40°C	846	ASTM D4052
	kg/m^3@100°C	801	ASTM D4052

Item	Unit	Typical value	Test method
Viscosity	mPa*s@20°C	4.5	ASTM D445
	mPa*s@40°C	2.8	ASTM D445
	mPa*s@100°C	1.1	ASTM D445

Dielectric Properties

Item	Unit	Typical value	Test method
Breakdown Voltage	KV@RT	>70	IEC 60156
Volume Resistivity	GΩ*m@90C	>100	IEC 60247
Dielectric Constant	@90˚C/1kHz	2.8	IEC 60247
	@RT/20~40GHz	2.3	IEC 62209
Dissipation Factor	@90 ˚C, %	<1	IEC 60247

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Environmental features

Item	Unit	Typical value	Test method
Total S, P, Cl	ppm	<1	ICP-OES
PFAS	-	0	-
GWP	-	0	-
ODP	-	0	-
Biodegradability	%	>60	OECD 301F
Renewable Carbon*	%	53-100	-

** Carbon of raw material can be selected from renewable sources.*

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Material Compatibility

Item		Materials
Plastic	Acceptable	PPS, PMMA, POM, PET, Epoxy
	Marginally Acceptable*	PC, PC/GF, PE, PP
	Unacceptable	PVC, CPVC, ABS, PS, Nylon
Rubber	Acceptable	PTFE, FFKM, FKM, Viton®ETP, TPU
	Marginally Acceptable*	NBR, HNBR, ACM, Nylon
	Unacceptable	EPDM, AEM, PU, SBR, VMQ, CR, NR

** Test condition and supplier dependent.*

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