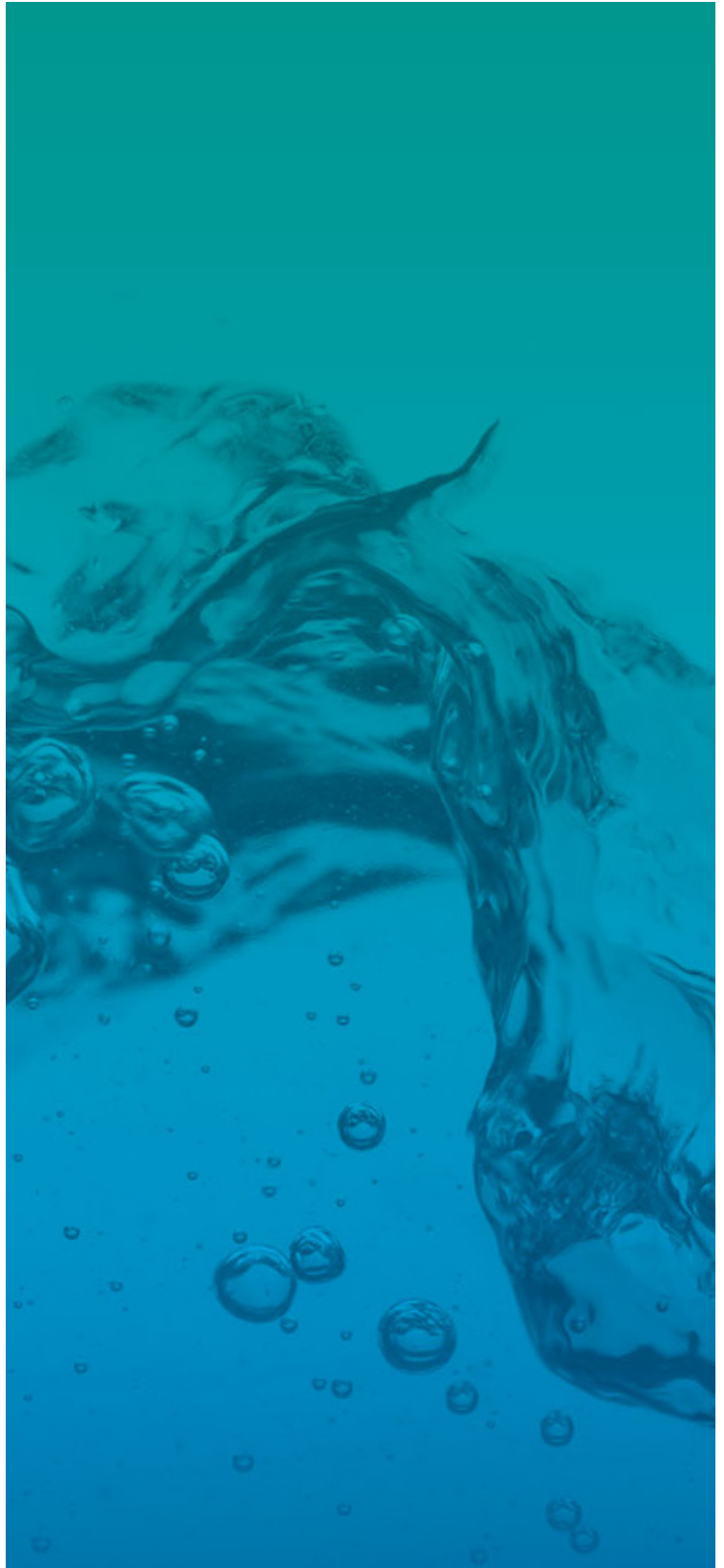


# MIVOLT®

LIQUID IMMERSION COOLING

Low viscosity  
Readily biodegradable  
Low pour point  
Non-volatile  
Halogen free  
Non-toxic



***DF7*** Dielectric  
Liquid

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Technical Brochure

# INTRODUCING MIVOLT DF7

A new, immersive approach to cooling electrical systems.

**MIVOLT DF7** is a new liquid for the immersive cooling of electrical systems. The unique chemistry of MIVOLT DF7 allows it to act as a dielectric coolant, removing heat directly from all areas of a component. Not only does this liquid have low viscosity and readily biodegradable status, but as a single phase coolant it does not require any of the complex systems necessary to evaporate and condense multiphase fluids.

## Key Features:

- Low viscosity
- Readily biodegradable
- Extremely low pour point -75°C
- Non-volatile
- Halogen free
- Non-toxic

## MIVOLT DF7 PROPERTIES

Thermal Properties	Units	Method	MIVOLT DF7
Density at 20°C	kg/m <sup>3</sup>	ISO 3675	916
Specific Heat at 20°C	J/kg-K	ASTM E1269	1907
Kinematic Viscosity at 20°C	mm <sup>2</sup> /s	ISO 3104	16.4
Thermal Conductivity at 20°C	W/m-K	ASTM D7896	0.129
Coefficient of Expansion at 20°C	1/K	ASTM D1903	0.00080
Cold Behaviour			
Kinematic Viscosity at -10°C	mm <sup>2</sup> /s	ISO 3104	87.4
Kinematic Viscosity at -30°C	mm <sup>2</sup> /s	ISO 3104	534
Pour Point	°C	ISO 3016	-75
Fire Safety			
Flash Point	°C	ISO 2719	194
Fire Point	°C	ISO 2592	218
Auto-Ignition Temperature	°C	ASTM E659	385
Environmental Impact			
Biodegradability		OECD 301	Readily Biodegradable
Global Warming Potential	GWP		<1
Ozone Depleting Potential	ODP		0
Chemical Properties			
Neutralisation Value	mg KOH/g	IEC 62021-2	<0.03
Net Calorific Value	MJ/kg	ASTM D 240-02	33.5
Dielectric Properties			
AC Breakdown Voltage	kV	IEC 60156	>75
Volume Resistivity at 20°C	GΩ.m	IEC 60247	>90

# MIVOLT DF7 MATERIALS COMPATIBILITY

Based upon testing with ester based dielectric liquids.

(Material compatibility assessment based on the guidelines set out in ASTM D3455. Temperature = 100°C, Duration = 164 hours)

Application	Compatible Materials
Seals and 'O' Rings	Nitrile Rubber (>35% Nitrile content [BS2751]), Polyurethane Rubber, Fluorocarbon Rubber (Viton), PTFE (Teflon), Nylon, PVDF
Gaskets and Jointings	Polyurethane, PTFE, Nitrile Rubber (>35% Nitrile content), PVDF
Wire and Wire Enamels	Polyesterimide / Polyamide-imide Coated Copper (Synflex), Polyester, Epoxy, Polyurethane
Tank Enamels	Alkyd, Polyurethane Modified Alkyd, Polyurethane, Epoxy
Insulating Varnishes	Alkyd, Epoxy, Polyurethane, Polyimide
Metals	Copper, Phosphor Bronze, Aluminium, Iron, Brass, Zinc Plated Steel, Nickel Plated Steel
Sleevings	Epoxy / Glass, Polyurethane / Glass, Polyurethane, Polyester / Glass, PVDF
Plastics	Glass / Epoxy Resin (HGW), PVDF, PP / Glass, Aramid, Polypropylene, Polythene, Fibre Reinforced Epoxy Glass (FRP), Nylon 6, Nylon 12, HDPE, PBT, PET
Cable	Fluoropolymer (Raychem Flexlite), PVC (Soflex TQ), Cross Linked Modified Polyester (Raychem 99M), Polyurethane (core / sheath)
Hose	Goodyear SAE J30R3 (inner only compatible), Gates Premoflex, Trelleborg Chemikler D-UPE (inner only compatible), Polyurethane, PTFE
Adhesives / Sealants	Bisphenol F-Epoxy Resin (Araldite 2014), Dimethacrylate Ester (Loctite 601), Electrolube Resin UR5097, Loctite Hysol 9461, 3M 847-507
Miscellaneous	Kraft Paper, Aramind Paper (Nomex), Pressboard, Phenolic Paper Laminate, Porcelain, Cotton Tape, Mica Insulation (Mica), Polyurethane Casting Resin, Diamond Patterned Epoxy Paper, Elephantide, Plywood, PVC Cable Sheathing

At elevated temperatures PVC may release plasticisers into MIVOLT DF7 and after prolonged immersion may become brittle.

Certain amorphous polymers or those with a low degree of crystallinity (e.g. Polycarbonate, ABS and CPVC) may exhibit environmental stress cracking in contact with MIVOLT DF7. Use of these polymers for pipework or mechanically stressed components in contact with the liquid is not recommended.

## ENVIRONMENTAL HEALTH & SAFETY

We advise that you read through the MIVOLT DF7 Material Safety Data Sheet (MSDS) before using this liquid. Please contact our technical team to request a copy.

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# MIVOLT®

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