



# MIDEL 7131

Synthetic Ester Transformer Fluid  
Fire safe and Biodegradable



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a product of  M&I MATERIALS

## MIDEL 7131 – Synthetic Ester Transformer Fluid

MIDEL protects life, property and the environment. It saves money while enabling innovation. It's MIDEL. It's safety inside.

MIDEL is the acknowledged leading brand of ester transformer fluid. Since the 1970s MIDEL has been used in hundreds of thousands of installations worldwide, providing unrivalled fire safety, environmental protection, increased asset performance and real cost savings.

**MIDEL 7131** is a synthetic ester dielectric fluid designed to provide an alternative to mineral oil, silicone fluid and dry-type transformers.

**MIDEL 7131** has a high fire point, significantly increasing the fire safety of your transformers and reducing the need for fire protection equipment.

**MIDEL 7131** is readily biodegradable, avoiding environmental damage should leakage occur and enabling reductions in containment measures.

**MIDEL 7131**, with its extremely low pour point of  $-56^{\circ}\text{C}$ , is a highly effective solution for colder climate installations.

**MIDEL 7131** has exceptionally high moisture tolerance. This characteristic enables the extension of cellulose insulation life.

**MIDEL 7131** is currently used in a wide range of transformer applications up to 433kV. Perfectly suited for non free-breathing and free-breathing transformers (due to its excellent oxidation stability) located indoors or outside.

**MIDEL 7131** offers the ability to safely increase transformer loading or reduce transformer size.

Transformer fires are a frequent occurrence in the world's power networks. Such fires are notoriously unforgiving, spreading very quickly and causing extensive damage, sometimes involving loss of life. MIDEL 7131 offers a proven solution in terms of fire risk mitigation. Specified and used across the globe, MIDEL 7131 has a 100% fire safety record since its introduction in the 1970s.

MIDEL's engineers and chemists have built close working relationships with end users and the major transformer manufacturers. They are also active in IEEE, CIGRÉ and IEC working groups and regularly undertake extensive projects with industrial associations and academic bodies. Such depth of experience allows the MIDEL team to provide an unrivalled level of expert technical guidance.



**MIDEL 7131  
IS PROVEN UP  
TO 433kV**

## MIDEL 7131 Fluid Properties

Property	Test Method	IEC 61099	MIDEL 7131
		Un-used new fluid property requirements	Typical Values
<b>Physical</b>			
Colour	ISO 2211	Max. 200 Hazen	125
Appearance		Clear, free from water and suspended matter and sediment	Clear, free from water and suspended matter and sediment
Density at 20°C (kg/dm <sup>3</sup> )	ISO 3675 or ISO 12185	Max. 1	0.97
Kinematic Viscosity (mm <sup>2</sup> /sec)	ISO 3104		
at 40°C		Max. 35	29
at -20°C		Max. 3000	1440
Flash Point PMCC (°C)	ISO 2719	Min. 250	260
Fire Point (°C)	ISO 2592	Min. 300	316
Pour Point (°C)	ISO 3016	Max. -45	-56
Crystallization	IEC 61099 (2010 Annex A)	No crystals	No crystals
Biodegradation	Readily Biodegradable		Readily Biodegradable
<b>Electrical</b>			
Dielectric Breakdown (kV)	IEC 60156	Min. 45	>75
Power Factor at 90°C	IEC 60247	Max. 0.03	<0.008
DC Resistivity at 90°C (GΩ.m)	IEC 60247	Min. 2	>20
<b>Chemical</b>			
Water Content (mg/kg)	IEC 60814	Max. 200	50
Acidity (mg KOH/g)	IEC 62021-1 or IEC 62021-2	Max. 0.03	<0.03
Oxidation Stability (164hr)	IEC 61125C		
Total Acidity (mg KOH/g)		Max. 0.3	0.02
Total Sludge (% mass)		Max. 0.01	<0.01

MIDEL 7131 is supplied in accordance with IEC industry standard acceptance values and test methods. The displayed typical values do not form part of this specification.

## Fire safety and improved performance from the original ester transformer fluid

MIDEL offers more than the benefits of a fire-safe fluid – there are also clear advantages to be gained in cost and risk reductions, deployment innovations, corporate social responsibility, and asset performance.

MIDEL 7131 is the only synthetic ester approved by both FM Global and UL.



## MIDEL 7131

Protecting lives, the environment and property since the 1970s

Developed in the 1970s, MIDEL 7131 is today used in thousands of new transformers to increase safety. Over the same period, MIDEL 7131 has gained an excellent reputation as a cost effective retrofill fluid for the replacement of flammable mineral oil.

### INCREASED FIRE SAFETY

- 100% fire safety record
- High fire point (>300°C) – K class classification
- K3 classification (IEC 61039)
- Suitable for indoor, outdoor and underground installations

### GREATER ENVIRONMENTAL PROTECTION

- Readily biodegradable
- Not detrimental to activated sludge in biological treatment plants

### IDEAL SOLUTION FOR COLD CLIMATE

- Very low pour point: -56°C

### EXTENDS TRANSFORMER LIFE

- Absorbs large amounts of moisture with no reduction of breakdown voltage (up to 600ppm)
- Allows moisture to migrate from cellulose into the fluid, thus extending cellulose life
- Very high saturation limit (2,700 ppm @ 20°C) making precipitation of free water virtually impossible

### SYNTHETIC ESTER ADVANTAGES

- Superior oxygen stability
- Flexible - used in non free-breathing and breathing systems
- Proven up to 433kV
- High performance in cold climates

### ENABLES INNOVATION

- Allows for compact transformer design
- Option to run at a higher temperature, for a standard lifetime
- Provides a higher power output, without the need for high temperature insulation



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