



MIDEL eN 1204

Natural Ester Transformer Fluid (Rapeseed)

Fire safe and Biodegradable



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MIDEL eN 1204

Safety and performance from a natural source.

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

MIDEL eN 1204 is our rapeseed oil based natural ester transformer fluid.

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

MIDEL eN 1204 is a natural ester dielectric fluid designed to provide an alternative to mineral oil, silicone liquid and dry-type transformers.

MIDEL eN 1204 has a high fire point, significantly increasing the fire safety of your transformers and reducing the need for fire protection equipment.

MIDEL eN 1204 is sustainably sourced and readily biodegradable, avoiding environmental damage should leakage occur and enabling reductions in containment measures.

MIDEL eN 1204 is an effective solution for non free-breathing transformers.

MIDEL eN 1204 has a pour point around 13°C lower than the soy-based natural ester making it a better choice in cooler climates.

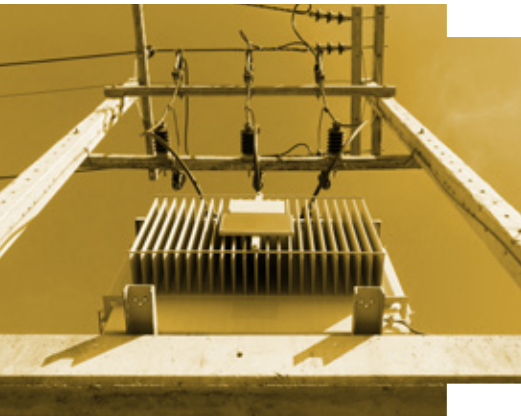
MIDEL eN 1204 has a high moisture tolerance. This characteristic enables the extension of cellulose insulation life.

MIDEL eN 1204 is currently used in a wide range of transformer applications and is ideal for non-breathing transformers located indoors or outside.

MIDEL eN 1204 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 eN 1204 offers a proven solution in terms of fire risk mitigation.

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 eN 1204
IS MANUFACTURED
FROM RAPESEED OIL**

MIDEL eN 1204 Fluid properties

	Standard test methods	IEC 62770	MIDEL eN 1204
Property	ISO/IEC	Un-used new fluid property requirements	Typical values
Physical			
Colour			0.5
Flash Point PMCC (°C)	ISO 2719	≥ 250	>260
Flash Point COC (°C)	ISO 2592		>315
Fire Point (°C)	ISO 2592	≥ 300	>350
Pour Point (°C)	ISO 3016	≤ -10	-31
Density at 20°C (g/cm ³)	ISO 3675	≤ 1.0	0.92
Relative Density (specific gravity) (15°C/15°C)			0.92
Viscosity (mm ² /sec)	ISO 3104		
@100°C		≤ 15	8.3
@40°C		≤ 50	37
@0°C			232
Visual examination	IEC 62770 4.2.1	clear, free from water and suspended matter and sediment	clear, free from water and suspended matter and sediment
Biodegradation	OECD 301	readily biodegradable	readily biodegradable
Electrical			
Dielectric Breakdown (kV)			≥ 30
1mm gap			45
2mm gap			57
2.5mm gap	IEC60156	≥ 35	>75
Gassing Tendency (µl/min)			-46.1
Power Factor			
Power Factor @25°C (%)			≤0.20
Power Factor @100°C (%)			≤4.0
Dissipation Factor @90°C	IEC 60247	≤0.05	<0.03
Impulse Voltage 25.4mm gap (kV)			134
Chemical			
Corrosive Sulfur	IEC 62535	non-corrosive	non-corrosive
Water Content (mg/kg)	IEC 60814	≤ 200	50
Acid Number (mg KOH/g)	IEC 62021.3	≤ 0.06	≤0.04
PCB Content (mg/kg)			not detectable
Oxidation Stability (48hr, 120°C)	IEC 61125C		
Total Acidity (mg KOH/g)	IEC 62021.3	≤ 0.6	<0.1
Viscosity at 40°C (mm ² /sec)	IEC 3104	≤ 30% over initial	8%
Dissipation Factor at 90°C	IEC 60247	≤ 0.5	<0.1

Only the defined IEC industry standard acceptance values and test methods should be used when writing specifications. The displayed typical values are to be identified as acceptance values.

IEC 62770 Fluids for Electrotechnical Applications – Unused natural esters liquids for transformers and similar electrical equipment.

MIDEL eN 1204 - manufactured using renewable vegetable oil, readily biodegradable, providing fire safety and environmental protection from a natural ester.

MIDEL 1204

Fire and environmental protection in a natural ester fluid

MIDEL eN 1204 is an excellent dielectric fluid because it has a high fire point, making it demonstrably safer than mineral oil. It is also one of the most environmentally friendly dielectric fluids available; not only is MIDEL eN 1204 manufactured using renewable vegetable oil (rapeseed oil), it is also non-toxic and readily biodegradable. In addition, MIDEL eN 1204 offers superior moisture tolerance and has the potential to increase the lifetime of cellulose based solid insulation, which in turn can extend transformer life.

INCREASED FIRE SAFETY

- 100% fire safety record
- High fire point (>300°C)
- K-class classification: Less flammable fluid
- Designed for indoor and outdoor installations

GREATER ENVIRONMENTAL PROTECTION

- Renewable vegetable oil
- Lower carbon footprint than mineral oil
- Readily biodegradable
- Non-water hazardous
- Non-toxic and not harmful to aquatic life
- No corrosive sulphur

SUPERIOR MOISTURE TOLERANCE

- Absorbs large amounts of moisture with no reduction of breakdown voltage (up to 300ppm)
- High saturation limit (1100ppm @20°C) making precipitation of free water virtually impossible

ASSET LIFE EXTENSION

- Slower rate of cellulose ageing than mineral oil
- Longer cellulose lifetime at standard temperatures
- Option to run at a higher temperature, for a standard lifetime
- Provides a higher power output, without the need for high temperature insulation

ENABLES INNOVATION

- Allows for compact transformer design
- Permits greater flexibility and temporary overload resilience



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