



Shell MIDEL 7131

Synthetic Ester Electrical Insulating Liquid, Fire Safe and Biodegradable

Technical Data Sheet

- Synthetic Ester Electrical Insulating Liquid
- Fire Safe and Biodegradable
- IEC 61039: K3 Classification, IEC 61099 and ASTM D8240



Shell MIDEL 7131 is a biodegradable, synthetic ester electrical insulating liquid. It is designed to provide an alternative to conventional mineral oil, silicone fluid and dry-type transformers. It offers robust low temperature performance and extended asset life.

Shell MIDEL 7131 has a high fire point, significantly increasing the fire safety of your transformers and reducing the need for fire protection equipment. It is also biodegradable, avoiding environmental damage should leakage occur and enabling simplifications in containment measures.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

SYNTHETIC ESTER ADVANTAGES

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

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

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

ENVIRONMENTAL PROTECTION

- Biodegradable according to OECD 301B: Shell MIDEL 7131 exceeds 60% biodegradation OECD 301B test after 28 days.
- Not detrimental to activated sludge in biological treatment plants.

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

COLD TEMPERATURE OPERATION

- Very low pour point: -56°C

Main Applications



Specifications, Approvals & Recommendations

- IEC 61099 and ASTM D8240 compliant
- IEC 61039: K3 classification.
- FM Global Approved
- UL approved

Typical Physical Characteristics

Properties		Method	IEC 61099	Shell MIDEL 7131 Typical
Colour	Hazen units	ISO 2211	Max. 200	125
Appearance		Visual		Clear, free from water and suspended matter and sediment
Density	@20°C kg/m ³	ISO 3675	Max. 1 000	970
Kinematic Viscosity	@40°C mm ² /s	ISO 3104	Max. 35	29
Kinematic Viscosity	@-20°C mm ² /s	ISO 3104	Max. 3 000	1 440
Flash Point	°C	ISO 2719	Min. 250	260
Fire Point	°C	ISO 2592	Min. 300	316
Pour Point	°C	ISO 3016	Max. -45	-56
Biodegradability	%	OECD 301		Biodegradable
Breakdown Voltage	kV	IEC 60156	Min. 45	>75
Volume Resistivity	@90°C G Ohm m	IEC 60247	Min. 2	>20
Water Content (Bulk)	mg/kg	IEC 60814	Max. 200	50
Acidity / Neutralisation value	mg KOH/g	IEC 62021-1	Max. 0.03	<0.03
Oxidation Stability		IEC 61125C		
Oxidation Stability (164 hrs) - Total Acidity	mg KOH/g	IEC 61125C	Max. 0.3	0.02
Oxidation Stability (164 hrs) - Sludge	%m	IEC 61125C	Max. 0.01	<0.01

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

• Health and Safety

Shell MIDEL 7131 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Shell MIDEL 7131 is free from polychlorinated biphenyls (PCB). Avoid contact with skin. Use impervious gloves with used liquid. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from <http://www.epc.shell.com>

• Protect the Environment

Take used liquid to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

• Storage precautions

The critical electrical properties of Shell MIDEL 7131 are easily compromised by trace contamination with foreign material. Typically encountered contaminants include moisture, particles, fibers, and surfactants. Therefore, it is imperative that electrical insulating liquids be kept clean and dry. It is strongly recommended that storage containers be dedicated for electrical service and include air-tight seals. It is further recommended that electrical insulating liquids are stored indoors in climate-controlled environments.