



Dielectric Insulating Fluid – Product Overview

OCTOBER 2025

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IsoTec SE 300 Product Overview

IsoTec SE 300 is a modern, synthetic ester-based insulating fluid used worldwide in transformers. It has been developed to provide a safe and environmentally friendly alternative to conventional insulating oils and solid insulation. IsoTec SE 300 is suitable for both indoor and outdoor applications. The high-performance fluid IsoTec SE 300 is characterized by enhanced safety, excellent environmental compatibility, and outstanding moisture tolerance. Extensive testing has confirmed the excellent dielectric properties of IsoTec SE 300.

Complies with IEC 61099

IsoTec SE 300 meets the requirements of the standard IEC 61099 “Synthetic Organic Esters for Electrical Applications” and is classified as Type T1. It is a halogen-free pentaerythritol ester.

Applications

IsoTec SE 300 is offered by numerous manufacturers for transformers and is suitable for a wide range of applications, including:

- Distribution transformers
- Power transformers
- Traction transformers
- Rectifier transformers
- Pole-mounted transformers
- Tap changers
- Thyristor cooling

Refilling

IsoTec SE 300 has also proven effective for transformer refilling. It helps extend the transformer's service life, reduces environmental risks, and provides improved fire safety.

Corrosive Sulfur

Tests according to ASTM D1275 B and IEC 62535 have confirmed that IsoTec SE 300 is non-corrosive.

Enhanced Fire Safety

IsoTec SE 300 provides exceptional protection against fire risks due to its high flash point (>300 °C) and low net calorific value (<32 MJ/kg). It is classified as a Class K3 fluid according to IEC 61100/61039.

- 100% fire safety
- High flash point (>300 °C)
- FM Global® approved transformer fluid

Greater Environmental Compatibility

IsoTec SE 300 is biodegradable and non-hazardous to water, making it an environmentally friendly alternative to conventional transformer oils.

- “Readily biodegradable” (OECD 301)
- “Fully biodegradable” (IEC 61039)
- Not classified in any water hazard class
- Non-toxic and non-volatile
- Harmless to biological wastewater treatment plants
- RoHS compliant

High Performance

IsoTec SE 300 is also stable under extreme temperatures. Its high oxygen stability makes it ideal for breather-equipped transformers and compact design applications.

- Long service life at high temperatures
- Enhanced oxygen stability
- No sludge formation

Moisture Tolerance

IsoTec SE 300 can absorb significantly more moisture without affecting the breakdown voltage.

- No reduction in breakdown voltage (up to 600 ppm / 20 °C)
- Moisture is absorbed from cellulose into the fluid
- Extended lifespan of cellulose insulation
- Reduced risk of condensation and bubble formation

Delivery

IsoTec SE 300 is available in sealed containers of 20 kg, 195 kg, or 1000 kg. Large quantities can be supplied in IBC containers starting from 20 tons or alternatively by tanker.

Disposal

For disposal of IsoTec SE 300 or remaining quantities, incineration in a suitable facility is recommended.

Reprocessing

IsoTec SE 300 is a circular product. It can be reprocessed by the manufacturer and reused, helping to conserve valuable resources.



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Table 1 – Description of Type T1 Transformer Ester according to IEC 61099 and DIN VDE 0375

	Unit	Test Method	Requirement	IsoTec SE 300
Physical Properties according to IEC 61099				
Color	HU	ISO 2211	max. 200	125
Appearance	-	IEC 61099 7.1.2	Clear, free from suspended matter and sediments	Clear, free from suspended matter and sediments
Density at 20 °C	kg/dm ³	ISO 3675	max. 1,00	0,97
Kinematic viscosity at -40 °C	mm ² /s	ISO 3104	max. 35,0	28
Kinematic viscosity at -20 °C	mm ² /s		max. 3000	1400
Flash point	°C	ISO 2719	min. 250	260
Fire point	°C	ISO 2592	min. 300	316
Pour point	°C	ISO 3016	max. -45	-60
Crystallization	-	IEC 61099 (2010) Annex A	No crystals	No crystals
Chemical Properties according to IEC 61099				
Water Content	mg/kg	IEC 60814	max. 200	50
Neutralization Number	mg KOH/g	IEC 62021-2	max. 0,03	<0,03
Oxidation Stability - Total Acid Number - Total Sludge Content	mg KOH/g % by mass	IEC 61125	max. 0,3 max. 0,01	0,01 <0,01
Net Calorific Value	MJ/kg	ASTM D 240-02	<32	31,7
Dielectric Properties according to IEC 61099				
Breakdown Voltage	kV	IEC 60156	min. 45	>75
Dielectric Loss Factor tan δ at 90 °C and 50 Hz	-	IEC 60247	max. 0,03	<0,008
Insulation Resistance (DC) at 90 °C	Gohm-m	IEC 60247	min. 2	>30

The values given are typical and do not constitute a specification; they are subject to change without notice.