



Synthetic Ester Fluid



SE3™ fluid is Cargill's next generation of synthetic dielectric transformer fluid. Brought to you by the makers of FR3™ fluid and FR3r™ fluid, SE3 fluid completes the portfolio of transformer fluid solutions as superior options to mineral oil. With exceptional performance, SE3 fluid greatly complements the needs of some specific transformer applications by delivering a high performance K-class fluid, optimized for extreme cold weather and suitable for free-breathing transformers.

Key Features

- **High fire point** of > 300 °C (compared to 160 °C for mineral oil) allows its classification as a K-Class, less flammable liquid
- **High thermal class dielectric liquid**, suitable for use in free-breathing applications
- Continuous flow even in extremely **cold climates**, pour point down to -50 °C
- Optimized for **oxidative stability**
- Meets IEC 61099 Standards

SE3 fluid values and specification units

Property	Test method	IEC 61099 permissible values	Typical
Physical			
Color	ISO 2211	≤ 200 Hazen	≤ 100 Hazen
	ISO 2719	-	0.1
Appearance	Visually clear, free from water, suspended matter and sediment		
Density at 20 °C (kg/dm ³)	ISO 3675, ISO 12185	≤ 1000	960-970
Kinematic viscosity (mm ² /s)	ISO 3104	-	-
	100 °C	≤ 15	6
	40 °C	≤ 35	28
	-20 °C	≤ 3000	1200
Flash-point (°C)	ISO 2719	≥ 250	> 260
Fire-point (°C)	ISO 2592	≥ 300	> 305
Pour-point (°C)	ISO 3016	≤ -45	< -50
Chemical			
Water content (mg/kg)	IEC 60814	≤ 200 ^b	≤ 100
Acidity (mg KOH/g)	IEC 62021 -1, IEC 62021 -2	≤ 0.03	0.01 – 0.02
Oxidation stability			
164 h @ 120 °C	IEC 61125, Method C	-	-
Total acidity (mg KOH/g)	-	≤ 0.3	0.02
Total sludge (% mass)	-	≤ 0.01	< 0.01
800 h @ 120 °C	IEC 61125, Method C	-	-
Total acidity (mg KOH/g)	-	-	0.11
Total sludge (% mass)	-	-	< 0.01
Electrical			
Break down voltage (kV)	IEC 60156	≥ 45 ^b	> 65
Dielectric dissipation factor (tanδ)	IEC 60247, IEC 61620	-	-
	90 °C and 50 Hz	≤ 0.03 ^b	0.01
DC resistivity at 90 °C (GΩ.m)	IEC 60247	≥ 2	60

^aIEC 61099 requires testing synthetic ester liquids according to IEC 61125 method C for 164h. SE3 was tested for 800h.

^bFor untreated liquid, as received

Learn more about the benefits of **SE3 fluid** and the power of a Cargill partnership by visiting cargill.com/SE3fluid or contacting your local representative.



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