



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**

SE3 fluid values and specification units

Property	Test method	IEC 61099 permissible values	Expected
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/dm³)	ISO 3675, ISO 12185	≤ 1000	960-970
Kinematic viscosity (mm²/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
Biodegradability	OECD 301	Readily biodegradable	Readily biodegradable
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	> 70
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 **SE3fluid.com** or contacting your local representative.



This document is provided for your information and convenience only. All information, statements, recommendations and suggestions are believed to be true and accurate but are made without guarantee, express or implied. WE DISCLAIM, TO THE FULLEST EXTENT PERMITTED BY LAW, ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE and FREEDOM FROM INFRINGEMENT and disclaim all liability in connection with the storage, handling or use of our products or information, statements, recommendations and suggestions made by Cargill. All such risks are assumed by you/user. The labeling, substantiation and decision making relating to the regulatory approval status of, the labeling on and claims for your products is your responsibility. We recommend you consult regulatory and legal advisors familiar with applicable laws, rules and regulations prior to making regulatory, labeling or claims decisions for your products. The information, statements, recommendations and suggestions contained herein are subject to change without notice.

©2025 Cargill, Incorporated. All rights reserved.