

One portfolio. Every application.

Cargill's complete dielectric fluid portfolio is engineered for today's demands and tomorrow's challenges.

**Dielectric fluids
built for modern
power demands.**

Cargill's suite of transformer dielectric fluids — including FR3™ fluid, FR3r™ fluid, and SE3™ fluid — represents an advanced portfolio of natural and synthetic ester solutions for the power industry. Designed to enhance transformer performance, our fluids deliver excellent fire safety (K-class fluids), biodegradability, and reliability across diverse applications.

FR3™

Derived from > 99% soybean oil, FR3 fluid is the original and most trusted natural ester. Used for over 30 years and in 5+ million transformers worldwide.

- 100% biodegradable in as little as 10 days per OPPTS 835.3100
- Up to 20% more load capacity*
- 2X the flash and fire point*
- 0 reported fires

FR3r™

Derived from > 99% rapeseed oil, this K-class natural ester fluid delivers performance and reliability.

- Low pour point, -33 °C
- Readily biodegradable per OECD 301 B
- 2X the flash and fire point*
- Up to 140 °C top fluid operating temperature

SE3™

Advanced synthetic ester engineered to meet the demands of specialized transformer applications.

- K-class fluid with > 300 °C fire point
- Pour point less than -50 °C
- Optimized for oxidative stability
- Readily biodegradable per OECD 301 B

*Compared to mineral oil

Key applications



Power transmission
and distribution



Retrofit



BESS



Data centers and
AI factories



Solar power



Wind power



Traction†

†SE3 fluid only

Dielectric fluid values and specification units

Property		Test method		Typical values			
Physical		ASTM	ISO/IEC	FR3™ fluid	FR3r™ fluid	SE3™ fluid	Conventional mineral oil
Color		D1500	ISO 2211	0.5	0.5	0.5	0.5
Flash Point PMCC		D93	ISO 2719	> 260	> 260	> 270	150
Flash Point COC		D92	ISO 2592	> 320	> 320	> 275	160
Fire Point		D92	ISO 2592	> 350	> 350	>305	170
Pour Point		D97	ISO 3016	-21	-33	-54	-50
Density at 20 °C (g/cm³)		-	ISO 3675	0.92	0.92	0.97	0.88
Viscosity (mm²/s)	100 °C	D445	ISO 3104	8	8	6	3
	40 °C	-	-	34	37	28	9
	0 °C	-	-	186	229	237	70
	-20 °C	-	-	650*	954	1270	400
Visual Examination		D1524	IEC 60247 4.2.1	Clear, light green	Clear, light	Clear, light	Clear, light
Biodegradation		OECD 301B	-	Readily biodegradable	Readily biodegradable	Readily biodegradable	Non-biodegradable
Electrical							
Dielectric Breakdown (kV)	2 mm gap	D1816	-	> 50	> 50	> 65	65
	2.5 mm gap	-	IEC 60156	> 60	> 60	> 70	> 70
Dissipation Factor	25 °C (%)	D924		< 0.15	< 0.15	< 0.05	< 0.05
	90 °C (tanδ)	-	IEC 60247	< 0.015	< 0.015	< 0.01	< 0.001
	100 °C (%)	D924		< 1.8	< 1.8	< 1	< 1
Chemical							
Corrosive Sulfur		D1275	IEC 62697	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive
Water Content (mg/kg)		D1533	IEC 60814	< 50	< 50	< 50	10
Acid Number (mg KOH/g)		D974	IEC 62021.3	< 0.05	< 0.05	< 0.02	< 0.01
PCB Content (mg/kg)		D4059	IEC 61619	Not detectable	Not detectable	Not detectable	Not detectable

*Measurement of viscosity near pour point may be inaccurate.

For more information on Cargill's dielectric fluid products, visit cargill.com/dielectric-fluids



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