

Cargill Envirotemp™ FR3™ Dielectric Fluid complies with New IEEE High Temperature Insulation Standard

MINNEAPOLIS – Cargill announced that its Envirotemp™ FR3™ renewable (natural ester) dielectric fluid complies with a new, third-party standard around its insulation capabilities for electrical transformers.

Envirotemp™ FR3™, which is made from vegetable oil, complies with a new design standard published by IEEE¹ and corroborates with information in the informative Annex. The new standard, IEEE C57.154™ (Standard for the Design, Testing, and Application of Liquid-Immersed Distribution, Power, and Regulating Transformers Using High-Temperature Insulation Systems and Operating at Elevated Temperature) sets the upper operating temperature limit of transformers designed with natural esters and high-temperature insulation at 130-degrees Celsius without adversely impacting transformer life. Industry-standard hottest spot temperature limits for electrical transformers are traditionally capped at 110-degrees Celsius.

Use of Envirotemp FR3 fluid in high-temperature insulation systems, operating at elevated temperatures for new and existing transformers, may enable improvements in transformer size, safety, and cost. Compared to mineral oil, Envirotemp FR3 fluid may enable transformers to last longer, better manage temperature during peak energy demand periods, and be built in a more compact design. Envirotemp FR3 fluid features and specifications are detailed in its product data sheet.

"The ability to design a more compact transformer using Envirotemp FR3 dielectric fluid may allow for the manufacture of transformers that are cost competitive to traditional petroleum-filled transformers, while providing significant improvements in fire and environmental safety," said Dave Roesser, general manager of Cargill's dielectric fluids business. "This allows substantial improvements in the way transformers are designed: smaller, safer, cost-competitive units possess the ability to improve the reliability of the electrical grid."

Cargill purchased the Envirotemp FR3 dielectric fluid business and obtained an exclusive license to all applicable patents from Cooper Power Systems in June 2012. Cargill's Industrial Oils & Lubricants business manufactures the industry leading fluid and other specialty K-class ester fluids used in a wide range of transformers and other electrical applications. These products uniquely position Cargill to provide customers with products that improve performance and enhance fire and environmental safety. The company has manufactured the Envirotemp™ 200 and Envirotemp FR3 brands since 2004.

A revolutionary product released to the market in 1998, Envirotemp FR3 fluid quickly gained global acceptance and is recognized by the National Electrical Code®, FM Global, and Underwriters Laboratories. In 2008, Envirotemp FR3 fluid was approved and listed for the United States Department of Agriculture BioPreferred® program. In 2011, the Federal Energy Regulatory Commission approved Envirotemp FR3 fluid for Capital Treatment, allowing public utilities to capitalize all costs incurred to retrofill a transformer with the bio-based dielectric

coolant. As a result, demand for Envirotemp FR3 fluid has increased, and there are currently more than 500,000 transformers filled with Envirotemp FR3 fluid on six continents.

¹ All statements made are that of Cargill, and does not necessarily represent a position of either the IEEE or the IEEE Standards Association.

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About Cargill

Cargill is an international producer and marketer of food, agricultural, financial and industrial products and services. Founded in 1865, the privately held company employs 142,000 people in 65 countries. Cargill helps customers succeed through collaboration and innovation, and is committed to applying its global knowledge and experience to help meet economic, environmental and social challenges wherever it does business. For more information, visit Cargill.com and its [news center](#).

About Cargill CIS

Cargill Industrial Specialties is the largest Business Unit within Cargill that is exclusively focused on providing bio-based solutions to industrial markets, including dielectric fluid, paints, inks and coatings, lubricants, construction & oilfield chemicals, consumer products, flexible foam & other diverse applications in the chemical industry. Our strategy is to drive growth in renewable vegetable-based products by delivering innovative customer solutions through a customer-focused approach. www.cargill.com/industrial-oils / www.cargill.com/fr3fluid .

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