

Powering our future:

CELME taps FR3™ fluid to power offshore oil development project



Situation

Since 1964, CELME has been partnering with their customers to deliver specialized transformers for offshore, oil & gas, and remote installations. Their mission is to combine technical excellence with sustainable innovation to support their clients in achieving long-term performance and safety.

CELME was recently approached to support an offshore oil development project in the Gulf of Mexico, located in a hazardous area. Prior to this project, CELME had manufactured transformers for the oil & gas industry, but this project required the transformer to achieve IECEx certification under IEC 60079 standard.

IECEx is a global standard certifying equipment used in potentially explosive atmospheres. It provides assurance to manufacturers, end-users and regulators that the equipment, in this case a transformer, is safe for use in high-risk explosive environments. To achieve this standard, CELME knew mineral oil was not an option and a natural ester transformer oil was the best choice to meet standards and minimize fire risk.

Goal

CELME sought a natural ester solution that could deliver enhanced fire safety and long-term stability. FR3™ fluid – backed with nearly 30 years of proven global applications – emerged as the ideal choice, meeting all project

requirements: reliable performance in extreme offshore conditions, fire risk mitigation, compliance with IECEx standards, and alignment with CELME's environmental goals.

This project involved installing a transformer on a floating platform off the coast of Mexico. The offshore setting introduced additional challenges, such as constant movement from water fluctuations and restricted access for maintenance. FR3 fluid's low-maintenance properties and robust performance made it especially well-suited for this demanding environment.



Solution

Given the offshore platform's floating nature, minimizing the transformer's size and weight was critical. FR3™ fluid allows for up to 20% additional load capacity compared to mineral oil and therefore, CELME was able to engineer a more compact transformer without compromising load performance—an essential factor for this installation.

Fire safety was a top priority for a transformer supplying energy to an oil & gas operation. FR3 fluid also proved ideal for meeting IECEx certification requirements, offering two times higher the flash and fire point compared to mineral oil.

Environmental impact and maintenance were also key considerations. Installed on a floating platform off the coast of Mexico, the transformer would be difficult to access for servicing. FR3 fluid's low-maintenance properties and environmental benefits made it a great choice because it is 100% biodegradable in as little as 10 days* and, according to OECD 203 testing, shows no acute aquatic toxicity (LC50 > 10,000 mg/L).

CELME also aimed to deliver a simple, stable solution for their customer's remote offshore conditions. With FR3 fluid, the transformer requires only one annual inspection to verify seal integrity and fluid levels.

Results

Daniele Pasquetto, Managing Director at CELME, explained their "adoption of FR3 fluid has not only met, but exceeded our expectations, meeting challenging application requirements and delivering safer operations and better performance – while also aligning with CELME's long-term sustainability goals".



Key Learnings

The oil and gas industry plays a critical role in the global energy landscape, encompassing the exploration, extraction, refining, and distribution of petroleum and natural gas. While petroleum is a key product of the industry, FR3 fluid has emerged as a superior choice for powering oil and gas facilities, particularly due to the high fire risk associated with operations. FR3 natural ester fluid offers enhanced fire safety and thermal performance compared to mineral oil and synthetic alternatives. Additionally, FR3 fluid also enables smaller transformer designs without compromising load capacity, making it ideal for space-constrained environments like offshore platforms. Finally, it is non-hazardous according to GHS classification, and it is 100% biodegradable in as little as 10 days*, making it a great solution for transformers operating at sea.

"We definitely plan to use FR3 fluid for future oil & gas applications, especially in hazardous zones, offshore platforms and remote installations requiring sealed, low maintenance designs," said Pasquetto. "Choosing Cargill's FR3 fluid helps further deliver CELME's commitment to safety, reliability, and environmental responsibility."

Learn more about the benefits of **FR3™ fluid** and the power of a Cargill partnership by visiting [FR3fluid.com](https://www.fr3fluid.com) or contacting your local representative.



*According to OPPTS 835.3100

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