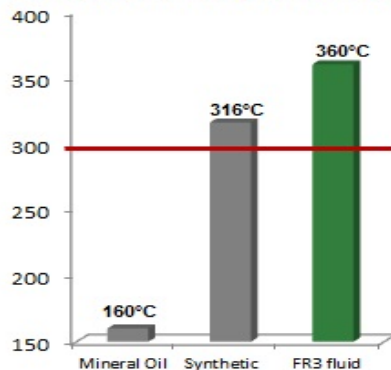


## Fire point is the most critical factor to consider when specifying transformer fire safety

All standards require K-class fluids to have a fire point greater than 300°C. To help prevent a transformer fire, specify the fluid with the HIGHEST fire point of all K-class fluids - Envirotemp™ FR3™ fluid.

### Focus on preventing a fire (versus measuring effects after a fire starts)

Dielectric fluid fire point comparison



The objective of specifying a K-Class fluid is to prevent a fire in the event of a transformer failure. In 2008, IEC 61100 'Classification of insulating liquids according to fire-point and net calorific value' was made obsolete, and was replaced with IEC 61039 'Classification of insulating liquids'.

- All K-class fluids are treated equally and will prevent a dielectric pool fire.
- No data exists that classifications such as net calorific value prevent or eliminate risk better than another.
- These classifications are based on fluid laboratory tests to measure heat generated AFTER a fire starts. In practice, they have nothing to do with preventing a fire or extinguishing it faster in a transformer application.
- The objective is to prevent the fire from ever occurring. The property that directly impacts fire prevention is fire point.



Since its commercial release in 1998, Cargill's K-class fluid, FR3 fluid, has been applied in over 750,000 distribution and power transformers across 6 continents in more than 30 countries. To date, there has not been a single fire-related failure with a FR3 fluid-filled transformer.

### Highly unlikely fire would even start or be sustained with FR3 fluid's high fire point

The reason why fire point is so critical to fire safety is to understand what it takes for a fire to start in a transformer:

1. If a fault does happen in a transformer, most of the energy vaporizes molecules generating combustible gases, while a small amount starts to heat the fluid.
2. If there is a breach in the transformer tank, the gases escape and are exposed to oxygen. If there is a source of ignition, the combustible gases will ignite.
3. However, if the fluid is at or near its fire point, a pool fire would result.

In an FR3 fluid-filled transformer, the differential between the operating temperature (110°C) and FR3 fluid's fire point (360°C) is so significant compared to mineral oil's fire point (160°C), it is nearly impossible for the fluid to be at or near its fire point.

- Inside a transformer, it would require a high temperature fault lasting several minutes to reach FR3 fluid's fire point.
- If there were a 'combustible gas' flame outside the breached tank, the gas flame would extinguish because FR3 fluid wouldn't be anywhere near its fire point and no pool fire would occur.

Heat required to raise 2,675 liters of dielectric fluid from 90°C to fire point			
Fluid	Fire Point °C	Temp Change °C	Heat (MJ)
Mineral oil	160	70	330
Synthetic fluid	315	225	1,046
FR3 fluid	360	270	1,462

Contact us - [envirotempfluids.com](http://envirotempfluids.com)