

# BecFluid® 9902

Dielectric Cooling and Insulating Fluid

## Fire safety

The key properties of high flash point, high flame point and high self ignition temperature of BecFluid® 9902 ensure a high level of fire safety. In addition BecFluid® 9902 has the advantage of a low rate of heating which follows from the high specific heat and thermal conductivity.

Furthermore, BecFluid® 9902 is self-extinguishing and in the event of a fire reduces the danger of a "pool-fire".

## Smoke and gases

One of the most important considerations when a material burns is the tendency to produce smoke and toxic gases which can seriously hinder the rescue of people in a fire. In this respect fluids based on PCBs have the worst properties because they produce thick black smoke, large quantities of hydrochloric acid gas and small amounts of extremely toxic halogenated dioxins and furans.

The combined properties of BecFluid® 9902 do not indicate either smoke or toxic gases in a fire which could be an acute threat to people. Nevertheless, in view of the sensitivity of transformer operators and fire authorities to the serious problems previously caused by PCBs, a comparative test programme was undertaken to confirm or contradict these expectations.

These tests results show that ester fluids generate minimal smoke, less than that from mineral oil and Askarel and comparable to the smoke of burning wood. As BecFluid® 9902 contains no chlorine, no dangerous hydrochloric acid gas or halogenated dioxins can be formed.

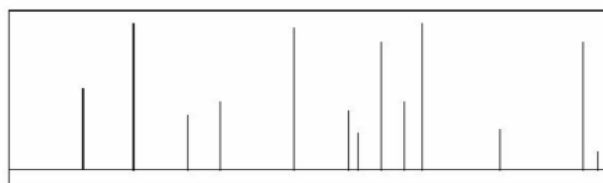
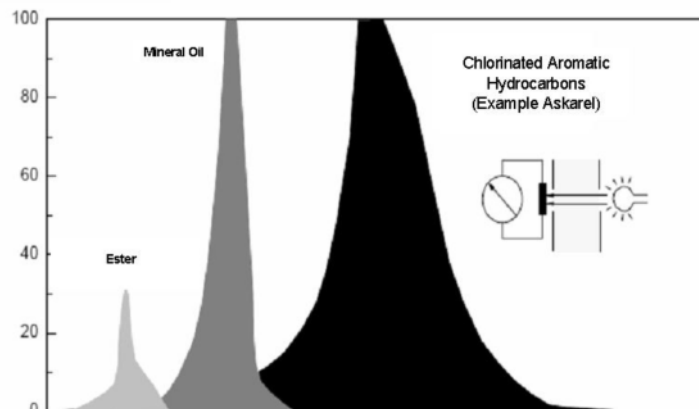
## Smoke density

The amount of smoke produced by esters and other transformer fluids was tested in a Tewarson Apparatus equipped with a light source and photocell to accord with the human eye. The results show clearly less smoke density from the ester.

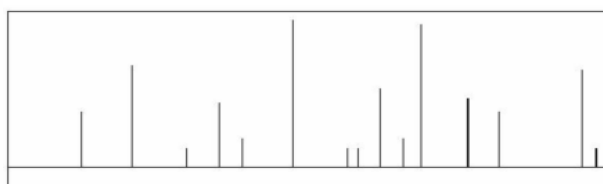
## Smoke analysis

The composition of the smoke was determined by burning the ester in a quartz tube at 400°, 600° and 950°C, temperatures representative of the conditions in a fire. For comparison, wood burns at a temperature of 950°C. The resulting gases were condensed and absorbed in methanol. After extraction with hexane they were analysed by gas chromatography and identified by mass spectrometry. The gas chromatographs on the following page shows no substances from the ester which are not also found in smoke from burning wood.

Smoke density % Comparison of smoke density from various fluids



Chromatogram of Combustion gas of ester at 950°C



Chromatogram of Combustion gas of wood at 950°C