

BecFluid[®] 9902

Dielectric cooling and insulating fluid

Environmental performance

BecFluid[®] has outstanding environmentally friendly properties. It is readily biodegradable, non-water hazardous and also non-toxic, non-mutagenic and non-irritant.

From the view of environmental protection BecFluid[®] 9902 is by far a better option than mineral or silicone oil.

Biological degradation

For classification as readily biodegradable a substance must satisfy the following two criteria: 60% biological breakdown must take place in 10 days and by 28 test days at least 60% must be broken down.

The biodegradation is tested in an external independently accredited laboratory. Laboratory testing of BecFluid[®] 9902 is 3% degraded in 1 day and 10 days later, that is on day 11, 64% degradation is attained.

Furthermore, after a 28 day test BecFluid[®] 9902 is biologically reduced by 74%. These results show clearly that BecFluid[®] 9902 fulfils the criteria of "readily biodegradable" without reservation.

Further independent studies of biodegradation of mineral and silicone oils show clearly that after a 28 day test none of the oils have reached 10% degradation. The results of the study demonstrate the outstanding biodegradability properties of BecFluid[®] 9902 as well as the general environmental advantages in comparison with mineral and silicone oil filled transformers.

Effects on aquatic organisms

It is important for a transformer fluid to be not only readily biodegradable, but also it should pose no danger to the ecosystem. To guarantee that in the unlikely event of an oil leak, there will be no harmful effects on life in water, a series of toxicological tests were carried out. In these tests even an extremely high

concentration of liquid in water courses produced no acute risk to aquatic communities was identified from BecFluid[®] 9902. Full test results are available on request. Furthermore, it is unlikely that a continuous slow release of BecFluid[®] 9902 from a small transformer leakage will produce a concentration in water to reach a problem level for the ecology.

Waste water purification

Biological waste water treatment plants use activated or microbiological sludge to break down organic materials. Various chemicals can kill the microorganisms and inhibit the purification process. This is an expensive and time consuming problem for waste water treatment installations. To prevent such environmental damage from any cause, there are several regulations, specifications and laws enforced by prosecution and claims for damages. Mineral oils can reduce the activity of activated sludge in waste water treatment by causing the death of the micro organisms or forming an oil film.

This reduces the oxygen exchange and inhibits waste water purification. The activity of activated sludge is measured by its respiration rate (oxygen use).

The measurement of respiration monitors the process of all the microbes and indicates the effect of environmental poisons. From test carried out by BASF in Germany we conclude that Esters comparable to BecFluid[®] 9902 even at high concentrations should have no effect on the oxygen demand of activated sludge.

It is unlikely that these high concentrations of BecFluid[®] 9902 can occur in water or waste water systems and the conclusion is that it should pose no risk to biological wastewater treatment.

Summary

BecFluid[®] 9902 is a transformer fluid which is readily biodegradable and is non-toxic to aquatic organisms and has no effect on degradation by activated sludge in biological wastewater treatment facilities. For transformers close to rivers, canals, lakes and water sports areas, waste water treatment plants or other ecologically sensitive locations, the risk to the environment can be reduced by the choice of BecFluid[®] 9902.