

BecFluid[®] 9902

Dielectric cooling and insulating fluid

Moisture behaviour

BecFluid shows very high tolerance to moisture. It absorbs much more water than mineral oil without influence on its insulation properties. Understanding this difference is very important, for the evaluation of the analysis of the fluids.

Testing of moisture content

The moisture contents of fresh and in-service fluids are shown in Table 1. Fresh BecFluid[®] 9902 is manufactured to very high standards and on delivery has a typical moisture content of 50 ppm. BecFluid[®] 9902 satisfies the requirements of the standards up to moisture content of 400 ppm.

In contrast mineral oil above 30 ppm moisture is no longer in-specification. This must therefore be considered in practical interpretation of moisture level analysis. Furthermore the specified tolerances should be fully incorporated into the moisture control systems installed in transformer equipment.

Effect on Insulation properties

Diagram 1 shows the breakdown voltage at room temperature of BecFluid[®] 9902 and mineral oil at increasing moisture content. Diagram 1 is a simplified and schematic presentation of internally determined values.

This shows clearly that even low levels of water content in mineral oil can bring about rapid deterioration of the breakdown voltage.

In contrast, BecFluid[®] 9902 containing a moisture level above 550 ppm maintains a high breakdown voltage >75 kV.

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Moisture removal

If the moisture content exceeds the maximum limit of the system, then BecFluid[®] 9902 can be processed in the same way and using the same equipment with molecular sieves, filtration etc, which would be employed to remove moisture from mineral oil.

Conclusion

BecFluid[®] 9902 is proven to provide an extraordinarily high capacity to absorb moisture without reducing its insulation properties.

Table 1: Moisture content Standards

Standard	Moisture content ppm
IEC 61099 – Delivered Ester	max. 200
IEC 61203 – Ester in service	max. 400
IEC 60296 – Fresh mineral oil	max. 30
IEC 60422 – Mineral Oil in service	max. 30

Diagram 1: Effect of moisture content on the breakdown voltage Of BecFluid[®] 9902 and mineral oil

