

Jarylec® GA and T make electrical transformers efficient and safe

Arkema, a global chemical company and France's leading chemicals producer, has developed and introduced in the market a gas absorption additive for transformer oil, which makes electrical transformers more reliable and efficient. Jérémie Walker, an Arkema researcher specializing in dielectric and heat-transfer fluids, shines the spotlight on this new technology.



> Why is Arkema interested in transformer oil?

Jérémie Walker – We started off from the following observation: transformer oil has a strong tendency to form gas, which is not without risk for the proper operation of transformers and electrical circuits. These types of oil are in fact of mineral origin, and they contain polyaromatic carbons which are carcinogenic; now to reduce these harmful carbons, the process used by manufacturers consists in hydrogenating the oil, which helps lower their level to below 0.1%. The counterpart of this is that the properties of the oils derived from good aromatic compounds are adversely affected: hydro-treated oils release a gas which promotes partial discharges, particularly harmful in the breakdown of the dielectric fluid.

On the strength of over 40 years' experience in dielectric fluids used in capacitors for their resistance to high voltage, Arkema came up with the idea of adding stable aromatic compounds to restore the good performances of the transformers' mineral oil: Jarylec® GA and T. Their physical properties (viscosity, vapour pressure, flash point, etc.) are close to those of mineral oil, and, with their high aromaticity, it features excellent resistance to decomposition while also being a powerful gas absorbant.

> What are Jarylec® GA and T, and what do they actually bring as additives?

J.W. – Jarylec® GA and T are blend of benzyltoluene isomers, non-classified synthetic oil presenting no hazard to health or the environment, and which by their chemical nature are fully compatible with mineral oils.

Adding Jarylec® GA and T as additives to transformer oil helps minimize partial discharges which cause the electro-chemical breakdown of the mineral oil and the formation of gas. Any build-up of gas promotes persistent partial discharges, and can also lead to a risk of the transformer blowing up and a risk of fire. By absorbing the gas, Jarylec® GA and T considerably reduce the partial discharges while minimizing risks of explosion and fire. Finally, resistance to electrical fields and heat transfer are also improved.

> Have the benefits of Jarylec® GA and T been demonstrated by approved tests?

J. W. – An IEC (International Electrotechnical Commission) test using hydrogen has shown that Jarylec® GA and T could absorb – 170 µl/min of gas. Tests conducted with a variety of mineral oil blends have shown that a gas evolving mineral oil could be transformed into a gas-absorbing oil with the addition of 3-5% of

Jarylec® GA and T. For transformers already in service and whose oil presents gassing problems, adding 8-10% of Jarylec® GA and T helps significantly to improve the gassing tendency.

> In practical terms, what are the benefits of including these additives for manufacturers and users?

J.W. – The benefits are unquestionable for both manufacturers and users of transformers: greater safety resulting from the absorption of gas, and superior resistance to oxidation and decomposition. Hence this reduces the ageing of the oil, and degassing is no longer necessary. By preventing the formation of gas, this reduces the maintenance costs involved in the monitoring of these gases and in oil reprocessing operations. Finally, the reliability of transformers in service can be improved, and their lifetime extended.



**Arkema will attend
Cigré 2010 Session
on stand n°55**

**If you require any information,
please contact:**

**Jérémie Walker or Olivier Dalle
info.jarylec_jarytherm@arkema.com
Tel.: + 33 (0)4 72 39 80 51**


ARKEMA
The world is our inspiration