

REOIL[®]

extending
life of transformers

EKOFLUID
TRANSFORMER OIL REGENERATION

www.ekofluid.sk/en/



The Advantage

Rising costs and high demands are a driving force in utilizing the transformer performance. Many transformers are being pushed to their limits with demands on minimizing downtimes and maximizing performance. It's these key factors that lead to rapid insulation oil deterioration causing it to lose its dielectric properties that could seriously endanger the reliability of a transformer. For this reason we have developed the REOIL® technology. REOIL® uses highly effective adsorption clay to treat oil into like new conditions conforming to the IEC 60422 standard without a requirement for oil change. Treatment of oil is carried on site where adsorption agents absorb all the degradation products from degraded transformer oil without interrupting the transformer operation.

REOIL® unit

REOIL® unit is a mobile unit suitable for use on an energized or de-energized transformer at the customer's site. The unit incorporates option for regular oil purification – degassing and filtration however its main application is transformer oil regeneration mainly the removal of acidity, sludge and other degradation products. Its mobility is making it a cost effective solution.

Why is REOIL® more effective??

- Regenerates degraded oil into like new conditions
- Treatment of oil is done on the transformer installation site
- Long lasting (proven) effect
- Fully eliminates the need for oil change.
- Works on all oil insulated transformers.
- Economical solution independent of current oil prices.
- Requires no downtime period of the transformer



Oil change is not sufficient

With REOIL® technology the total volume of oil in the transformer recirculates number of times generating a flushing effect within the transformer. The flushing effect helps to remove degradation products from solid insulation which are then contained within the insulating oil. Insulating oil is then treated in the REOIL® unit and disposed of the degradation products.

REOIL® unit uses a close circuit oil treatment process where as standard oil change leaves up to 15% of old degraded oil in the transformer together with all embedded degradation products greatly harming newly inserted oil into the transformer. An issue that is non-existent with the REOIL® closed circuit operation.

Environmental conscience is an important factor in the design of REOIL® technology. The key factor of the technology is completely obviates the necessity of disposal of old degraded oil by regenerating it to a like new condition without producing any harmful or toxic side products. Eliminating the necessity to bringing fresh adsorption clay and removal of vast quantities of oily saturated clay offsite

Time and distance is not a constraint

The trailer-mounted REOIL® unit has been specifically designed for on-site use completely eliminating the need of relocating the transformer to different service location.

Advantages to an oil change

- No downtime required
- Long lasting (proven) effect
- Desludging of a transformer
- Highly cost effective
- Treatment performed onsite
- Highly effective moisture removal



Time proofed results

Property (Unit)	IEC 60422 value	Prior to regeneration	After regeneration	9 years after regeneration
Dielectric strenght (kV/2,5mm)	≥ 50	85	98	82
Dielectric dissipation factor at 90 °C	< 0,01	0,0510	0,0008	0,0038
Neutralization number (mg KOH/g)	< 0,03	0,068	0,017	0,018
Water content (ppm)	30	13	7	11
Interfacial tension (mN/m)	> 35	33	55	48

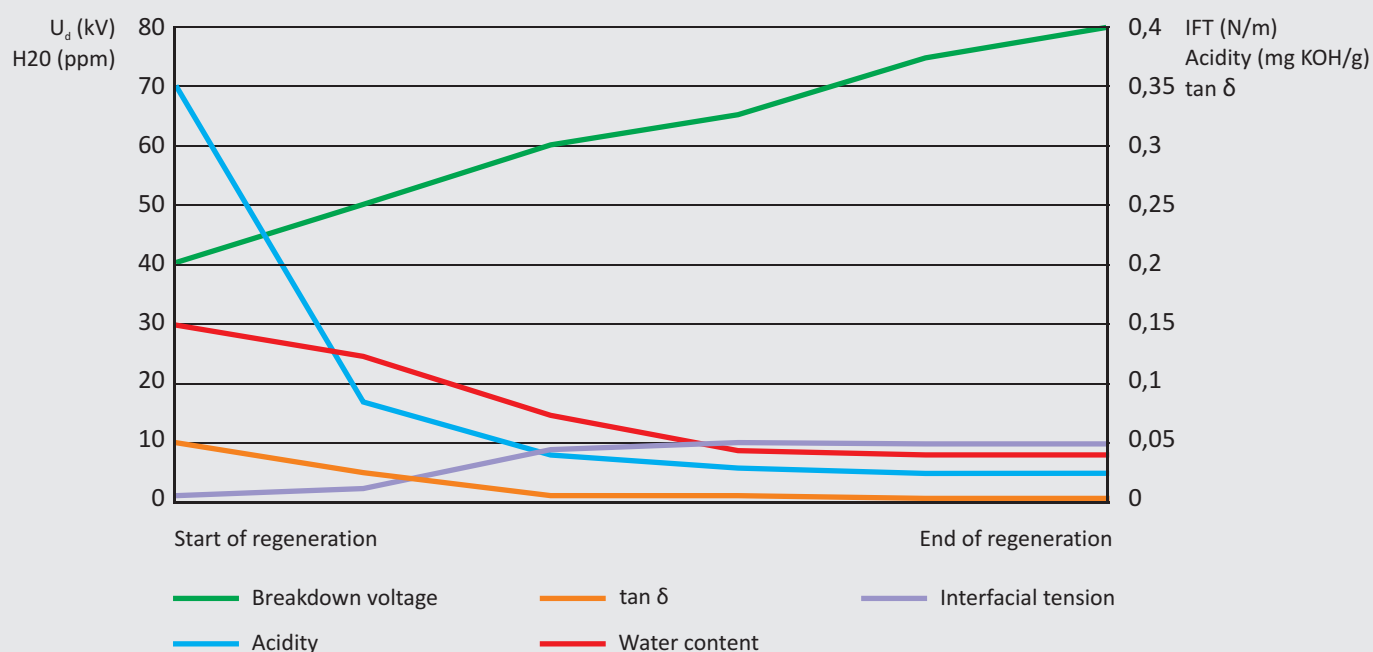
In our recently conducted case study our engineers have collected 9 years old regenerated oil samples. Oil samples were collected from transformers using regenerated oil processed by one of our REOIL® units. Collected samples were subjected for thorough analysis in an independent laboratory. Results proved that regenerated oil even after 9 years inside the transformer maintains its insulation properties conforming to the IEC 60422 standards and showed no degradation differences to that of new oil.

Safety and process monitoring

REOIL® unit is filled with numerous safety measures to fully satisfy increasing customer safety demands. We continuously measure oil levels to ensure the optimal filling in the transformer. REOIL® uses quick acting pneumatic valves within the unit as well as for the transformer. We use automated modules to aid in the safety precautions while the system is design to power down in case of system malfunction. During the entire regeneration process we have trained operators supervising the REOIL® unit on site.

Environmentally friendly

REOIL® technology is inherently designed to be environmentally conscious. Its core focus is regeneration of degraded transformer oils thus providing the opportunity to recycle used oil fully eliminating the necessity of disposal of degraded transformer oil. While REOIL® technology uses highly efficient adsorbent clay for oil treatment it is also capable of reabsorbing this clay therefore again eliminating the necessity of disposal. REOIL® regeneration process is environmentally friendly, waste free and does not produce any hazardous by products.



Exceeding the standards

During the entire regeneration process we monitor the quality of oil flowing through the REOIL® unit. Oil monitoring allows effectively managing the regeneration process allowing for more optimal results. At the end of the regeneration process oil is analyzed by a certified third party laboratory to ensure the quality conforms to the IEC 60422 standard. Our 15+ years' of experience confirm that regenerated oil exceeds the standards set by IEC 60422.



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