



TRANSFORMER-LIFE-MANAGEMENT
CONFERENCE

Demystifying transformer Oil Treatment and regeneration

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Ekofluid





Demystifying transformer Oil Treatment and regeneration

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Demystifying transformer Oil treatment and regeneration

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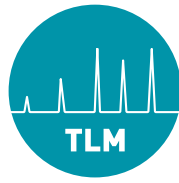
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Not your average presentation

- No technical speak
- KISS principal
- Establish a common base
- Destroy the false truth
- No graphs , numbers or tables



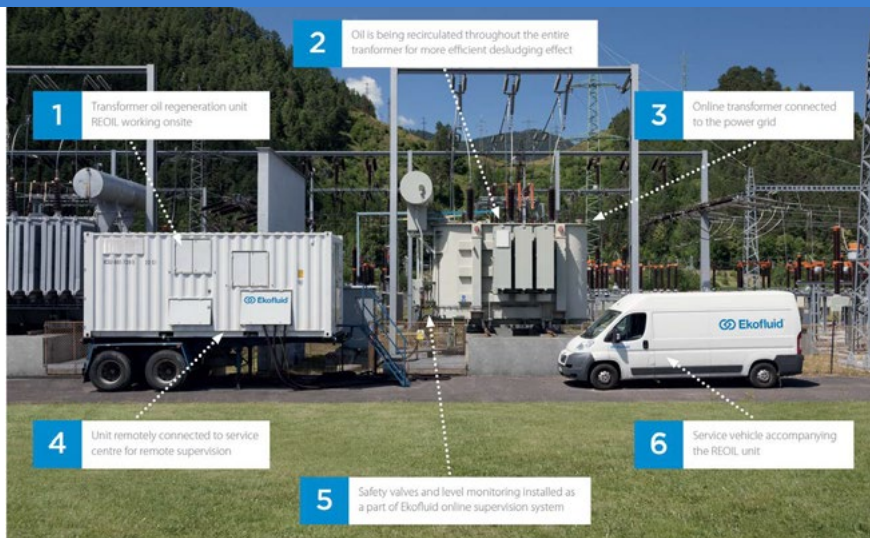


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Generic onsite setup



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OIL what ??

- Oil degassing
- Oil filtration
- Oil de humidifying
- Oil treatment
- Oil regeneration
- Oil reclamation
- Oil purification
- Oil drying
- Oil processing





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Which is it ?

Your oil is either wet (full of water) or full of gas
OR
Your oil is old (and can also be wet and full of gas)



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Remove water and gas

- Oil degassing
- Oil filtration
- Oil de humidifying
- Oil treatment
- ~~Oil regeneration~~
- ~~Oil reclamation~~
- Oil purification
- Oil drying
- Oil processing





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What removes the water and gas

- Vacuum inside the vacuum chamber
- Temperature of the oil
- Separation elements (inside the vacuum chamber)



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How do you know when to start

There are 2 factors that can influence your decision

- Time
- Oil test results





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How do you now when to end

- Ask the simple question , is the water and gas gone
- Gone means below the requirements of the standards
- And always confirm with measuring instruments or even better with the accredited laboratory



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Do I have good equipment

Forget about

- Leakage rate
- Absolut vacuum
- Vacuum tight

Concentrate on

- What is inside the vacuum chamber
- Oil flow
- Heating capacity
- Size
- Performance of the plant





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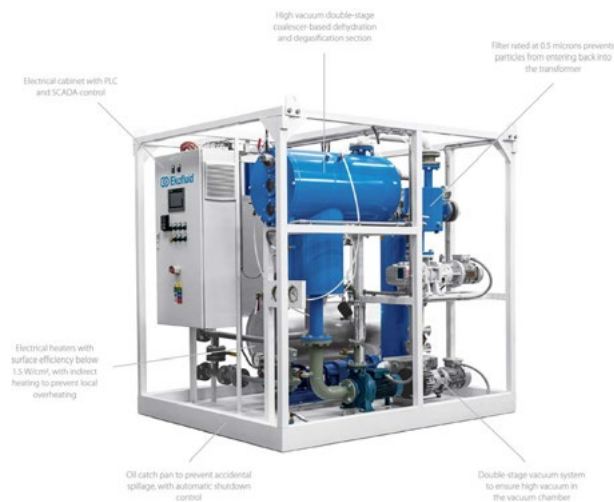
What to look for

- Good vacuum pumps
- Reliable foam sensor
- Inlet and outlet pump
- Good enough heating
- Reliable control system with enough protections
- Safety features



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Oil Plant





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Common misconceptions

- Offline treatment is different to online treatment
- Vacuum tight
- The bigger the better
- As long as there is a vacuum chamber all is good



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Renews old oil

- ~~Oil degassing~~
- ~~Oil filtration~~
- ~~Oil de humidifying~~
- ~~Oil treatment~~
- Oil regeneration
- Oil reclamation
- ~~Oil purification~~
- ~~Oil drying~~
- ~~Oil processing~~





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What renews the oil ?

Special filters inside the equipment but more importantly what is inside them.

- Fuller earth
- Activated bauxite
- Sorbent

It is a very advanced filter made by nature which attracts everything that is old in the oil and keeps it.



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The big question is:

What happens after these filters are full
They stop to work and you need to renew them





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How do you renew filters

By vacuum and heat

- Its like burning a cigarette only 12 hours long and under vacuum
- The filters are restored to their initial capacity
- This can be done many (up to 300) times
- Than you need to replace them



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Time factor

Renewing of oil takes time

Renewing of filters (material inside them) takes also time

Very different to gas and water removal





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How do you know when to start

There are 3 factors that can influence your decision

- Time
- Oil results
- Life extension



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How do you know when to end

- Ask the simple question , is the oil new again ?
- New means does it meet the required standards ?
- You can do it visually but always ask the local laboratory to confirm.





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Do I have good equipment

Forget about

- Oil flow
- Vacuum capacity

Concentrate on

- Amount of filter media in the filters
- Effectiveness of filter media in the filters (usually defined by the amount of oil in kg before the renew cycle needs to be started)
- Size



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What to look for

- Good vacuum pumps
- Well known PLC and SACADA system
- Good enough heating
- Reliable control system with enough protections
- Safety features





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Oil Plant

Inlet and outlet filters with advanced technology to prevent any particle contamination

Electrical features with surface efficiency below 1.5 Ohm/m² with indirect heating to prevent local overheating

Stainless steel double section oil storage tank with drain system and level monitoring

Column back section housing the regeneration system and vacuum reactivation technology

High vacuum double stage condenser based distillation and degasification section

Easy to use inhibition system (glycol based or liquid based) inhibitors can be used

Oil catch pan to prevent accidental spillage with automatic shut-down control

Technical cabinet with PLC and SCADA control

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Common misconceptions

- Offline treatment is different to online treatment
- Capacity of the plant is defined by oil flow
- You can only improve to the initial state of the oil not better



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END



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