GIEBEL Adsorber®

...setting standards in aeration drying!

GIEBEL ADSORBER® DESIGNED AND PRODUCED IN GERMANY

Use: **Transformer in a research institute**

Transformer data:

- Power 31,5 MVA
- Oil amount: appr. 19 to.
- Outdoor installation

At a transformer with 31,5 MVA in a research institute a GIEBEL Adsorber DUO-VARIO TB 550-PA was installed in August 2012. The conventional dehumidifier with the size L3 was replaced.

Since the installation of the absorber, the oil was tested at various time intervals and analyzed in a laboratory. Since the use of the GIEBEL Adsorber two positive results have set:

1. Improved characteristics of the oil

The water content, responsible for the breakdown voltage of the oil and the aging behavior of liquid and solid insulation has decreased. Moreover, the breakdown voltage of withstanding measure of the suitability of the oil of the electrical stress, increased. Anticipated, these values are not actively changed by a dehumidifier. However, this can favor the influencing factors of the transformer in order to improve these values.

Date	June 2007	August 2012	February 2014	July 2014
Breakdown voltage (DIN EN 60156)	68,8	63,0	61,9	73,0
Water content (DIN EN 60814)	9,0	6,7	5,2	4,0

Adsorber assembled at 12.08.2012

2. Extended service intervals of the dehumidifier

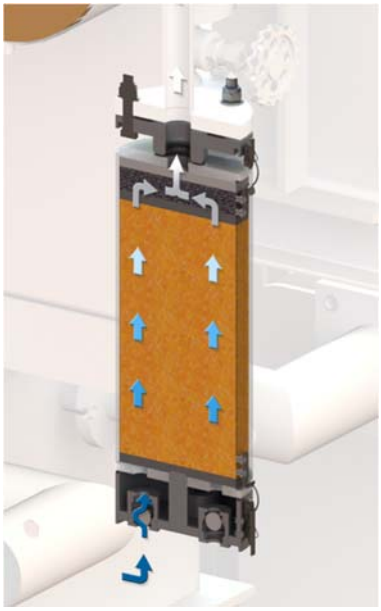
Since the installation in August 2012 to December 2015, no maintenance was performed on adsorber. The silica gel was not changed over a period of about three years. To avoid negative influences a status check was carried out in December 2015 to the request of the operator.

In this case the adsorbers were opened and tested regarding the general condition and loading state. The silica gel orange-colourless had adsorbed 555,7g water and was in a very good state.

The activated carbon was separated at the beginning and it could dissolved 3.6g water therefrom. This means that the active carbon had capacity for oil adsorption. Non-polar oil is more strongly bound at activated carbon as water. This would displaces the water the water molecules from the pores.

Reasons for these results

In order to achieve efficient air drying and long service intervals, it is necessary to adapt the dehumidifier on the respiratory behavior of the transformer.



Firstly, it must be noted that oil causes significant harm to the silica gel. The pores are blocked, so that only a limited water adsorption is possible. Through the use of activated carbon, the

outflowing oil particles are bound and the cleaned air can be used for regeneration of the silica gel. This extends the service life of the silica gel and ensures better air drying.

Moreover, in the conventional dehumidifier, the oil is also entered through the oil reservoir into the silica gel. The negative impact of the oil is often clearly visible. The lack of cleaning the outflowing air and additionally attached exposure to the oil reservoir, the silica gel is contaminated from both sides. The drying of the air is thus limited, and the moisture in the transformer rises continuously.

Conclusion

A dehumidifier will not affect the water content and the breakdown voltage active to a positive amount. However, a good adsorber will create the general conditions to keep these values sustained at a good level. In addition, the service costs can be considerably reduced and thus operating costs are saved.

GIEBEL FilTec, 21.03.2016