



CAPABILITY STATEMENT

OIL TESTING LABORATORY

Insulating oil testing is a critical step in the management of transformer assets to optimise operational availability. Oil sampling is a cost-effective way of determining the health of your transformer with no need for down time. Sample results are used to determine the suitability of the insulating oil for future use as well as indicate if a possible fault exists in the transformer.

OUR APPROACH

Verico's Insulating Oil Laboratory provides access to a wide range of insulating oil analysis methods to keep you informed on the overall health of your transformer. We are compliant with ISO/IEC 17025 and NATA Accreditation (Accreditation No. 4669) and all work is performed to Australian and International standards.

We provide a wide range of insulating oil analysis services for a diverse client base. Our current clients include power stations, electrical distribution networks, mines and transformer build and maintenance companies.



SERVICE TIME

Under normal conditions, results are available within four working days. 24/7 emergency service is also available.

SAMPLING

Sampling services are available or you can arrange for Verico to train your staff in the standard methods of sampling.

SAMPLE TRANSPORT

Robust sampling kits can be delivered overnight (nationally).





OIL TESTING LABORATORY



VERICO PROVIDES ANALYSIS ON:

DISSOLVED GAS ANALYSIS (DGA)

DGA is the analysis of gases dissolved in the transformer oil. When a fault occurs in the transformer it causes the formation of gas from the breakdown of the oil. Key gases can indicate what type of fault may exist. A sudden increase in key gases and the rate of gas production may indicate an active fault.

MOISTURE

High water content in the oil indicates high water content in the insulation paper. Water is one of the major contributors to the paper deterioration which is irreversible. Water is also produced during oxidation of the oil and paper, which further accelerates the breakdown of the paper.

ACIDITY

Acidity measures the breakdown products of the oil (organic acids). It is an indication of the extent of oxidation of the oil and whether oil treatment or replacement is required. The acidity of the oil increases as the oil ages/degrades and the rate of degradation is dependent on temperature.

INTERFACIAL TENSION (IFT)

IFT measures a physical property of the oil (surface tension) that decreases with increasing presence of oxidation products (acidity). IFT is a very sensitive test to the early oxidation of oil. The IFT of an oil will decrease with the ageing/degradation of the oil.

ELECTRICAL STRENGTH OR BREAKDOWN VOLTAGE

The breakdown voltage is a measure of the ability of the oil to withstand electrical stress. This property is complex and depends on particle content, particles type and water content. The breakdown voltage decreases with increasing moisture and particle content of the oil.



BAUR Electrical Strength Test Cell

RESISTIVITY / DIELECTRIC DISSIPATION FACTOR (DDF)

DDF or Power Factor is a measure for dielectric losses within the oil (new oil has low DDF). Resistivity is the inverse of conductivity and is a measure for the electrical insulation properties of the oil. These electrical measurements are very sensitive to the presence in of polar compounds contaminants, oxidation products or colloids in oil. The DDF/Resistivity measurement can monitor slight changes in oil quality that chemical methods would not detect.

COLOUR AND APPEARANCE

As a field observation, the colour and appearance of the oil gives rapid and useful information about the quality of the oil. The appearance of the oil can indicate presence of free water (turbid samples) and if any impurities such as fibres or cellulose particles are present. The ASTM D1500/ISO 2049 standard colour test method applies a colour index number from 0.0 (new oil/light) to 8.0 (highly oxidized oil/dark) in 0.5 increments.





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VERICO PROVIDES ANALYSIS ON:

DEGREE OF POLYMERISATION (DP)

One of the most dependable means of determining paper deterioration and remaining life is the DP test of the cellulose in the paper. The cellulose molecule is made up of a long chain of glucose rings which form the mechanical strength of the molecule and the paper. DP is the average number of these rings in the molecule. As paper ages or deteriorates from heat, acids, oxygen, and water the number of glucose rings decrease. DP is the average number of glucose units per cellulose molecule in the paper.

FURAN ANALYSIS

Furans are a family of organic compounds which are formed by degradation of paper insulation. Furan analysis is a non-destructive test carried out on oil, which gives information about the integrity and remnant life of the insulation paper. A relationship between one of the more stable furans produced, 2-Furaldehyde (also known as 2-Furfural or 2FAL) and Degree of Polymerisation (DP) can be determined. Thus, by measuring the 2FAL content of the oil an indication of the integrity of the paper insulation can be obtained.

POLYCHLORINATED BIPHENYLS (PCBs)

PCBs are a group of very stable chlorinated aromatic hydrocarbons. PCBs are amongst a broader group of harmful Persistent Organic Pollutants that are toxic, persist in the environment and animals, bioaccumulate through the food chain and pose a risk of causing adverse effects to human health and the environment. PCBs were in common use for insulating electrical equipment from 1930 until the mid-1970s, are banned by law and serve as sources of contamination to the environment.



Shimadzu GC/ECD used for PCB analysis

OTHER ANALYSIS SERVICES AVAILABLE INCLUDE:

- Corrosive sulphur
- Passivator
- Inhibitor
- Dissolved metals
- Particle count
- Buchholz gas analysis
- Sediment/sludge
- Viscosity
- Flashpoint
- Density

