FOURIER TRANSFORM INFRARED TESTING

PRODUCT BROCHURE

OVERVIEW

Our insulating oil laboratory provides access to a wide range of insulating oil analysis methods to determine the overall health of a transformer through the use of a variety of scientific instrumentation and methodologies to analyse insulating oil samples. The sample results obtained 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.

Due to an increase in demand for oxidation inhibitor analysis, our new Fourier Transform Infrared (FTIR) spectrophotometer for samples to be analysed in-house.

Oxidation inhibitors in the oil prevent early ageing of the oil and transformer insulation. Mineral oil has some natural oxidation inhibitors but it is standard industry practice to add an oxidation inhibitor compound DBPC (2,6-di-tertiary-butyl-paracresol) to maintain the slower ageing of the oil and transformer insulation.

Knowing the amount of inhibitor in the oil is important in determining how quickly it is being consumed and when to re-dose the oil.

FTIR is a method of measuring infrared absorption and emission spectra of organic compounds. It detects chemical bonds and can be used to determine chemical functional groups contained in organic compounds, that is, transformer oil.

The FTIR spectra of an organic compound is unique for that compound (spectral fingerprint). Unknown organic compounds or associated functional groups can be identified by comparison with reference compound spectra.

The new FTIR instrument, a Shimadzu IRSpirit with Specac Pearl sampling attachment (Figure 2) is a compact modern instrument that is reliable, precise and easy to use.

The Shimadzu IRSpirit won a red-dot design award in 2018 from the Design Zentrum Nordrhein Westfalen in Germany, and the Specac Pearl™ sampling system allows for fast analysis of samples (Verico has the first of its type on a Shimadzu instrument in Australia).

Not only can this instrument be used for determining the amount of DBPC in insulation oil, it can also determine the insulating fluid type in a transformer and possible sources of contamination.