

WECOSOL®

Insulating Liquid

WECOSOL® (PDS 51550BT) is the trademark for Westinghouse fire and explosion resistant transformer dielectric liquid. The liquid is an ultra-pure grade of perchloroethylene. Transformers containing perchloroethylene are offered as a replacement for transformers containing polychlorinated biphenyl (PCB). WECOSOL-filled transformers are rated "non-flammable" because the liquid has no fire or flash point as measured by ASTM Test D-92. Extensive testing has verified the acceptability of WECOSOL as a transformer dielectric fluid in transformers designed for its use.

Sampling

Clean, dry glass containers should be used to obtain the dielectric liquid samples from WECOSOL insulated transformers. The Liquid Sampling Kit (Figure 1) may be obtained from Westinghouse. Refer to Price List 48-525 for ordering instructions.

To prevent air from being drawn into the tank, the tank pressure must be greater than zero psi. If necessary, increase the tank pressure by injecting dry nitrogen until a positive pressure of about one half psi is reached. The sample should be taken when the transformer is warmer than the ambient air to avoid condensation.

Care should be taken to procure a sample which fairly represents the liquid in the tank. Due to the higher relative density of WECOSOL as compared to oil, any free water will collect at the top of the transformer. All samples must be taken from the top liquid sample valve near the top fluid



Figure 1

Liquid Sampling Kit

level. A sufficient amount of liquid should be drawn off and properly disposed of before the sample is collected to insure that the sample obtained is representative of the liquid in the body of the transformer. If the sample taken contains free water, it is not suitable for dielectric tests and the sample must be properly discarded. A second sample should then be taken after at least two quarts of liquid have been withdrawn.

Tests

General tests performed on WECOSOL are:

- (a) Dielectric Breakdown Voltage —ASTM D-877
- (b) Acid Number —ASTM D-974
- (c) Power Factor, 60 Hertz at 25°C —ASTM D-924
- (d) Moisture Content —ASTM D-1533
- (e) Oxygen Stabilizer Content

Measurement of the oxygen stabilizer content is determined by chromatographic analysis of the liquid. Additional tests such as particle count, and atomic absorption for determination of dissolved metals can also be performed when requested.

Physical Properties of WECOSOL

Properties routinely measured for monitoring the insulating quality of WECOSOL are listed below. These are specification values.

Dielectric Breakdown Strength	kV min. 30
Acid Number	mg KOH/gr max. 0.01
Power Factor	% 60 Hertz at 25°C max. 0.30
Moisture Content	PPM max. 35
Oxygen Stabilizer Content	PPM min. 50

Chart 1 illustrates the behavior of the power factor of WECOSOL as a function of temperature. Chart 2 gives the dielectric breakdown as a function of water content.

The detection of low energy incipient faults through gas from liquid chromatographic analyses may be made on WECOSOL insulated transformers. The procedures for sampling and testing are the same as for oil-filled transformers. The Gas and Gas-in-Liquid Sampling Kit, Figure 2, consists of two stainless steel bottles fitted with valves on each end. The smaller bottle (150 cc) is for the gas sample taken from the gas space of the transformer. The larger bottle (300 cc) is for the liquid sample. Liquid samples may also be taken using a glass syringe, Figure 5. Refer to Price List 48-525 for details in obtaining liquid sampling kits.