



OXIDATION STABILITY OF MINERAL INSULATING OIL (TRANSFORMER OIL) - (ASTM D2440)

Compliance Standards:

ASTM D2440, IP 280

Introduction:

This test method determines the resistance of mineral transformer oils to oxidation under prescribed accelerated aging conditions. Oxidation stability is measured by the propensity of oils to form sludge and acid products during oxidation.

Significance & Use:

A test specimen of mineral transformer oil is oxidized at bath temperature of 110 °C/95 °C, in the presence of a copper catalyst coil, by bubbling oxygen through duplicate test specimens for 72 and 164 h, respectively. The oil is evaluated at the end of each aging period by measuring the amount of sludge and acid formed. The test specimen is diluted with n-heptane and the solution filtered to remove the sludge. The sludge is then dried and weighed.

Brief Construction Details:

The complete unit comprises of following main parts and accessories

1) Oil bath

- Double walled oil bath with inlet provision
- Rectangular shape
- Stainless steel structure
- Outer body fabricated from Stainless Steel - 304
- Inner chamber fabricated from Stainless Steel - 316
- Heavy insulation between inner chamber and exterior body
- Inner chamber is fitted with efficient heating element and PT-100 Sensor
- Bath temperature is controlled by Microprocessor based dual display PID Temperature indicator cum controller
- Temperature control accuracy : $\pm 0.5^{\circ}\text{C}$
- Temperature display : LED
- Temperature range : 5 °C above ambient to 200 °C
- Supplied with over temperature protection safety



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GST TIN No. : 24AABCE4018L1ZU
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2) Oil Receptacle and Head:

- 4 nos of test tube
- Made of borosilicate glass

Provided with B -24 cone having the following dimensions:

Overall Length : 210 ± 2.0 mm
External diameter : 25 ± 0.5 mm
Wall thickness : 1.25 ± 0.2 mm
Height of head : 28 ± 2.0 mm
Side outlet tube : 5.0 mm outside diameter

3) Oxygen inlet tube (Delivery Tube) Dimensions

External dia : 5.0 ± 0.4 mm
Wall thickness : 0.8 ± 0.1 mm
Inside diameter : 3.0 ± 0.1 mm

The test tube is fitted with a Drechsel head to which is attached the inlet tube which will extend within 2.5 ± 0.5 mm of the bottom and its end ground at an angle of 30° to the horizontal axis.

4) 4 nos. Metallic Copper Catalyst of following dimension:

Copper catalysts consist of a wire of non-annealed commercial electrolytic copper of diameter between 1.00 and 1.02 mm. And wire shall have a length of 305 ± 1.0 mm rolled into a spiral of approximately 20 mm external diameter and 50 mm in length.

5) 4 nos. rotameters (flowmeters) of following features:

These are rotameter type flowmeters with the capacity to measure the flow rate of oxygen in the range (1 ± 0.1) litre / hour in case of ASTM D2440 test method or (3 ± 0.1) litre / hour in case of ASTM D943 test method.

Following accessories will be the part of standard supply:

- Oil bath for the immersion of 4 standard test-tubes held by a double bottom
- Stainless steel structure
- Insulated double wall
- 04 independent flow-meters that transfer oxygen at (1 ± 0.1) l/h or (3 ± 0.1) l/h rate
- Heavy duty motor stirrer
- Outlet system
- Complete set of glassware

Note:

Please refer to the recommended accessories section to carry out the test as per ASTM Standard

1. Hot air oven for glassware drying
2. Membrane filter holder for filtering out the test sample oil at the end of experiment, so that generated sludge and oil can be separated.
3. Conical flask, 500 ml, to collect the filtered test sample (oil) at the end of the experiment
4. Burette with 10 ml capacity and 0.05 ml accuracy to carry out Neutralization value test using titration solution.

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