

Tentative Methods of Test for

SLUDGE FORMATION IN MINERAL TRANSFORMER OIL¹



A.S.T.M. Designation: D 670 - 42 T

ISSUED, 1942.²

These Tentative Methods have been approved by the sponsoring committee and accepted by the Society in accordance with established procedures, for use pending adoption as standard. Suggestions for revisions should be addressed to the Society at 1916 Race St., Philadelphia 3, Pa.

Scope

1. These methods of test are applicable in the evaluation of the sludge forming tendency in new, mineral transformer oils (see Explanatory Note). Two methods are covered as follows:

(a) *Method A*, the sludge accumulation test, is applicable to new, mineral transformer oils except those that have been "stabilized" by the addition of retarders, stabilizers, and negative catalysts.

(b) *Method B*, the high-pressure oxidation test, is applicable to new, mineral transformer oils except the so-called highly refined, white oils of zero iodine value, and mineral oil containing retarders, stabilizers, and negative catalysts.

METHOD A: SLUDGE ACCUMULATION TEST

Nature of Test

2. The sludge accumulation test for mineral transformer oil evaluates the

propensity of an oil to deposit an insoluble sludge under definitely prescribed conditions of oxidation in the presence of a copper catalyst for 72, 168, and 336 hr. The total evaluation of an oil includes consideration of the tendency of the oil to deposit sludge under mild oxidation (72 hr.) and the rate at which this sludge deposition increases as a result of more severe oxidation as the test is continued for 168 and 336 hr.

Apparatus

3. The apparatus shall consist of the following:

(a) *Aging (Oxidation) Bath*.—An oil or wax bath of a suitable type capable of controlling the temperature at 120 ± 0.5 C. with a temperature gradient of less than 1 C. in the body of the oil or wax used. Circulation of the oil or wax heating medium such as by a pump or stirrer is recommended.

(b) *Drying Tower*.—A drying tube, 10 to 12 in. (25 to 31 cm.) in height, fitted with a ground-glass stopper and side tubes for conditioning of the air supply.

¹ Under the standardization procedure of the Society, these methods are under the jurisdiction of the A.S.T.M. Committee D-9 on Electrical Insulating Materials.

² Accepted by the Society at annual meeting, June, 1942.