Designation: D7150 – 13

Standard Test Method for the Determination of Gassing Characteristics of Insulating Liquids Under Thermal Stress[1]

This standard is issued under the fixed designation D7150; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method describes the procedures to determine the gassing characteristics due to thermal stress at 120°C of insulating liquids specifically and without the influence of other electrical apparatus materials or electrical stresses. This test method was primarily designed for insulating mineral oil. It can be applied to other insulating liquids in which dissolved gas-in-oil analysis (Test Method D3612) is commonly performed.

1.2 This test method is particularly suited for detection of the phenomenon sometimes known as "stray gassing" and is also referred to in CIGRE TF11 B39.

1.3 This test method is performed on transformer insulating liquids to determine the propensity of the oil to produce certain gases such as hydrogen and hydrocarbons at low temperatures.

1.4 This test method details two procedures:

1.5 Method A describes the procedure for determining the gassing characteristics of insulating liquids, at 120°C for 164 h.

1.6 Method B describes the procedure for processing the insulating liquid through an attapulgite clay column to remove organic contaminants and other reactive groups that may influence the gassing behavior of an insulating liquid, which is suspected of being contaminated. This procedure applies to both new and used insulating liquids.

1.7 The values stated in SI units are to be regarded as standard. English units are used when there is no metric equivalent.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1933 Specification for Nitrogen Gas as an Electrical Insulating Material

D3612 Test Method for Analysis of Gases Dissolved in Electrical Insulating Oil by Gas Chromatography

2.2 *IEEE Document:*[3]

C 57.104 IEEE Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers, 2008

2.3 *IEC Documents:*[4]

IEC 60599 Mineral oil-impregnated electrical equipment in service – Guide to the interpretation of dissolved and free gases analysis, 2007

IEC 61464 Guide for the interpretation of dissolved gas analysis (DGA) in bushings where oil is the impregnating medium of the main insulation (generally paper), 1998

CIGRE TF11 B39 Gas formation tendency test for mineral transformer oils, 2002

3. Terminology

3.1 *Definitions:*

3.1.1 *stray gassing, n*—the production of gases in an insulating liquid due to heating, contamination or in combination.

3.1.2 *Fuller's Earth, n*—highly adsorbent clay-like substance consisting mainly of hydrated aluminum silicates with the main minerals being montmorillonite, kaolinite, attapulgite and palygorskite.

4. Summary of Test Method

4.1 *Method A*—Insulating liquid is filtered through a mixed cellulose ester filter. A portion of the test specimen is sparged for 30 min with dry air. A test specimen is then placed into a glass syringe, capped and aged at 120 ± 2°C for 164 h. The test is run in duplicate. The other portion of the test specimen is

[1] This test method is under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Gases and is the direct responsibility of Subcommittee D27.03 on Analytical Tests.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from the Institute of Electrical and Electronic Engineers, Inc, (IEEE), 445 Hoes Lane, Piscataway, NJ 08854; www.ieee.org

[4] Available from the International Electrotechnical Commission, 3, rue de Varembé, P.O. Box 131 CH-1211, Geneva 20, Switzerland; www.iec.ch

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