This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D1868 – 20

Standard Test Method for Detection and Measurement of Partial Discharge (Corona) Pulses in Evaluation of Insulation Systems[1]

This standard is issued under the fixed designation D1868; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers the detection and measurement of partial discharge (corona) pulses at the terminals of an insulation system under an applied test voltage, including the determination of partial discharge (corona) inception and extinction voltages as the test voltage is raised and lowered. This test method is also useful in determining quantities such as apparent charge and pulse repetition rate together with such integrated quantities as average current, quadratic rate, and power. This test method is useful for test voltages ranging in frequency from zero (direct voltage) to approximately 2000 Hz.

1.2 This test method is directly applicable to a simple insulation system that can be represented as a two-terminal capacitor (**1**), (**2**).[2]

1.3 This test method is also applicable to (distributed parameter) insulation systems such as high-voltage cable. Consideration must be given to attenuation and reflection phenomena in this type of system. Further information on distributed parameter systems of cables, transformers, and rotating machines will be found in Refs (**1-9**). (See AEIC CS5-87, IEEE C57 113-1991, IEEE C57 124-1991, and IEEE 1434-2005.)

1.4 This test method can be applied to multi-terminal insulation systems, but at some loss in accuracy, especially where the insulation of inductive windings is involved.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Specific precaution statements are given in Sections 8 and 14.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

D618 Practice for Conditioning Plastics for Testing

D2275 Test Method for Voltage Endurance of Solid Electrical Insulating Materials Subjected to Partial Discharges (Corona) on the Surface

D3382 Test Methods for Measurement of Energy and Integrated Charge Transfer Due to Partial Discharges (Corona) Using Bridge Techniques

2.2 *IEEE Standards*[4]

IEEE 48 Standard Test Procedures and Requirements for High Voltage Alternating Current Cable Terminations

IEEE 1434-2005 Guide to the Measurement of Partial Discharges in Rotating Machinery

IEEE C57 113-1991 Guide for PD Measurement in Liquid-Filled Power Transformers and Shunt Reactors

IEEE C57 124-1991 Recommended Practice for the Detection of PD and the Measurement of Apparent Charge in Dry-Type Transformers

2.3 *Other Documents:*

AEIC CS5-87 Specifications for Thermoplastic and Cross-linked Polyethlene Insulated Shielded Power Cables Rated 5 through 35 kV (9th Edition) October 1987[5]

[1] This test method is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.12 on Electrical Tests.

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[2] The boldface numbers in parentheses refer to the list of references at the end of this test method.

[3] 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.

[4] Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854-4141, http://www.ieee.org.

[5] Available from Association of Edison Illuminating Companies (AEIC), P.O. Box 2641, Birmingham, AL 35291-0992, http://www.aeic.org.

***A Summary of Changes section appears at the end of this standard**

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