



Designation: D2275 – 22

Standard Test Method for Voltage Endurance of Solid Electrical Insulating Materials Subjected to Partial Discharges (Corona) on the Surface¹

This standard is issued under the fixed designation D2275; 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 determines the voltage endurance of solid electrical insulating materials for use at commercial power frequencies under the action of corona (see **Note 1**). This test method is more meaningful for rating materials with respect to their resistance to prolonged ac stress under corona conditions for comparative evaluation between materials.

NOTE 1—The term “corona” is used almost exclusively in this test method instead of “partial discharge,” because it is a visible glow at the edge of the electrode interface that is the result of partial discharge. Corona, as defined in Terminology **D1711**, is “visible partial discharges in gases adjacent to a conductor.”

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.3 *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.* For specific hazard statements, see Section 7.

1.4 *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:²

D149 Test Method for Dielectric Breakdown Voltage and

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.

Current edition approved March 15, 2022. Published March 2022. Originally approved in 1964. Last previous edition approved in 2014 as D2275 – 14. DOI: 10.1520/D2275-22.

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.

Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

D618 Practice for Conditioning Plastics for Testing

D1711 Terminology Relating to Electrical Insulation

D1868 Test Method for Detection and Measurement of Partial Discharge (Corona) Pulses in Evaluation of Insulation Systems

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

2.2 Special Technical Publications:²

Symposium on Corona, STP 198, ASTM, 1956

Corona Measurement and Interpretation, Engineering Dielectrics, Vol 1, STP 669, ASTM, 1979

2.3 International Electrotechnical Commission (IEC)

Documents:³

IEC Publication 60343 Recommended Test Methods for Determining the Relative Resistance of Insulating Materials to Breakdown by Surface Discharges

IEEE/IEC 62539-2007 – IEC 62539 Ed.1 (IEEE Std 930™-2004) Guide for the Statistical Analysis of Electrical Insulation Breakdown Data⁴

3. Terminology

3.1 *Definitions*—For definitions of other terms used in this standard, refer to Terminology **D1711** and Test Method **D1868**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *surface corona, n*—corona that exists in the electrically stressed gas where electrodes are near insulation surfaces.

3.2.2 *threshold voltage*—that voltage below which failure will not occur under the test conditions irrespective of the duration of the test.

3.2.3 *voltage endurance, n*—the time that an insulating material can withstand a prolonged alternating voltage stress under the action of surface corona.

³ Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, 1st floor, P.O. Box 131, CH-1211, Geneva 20, Switzerland, <https://www.iec.ch>.

⁴ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., P.O. Box 1331, Piscataway, NJ 08854-1331, <http://www.ieee.org>.