



Designation: D3638 – 21^{ε1}

Standard Test Method for Comparative Tracking Index of Electrical Insulating Materials¹

This standard is issued under the fixed designation D3638; 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.

^{ε1} NOTE—Subsections 7.1.1, 7.1.2, and 9.4 were corrected editorially in January 2022.

1. Scope*

1.1 This test method evaluates in a short period of time the low-voltage (up to 600 V) track resistance or comparative tracking index (CTI) of materials in the presence of aqueous contaminants.

1.2 The values stated in metric (SI) units are to be regarded as standard. The inch-pound equivalents of the metric units are approximate.

1.3 This test method is technically equivalent to the version of IEC Publication 112 cited in 2.2. However, the 2007 version of IEC 60112 Fourth Edition yields numerical CTI values that are very likely to differ significantly from this test method.

1.4 *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.*

1.5 *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

[D1711 Terminology Relating to Electrical Insulation](#)

[D6054 Practice for Conditioning Electrical Insulating Mate-](#)

[rials for Testing](#) (Withdrawn 2012)³

2.2 *IEC Publications:*⁴

[IEC 112 Method for the determination of the proof and the comparative tracking indices of solid insulating materials](#)

[IEC 60112 Method for the determination of the proof and the comparative tracking indices of solid insulating materials](#)

[IEC 60664-1 Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests, 2020 Edition 3.0](#)

2.3 *ANSI/UL Publication:*⁵

[ANSI/UL 840 Standard for Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment. January 6, 2005, 3rd edition](#)

3. Terminology

3.1 *Definitions:*

3.1.1 *track, n*—a partially conducting path of localized deterioration on the surface of an insulating material.

3.1.2 *tracking, n*—the process that produces tracks as a result of the action of electric discharges on or close to an insulation surface.

3.1.3 *tracking, contamination, n*—tracking caused by scintillations that result from the increased surface conduction due to contamination.

3.1.4 *tracking resistance, n*—the quantitative expression of the voltage and the time required to develop a track under the specified conditions.

3.1.5 For other terminology, refer to Terminology [D1711](#).

3.2 *Definitions of Terms Specific to This Standard:*

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 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 The last approved version of this historical standard is referenced on www.astm.org.

⁴ 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>.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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