



Designation: D5642 – 16

Standard Test Method for Sealed Tube Chemical Compatibility Test¹

This standard is issued under the fixed designation D5642; 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 covers procedures for evaluating the interaction of electrical insulation components used, or intended to be used, in electrical insulation systems.

1.2 This test method is useful for determining compatibility but additional testing will potentially be required for some applications.

1.3 This test method also provides useful information about the behavior of selected insulating materials when compared to a reference value as opposed to a reference system.

1.4 This test method does not cover systems which operate in liquids or gases other than air.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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 determine the applicability of regulatory limitations prior to use.* See also 8.2.4, 8.3.1 and 8.3.2.1

2. Referenced Documents

2.1 *ASTM Standards:*²

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

D1676 Test Methods for Film-Insulated Magnet Wire

D1711 Terminology Relating to Electrical Insulation

3. Terminology

3.1 *Definitions:*

3.1.1 *magnet wire*—See Terminology D1711 for the definition of this term.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aging test, n*—a process of exposure, to a specified set of conditions for a defined period of time, which results in an irreversible change in one or more physical, chemical, electrical, or thermal characteristics of a material.

3.2.2 *candidate system, n*—the proposed electrical insulation system to be evaluated.

3.2.3 *electrical insulation system, n*—an intimate combination of insulating materials with conductors, as used in electrical equipment.

3.2.4 *insulation system class, n*—a standardized designation of the temperature capability of the electrical insulation system. It is expressed by both numbers and letters as follows:

System	Class
105	(A)
120	(E)
130	(B)
155	(F)
180	(H)
200	(N)
220	(R)
240	(S)

3.2.5 *reference system, n*—an electrical insulation system which has been previously evaluated and found acceptable.

3.2.6 *twisted pair, n*—film-insulated round magnet wire that has been prepared in accordance with Test Methods D1676.

4. Summary of Test Method

4.1 A combination of specific materials is sealed in a limited space and subjected to a specific elevated temperature for a specified time. Following this exposure the dielectric breakdown voltage of the insulated conductors is used as a basis for judging the compatibility of the candidate system.

5. Significance and Use

5.1 This test method is useful for evaluating a combination of materials for potential use in an electrical insulation system.

6. Apparatus

6.1 *Oven*, capable of maintaining the required exposure temperature within ± 3 °C.

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 D09.17 on Fire and Thermal Properties.

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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.

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