Designation: D 5642 – 99

An American National Standard

Standard Test Method for Sealed Tube Chemical Compatibility Test[1]

This standard is issued under the fixed designation D 5642; 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 may be required depending upon application.

1.3 This test method may also provide 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 the standard in this test method.

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 Note 3, Note 4 and 8.3.2.1

2. Referenced Documents

2.1 *ASTM Standards:*

D 149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Electrical Insulating Materials at Commercial Power Frequencies[2]

D 1676 Test Methods for Film-Insulated Magnet Wire[2]

D 1711 Terminology Relating to Electrical Insulation[2]

3. Terminology

3.1 *Definitions:*

3.1.1 *magnet wire*—See Terminology D 1711 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 D 1676.

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.

6.2 *Glass Tubes* with inside volume not exceeding 900 mL that can be sealed. Two general types are described as follows:

[1] This test method is under the jurisdiction of ASTM Committee D-9 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.17 on Thermal Characteristics.

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[2] *Annual Book of ASTM Standards*, Vol 10.01.