



Designation: D5374 – 22a

Standard Test Methods for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation¹

This standard is issued under the fixed designation D5374; 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 These test methods cover procedures for evaluating the characteristics of forced-convection ventilated electrically-heated ovens, operating over all or part of the temperature range from 20 °C above the ambient temperature to 500 °C and used for thermal endurance evaluation of electrical insulating materials.

1.2 These test methods are based on IEC Publication 60216-4-1, and are technically identical to it. This compilation of test methods and an associated specification, D5423, have replaced Specification D2436.

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.*

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

D1711 Terminology Relating to Electrical Insulation

D2436 Specification for Forced-Convection Laboratory Ovens for Electrical Insulation (Withdrawn 1994)³

D5423 Specification for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation

¹ These test methods are under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and are 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.

³ The last approved version of this historical standard is referenced on www.astm.org.

2.2 Other Document:

IEC Publication 60216-4-1 Guide for the Determination of Thermal Endurance Properties of Electrical Insulating Materials, Part 4—Aging Ovens, Section 1—Single-Chamber Ovens⁴

3. Terminology

3.1 Refer to the terminology section of Specification D5423. For other terms related to electrical and electronic insulating materials issues, refer to Terminology D1711.

4. Significance and Use

4.1 Ovens used for thermal evaluation of insulating materials are to be capable of maintaining uniform conditions of temperature and air circulation over the extended periods of time that are required for conducting these tests. Specification D5423 specifies the permissible variations from absolute uniformity that have been accepted internationally for these ovens. These test methods include procedures for measuring these variations and other specified characteristics of the ovens.

5. Apparatus

5.1 *Multi-Point Recording Potentiometer*, having provisions for at least nine iron-constantan or chromel-alumel thermocouples, with scale readings to 0.1 °C or less. Use of a data processor or a data logger is helpful in reducing the number of calculations required.

5.2 *Calibrated Iron-Constantan or Chromel-Alumel Thermocouples*, using 0.5 mm diameter or smaller wire and having a junction size not over 2.5 mm long.

5.2.1 If calibrated thermocouples are not available, use thermocouples made from a single spool of thermocouple wire that gives values for temperature that do not differ from each other by more than 0.2 °C when placed within 10 mm of each other without touching inside an oven chamber at 200 °C.

5.3 It is acceptable to use a temperature measuring system other than thermocouples and a potentiometer, provided that the sensitivity, accuracy, and response time are equivalent to

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