



# Standard Specification for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation<sup>1</sup>

This standard is issued under the fixed designation D5423; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers 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 The specification requirements for Type I ovens are based on IEC Publication 216-4-1, and are technically identical to it. The requirements for Type II ovens are essentially identical to the requirements of Specification D2436. This specification and an associated test method, D5374, have replaced Specification D2436.

1.3 While the ovens covered by this specification are intended primarily for thermal endurance evaluation, they can also be used wherever their characteristics make them suitable for other applications.

1.4 This specification does not address safety aspects. If it is anticipated that oven contents or the location in which the oven is to be installed may create a hazard, the purchaser should determine and specify what additional requirements are needed.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

D2436 Specification for Forced-Convection Laboratory Ovens for Electrical Insulation (Withdrawn 1994)<sup>3</sup>

D5374 Test Methods for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation

### 2.2 Other Document:

IEC Publication 216-4-1 Guide for the Determination of Thermal Endurance Properties of Electrical Insulating

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.17 on Thermal Characteristics.

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<sup>2</sup> 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.

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

Materials, Part 4—Aging Ovens, Section 1—Single-Chamber Ovens<sup>4</sup>

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *rate of ventilation, n*—the number of air changes per hour in the oven chamber.

3.1.2 *set temperature, n*—the average of all of the measured temperatures within the oven, averaged over the period of any cyclic temperature variation that may occur.

3.1.2.1 *Discussion*—This is the actual operating temperature of the oven.

3.1.3 *temperature fluctuation, n*—temperature differences at one point in the oven over a period of time.

3.1.3.1 *Discussion*—This property depends upon the sensitivity and type (on/off or proportional) of control used and the heater mass in relation to surface area.

3.1.4 *temperature gradient, n*—the maximum temperature difference at one time between different points in the oven chamber.

3.1.4.1 *Discussion*—This property depends on such factors as uniformity of heater temperature, heater distribution about the oven, and air flow patterns within the oven.

3.1.5 *temperature variation, n*—temperature differences with time and location due to the combination of temperature gradient and temperature fluctuation.

3.1.6 *thermal lag time, n*—the time required for a defined specimen to reach a specified temperature (or range of temperature).

3.1.6.1 *Discussion*—This property is largely dependent upon the rate of air circulation within the oven. In IEC 216-4-1, this term is called “time constant.”

3.1.7 *time constant, n*—See thermal lag time.

## 4. Classification

4.1 *Type I*—Ovens with rate of ventilation of 5 to 20 air changes per hour.

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