



Designation: D8345 – 21

Standard Test Method for Determination of an Emission Parameter for Phthalate Esters and Other Non-Phthalate Plasticizers from Planar Polyvinyl Chloride Indoor Materials for Use in Mass Transfer Modeling Calculations¹

This standard is issued under the fixed designation D8345; 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 Planar polyvinyl chloride (vinyl) indoor materials can contain semi-volatile organic compounds (SVOCs), such as phthalate esters and other non-phthalate plasticizers, that can emit into indoor air. Phthalate esters and other non-phthalate plasticizers that have been measured using this standard are listed in Table 1 and are referred to as SVOCs in the remainder of this document.

1.2 The SVOCs listed in Table 1 are present in a wide range of products and not limited to planar polyvinyl chloride (vinyl) indoor materials. This standard discusses specific planar polyvinyl chloride materials due to method development and associated quality control data produced from testing these materials. The materials inclusion in this standard does not indicate the SVOC source strength of specific polyvinyl chloride planar materials relative to other products.

1.3 This method describes the design of a 1 L environmental chamber with minimal exposed chamber walls.

1.4 This method measures the steady-state gas phase concentration of SVOCs in the chamber. Samples of products are tested at specified conditions of temperature, airflow rate, and elapsed time in a specially designed chamber with dry air. Air samples are collected periodically using sorbent sampling tubes at the chamber exhausts at controlled flow rates, and then analyzed by thermal desorption-gas chromatography-mass spectrometry (TD-GC-MS).

1.5 This method determines the SVOC convective gas-phase mass transfer coefficient across the material surface, h_m , from the known dimethyl phthalate mass transfer coefficient in the chamber (1).²

1.6 Using the steady-state gas phase concentration and mass transfer coefficient, the method estimates the gas-phase con-

centration of SVOC in equilibrium with the material phase (y_0) at a specified temperature. The obtained y_0 data can be used to predict emissions in real indoor environments. However, exposure modeling is beyond the scope of this method. For more information on mass transfer emission and exposure modeling see Little et al. (2), Liang and Xu (1, 3), and Guo (4).

1.7 The results for gas phase concentration change in the chamber with time, steady-state gas phase SVOC concentrations (y_{ss}), and y_0 , only represent the conditions specified in the test method and are the result of assumptions built into the method such as instantaneous equilibrium at the source/air interface. The results may not be representative of those collected under other test conditions (that is, temperature or flow rate) or comparable with other SVOC test methods.

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

1.9 *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.*

1.10 *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:*³

D1193 Specification for Reagent Water

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

¹ This test method is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.05 on Indoor Air.

Current edition approved March 1, 2021. Published December 2021. DOI: 10.1520/D8345-21.

² The boldface numbers in parentheses refer to a list of references at the end of this standard.

³ 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.