



Designation: D5116 – 17

Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products¹

This standard is issued under the fixed designation D5116; 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 guide provides direction on the measurement of the emissions of volatile organic compounds (VOCs) from indoor materials and products using small-scale environmental test chambers.

1.2 This guide pertains to chambers that fully enclose a material specimen to be tested and does not address other emission chamber designs such as emission cells (see instead Practice [D7143](#)).

1.3 As an ASTM standard, this guide describes options, but does not recommend specific courses of action. This guide is not a standard test method and must not be construed as such.

1.4 The use of small environmental test chambers to characterize the emissions of VOCs from indoor materials and products is still evolving. Modifications and variations in equipment, testing procedures, and data analysis are made as the work in the area progresses. For several indoor materials, more detailed ASTM standards for emissions testing have now been developed. Where more detailed ASTM standard practices or methods exist, they supersede this guide and should be used in its place. Until the interested parties agree upon standard testing protocols, differences in approach will occur. This guide will continue to provide assistance by describing equipment and techniques suitable for determining organic emissions from indoor materials. Specific examples are provided to illustrate existing approaches; these examples are not intended to inhibit alternative approaches or techniques that will produce equivalent or superior results.

1.5 Small chambers have obvious limitations. Normally, only samples of larger materials (for example, carpet) are tested. Small chambers are not applicable for testing complete assemblages (for example, furniture). Small chambers are also inappropriate for testing combustion devices (for example, kerosene heaters) or activities (for example, use of aerosol spray products). For some products, small chamber testing may

provide only a portion of the emission profile of interest. For example, the rate of emissions from the application of high solvent materials (for example, paints and waxes) by means of brushing, spraying, rolling, etc. are generally higher than the rate during the drying process. Small chamber testing cannot be used to evaluate the application phase of the coating process. Large (or full-scale) chambers may be more appropriate for many of these applications. For guidance on full-scale chamber testing of emissions from indoor materials refer to Practice [D6670](#).

1.6 This guide does not provide specific directions for the selection of sampling media or for the analysis of VOCs. This information is provided in Practice [D6196](#).

1.7 This guide does not provide specific directions for determining emissions of formaldehyde from composite wood products, since chamber testing methods for such emissions are well developed and widely used. For more information refer to Test Methods [E1333](#) and [D6007](#). It is possible, however, that the guide can be used to support alternative testing methods.

1.8 This guide is not applicable to the determination of emissions of semi-volatile organic compounds (SVOCs) from materials/products largely due to adsorption of these compounds on materials commonly used for construction of chambers suitable for VOC emissions testing. Alternate procedures are required for SVOCs. For example, it may be possible to screen materials for emissions of SVOCs using micro-scale chambers operated at temperatures above normal indoor conditions (see Practice [D7706](#)).

1.9 This guide is applicable to the determination of emissions from products and materials that may be used indoors. The effects of the emissions (for example, toxicity) are not addressed and are beyond the scope of the guide. Guide [D6485](#) provides an example of the assessment of acute and irritant effects of VOC emissions for a given material. Specification of “target” organic species of concern is similarly beyond the scope of this guide. As guideline levels for specific indoor contaminants develop, so too will emission test protocols to provide relevant information. Emissions databases and material labeling schemes will also be expected to adjust to reflect the current state of knowledge.

¹ This guide 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 Nov. 1, 2017. Published November 2017. Originally approved in 1990. Last previous edition approved in 2010 as D5116 – 10. DOI: 10.1520/D5116-17.