



Designation: D8142 – 17

Standard Test Method for Determining Chemical Emissions from Spray Polyurethane Foam (SPF) Insulation using Micro-Scale Environmental Test Chambers¹

This standard is issued under the fixed designation D8142; 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 is used to identify and to measure the emissions of volatile organic compounds (VOCs) emitted from samples of cured spray polyurethane foam (SPF) insulation using micro-scale environmental test chambers combined with specific air sampling and analytical methods for VOCs.

1.2 Specimens prepared from product samples are maintained at specified conditions of temperature, humidity, airflow rate, and elapsed time in micro-scale chambers that are described in Practice D7706. Air samples are collected periodically at the chamber exhaust at the flow rate of the micro-scale chambers.

1.2.1 Samples for formaldehyde and other low-molecular weight carbonyl compounds are collected on treated silica gel cartridges and are analyzed by high performance liquid chromatography (HPLC) as described in Test Method D5197 and ISO 16000-3.

1.2.2 Samples for other VOCs are collected on multi-sorbent samplers and are analyzed by thermal-desorption gas chromatography / mass spectrometry (TD-GC/MS) as described in U.S. EPA Compendium Method TO-17 and ISO 16000-6.

1.3 This test method is intended specifically for SPF insulation products. Compatible product types include two component, high pressure and two-component, low pressure formulations of open-cell and closed-cell SPF insulation.

1.4 VOCs that can be sampled and analyzed by this test method generally include organic blowing agents such as 1,1,1,3,3-pentafluoropropane, formaldehyde and other carbonyl compounds, residual solvents, and some amine catalysts. Emissions of some organic flame retardants can be measured after 24 h with this method, such as tris (chloroisopropyl) phosphate (TCPP).

1.5 This test method does not cover the sampling and analysis of methylene diphenyl diisocyanate (MDI) or other isocyanates.

1.6 Area-specific and mass-specific emission rates are quantified at the elapsed times and chamber conditions as specified in 13.2 and 13.3 of this test method.

1.7 This test method is used to identify emitted compounds and to estimate their emission factors at specific times. The emission factors are based on specified conditions, therefore, use of the data to predict emissions in other environments may not be appropriate and is beyond the scope of this test method. The results may not be representative of other test conditions or comparable with other test methods.

1.8 This test method is primarily intended for freshly applied, SPF insulation samples that are sprayed and packaged as described in Practice D7859. The measurement of emissions during spray application and within the first hour following application is outside of the scope of this test method.

1.9 This test method can also be used to measure the emissions from SPF insulation samples that are collected from building sites where the insulation has already been applied. Potential uses of such measurements include investigations of odor complaints after product application. However, the specific details of odor investigations and other indoor air quality (IAQ) investigations are outside of the scope of this test method.

1.10 The values stated in SI units are to be regarded as standard. No other units of measure are used.

1.11 *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.*

1.12 *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.*

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 Oct. 1, 2017. Published October 2017. DOI: 10.1520/D8142-17.