



Designation: D6060 – 24

## Standard Practice for Sampling of Process Vents with a Portable Gas Chromatograph<sup>1</sup>

This standard is issued under the fixed designation D6060; 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 practice describes a method for direct sampling and analysis of process vents for volatile organic compound (VOC) vapors and permanent gases using a portable gas chromatograph (GC).

1.2 This practice is applicable to analysis of permanent gases such as oxygen ( $O_2$ ), carbon dioxide ( $CO_2$ ) and nitrogen ( $N_2$ ), as well as vapors from organic compounds with boiling points up to 125 °C.

1.3 The detection limits obtained will depend on the portable gas chromatograph and detector used. Detectors available include but are not limited to thermal conductivity, photoionization, argon ionization, and electron capture. For instruments equipped with thermal conductivity detectors, typical detection limits are one to two parts per million by volume (ppm(v)) with an applicable concentration range to high percent by volume levels. For instruments with photoionization detectors detection limit of one to ten parts per billion by volume (ppb(v)) are obtainable with a concentration range from 1000 ppm(v) to 2000 ppm(v). The argon ionization detector has an achievable detection limit of one (ppb(v)), while the electron capture detector has an achievable detection limit of one part per trillion by volume (ppt(v)) for chlorinated compounds.

1.4 The applicability of this practice should be evaluated for each VOC by determining stability, reproducibility, and linearity.

1.5 The appropriate concentration range must also be determined for each VOC, as the range will depend on the vapor pressure of the particular VOC.

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

1.7 *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. Refer to Section 8 on Hazards for additional safety precautions.*

1.8 *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:<sup>2</sup>

**D1356 Terminology Relating to Sampling and Analysis of Atmospheres**

**D3154 Test Method for Average Velocity in a Duct (Pitot Tube Method)**

**D3464 Test Method for Average Velocity in a Duct Using a Thermal Anemometer**

**E355 Practice for Gas Chromatography Terms and Relationships**

#### 2.2 NFPA Standards:<sup>3</sup>

**NFPA 70 National Electrical Code**

**NFPA 496 Standard for Purged and Pressurized Enclosures for Electrical Equipment**

### 3. Terminology

3.1 *Definitions*—For the definition of terms used in this practice, refer to Terminology **D1356** and Practice **E355**.

#### 3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *portable, n*—refers to gas chromatograph with internal battery, internal sample pump, and internal/rechargeable carrier gas supply cylinder.

### 4. Summary of Practice

4.1 One end of a sampling line (typically 6 mm outside diameter PTFE/fluorocarbon tubing) is connected to a tee in a

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee **D22** on Air Quality and is the direct responsibility of Subcommittee **D22.03.01** on Source Emissions.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [www.astm.org/contact](http://www.astm.org/contact). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.