Designation: D5337 – 11

StandardPractice for Flow Rate Adjustment of Personal Sampling Pumps[1]

This standard is issued under the fixed designation D5337; 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 practice describes the calibration of sampling pumps commonly used for monitoring personal airborne exposures in the work-place.

1.2 This practice includes procedures for describing primary and secondary calibration techniques.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

2.2 *NIOSH and OSHA Documents:*

HSM-99-71-31 Personal Sampling Pump for Charcoal Tubes; Final Report[3]

NIOSH— Manual of Analytical Methods, 4th ed.[4]

OSHA— Analytical Methods Manual[5]

3. Terminology

3.1 For definitions of terms used in this practice, refer to Terminology D1356.

3.2 The term *primary flow-rate calibration*, as used in this practice, does not imply the calibration is traceable to a primary standard, unless the apparatus used in the calibration (burets, stop-watches, etc.) has been demonstrated to be traceable to national or international standards, and that this traceability is established on a routine (generally annual) basis. Traceability of calibration is strongly recommended.

4. Summary of Practice

4.1 A bubble tube meter or electronic near-frictionless pump is used for primary calibration of personal sampling pumps. The practice is applicable to systems using air sampling devices. Provisions are made for both manual and automated bubble meters.

4.2 Secondary calibration procedures for field applications are also included in the practice (see 7.3).

5. Significance and Use

5.1 Most occupational exposure assessment methods require the use of personal sampling pumps to collect air samples at typical workplace sampling rates, with sampling volumes specified by (a) particular procedure(s). The precision and bias of these methods are directly affected by the precision and bias of the pumps used to measure the air volume(s) sampled.

6. Apparatus

6.1 *Burets,* 1-L (for high flow) and 100-mL or 10 mL (for low flow).

6.2 *Manometer.*

6.3 *Rotameter.*

6.4 *Stop Watch.*

6.5 Electronic Bubble Meter or Near-frictionless Piston Flowmeter (alternates), should have traceable calibration (see 3.2).

7. Procedure

7.1 Calibrate the personal sampling pumps before and measure after each day's sampling.

7.2 *Primary Flow-rate Calibration Device(s),* (as noted in 3.2, these are not primary standards unless the apparatus used in the calibration has been demonstrated to be traceable to national and international standards):

7.2.1 *Bubble Meter Method:*

[1] This practice is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.04 on Workplace Air Quality.

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[2] 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.

[3] Available from the U.S. Department of Commerce, National Technical Information Service, Port Royal Road, Springfield, VA 22161.

[4] Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health (NIOSH), Cincinnati, Ohio (1994); Available from NIOSH Publications, 4676 Columbia Parkway, Cincinnati, Ohio 45226; www.cdc.gov/niosh/nmam.

[5] Occupational Safety and Health Administration, Salt Lake Technical Center, Salt Lake City, Utah (1985); Available from OSHA Analytical Laboratory, 8660 S. Sandy Parkway, Sandy, UT 84070; www.osha.gov/dts/sltc/methods.