



Designation: E 884 – 82 (Reapproved 1993)

Standard Practice for Sampling Airborne Microorganisms at Municipal Solid- Waste Processing Facilities¹

This standard is issued under the fixed designation E 884; 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 covers sampling of airborne microorganisms at municipal solid-waste processing facilities, hereafter referred to as facilities. Investigators should consult Practice D 1357 for the general principles of conducting an air-sampling program.

1.2 This practice applies only to sampling airborne bacteria and fungi, not viruses. Since sampling airborne viruses is significantly more difficult than sampling bacteria and fungi, reliable methods of sampling viruses are not yet available.

2. Referenced Documents

2.1 ASTM Standards:

D 1356 Terminology Relating to Atmospheric Sampling and Analysis²

D 1357 Practice for Planning the Sampling of the Ambient Atmosphere²

2.2 Other Standards:

Microbiological Methods for Monitoring the Environment, Water and Wastes³

Air Sampling Instruments for the Evaluation of Atmospheric Contaminants⁴

3. Definitions

3.1 *microbiological aerosol*—an airborne particle partially or exclusively composed of microorganisms including bacteria and fungi.

3.2 For definitions of other terms used in this practice, refer to Terminology D 1356.

4. Summary of Practice

4.1 Concentrations of selected airborne bacteria and fungi are determined using both liquid impinger and multi-stage impactor samplers.

4.2 Procedures are included for selecting sampling locations; determining numbers of samples, types of microorganisms to be sampled, intervals between sample collection and analysis; choosing sampling equipment; preserving samples; and reporting results.

5. Significance and Use

5.1 Bacteria and fungi present in municipal solid wastes (as well as in other forms of waste) may become airborne as dusts during waste processing. Several investigations to determine the health significance of these microbiological aerosols have been hindered by the lack of standardized procedures for sampling airborne bacteria and fungi in an industrial environment and by the absence of standards for assessing their health significance. Because it is difficult to correlate airborne levels of bacteria and fungi with epidemiological data, this standard is designed to permit the formation of a data base to aid in the assessment of the health significance of airborne microorganisms. It is intended that the use of this practice will improve sampling precision and thereby facilitate comparisons between sampling results.

6. Apparatus

6.1 Two types of samplers are used in each sampling program for microbiological aerosols at waste processing facilities (5).⁵

6.1.1 *Multi-Stage Impactor*, for collection of airborne microbes on agar plates. It is recommended that an impactor be used for sampling all of the types of bacteria and fungi listed in 10.6.1.⁶

6.1.2 *All-Glass Impinger*, for collection of airborne microbes in a liquid medium. It is recommended that an impinger be used for sampling fecal coliforms and for determination of total plate count.⁷

6.2 *Air Sampling Pumps*, providing approximately 40 L per min (1.4 CFM) free-flow capacity.

6.3 Additional equipment such as carts, stands, and tool

¹ This practice is under the jurisdiction of ASTM Committee D-34 on Waste Management and is the direct responsibility of Subcommittee D34.01 on Sampling and Monitoring.

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² *Annual Book of ASTM Standards*, Vol 11.03.

³ Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. Request EPA-600/8-78-017.

⁴ Available from American Conference of Governmental and Industrial Hygienists, 6500 Glenway Avenue, Building D-5, Cincinnati, Ohio 45211.

⁵ The boldface numbers in the parentheses refer to the list of references at the end of the method.

⁶ The six-stage and two-stage microbiological samplers manufactured by Anderson Samplers, Inc. have been found to be satisfactory.

⁷ Air sampling impinger No. 7540 manufactured by Ace Glass, Inc. (AGI 30) has been found to be satisfactory.