



Standard Test Method for CONCENTRATION AND PARTICLE SIZE DISTRIBUTION OF AIRBORNE PARTICULATES COLLECTED IN LIQUID MEDIA USING AN ELECTRONIC COUNTER¹

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⁶¹ NOTE—Editorial changes were made throughout in June 1985.

1. Scope

1.1 This test method covers the determination of quantitative counts and size distribution of insoluble airborne particulate matter greater than 0.6- μ m diameter collected in a Greenburg-Smith or a midjet liquid impinger, using an electronic particle size analyzer and counter. Both ambient and stack particulates can be analyzed by this test method.

2. Applicable Documents

2.1 ASTM Standards:

C 690 Test Method for Particle Size Distribution of Alumina or Quartz by Electronic Counting²

D 1193 Specification for Reagent Water³

D 1356 Definitions of Terms Relating to Atmospheric Sampling and Analysis⁴

D 1357 Practice for Planning the Sampling of the Ambient Atmosphere⁴

D 1605 Recommended Practices for Sampling Atmospheres for Analysis of Gases and Vapors⁴

3. Definitions

3.1 For definitions of terms used in this test method, refer to Definitions D 1356, except that the definition of "particulates" is modified to be "solid phase only" for this test method.

4. Summary of Method

4.1 The analyzer uses an electric current path of small dimensions which is modulated by in-

dividual particle passage through an aperture and produces individual pulses of amplitude proportional to each particle volume.

4.2 Sample of airborne particulate matter, properly collected in a liquid impinger (charged with a clean electrolyte) is placed in the counting position in the instrument sample stand (1-6).⁵ The suspension is forced through a restricting aperture. Each particle passing is recorded on an electronic counter scaled according to selected size levels.

4.3 The instrument response essentially is to particle volume (liquid displacement). Therefore, equivalent spherical diameter is commonly used to express the particle size. (Comparison with other techniques has been found to be good for spherical particles; for nonspherical particles, results may differ (7, 8).

5. Significance and Use

5.1 Particulate matter concentrations and size distributions are determined rapidly and automatically with a high degree of calibration accuracy and a high degree of number count accuracy. Reference (9) provides documentation of the

¹ This test method is under the jurisdiction of ASTM Committee D-22 on Sampling and Analysis of Atmospheres.

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² *Annual Book of ASTM Standards*, Vol 15.02.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 11.03.

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