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Standard Test Method for PARTICLE-SIZE DISTRIBUTION OF SPACE-INSECTICIDE AEROSOL¹

This standard is issued under the fixed designation D 3092; 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 covers the particle-size distribution of space-insecticide aerosol.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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.*

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Summary of Test Method

2.1 The aerosol is drawn into a wind tunnel so that the individual particles deposit on a rotating microscope slide. The particles on the slide are counted and classified by size. A suitable correction is applied, in order to calculate the particle size in the original specimen.

2.2 This test method is an adaptation of methods previously described by Yeomans et al. (1, 2, 3)² and Bower (4).

3. Apparatus and Materials

3.1 *Wind Tunnel*, constructed of a tube approximately 18 in. (457 mm) in diameter and 4 in. (102 mm) long. This is attached by a hinged joint to a compartment containing an exhaust fan and slide rotator.

3.2 *Exhaust Fan*, of a nominal capacity of approximately 2400 ft³/min (1 m³/s), operated at a reduced voltage and speed to give a wind velocity in the tunnel of 500 $\pm$ 100 ft/min (2.54 $\pm$ 0.51 m/s). The wind velocity should be measured at the axis of the tunnel, and may be

correlated with the fan motor voltage, or the fan rate of rotation, so that the wind velocity need not be determined before each run. A small hand-held stroboscope is recommended for standardizing the fan speed.

3.3 *Microscope Slides*, 1 by 3-in. (925.4 by 76-mm), to be used for collecting the droplets and for covering them to prevent evaporation before they are counted. Microculture slides having a spherical concavity may be used, but this introduces some distortion and requires constant refocusing of the microscope as the droplets are counted. Any cover used must leave from 200 to 300 μ m of air space above the collecting slide.

3.4 *Paper Shims*, 1 by 3-in. (25.4 by 76-mm), cut from heavy paper or light card stock, to support the cover slides. Three holes, $\frac{3}{8}$ in. (16 mm) in diameter, shall be cut in each shim, and one side of the shim shall be clearly marked "up."

3.5 *Slide Rotator*, consisting of a small motor-driven arm fitted with a microscope slide holder and a counter balance. The slide shall be held with its 3-in. (76-mm) side parallel to the axis of the tunnel. The 1-in. (25.4-mm) end of the slide shall be tilted 40° forward in the direction of the rotation, giving the center of the slide a radius of 4 in. (102 mm). The slide rotator shall be operated at 450 $\pm$ 50 rpm, giving a slide velocity of 10.7 $\pm$ 1.2 mph (4.8 $\pm$ 0.5 m/s). A small hand-held stroboscope is recommended for standard-

¹ This test method is under the jurisdiction of ASTM Committee E-35 on Pesticides and is the direct responsibility of Subcommittee E35.12 on Insect Control Agents. This test method was originally developed by the Chemical Specialties Manufacturers Assn.

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² The boldface numbers in parentheses refers to the list of references at the end of this test method.