



Designation: E 1053 – 97

Standard Test Method for Efficacy of Virucidal Agents Intended for Inanimate Environmental Surfaces¹

This standard is issued under the fixed designation E 1053; 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 laboratory test method is used to evaluate the virucidal efficacy of liquid, aerosol, or trigger spray antimicrobial solutions on inanimate nonporous environmental surfaces. This test method may be employed with most viruses and is designed for cell culture host systems.

1.2 This test method should be performed only by those trained in microbiological or virological 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.* The user should consult a reference for the laboratory safety recommendations.²

1.4 It is the responsibility of the investigator to determine whether Good Laboratory Practice regulations (GLPs) are required and to follow them where appropriate (40 CFR, Part 160 for EPA submissions and 21 CFR, Part 58 for FDA submissions). Refer to the appropriate regulatory agency for performance standards of virucidal efficacy.

2. Referenced Documents

2.1 ASTM Standards:

E 1052 Test Method for Efficacy of Virucidal Agents Against Viruses in Suspensions³

E 1153 Test Method for Efficacy of Sanitizers Recommended for Inanimate Non-Food Contact Surfaces³

E 1482 Test Method for Neutralization of Virucidal Agents in Virucidal Efficacy Evaluations³

2.2 Federal Standards:

Title 40, Code of Federal Regulations (CFR), Environmental Protection Agency, Subchapter E, Pesticide Programs; Part 160, Good Laboratory Practice Standards⁴

Title 21, Code of Federal Regulations (CFR), Food and

Drug Administration, Part 58, Laboratory Practice for Nonclinical Laboratory Studies⁴

3. Summary of Test Method

3.1 The virus suspension is dried on an inanimate, nonporous surface. The antimicrobial is added over the dried film as a use dilution solution or sprayed from an aerosol can or trigger spray container following the recommended directions. After exposure at the appropriate temperature (usually $22 \pm 2^\circ\text{C}$) for the recommended time, the virus-antimicrobial mixture is assayed in a host system appropriate for the test virus. The virus titer of an untreated surface is determined by the median infective dose (ID_{50}) method of virus titration. Cytotoxicity to the host system of the antimicrobial at the tested concentration is determined by an LD_{50} method. The virus-antimicrobial mixture is assayed in numerous units of the host system at a dilution just beyond the cytotoxicity range of the antimicrobial. The extent of virus inactivation by the antimicrobial is determined. Results are recorded as $\log_{10}$ -virus inactivated.

3.2 This test method is designed to be performed by a trained virologist who is responsible for choosing the appropriate host system for the test virus and applying the techniques necessary for propagation and maintenance of host and test virus. For a reference text, refer to Schmidt and Emmons.⁵

4. Significance and Use

4.1 This test method may be used to determine the effectiveness of liquid and aerosol antimicrobial products against designated prototype viruses.

4.2 The effective antimicrobial concentration should be determined utilizing cell cultures as the host system for specific viruses.

4.3 This test method is applicable for testing of liquid and pressurized antimicrobial products against viruses on inanimate nonporous environmental surfaces.

5. Materials and Reagents

5.1 Cell Culture Technique:⁵

5.1.1 Cell Culture System, appropriate for test virus.

5.1.2 Growth Media/Maintenance Media, Medium 199, Eagle's minimal essential medium (EMEM) or equivalent,

⁵ *Diagnostic Procedures for Viral and Rickettsial Infections*, N. J. Schmidt and R. W. Emmons, eds., 6th ed., American Public Health Association, Washington, DC, 1989.

¹ This test method is under the jurisdiction of ASTM Committee E-35 on Pesticides and is the direct responsibility of Subcommittee E35.15 on Antimicrobial Agents.

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² CDC-NIH, *Biosafety in Microbiological and Biomedical Laboratories*, 3rd ed., U.S. Department of Health and Human Services, Washington, DC, May 1993.

³ *Annual Book of ASTM Standards*, Vol 11.05.

⁴ Available from U.S. Government Printing Office, Superintendent of Documents, Washington, DC 20402.