



Designation: E723 – 07

Standard Test Method for Efficacy of Antimicrobials as Preservatives for Aqueous-Based Products Used in the Paper Industry (Bacterial Spoilage)¹

This standard is issued under the fixed designation E723; 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 determine the efficacy of an antimicrobial for preventing bacterial spoilage of in-process aqueous-based products used in the paper industry. For information on fungal spoilage, see Test Method E875. This test method should be performed by persons who have had basic microbiological training.

1.2 *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

D1193 Specification for Reagent Water

E875 Test Method for Efficacy of Fungal Control Agents as Preservatives for Aqueous-Based Products Used in the Paper Industry

E1054 Test Methods for Evaluation of Inactivators of Antimicrobial Agents

E1326 Guide for Evaluating Nonconventional Microbiological Tests Used for Enumerating Bacteria

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *antimicrobial, n*—chemical or physical agent that kills or inactivates microorganisms or suppresses their growth or reproduction.

3.1.2 *bactericide, n*—a physical or chemical agent that kills bacteria, but not necessarily bacterial spores.

¹ This test method is under the jurisdiction of ASTM Committee E35 on Pesticides, Antimicrobials, and Alternative Control Agents and is the direct responsibility of Subcommittee E35.15 on Antimicrobial Agents.

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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.

3.1.3 *preservatives, n*—a chemical agent(s) added to a product to reduce or prevent microbial growth.

4. Summary of Test Method

4.1 Aqueous material to be preserved is inoculated with an appropriate bacterial inoculum followed by addition of a bactericide that will reduce populations of bacteria and prevent the growth of survivors for a specified period of time. Bacterial numbers in the sample are determined at various time periods and compared to a control without any bactericide. The proper level of antimicrobial is one that reduces and keeps the organisms to an acceptable level in the test material.

5. Significance and Use

5.1 This test method should be used to determine if an antimicrobial preserves pigment suspensions, dye solutions, pulp slurries, starch solutions, polymers, sizing agents, latex emulsions, and other aqueous-based materials used in the paper industry from bacterial spoilage.

6. Apparatus

6.1 *Balance*—Two balances: one should be sensitive to 0.1 g at a load of 200 g and have a platform to accommodate bottles being used in the test. The second balance (analytical) should be sensitive to 0.1 mg and should be employed to weigh the candidate preservative to be used in the preparation of the stock solutions.

6.2 *Bottles*—Borosilicate glass milk dilution bottles or other suitable containers fitted either with screw caps or Escher rubber stoppers. These bottles are used for water blanks and aqueous-based samples.

6.3 *Colony Counter*—Any one of several types may be used as the Quebec, Buck, and Wolfhugel. A hand tally for the recording of the bacterial count is recommended if manual counting is done. Alternatively, an automated video colony counter may also be used.

6.4 *Culture Tube Closures*—Appropriate nontoxic closures should be selected.

6.5 *Culture Tubes*—Recommended size is 15 by 125 mm or 18 by 150 mm without lip, and preferably of borosilicate glass.