



Designation: D 5590 – 94

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay¹

This standard is issued under the fixed designation D 5590; 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 an accelerated method for determining the relative resistance of two or more paints or coating films to fungal growth.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

2. Referenced Documents

2.1 ASTM Standards:

D 822 Practice for Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus²

D 3273 Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber²

D 3456 Practice for Determining by Exterior Exposure Tests the Susceptibility of Paint Films to Microbiological Attack²

D 4141 Practice for Conducting Accelerated Outdoor Exposure Tests of Coatings²

D 4587 Practice for Conducting Tests on Paint and Related Coatings and Materials Using a Fluorescent UV-Condensation Light- and Water-Exposure Apparatus²

D 5031 Practice for Conducting Tests on Paints and Related Coatings and Materials Using Enclosed Carbon-Arc Light and Water Exposure Apparatus²

3. Summary of Test Method

3.1 This test method outlines a procedure to (1) prepare a suitable specimen for testing, (2) inoculate the specimen with the proper fungal species, (3) expose the inoculated samples

under the appropriate conditions for growth, and (4) provide a schedule and guidelines for visual growth ratings. This test method is not designed to include all the necessary procedures to maintain the proper microbiological techniques required to provide the most accurate results.

4. Significance and Use

4.1 Defacement of paint and coating films by fungal growth (mold, mildew) is a common phenomenon, and defacement by algal growth can also occur under certain conditions. It is generally known that differences in the environment, lighting, temperature, humidity, substrate pH, and other factors in addition to the coating composition affect the susceptibility of a given painted surface. This test method attempts to provide a means to comparatively evaluate different coating formulations for their relative performance under a given set of conditions. It does not imply that a coating that resists growth under these conditions will necessarily resist growth in the actual application.

NOTE 1—It is hoped that a ranking of relative performance would be similar to that ranked from outdoor exposures. However, this test method should not be used as a replacement for exterior exposure (that is, Practice D 3456) since many other factors, only a few of which are listed will affect those results.

NOTE 2—Several companies have reported reasonable correlation of results from this test with actual use when testing film-forming, pigmented coatings. Round-robin testing of this test method versus exterior exposure is planned.

4.2 Familiarity with microbiological techniques is required. This test method should not be used by persons without at least basic microbiological training.

5. Apparatus and Materials

5.1 *Balance*, capable of weighing to 0.10 g.

5.2 *Incubator*, or other device capable of maintaining a constant temperature between 25 and 30°C, relative humidity of ≤85 %.

5.3 *Refrigerator*.

5.4 *Petri Dishes*, 100 by 15 mm (3.9 by 0.6 in.).

5.5 *Autoclave*.

5.6 *Paint Brush*, coarse bristle, 12 to 19 mm (½ to ¾ in.).

5.7 *Substrate*, Filter Paper (Glass fiber, Grade 391, 4.2 cm (1.65 in.)) or draw-down paper (unlaquered chart paper 216 by

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.28 Biodeterioration.

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² *Annual Book of ASTM Standards*, Vol 06.01.