Designation: D4610 – 98 (Reapproved 2021)

Standard Guide for Determining the Presence of and Removing Microbial (Fungal or Algal) Growth on Paint and Related Coatings[1]

This standard is issued under the fixed designation D4610; 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 guide describes techniques used for determining the presence of fungal or algal growth on paint and related coatings and methods for removal of such growth prior to recoating.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D2022 Test Methods of Sampling and Chemical Analysis of Chlorine-Containing Bleaches

D3274 Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation

3. Significance and Use

3.1 Microbial growth is a major cause of discoloration and deterioration of paint films. This guide describes techniques used to distinguish fungi and algae from other surface contaminants.

3.2 Repainting a surface contaminated with fungi or algae generally causes more rapid infestation of the new paint than repainting a surface from which fungal or algal growth has been removed. In addition, poor adhesion, staining/bleeding, and many other problems may result. This guide describes methods for removing fungal or algal growth prior to repainting.

NOTE 1—It is extremely important that all steps and notes be read and followed. In particular the washing steps outlined in 5.2.2 and 5.2.4 must be fully carried out, since residual sodium hypochlorite (bleach) can cause many of the same problems, or even loss of coloration after repainting, and residual phosphate detergents can encourage further fungal and algal growth.

NOTE 2—This procedure is intended for use when recoating the surface. Reports of using this procedure to remove fungi and algae without recoating necessitate inclusion of a warning about the adverse effects of bleach on a coating film. The oxidative effects of bleach can degrade film properties, including particularly the "bleaching" (loss of color) in films containing organic coloring pigments (such as quinacridones, etc.), loss of gloss, chalking, etc. A small patch must be tested prior to use of this procedure for that purpose.

4. Reagents

4.1 *Sodium Hypochlorite,* approximately 5 % aqueous (NaOCl) as commercial household bleach. Because sodium hypochlorite decomposes on exposure to heat and sunlight and becomes ineffective, use only fresh material. See Test Methods D2022 for methods of sampling and chemical analysis.

4.2 *Phosphate-Free,* non-ammonia-containing detergent or commercial cleaner recommended for washing paint.

5. Procedures

5.1 *Determining the Presence of Fungal or Algal Growth on Paint:*

5.1.1 *Chemical*—Apply a drop of 5 % aqueous sodium hypochlorite solution (common household bleach) to the area suspected of being contaminated with fungal or algal growth. Fungal or algal discoloration will normally bleach within 60 s. Discoloration that does not bleach is probably dirt. For further confirmation do visual and subculture tests.

5.1.2 The following procedures should preferably be used by persons who have had basic microbiological training:

5.1.2.1 *Visual*—Examine the surface using magnification from 10 to 100× to distinguish among fungal, algal, or dirt disfigurement in accordance with Test Method D3274.

[1] This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.28 on Biodeterioration.

Current edition approved Nov. 1, 2021. Published November 2021. Originally approved in 1986. Last previous edition approved in 2017 as D4610 – 98 (2017). DOI: 10.1520/D4610-98R21.

[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.