



# Standard Practice for Testing Biofouling Resistance of Marine Coatings Partially Immersed<sup>1</sup>

This standard is issued under the fixed designation D 5479; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers a procedure to test a biofouling resistant coating systems or antifouling systems, or both, when subjected to in-situ partial immersion exposure. This enhances settlement of certain marine fouling organisms and increase the rate of possible physical deterioration.

1.2 The values stated in inch-pound 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 3623 Method of Testing Antifouling Panels in Shallow Submergence<sup>2</sup>

D 4938 Test Method for Erosion Testing of Antifouling Paints Using High Velocity Water<sup>2</sup>

D 4939 Test Method for Subjecting Marine Antifouling Coating to Biofouling and Fluid Shear Forces in Natural Seawater<sup>2</sup>

D 5108 Test Method for Organotin Release Rates of Antifouling Coating Systems in Sea Water<sup>2</sup>

## 3. Terminology

### 3.1 Definitions:

3.1.1 Biofouling resistant coatings and antifouling coatings are interrelated; thus they are used in this practice interchangeably.

3.1.2 *antifouling coatings*—polymeric applied films engineered to prevent marine fouling settlement due to inclusion of antifouling compounds within its formulated matrix.

3.1.3 *biofouling-resistant coatings*—polymeric applied films, engineered to prevent secured or permanent attachment of marine fouling organisms due to certain surface characteristics.

3.1.4 *film(s)*—each layer or coat of paint as applied to the substrate or on top of another applied coat.

3.1.5 *system*—cumulative total number of coating films, which includes application of a primary film(s) for the purpose of protecting the substrate from possible deterioration, or enhancing the adhesion of the biofouling resistant coating or antifouling coating to the primary film(s), or both.

## 4. Significance and Use

4.1 This test method is designed as a screening test to evaluate the performance of applied coating systems and other materials designed to resist biofouling settlement.

4.2 The degree and type of fouling will vary depending on the environment. Differences in geographic location of test sites, time of year when panels are exposed, and weather conditions from one year to the next, can affect results. Such variables are accounted taking a fouling census on a nontoxic surface. For the exposure to be valid, the nontoxic surface should show heavy fouling accretion.

## 5. Apparatus

5.1 *Floating Raft*—The test panels shall be mounted on a floating raft to maintain the correct position in the water.

5.1.1 The floating raft shall be constructed with a minimal amount of decking to maximize sunlight exposure on the test panel's surfaces.

5.2 *Exposure Rack*—Each rack will provide firm vertical installation of several (4 to 8) test panels that must be positioned in such a manner that the prevailing tidal currents will move parallel to the panels' surfaces.

5.2.1 The method of rack installation must provide a means of easy but dependable height adjustment. The movement of the lower (immersed) end of each rack is limited to 20° from the vertical.

5.2.2 Test panel racks should be constructed of plastic materials, or insulators must be utilized to prevent test panels from metallic contact.

5.2.3 The distance between two racks (from panels' surface) shall be a minimum of 12 in. (30 cm) to allow sufficient sunlight on the coating surface.

## 6. Materials

6.1 *Test Panels*—The substrate(s) for application of the experimental coating system shall be one or more of the

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.45 on Marine Solvents.

Current edition approved Mar. 15, 1994. Published May 1994.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.02.