



## Standard Practice for Conducting a Patch Test to Assess Coating Compatibility<sup>1</sup>

This standard is issued under the fixed designation D 5064; 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 practice covers the procedures for testing coating compatibility when maintenance of an in-place coating system is being contemplated. It does not cover procedures for assessing the integrity of the existing coating to determine if it can be repainted, nor does it establish the compatibility of the maintenance coating system with the substrate or corrosion products. The practice is intended for use in the field.

NOTE 1—Pass-Fail Criteria (for example, adhesion requirements) are not established by this practice. These should be established by the user or specifier with input from the supplier.

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 1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base<sup>2</sup>

D 1400 Test Method for Nondestructive Measurement of Dry Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base<sup>2</sup>

D 3359 Test Methods for Measuring Adhesion by Tape Test<sup>2</sup>

D 4138 Test Method for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive Means<sup>3</sup>

D 4414 Practice for Measurement of Wet Film Thickness by Notch Gages<sup>2</sup>

D 4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers<sup>3</sup>

### 3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to the Federation of Societies for Coatings Technology (FSCT) *Paint/Coatings Dictionary*.<sup>4</sup>

### 4. Summary of Test Method

4.1 The materials under test are applied to the previously painted surface after proper surface preparation. After the appropriate time has elapsed, the test patch is examined for visual defects and adhesion is determined.

### 5. Significance and Use

5.1 In performing maintenance of a coating system, the new coating being applied must be compatible with the existing coating. While general guides exist which indicate compatibility of different generic types of coatings, differences in manufacturer's formulation and the condition of the in-place coating will affect compatibility.

### 6. Procedure

6.1 Select test locations for evaluation that properly characterize differences in configuration of the structure and exposure; that is, vertical versus horizontal surfaces and sheltered versus unsheltered exposure. A minimum of three test locations with one test patch in each is recommended.

6.2 The size of each test patch will be determined by the size and configuration of the test locations. Each test patch shall be as large as possible, with a minimum size of 10 ft<sup>2</sup> (0.93 m<sup>2</sup>) recommended.

6.3 Clean the surface of the test areas using the methods specified for the maintenance painting procedure (Note 2). Alternative methods of preparation may also be evaluated in separate, adjacent tests.

NOTE 2—This test method assesses compatibility with the existing coating only and does not apply to areas where the substrate is exposed by the methods of preparation.

6.4 Measure the existing coating thickness in accordance with Test Methods D 1186, D 1400, or D 4138, as appropriate for the substrate.

6.5 Measure the ambient conditions and surface temperature and assure the conditions are within the limits specified by the coatings manufacturer for the product being tested.

<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 D01.46 on Industrial Protective Coatings.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 06.02.

<sup>4</sup> *Paint/Coatings Dictionary*, Federation of Societies for Coatings Technology, Philadelphia, PA, 1978.

6.6 Apply the test coating to the thickness recommended for the particular job. Use the application technique as intended for use on the full-scale job. If agreed upon between the purchaser and the seller, the method of coating application may be different from that used on the job, that is, brush application of the test patch even though spray application will be used on the job. However, this can cause some error and is not generally recommended.

6.7 Immediately after application, measure the wet-film thickness in accordance with Practice D 4414. Make corrections to the application, if necessary, by either applying more material if the expected dry-film thickness is low or applying another test patch if the expected dry-film thickness is above the recommended maximum. Inspect each patch for application defects such as runs, sags, and holidays. If such defects cannot be corrected as a part of the initial application process, prepare a new test patch.

6.8 After the coating has dried, measure the dry-film thickness in accordance with Test Method D 1186, D 1400, or D 4138.

**NOTE 3**—When using Test Methods D 1186 or D 1400, the dry film thickness is the difference in average thickness of the coating system less the average thickness of the in-place coating.

6.9 Allow the coating to cure or weather prior to testing. Cure durations are defined as long term and short term. Long-term curing provides the most reliable assessment of compatibility. Short-term curing provides for more rapid evaluation of results, but may not reveal all potential compatibility problems.

6.9.1 *Long-Term Curing*—Curing for as long a time as possible, with a minimum of six months preferred. Curing should span seasonal weather changes.

6.9.2 *Short-Term Curing*—Curing at the following minimum times based on average daily (24 h) temperatures:

|             |             |             |
|-------------|-------------|-------------|
| 50°F (10°C) | 70°F (21°C) | 90°F (32°C) |
| 14 days     | 10 days     | 7 days      |

6.10 After curing, examine the total surface of each test patch for wrinkling, blistering, mudcracking, checking, cracking, peeling, lifting, and disbonding. Measure or rate the adhesion in a minimum of five locations per test patch in accordance with Test Methods D 3359. If agreed upon between the purchaser and the seller, adhesion testing in accordance with Test Method D 4541 may be used.

6.11 Examine the test patches for the defects noted in 6.10 on a regular schedule, discounting rust caused by previous tests such as adhesion measurements and destructive film thickness measurements.

## 7. Report

7.1 Report the following information:

7.1.1 The identity of the structure tested, the location and size of the test patches, the identity of the test coating, the method and grade of surface preparation, and the method of coating application.

7.1.2 For each test patch, the dry film thickness measurements and average of the in-place coating, the dry film thickness measurements and average of the test coating, the elapsed time for each evaluation, the visual defects noticed, and the results of adhesion tests.

## 8. Keywords

8.1 coating; coating compatibility; coating test patch; paint; paint compatibility; test patch

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