



Designation: D6677 – 18

# Standard Test Method for Evaluating Adhesion by Knife<sup>1</sup>

This standard is issued under the fixed designation D6677; 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 test method covers the procedure for assessing the adhesion of coating films to substrate by using a knife.

1.2 This test method is used to establish whether the adhesion of a coating to a substrate or to another coating (in multi-coat systems) is at a generally adequate level.

NOTE 1—The term “substrate” relates to the basic surface on which a coating adheres (may be steel, concrete, etc. or other coating).

1.3 This method can be used in the laboratory and field.

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

1.5 *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.*

1.6 *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:*<sup>2</sup>

D2197 Test Method for Adhesion of Organic Coatings by Scrape Adhesion

D3359 Test Methods for Rating Adhesion by Tape Test

D4138 Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D01 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> 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.

D4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

D6132 Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Coating Thickness Gage

D7091 Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals

D7234 Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

## 3. Summary of Test Method

3.1 Adhesion is determined by scribing an “X” into the coating film to the substrate and by lifting the coating with the point of a utility knife. Adhesion is evaluated qualitatively on a 0 to 10 scale.

## 4. Significance and Use

4.1 Coatings, to perform satisfactorily, must adhere to the substrates on which they are applied. This test method has been found useful as a simple means of assessing the adhesion of coatings. Although this method is a qualitative (subjective) test it has been used in industry for many years and can provide valuable information.

4.2 Other adhesion test methods may be useful in obtaining quantitative results. See Test Methods D2197, D3359, D4541, and D7234.

4.3 The Performance Evaluation Scale (see Table 1) is based on both the degree of difficulty to remove the coating from the substrate and the size of removed coating chip.

4.4 This test method does not have a known correlation to other adhesion test methods (pull-off, tape, etc.).

4.5 A coating that has a high degree of cohesive strength may appear to have worse adhesion than one that is brittle and hence fractures easily when probed.

4.6 This method is not to be used on overly thick coatings, that is, those which cannot be cut to the substrate with a utility knife in one stroke.

## 5. Apparatus and Materials

5.1 *Cutting Tool*—Sharp utility knife.