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.

Designation: D7234 – 22

Standard Test Method for Pull-Off Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers[1]

This standard is issued under the fixed designation D7234; 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 procedures for evaluating the pull-off strength of a coating on concrete. Pull-Off strength of coatings for other rigid substrates is described in Test Method D4541. The test determines the greatest perpendicular force (in tension) that a surface area can bear before a plug of material is detached. Failure will occur along the weakest plane within the system comprised of the loading fixture, glue, coating system, and substrate, and will be exposed by the fracture surface.

1.2 This test method uses a class of apparatus known as portable pull-off adhesion testers.[2] They are capable of applying a concentric load and counter load to a single surface so that coatings can be tested even though only one side is accessible. Measurements are limited by the strength of adhesion bonds between the loading fixture, coating system and the substrate or the cohesive strengths of the glue, coating layers, and substrate.

1.3 This test method is suitable for both laboratory and field testing.

1.4 Pull-off strength measurements depend upon both material and instrumental parameters. There are different instruments used that comply with this test method. The specific instrument used should be identified when reporting results. This test is destructive and spot repairs may be necessary.

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

1.6 *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.*

1.7 *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:*[3]

C1583 Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)

D16 Terminology for Paint, Related Coatings, Materials, and Applications

D2651 Guide for Preparation of Metal Surfaces for Adhesive Bonding

D3933 Guide for Preparation of Aluminum Surfaces for Structural Adhesives Bonding (Phosphoric Acid Anodizing)

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

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E178 Practice for Dealing With Outlying Observations

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 The terms and definitions in Terminology D16 apply to this test method.

3.2 *Definitions:*

3.2.1 *concrete, n—with respect to this test method*, refers to all forms of concrete including masonry units.

3.2.2 *glue, n—with respect to this test method*, glue refers to the material that bonds the bottom of the loading fixture to the top surface of the coating to be tested.

[1] 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.

Current edition approved Dec. 1, 2022. Published December 2022. Originally approved in 2005. Last previous edition approved in 2021 as D7234 – 21. DOI: 10.1520/D7234-22.

[2] The term adhesion tester may be somewhat of a misnomer, but its adoption by two manufacturers and at least two patents indicates continued usage.

[3] 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.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States