



Standard Test Method for Specific Cathodic Disbonding of Pipeline Coatings¹

This standard is issued under the fixed designation G 80; 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 an accelerated procedure for simultaneously determining comparative characteristics of insulating coating systems applied to steel pipe exterior for the purpose of preventing or mitigating corrosion that may occur in underground service where the pipe will be in contact with natural soils and may or may not receive cathodic protection. It is intended for use with samples of coated pipe taken from commercial production and is applicable to such samples when the coating is characterized by function as an electrical barrier.

1.2 This test method is specific with no options. For alternative methods of test see Test Methods G 8.

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

1.4 *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:²

G 8 Test Methods for Cathodic Disbonding of Pipeline Coatings

G 12 Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel³

G 16 Guide for Applying Statistics to Analysis of Corrosion Data

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 D01.48 on Durability of Pipeline Coating and Linings.

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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.

³ Withdrawn.

3. Summary of Test Method

3.1 The coating on the test specimen is subjected to electrical stress in a highly conductive, alkaline electrolyte. Electrical stress is obtained by means of a sacrificial magnesium anode. The coating is perforated before starting the test.

3.2 After the test period is concluded, results are determined by physical examination and comparing the loosened or disbonding coating at the perforations in the immersed area with loosened or disbonded coating at a new test hole in the coating made in an area that was not immersed.

4. Significance and Use

4.1 Breaks or holidays in pipe coatings may expose the pipe to possible corrosion, since after a pipe has been installed underground, the surrounding earth will be more or less moisture-bearing and constitutes an effective electrolyte. Damage to pipe coating is almost unavoidable during transportation and construction. Normal soil potentials as well as applied cathodic protection potentials may cause loosening of the coating, beginning at holiday edges, in some cases increasing the apparent size of the holiday. Holidays may also be caused by such potentials. While apparently loosened coating and cathodic holidays may not result in corrosion, this test provides accelerated conditions for loosening to occur and therefore gives a measure of resistance of coatings to this type of action.

4.2 The effects of the test are evaluated by physical examination assessing the effective contact of the coating with the metal surface in terms of observed differences in the relative adhesive bond. It is usually found that the electrically stressed area propagates from the holiday to a boundary where the loosened coating leaves off for the more effective contact or bond attributed to an original condition throughout the specimen before electrical stressing was applied. Assumptions associated with test results include:

4.2.1 That attempting to loosen or disbond the coating at a new test hole made in the coating in an area that was not immersed represents maximum adhesion or bond as measured by the lifting technique used, and that the same lifting technique can be used at a test hole that was immersed, thereby providing a means of comparing relative resistance to lifting.