



Standard Test Method

Cathodic Disbondment Test for Coated Steel Structures Under Cathodic Protection

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Foreword

This NACE International standard test method specifies procedures to evaluate cathodic disbondment resistance of the steel structure coating systems under cathodic protection, such as buried or submerged pipeline and tank linings. The standard covers all test specimen geometries and test temperatures. This standard also takes into consideration all test parameters with the goal of the standard to be used during the selection of protective coating systems for use under cathodic protection. This test method is intended for use by facility owners, coating applicators, and coating manufacturers.

This test method was prepared in 2015 by Task Group (TG) 470, "Cathodic Disbondment Test for Coated Steel Structures Under Cathodic Protection." TG 470 is administered by Specific Technology Group (STG) 03, "Coatings and Linings, Protective—Immersion and Buried Service." This standard is issued by NACE under the auspices of STG 03.

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Standard Test Method**

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Section 1: General

- 1.1 This test method describes an accelerated test procedure for determining comparative resistance to cathodic disbondment of protective coating systems applied to the exterior of steel pipes and structures that are buried in soil or submerged. This test method is intended for use with specimens of coated tube, a specimen cut from a section of coated pipe, or flat coated steel plates.
- 1.2 This test method also is applicable to tank linings with an internal cathodic protection system.
- 1.3 This test method is not intended for tape or sleeve coatings with a soft adhesive that may flow at the test temperature.
- 1.4 This test method is intended to cover all service temperatures from ambient to elevated temperatures.
- 1.5 The test results obtained in this method will serve as a ranking of the candidate coating systems in their cathodic disbondment resistance at different service temperatures. This standard test method is not intended to simulate field conditions or predict service life.
- 1.6 There are many test parameters that may affect the cathodic disbondment test results. This test method has taken all test parameters into consideration, and all the test parameters shall not be modified to satisfactorily meet the requirements of this standard.

Section 2: Definitions

Anode: The electrode of an electrochemical cell at which oxidation occurs. (Electrons flow away from the anode in the external circuit. It is usually the electrode where corrosion occurs and metal ions enter solution.)

Anode Isolation: The placement of the anode such that the chlorine gas from the anodic reaction is kept away from the drilled holiday of the test specimen. The chlorine gas may react with the alkaline of the reaction product at the drilled holiday to form hypochlorite, which may attack organic coatings and affect the test results. This phenomenon does not occur in the field because the anode and cathode are far apart and will not produce the hypochlorite. In the laboratory testing of cathodic disbondment, the anode shall be isolated to prevent the dissolved anolyte chlorine gases from migrating to the cathodic sites.

Attached Cell: A cylindrical cell made of plastic or glass that is placed on top of a coated flat or curved plate to hold electrolyte for a cathodic disbondment test.

Cathodic Disbondment (CD): The destruction of adhesion between a coating and the coated surface caused by products of a cathodic reaction.

Cathodic Protection: A technique to reduce the corrosion rate of a metal surface by making that surface the cathode of an electrochemical cell.

Coating System: The complete number and types of coats applied to a substrate in a predetermined order.

Reference Electrode: An electrode having a stable and reproducible potential, which is used in the measurement of other electrode potentials.

Room Temperature (RT): An indoor temperature generally between 20 and 25 °C (68 and 77 °F).

Salt Bath: A reservoir containing a 3% by weight NaCl solution.