



Designation: B380 – 97 (Reapproved 2018)

# Standard Test Method for Corrosion Testing of Decorative Electrodeposited Coatings by the Corrodkote Procedure<sup>1</sup>

This standard is issued under the fixed designation B380; 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 Corrodkote<sup>2</sup> method of evaluating the corrosion performance of copper/nickel/chromium and nickel/chromium coatings electrodeposited on steel, zinc alloys, aluminum alloys, plastics and other substrates.

NOTE 1—The following ASTM standards are not requirements. They are reference for information only: Practice B537, Specification B456, Test Method B602, and Specification B604.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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>3</sup>

B117 Practice for Operating Salt Spray (Fog) Apparatus

B456 Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.10 on Test Methods.

The original work in developing the Corrodkote procedure was initiated by the American Electroplaters' Society Research Committee, Project No. 15.

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<sup>2</sup> Bigge, D. M., "Experience with the Use of the Corrodkote Test," *Proceedings, Am. Electroplaters' Soc.*, Vol. 46, 1959, p. 149.

<sup>3</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.

B537 Practice for Rating of Electroplated Panels Subjected to Atmospheric Exposure

B602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings

B604 Specification for Decorative Electroplated Coatings of Copper Plus Nickel Plus Chromium on Plastics

D1193 Specification for Reagent Water

## 3. Summary of Test Method

3.1 The test is conducted by applying a slurry containing corrosive salts to test specimens, allowing the slurry to dry, and exposing the specimens coated with the slurry to a high relative humidity for a specified period of time.

## 4. Significance and Use

4.1 Nickel/chromium and copper/nickel/chromium electrodeposited coatings are widely used for decorative and protective applications. The Corrodkote test provides a method of controlling the quality of electroplated articles and is suitable for manufacturing control, as well as research and development.

## 5. Apparatus

5.1 The apparatus shall consist of a humidity chamber, specimen supports, provision for heating the chamber, and provisions for air circulation in the chamber.

5.2 Drops of moisture that might accumulate on the ceiling or cover of the chamber of specimen supports shall not be permitted to fall on the specimens being tested.

NOTE 2—Suitable apparatus may be constructed from salt-spray equipment by eliminating fog-spray nozzles, substituting water for the salt solution in the reservoir, adding a manifold for bubbling air through the water in the reservoir, and adding a fan for circulating the air in the chamber with the fan discharge directed across the surface of the water in the reservoir.

5.3 Materials of construction shall not affect the corrosiveness of the test.

## 6. Procedure

6.1 *Corrodkote Slurry*—Prepare the Corrodkote slurry in a glass beaker by dissolving 0.035 g of reagent grade cupric nitrate ( $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ ), 0.165 g of ACS reagent grade ferric