



Designation: B940 – 05 (Reapproved 2014)

Standard Practice for Testing Non-Chromate Coatings on Zinc and Cadmium Surfaces¹

This standard is issued under the fixed designation B940; 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 practice covers a procedure for evaluating the protective value of chemical and electrochemical conversion coatings produced by non-chromate (chromate being defined as a compound that has chromium in the plus six oxidation state, and as such, chromium compounds in other oxidation states, such as plus three, shall not be excluded) treatments of zinc and cadmium surfaces.

1.2 The protective value of a non-chromate coating is usually determined by salt-spray test and by determining whether or not the coating possesses adequate abrasion resistance when applied for that purpose.

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

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
B117 Practice for Operating Salt Spray (Fog) Apparatus

3. Terminology

3.1 Descriptions of Terms:

3.1.1 *time to failure*—time to failure will depend on the type of coating tested. The minimum expected protective value obtainable in a given salt spray test is given in **Appendix X2**.

3.1.1.1 *Discussion*—In most instances, failure is defined as the first appearance on significant surfaces of white corrosion

¹ This practice is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.07 on Conversion Coatings.

Current edition approved Nov. 1, 2014. Published November 2014. Originally approved in 2000. Last previous edition approved in 2009 as B940–05(2009)^{ε1}. DOI: 10.1520/B0940-05R14.

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.

products visible to the unaided eye at normal reading distance, except that the presence of white corrosion products at sharp edges (for example, on threaded fasteners) and at junctions between dissimilar metals should not be considered failure. In some instances, it may be desirable to regard the first appearance of red rust as failure.

3.1.2 *significant surfaces*—in general, significant surfaces are those surfaces that are visible and subject to corrosion or wear, or both, except that surfaces that are normally difficult to coat by electroplating or mechanical deposition may be exempt. The designation of significant surfaces may be indicated on the drawing.

4. Significance and Use

4.1 This practice is applicable to non-chromate coatings that are colorless, colored, electrochemically applied or non-electrochemically applied. The zinc or cadmium, or both, may be electrodeposited, mechanically deposited, hot-dipped, rolled, or in the form of castings.

4.2 Because of variables inherent in the salt-spray test which may differ from one test cabinet to another, interpretation of test results for compliance with expected performance should be specified by the purchaser.

4.3 Properties such as thickness, color, luster, and ability to provide good paint adhesion are not covered in this practice, nor are the chemical composition and the method of application of these finishes.

5. Conditioning

5.1 *Aging*—Before subjecting a non-chromate coating to test, check with the chemical producer to determine if aging is an issue that needs to be considered.

5.2 *Preparation of Specimen*—The test surface must be free of fingerprints and other extraneous stains and must not be cleaned except by gentle wiping with a clean, dry, soft cloth to remove loose particles. Oily or greasy surfaces should not be used for testing, and degreasing with organic solvents is not recommended.

6. Procedure

6.1 *Salt Spray Test*—Expose the clean specimen to a 5 % solution salt spray and conduct the test in accordance with the