



Standard Test Method for Chloride Resistance Test for Chromium Electroplated Parts (Russian Mud Test)¹

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1. Scope

1.1 This standard details a laboratory method to accelerate the effects of exposure to hygroscopic corrosive chloride compounds on electroplated chromium components. It is applicable to any substrate and coating system that utilizes electroplated chromium as the final metallic coating.

1.2 Field experience has shown that hygroscopic chlorides are significantly more aggressive than sodium chloride toward chromium electroplated deposits. The most common of which is calcium chloride.

1.3 The standard does not specify exposure periods to be used for a specific product nor the interpretation to be given to the results. The suitability of this test and correlation of results with service experience should be determined before it is specified for coating systems.

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

1.5 *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:

- B117 Practice for Operating Salt Spray (Fog) Apparatus
- B368 Test Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)
- D1193 Specification for Reagent Water

¹ 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.

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3. Significance and Use

3.1 This test replicates in the laboratory the corrosive actions of a film containing hygroscopic chlorides and solid material (mud) on electroplated chromium. The test's reactive media, the test slurry, was developed to simulate the film found on electroplated chromium deposits during a winter in Russia, thus the common name for the test, Russian Mud Test.

3.2 This test is used for specification acceptance, simulated service evaluation, manufacturing control, and research and development. It was developed specifically for use on components with electrodeposited chromium coatings exposed to hygroscopic chlorides. Test and production specimens may be used. Use of a standardized test could help in developing improved quality of chromium electrodeposited components and lead to the development of improved electroplated chromium systems.

3.3 This test simulates the amount of electrodeposited decorative and functional chromium deposit lost when exposed to the combination of “mud/solid material” and hygroscopic chlorides, most commonly calcium chloride. The metric is the loss of only the chromium and adjacent nickel layer. Other tests used with nickel/chromium electroplated components, such as CASS (Test Method B368), simulate the resistance of the part to basis metal corrosion involving all of the component's deposits and substrate.

4. Apparatus

4.1 The apparatus required for this test consists of an environment chamber capable of controlling both temperature and humidity within the specified range (see 7.4). The chamber must be large enough to hold the test specimens without touching one another or the walls of the chamber. Also, the reaction products formed on one specimen shall not fall on another specimen. Materials of construction shall not affect the corrosiveness of the test environment, nor be themselves corroded by the test environment. Practice B117 offers a guide for chamber design.