



Designation: B 537 – 70 (Reapproved 1997)

## Standard Practice for Rating of Electroplated Panels Subjected to Atmospheric Exposure<sup>1</sup>

This standard is issued under the fixed designation B 537; 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 preferred method for evaluating the condition of electroplated test panels that have been exposed to corrosive environments for test purposes. It is based on experience in use of the method with standard 10- by 15-cm (4- by 6-in.) panels exposed on standard ASTM racks at outdoor test sites in natural atmospheres. It has been used also for rating similar panels that have been subjected to accelerated tests such as those covered by Practice B 117, Method B 287, Method B 368, and Method B 380. Any modifications needed to adapt the method to rating actual production parts are not considered in this practice.

1.2 This practice refers only to decorative-protective coatings that are cathodic to the substrate, typified by nickel/chromium or copper/nickel/chromium on steel or zinc die castings. It is not intended for use with anodic sacrificial coatings such as zinc and cadmium on steel.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- B 117 Practice for Operating Salt Spray (Fog) Apparatus<sup>2</sup>
- B 287 Method of Acetic Acid-Salt Spray (Fog) Testing<sup>3</sup>
- B 368 Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)<sup>4</sup>
- B 380 Method of Corrosion Testing of Decorative Electrodeposited Coatings by the Corrodokote Procedure<sup>4</sup>

### 3. Basis of Procedure

3.1 The rating method described in this recommended practice is based on the recognition that typical decorative-protective deposits such as nickel/chromium, with or without a copper undercoat, have two functions: (1) to protect the substrate from corrosion and thus prevent degradation of appearance caused by basis metal corrosion products (for example, rust and rust stain); and (2) to itself maintain a

satisfactory appearance. Although these functions overlap, they can be evaluated separately and it is frequently desirable to do so. Accordingly, this practice assigns separate ratings to (1) appearance as affected by corrosion of the substrate and (2) appearance as affected by deterioration of the coating itself.

3.2 The rating number assigned to the ability of the coating to protect the substrate from corrosion is called the “protection” number or rating.

3.3 The rating number assigned to the inspector’s judgment of the overall appearance of the panel, including all defects caused by the exposure (Note 1), is called the “appearance” number or rating.

NOTE 1—Panels that are not “perfect” even before being exposed should normally be rejected (see Note 4).

3.4 The result of inspecting a panel is recorded as two numbers separated by a slash (/), the protection number being given first.

3.5 In addition to recording the numerical rating of a panel, the inspector should note the type(s) and severity of defect(s) contributing to the rating. This may be done by the use of agreed symbols for the most common defects (Appendix X1) and abbreviations for degree or severity of these defects.

### 4. Types of Defects

4.1 “Protection” defects include crater rusting (Note 2), pinhole rusting, rust stain, blisters (Note 3), and any other defects that involve basis metal corrosion.

NOTE 2—“Rusting” or “rust” as used in this document includes corrosion products of the substrate and is not confined to iron or steel: the white corrosion products of zinc die castings and aluminum, for example, are included in this term.

NOTE 3—Blisters on plated zinc die casting usually connote basis metal corrosion; but the inspector’s judgment may be required to decide whether a blister does or does not arise at the substrate-coating interface.

4.2 “Appearance” defects include, the addition to those caused by basis metal corrosion, all defects that detract from the appearance (that is, the commercial acceptability) of the panel. Typical are: surface pits, “crow’s feet,” crack patterns, surface stain, and tarnish.

4.3 Defects developing on exposure that reflect improper preparation or plating should be noted but no attempt should be made to rate panels showing major amounts of such defects. Peeling of the coating from the substrate, or of one coat from

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.08.03 on Decorative Coatings.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 03.02.

<sup>3</sup> *Discontinued 1988—Replaced by G85*; see 1987 *Annual Book of ASTM Standards*, Vol 02.05.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 02.05.