



Designation: B 650 – 95

Standard Specification for Electrodeposited Engineering Chromium Coatings on Ferrous Substrates¹

This standard is issued under the fixed designation B 650; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers the requirements for electrodeposited chromium coatings applied to ferrous alloys for engineering applications.

1.2 Electrodeposited engineering chromium, which is sometimes called “functional” or “hard” chromium, is usually applied directly to the basis metal and is much thicker than decorative chromium. Engineering chromium is used for the following:

- 1.2.1 To increase wear and abrasion resistance,
- 1.2.2 To increase fretting resistance,
- 1.2.3 To reduce static and kinetic friction,
- 1.2.4 To reduce galling or seizing, or both, for various metal combinations,
- 1.2.5 To increase corrosion resistance, and
- 1.2.6 To build up undersize or worn parts.

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

2. Referenced Documents

2.1 ASTM Standards:

- B 117 Practice for Operating Salt Spray (Fog) Apparatus²
- B 177 Practice for Chromium Electroplating on Steel for Engineering Use²
- B 183 Practice for Preparation of Low-Carbon Steel for Electroplating²
- B 242 Practice for Preparation of High-Carbon Steel for Electroplating²
- B 320 Practice for Preparation of Iron Castings for Electroplating²
- B 374 Terminology Relating to Electroplating²
- B 487 Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of a Cross Section²

B 499 Test Method for Measurement of Coating Thickness by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals²

B 504 Test Method for Measurement of Thickness of Metallic Coatings by the Coulometric Method²

B 507 Practice for Design of Articles to Be Electroplated on Racks²

B 568 Test Method for Measurement of Coating Thickness by X-Ray Spectrometry²

B 571 Test Methods for Adhesion of Metallic Coatings²

B 602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings²

B 697 Guide for Selection of Sampling Plans for Inspection of Electrodeposited Metallic and Inorganic Coatings²

B 762 Method of Variables Sampling of Metallic and Inorganic Coatings²

B 849 Specification for Pre-Treatments of Iron or Steel for Reducing the Risk of Hydrogen Embrittlement²

B 850 Specification for Post-Coating Treatments of Iron or Steel for Reducing the Risk of Hydrogen Embrittlement²

D 3951 Practice for Commercial Packaging³

E 8 Test Methods for Tension Testing of Metallic Materials⁴

F 1459 Test Method for Determination of the Susceptibility of Metallic Materials to Gaseous Hydrogen Embrittlement⁵

2.2 Other Standard:

MIL-S-13165 Shot Peening of Metal Parts⁶

3. Terminology

3.1 Definitions:

3.1.1 *significant surfaces*—all surfaces upon which a deposit of controlled thickness is required.

3.1.1.1 *Discussion*—When a controlled deposit is required in holes, corners, recesses, and similar areas, special racking, auxiliary anodes or shielding, or both, will be necessary. With the best practices there will be areas where a controlled deposit is impossible.

3.2 Definitions used in this specification are in accordance with Terminology B 374.

¹ This specification is under the jurisdiction of ASTM Committee B-8 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.08.01 on Engineering Coatings.

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² *Annual Book of ASTM Standards*, Vol 02.05.

³ *Annual Book of ASTM Standards*, Vol 15.09.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

⁵ *Annual Book of ASTM Standards*, Vol 15.03.

⁶ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.