



Designation: F 1941M – 00

METRIC

Standard Specification for Electrodeposited Coatings on Threaded Fasteners [Metric]¹

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INTRODUCTION

This specification covers the coating of steel metric screw threaded fasteners by electrodeposition. The properties of the coatings shall conform to the ASTM standards for the individual finishes listed.

Coating thickness values are based on the tolerances for *M* series metric threads having the following tolerance positions: 6g and 4g6g for external threads, and 6H for internal threads. The coating must not cause the basic thread size to be transgressed by either the internal or external threads. The method of designating coated threads shall comply with ASME B1.13M.

With normal methods for depositing metallic coatings from aqueous solutions, there is a risk of delayed failure due to hydrogen embrittlement for case hardened fasteners and fasteners having a hardness 40 HRC or above. Although this risk can be managed by selecting raw materials suitable for the application of electrodeposited coatings and by using modern methods of surface treatment and post heat-treatment (baking), the risk of hydrogen embrittlement cannot be completely eliminated. Therefore, the application of a metallic coating by electrodeposition is not recommended for such fasteners.

1. Scope

1.1 This specification covers application, performance and dimensional requirements for electrodeposited coatings on threaded fasteners with metric screw threads. It specifies coating thickness, supplementary chromate finishes, corrosion resistance, precautions for managing the risk of hydrogen embrittlement and hydrogen embrittlement relief for high-strength and surface-hardened fasteners. It also highlights the differences between barrel and rack plating and makes recommendations as to the applicability of each process.

1.2 The following precautionary statement pertains to the test method portion only, Section 9, of this specification: *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 487 Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of a Cross Section³
- B 499 Test Method for Measurement of Coating Thickness by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals³
- B 504 Test Method for Measurement of Thickness of Metallic Coatings by the Coulometric Method³
- B 567 Test Method for Measurement of Coating Thickness by the Beta Backscatter Method³
- B 568 Test Method for Measurement of Coating Thickness by X-Ray Spectrometry³
- B 633 Specification for Electrodeposited Coatings of Zinc on Iron and Steel³
- B 659 Guide for Measuring Thickness of Metallic and Inorganic Coatings³

¹ This specification is under the jurisdiction of ASTM Committee F-16 on Fasteners and is the direct responsibility of Subcommittee F16.03 on Coatings on Fasteners.

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² Annual Book of ASTM Standards, Vol 03.02.

³ Annual Book of ASTM Standards, Vol 02.05.