



Designation: F2833 – 11 (Reapproved 2017)

# Standard Specification for Corrosion Protective Fastener Coatings with Zinc Rich Base Coat and Aluminum Organic/Inorganic Type<sup>1</sup>

This standard is issued under the fixed designation F2833; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers the basic requirements for chromium-free fastener coatings that combine an inorganic zinc-rich basecoat with an aluminum-rich topcoat that contains an integrated lubricant.

1.2 These coatings are applied by conventional dip-spin, dip-drain, or spray methods to ferrous parts which can be handled through a cleaning, or phosphate, coating, and baking operation. Phosphating or shot blast is required to clean and prepare the surface of the steel. These coatings are bake cured at temperatures up to 500°F.

NOTE 1—If used, phosphate to be used in accordance with Specification F1137, grade 0.

1.3 *Units*—The values stated in inch-pound 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

**B117 Practice for Operating Salt Spray (Fog) Apparatus**

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.03 on Coatings on Fasteners.

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<sup>2</sup> 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.

[D610 Practice for Evaluating Degree of Rusting on Painted Steel Surfaces](#)

[D3359 Test Methods for Rating Adhesion by Tape Test](#)

[F606/F606M Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets](#)

[F1137 Specification for Phosphate/Oil Corrosion Protective Coatings for Fasteners](#)

[F1470 Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection](#)

[F1624 Test Method for Measurement of Hydrogen Embrittlement Threshold in Steel by the Incremental Step Loading Technique](#)

[F1789 Terminology for F16 Mechanical Fasteners](#)

[F1940 Test Method for Process Control Verification to Prevent Hydrogen Embrittlement in Plated or Coated Fasteners](#)

## 3. Classification

3.1 When the zinc phosphate option is used, its coating weight shall be in the range of 8-20 g/square meter. If used, phosphate to be used in accordance to Specification F1137 grade 0.

3.2 These coatings are classified into 5 different types:

3.2.1 *Grade 1*—requires a minimum basecoat thickness of 0.27 mils applied in one coat. An organic topcoat with an integrated lubricant is applied at a minimum thickness of 0.20 mils in one coat and ; with no additional layers.

3.2.2 *Grade 2*—requires a minimum basecoat thickness of 0.27 mils applied in two coats bulk or one coat sprayed. An organic topcoat with an integrated lubricant is applied at a minimum thickness of 0.20 mils in one coat; with no additional layers.

3.2.3 *Grade 3*—requires a minimum basecoat thickness of 0.27 mils applied in one coat. This basecoat is dark gray in color. A black organic topcoat with an integrated lubricant is applied at a minimum thickness of 0.20 mils in two coats bulk or one coat sprayed; with no additional layers.

3.2.4 *Grade 4*—requires a minimum basecoat thickness of 0.27 mils applied in one coat. An inorganic topcoat with an