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Standard Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners[1]

This standard is issued under the fixed designation F1136/F1136M; 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 specification covers the basic requirements for water-based zinc/aluminum dispersion inorganic basecoats and optional sealers and topcoats for fasteners. The basecoat can contain chrome (C) or be non-chrome (NC).

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, coating, and baking operation, and which are not adversely affected by baking temperatures up to 330°C [626°F].

1.3 The coating process does not induce the possibility of internal hydrogen embrittlement providing that the fasteners have not been cleaned or pre-treated with an acid or phosphate. Alkaline cleaning or vapor degreasing is required along with shot blasting to remove rust or scale.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the 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:*[2]

B117 Practice for Operating Salt Spray (Fog) Apparatus

D610 Practice for Evaluating Degree of Rusting on Painted Steel Surfaces

D3359 Test Methods for Measuring Adhesion by Tape Test

F606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets

F606M Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets (Metric)

F1624 Test Method for Measurement of Hydrogen Embrittlement Threshold in Steel by the Incremental Step Loading Technique

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 These coatings are classified into six grades according to the requirements in Table 1.

3.1.1 Grade 1 requires a minimum basecoat thickness of 4µm [16g/m^2] or 0.16 mil (0.052 oz/ft^2). This is usually applied in two coats to bulk parts, or one coat to racked parts. No topcoat is applied in Grade 1.

3.1.2 Grade 2 requires a minimum basecoat thickness of 5µm [20 g/m^2] or 0.20 mil (0.066 oz/ft^2). This is usually applied in two coats to bulk parts, or one coat to racked parts. No topcoat is applied in Grade 2.

3.1.3 Grade 3 requires a minimum basecoat thickness of 5µm [20 g/m^2] or 0.20 mil (0.066 oz/ft^2) and a single coat of the clear sealer. The sealer provides additional corrosion protection and greater lubricity than Grade 2.

3.1.4 Grade 4 requires a minimum basecoat thickness of 8µm [28 g/m^2] or 0.31 mil (0.092 oz/ft^2). This is usually applied in three coats to bulk parts, or one to two coats to racked parts. No topcoat is applied in Grade 4.

3.1.5 Grade 5 requires a minimum basecoat thickness of 5µm [20 g/m^2] or 0.20 mil (0.066 oz/ft^2) and a single coat of the lubricated sealer. The sealer provides additional corrosion protection than Grade 2 and greater lubricity than Grade 3.

[1] 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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[2] 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.

***A Summary of Changes section appears at the end of this standard**