



Standard Specification for Aluminum Particle-Filled Basecoat/Organic or Inorganic Topcoat, Corrosion Protective Coatings for Fasteners¹

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1. Scope

1.1 This specification covers the basic requirements for a corrosion-resistant coating consisting of an inorganic aluminum particle-filled basecoat and an organic or inorganic topcoat, depending on the specific requirements.

1.2 The coating may be specified with basecoat only, or with the top coated with compatible organic polymer or inorganic topcoats, depending on the specific requirements.

1.3 The basecoat is a water-dilutable slurry containing aluminum particles dispersed in a liquid binder of chromate/phosphate compounds.

1.4 The organic topcoats consist of polymer resins and dispersed pigments and are for service where temperatures do not exceed 230°C (450°F).

1.5 The inorganic topcoats consist of ceramic oxide pigments dispersed in a liquid binder of chromate/phosphate compounds and are for service where temperatures do not exceed 645°C (1200°F).

1.6 These coatings are applied by conventional dip/spin, dip/drain, or spray methods.

1.7 The coating process does not normally induce hydrogen embrittlement, provided that the parts to be coated have not been subjected to an acid cleaner or pretreatment (see **Note 1**).

NOTE 1—Although this coating material contains water, it has a relatively low susceptibility to inducing hydrogen embrittlement in steel parts of tensile strengths equal to or greater than 1000 MPa (approximately RC31). Normal precautions for preparing, descaling, and cleaning steels of these tensile strengths must be observed. An initial stress relief treatment should be considered prior to any chemical treatment or cleaning operation. Acids or other treatments that evolve hydrogen should be avoided. Mechanical cleaning methods may be considered. Some steels are more susceptible to hydrogen embrittlement than others and may also require hydrogen embrittlement relief baking after cleaning but before coating. Since no process can completely guarantee freedom from embrittlement, careful consideration must be given to the entire coating process and the specific steel alloy employed.

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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1.8 The coating systems defined by this specification can be applied to ferrous alloy steels, aluminum, and ferritic and austenitic stainless steels.

1.9 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.10 The following safety hazards caveat pertains only to the test methods portion, Section 6, 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*:²

- B117 Practice for Operating Salt Spray (Fog) Apparatus
- B487 Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section
- B568 Test Method for Measurement of Coating Thickness by X-Ray Spectrometry
- D1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base (Withdrawn 2006)³
- D2247 Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity
- D3359 Test Methods for Measuring Adhesion by Tape Test
- E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process
- E376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Testing Methods

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.

³ The last approved version of this historical standard is referenced on www.astm.org.