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# Standard Specification for Phosphate/Oil Corrosion Protective Coatings for Fasteners<sup>1</sup>

This standard is issued under the fixed designation F1137; 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 four grades of corrosion protection for fasteners. Grade A consists of a zinc phosphate coating with no additional sealer (dry), Grade B consists of a zinc phosphate coating with a dry organic sealer, Grade C, and Grade D. 1.2 This specification is intended primarily for fasteners such as nuts, clips, washers, and other ferrous threaded and non-threaded fasteners that require corrosion protection.

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1.3 These coatings may or may not have a decorative finish.

## 2. Referenced Documents

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

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

**F1470** Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection

## 3. Classification

3.1 The zinc phosphate treatment and subsequent protective coatings are classified into four grades according to the requirements shown in **Table 1**.

## 4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Quantity of parts,

4.1.2 Grade required (see **Table 1**), and

<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.

**TABLE 1 Classification and Performance Requirements of Protective Coatings**

Grade No.	Zinc Phosphate, g/m <sup>2</sup>	Supplemental Coating	Coating Thickness, $\mu\text{m}$	Salt Spray, h
Grade A	11, min	none	see 5.3	72 <sup>A</sup>
Grade B	11, min	sealer	see 5.3	72
Grade C	11, min	protective oil-type compound	see 5.3	24
Grade D	11, min	protective oil-type compound	see 5.3	72

<sup>A</sup> When testing Grade A finished parts, a protective oil coating shall be added before salt spray testing.

4.1.3 Any additions agreed upon between the purchaser and the supplier.

## 5. Requirements

5.1 *Appearance*—Unless otherwise agreed upon between the purchaser and the producer, the color of the protective coating shall be as-coated gray for Grades A, B, C, and D.

5.2 *Corrosion Resistance*—These coatings shall be capable of withstanding neutral salt spray for the minimum h specified in **Table 1** with no base metal corrosion on significant surfaces. Significant surfaces on threaded fasteners are defined as the exposed surfaces when the fasteners are installed in a normal manner (bolt head, nut head, face, etc.). On other surfaces where control of the coating cannot be obtained under normal processing such as holes, recesses, threads, etc., the above requirements do not apply.

5.3 *Thread Fit*—The maximum thickness of coating which may be applied to threads on threaded products is limited by the basic thread size (see 8.2). Threads may be produced undersize/oversize (before coating) to accommodate the coating thickness, providing the finished product (after coating) meets all specified mechanical properties. All undersize/oversize must be within permissible limits as agreed upon between the supplier and the purchaser.

5.4 *Dry-to-Touch*—Grade C shall be evenly coated and dry-to-touch such that when held with filter paper or equivalent and applying hand pressure for 5 to 10 s, there shall be no visible staining of the filter paper when viewed without use of

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