

**BUREAU OF INDIAN STANDARDS**  
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*भारतीय मानक मसौदा*

इस्पात के चूड़ीदार बंधको की तकनीकी पूर्ति शर्तें  
भाग 12 थ्रेडेड फास्टनरों पर फॉस्फेट कोटिंग  
[IS 1367 (भाग 12) का तीसरा पुनरीक्षण ]

*Draft Indian Standard*

**Technical Supply Condition for Threaded Steel Fasteners**  
**Part 12 Phosphate Coatings on Threaded Fasteners**  
[Third Revision of IS 1367 (Part 12)]

ICS 21.060.20

General Engineering and Fasteners Standards Sectional Committee, PGD 37	Last date for receipt of comment is <b>02 March 2025</b>
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**FOREWORD**

*(Formal clause will be added later)*

This standard was first published in 1967 and was subsequently revised in 1975 and 1981. This third revision has been brought out to keep pace with the latest technological developments and international practices. In this revision following changes have been made:

- a) Scope of the standard has been revised to cover the requirements of manganese phosphate coating on fasteners;
- b) Neutral salt spray (NSS) for testing corrosion resistance of fasteners has been revised based on the latest international practices; and
- c) References have been updated.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Draft Indian Standard*

**TECHNICAL SUPPLY CONDITION FOR THREADED STEEL FASTENERS**  
**PART 12 PHOSPHATE COATINGS ON THREADED FASTENERS**  
*(Third Revision)*

## **1 SCOPE**

This standard covers the requirements of threaded steel fasteners with phosphate coating of either zinc phosphate (ZnPh) or manganese phosphate (MnPh), that is intended to be used in conjunction with a sealant for protection against corrosion.

## **2 REFERENCES**

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

## **3 MASS OF PHOSPHATE COATING**

The mass of coating that consists either of zinc phosphate or manganese phosphate, shall have a coating weight in the range of 2.5 g/m<sup>2</sup> to 4.5 g/m<sup>2</sup> of treated surface.

## **4 SEALANT REQUIREMENTS**

Phosphate coating shall be sealed with suitable oil of rust-preventive type.

## **5 TESTING**

### **5.1 Freedom from Defects**

Zinc phosphate and manganese phosphate coatings shall evenly cover the metal surface and shall not show any white stains, corrosion products or fingerprints, excessively crystalline appearance and uneven deposits.

NOTE — Slight fluctuations in the appearance of phosphate coatings because of contact with frames, properties of the base material or through minor contact inside the drum do not constitute any reason for claim.

### **5.2 Colour of Phosphate Coating**

Zinc Phosphate (ZnPh) coating shall have light grey to dark grey colour while manganese phosphate coating (MnPh) shall have dark grey to black colour.

### **5.3 Verification for Coating**

The phosphate coating shall be chemically verified in accordance with the test method given in **5.3.1** and **5.3.2**.

### **5.3.1 Reagent**

Dissolve 8 g of ammonium molybdate in 80 ml of distilled water. Add 12 ml concentrated hydrochloric acid with a specific gravity of 1.14, 20 g ammonium chloride and 10 ml of saturated potassium persulphate solution. The reagent shall be freshly prepared.

### **5.3.2 Procedure**

Add one drop of the reagent to the test surface. The appearance of a blue colour within 30 s indicates the presence of a phosphate coating.

NOTE — A plain untreated fastener shall be used as control.

## **5.4 Dimensional Accuracy**

**5.4.1** In case of unthreaded features, dimensions apply before coating.

**5.4.2** For threaded features, the permissible dimensional variations will be applicable before coating. However, after coating, the threads shall not transgress the maximum material limit for tolerance position H or h. If required by the purchaser, fasteners may be checked at random for dimension after de-phosphating.

## **5.5 Test for Mass of Coating**

Test for mass of coating shall be in accordance with IS 3618.

## **5.6 Test for Resistance to Corrosion**

When tested in accordance with the neutral salt spray (NSS) test as specified in IS 5528 for 48 h, the test surface shall remain free from red corrosion products when examined by the unaided eye or with normal corrected vision. Slight staining shall not be a cause for rejection. If required, other test methods may be agreed between the customer and the supplier. The test should be performed with original components, without alteration to sealing oil.

## **6 DESIGNATION**

The designation of a bolt or screw with phosphate coating shall include the letter 'P' for phosphating. [*see also IS 1367 (Part 16)*].

### *Example:*

A hexagon head bolt conforming to, IS 1364 (Part 1), size M20, length 75 mm, product grade A, property class 8.8 and with phosphate coating shall be designated as.

Hex Bolt M20 x 75 IS 1364 (Part 1)—A—8.8—P

NOTE — If specific coating is required, P can be replaced with ZnPh for zinc phosphate and MnPh for manganese phosphate.

**ANNEX A**  
*(Clause 2)*

**LIST OF REFERRED STANDARDS**

<i>IS No</i>	<i>Title</i>
IS 1364 (Part 1) : 2023 ISO 4014 : 2022	Hexagon head bolts, screws and nuts of product grades A and B: Part 1 Hexagon head bolts (size range M1.6 to M64) ( <i>sixth revision</i> )
1367 (Part 16) : 2002	Technical supply conditions for threaded steel fasteners: Part 16 Designation system for fasteners ( <i>third revision</i> )
IS 3618 : 1966	Specification for phosphate treatment of iron and steel for protection against corrosion
IS 5528 : 2024/ ISO 9227 : 2022	Corrosion tests in artificial atmospheres — Salt spray tests ( <i>second revision</i> )