IS 10238 (2001): Fasteners - Threaded Steel Fastener - Step Bolts for Steel Structures [PGD 31: Bolts, Nuts and Fasteners Accessories]

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*भारतीय मानक*

# बंधन सामग्री — चूड़ीदार बंधन सामग्री — इस्पात संरचनाओं हेतू स्टेप काबले — विशिष्टि

*( पहला पुनरीक्षण )*

*Indian Standard*

# FASTENERS — THREADED STEEL FASTENERS — STEP BOLTS FOR STEEL STRUCTURES — SPECIFICATION

*( First Revision )*

ICS 21.060.01



**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*June* 2001

**Price Group 2**

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bolts, Nuts and Fasteners Accessories Sectional Committee and had been approved by the Basic and Production Engineering Division Council.

This standard was originally issued in 1982. Subsequent to the publication, three amendments have been issued. This revision has been taken up to incorporate these amendments as well as to make in line with the actual products which are being used by the electrical transmission and tower erection industries.

Step bolts are used to gain access to the top of steel structures including transmission towers. For safety reasons, while gaining access to the top of the structure, with the help of step bolts, the maximum total weight of a person including the bolts, nuts, tools and tackles that he may carry with him, should not exceed 150 kg.

Hexagon bolts intended for fabrication of general steel structures are covered in IS 6639 'Hexagon bolts for steel structures'.

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 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off values should be the same as that of the specified value in this standard.

*Indian Standard*

# FASTENERS — THREADED STEEL FASTENERS — STEP BOLTS FOR STEEL STRUCTURES — SPECIFICATION

*( First Revision )*

## 1 SCOPE

**1.1** This standard covers the requirements for step bolt used in steel structures including transmission towers to gain access to the top.

**1.2** Each bolt shall be supplied with two hexagon nuts.

## 2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

| *IS No.* | *Title* |
|---|---|
| 1367 | Technical supply conditions for threaded steel fasteners: |
| (Part 2) : 1979 | Product grades and tolerances (*second revision*) |
| (Part 3) : 1991 | Mechanical properties and test methods for bolts, screws and studs with full loadability (*third revision*) |
| (Part 9/Sec2) : 1993 ISO 6157–3 : 1988 | Surface discountinuties: Section 2 Bolts, screws and studs for special applications (*third revision*) |
| (Part 13) : 1983 | Hot-dip galvanized coatings on threaded fasterners (*second revision*) |
| (Part 17) : 1996 | Inspection, smapling and acceptance procedure (*third revision*) |
| (Part 18) : 1996 | Packaging (*third revision*) |
| 1369 : 1982 | Dimensions of screw thread run-outs and undercuts (*second revision*) |
| 2016 : 1967 | Plain washers (*first revision*) |
| 4218 | ISO general purpose metric screw threads: |
| Part 1 : 2001 ISO 68-1 : 1998 | Basic profile (*second revision*) |
| Part 2 : 2001 ISO 261 : 1998 | General plan (*second revision*) |
| Part 3 : 1999 ISO 724 : 1993 | Basic dimensions (*second revision*) |
| Part 4 : 2001 ISO 262 : 1998 | Selected sizes for screws, bolts and nuts (*second revision*) |
| 4759 : 1996 | Hot-dip zinc coating on structural steel and other allied products (*third revision*) |
| 14394 : 1996 | Industrial fasteners—Hexagon nuts of product grade C— Hot-dip galvanized—Sepcification (size range M 12 to M 36) |

## 3 DIMENSIONS AND TOLERANCES

The dimensions and tolerances for step bolts shall be as given in Fig. 1.

## 4 GRADES

The step bolts shall be of product Grade C as specified in IS 1367 (Part 2).

## 5 MECHANICAL PROPERTIES

The step bolts shall conform to the requirements of property class 4.6 as specified in IS 1367(Part 3).

## 6 MATING NUTS AND WASHERS

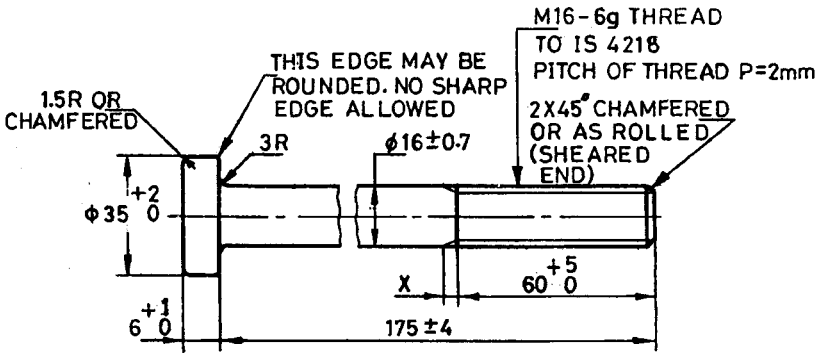
### 6.1 Nuts

The hexagon nuts used (*see* **1.2**) with step bolts covered in this standard shall be of property class 5 and conforms to the requirements of IS 14394.

### 6.2 Washers

**6.2.1** The plain washers used on these bolts shall be of Type A punched washers type and conform to the requirements given in IS 2016 except the thickness of washers which shall be 5 ± 1 mm.

**6.2.2** The washers supplied along with bolts shall be hot-dip galvanized and in accordance with **8.2**.




All dimensions in millimetres.
'x' according to IS 1369
FIG. 1 DIMENSIONS FOR STEP BOLT

## 7 GENERAL REQUIREMENTS

The permissible surface discontinuities of the step bolts shall conform to IS 1367(Part 9/Sec 2).

## 8 FINISH

**8.1** The step bolts shall be galvanized in accordance with IS 1367 (Part 13). All dimensions given in Fig. 1 shall apply before galvanizing.

**8.2** The plain washers supplied alongwith the step bolts covered in this standard shall be hot-dip galvanized in accordance with the requirements of IS 4759.

**8.3** Hot-dip galvanized bolts, nuts and washers shall be passivate by dipping, immediately after galvanizing in a 0.15 percent solution of sodium dichromate with 0.5 percent concentrated sulphuric acid maintained at a temperature more than 32°C to provide protection against wetstorage strain.

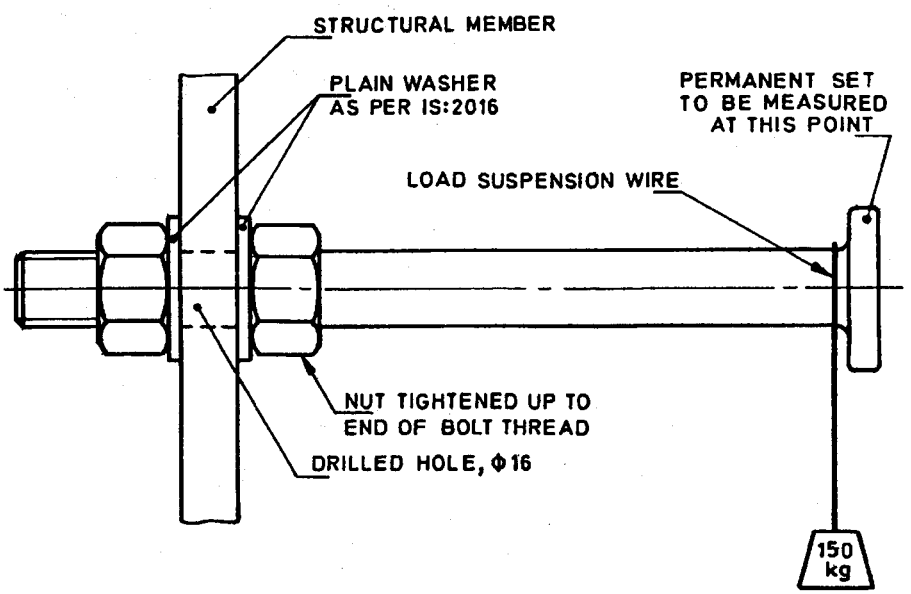
## 9 SAMPLING, INSPECTION AND ACCEPTANCE CRITERIA

The sampling, inspection and acceptance criteria shall be in accordance with IS 1367 (Part 17).

## 10 TESTS

**10.1** The step bolts shall not have any permanent set when subjected to the cantilever test as shown in Fig. 2.

**10.1.1** Before carrying out the cantilever test, the step bolt shall be loaded with 150 kg for 10 seconds with the set up shown in Fig. 2.




All dimensions in millimetres.
FIG. 2 CANTILEVER TEST

The bolts then shall be loaded again with 150 kg load for 10 seconds and there shall be no permanent set at the point indicated, after withdrawal of the load subject to a tolerance of 30 μ m for measurement error.

Both these loadings shall be done after the step bolts and nuts are tightly fixed as shown in Fig. 2.

## 11 DESIGNATION

The step bolts shall be designated by the size, length and the number of this Indian Standard. The letter NN shall be added to the designation to indicate supply with two nuts.

*Example:*

A step bolt of size M16 and length 175 mm with two hexagon nuts shall be designated as:

Step Bolt M16 × 175 NN IS 10238

## 12 MARKING

**12.1** The marking on the step bolts shall be in accordance with the IS 1367(Part 3).

### 12.2 BIS Certification Marking

The use of Standard Mark is governed by the provision of the *Bureau of Indian Standards Act,* 1986 and Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 13 PACKAGING

The packaging of step bolts shall be in accordance with IS 1367 (Part 18).

**Bureau of Indian Standards**

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. **BP 33 (0092).**

**Amendments Issued Since Publication**

| Amend No. | Date of Issue | Text Affected |
|---|---|---|
| | | |
| | | |
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