

Specification for

The use of high strength friction grip bolts in structural steelwork metric series —

Part 1: General grade

UDC 621.882:624.014.2:693.814

Co-operating organizations

The committee responsible for the preparation of this British Standard consists of representatives from the following Government departments and scientific and industrial organizations:

- Association of Crane Makers
- Black Bolt and Nut Association of Great Britain
- British Bolt, Nut, Screw and Rivet Federation
- British Constructional Steelwork Association
- British Steel Industry
- Greater London Council
- Ministry of Defence, Army Department
- Ministry of Transport, Road Research Laboratory
- Individual consultants

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The following BSI references relate to the work on this standard:
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Foreword

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 9,000, fully indexed and with a note of the contents of each, will be found in the BSI Catalogue which may be purchased from BSI Sales Department. The Catalogue may be consulted in many public libraries and similar institutions.

This standard makes reference to the following British Standards:

BS 449, *The use of structural steel in building — Part 2: Metric units.*

BS 4395, *High strength friction grip bolts and associated nuts and washers for structural engineering. Metric series — Part 1: General grade.*

BS....., *Podger spanners. Metric series*¹⁾.

BS 3294-1²⁾ gives rules for the use in structural steelwork of high strength friction grip bolts of the general grade specified in BS 3139-1³⁾. Both those standards are in imperial units.

The present standard is now issued, in metric terms, to cover the use of general grade bolts as specified in BS 4395-1⁴⁾. The technical content is substantially that of BS 3294-1²⁾.

The tightening methods specified in the standard both aim at a shank tension of at least the proof load. Tests and experience show that the excess over proof load obtained in practice is not detrimental. The design factors also are based on extensive experimental work. Variations in them are permissible, under the engineer's authority, where the structure, the materials or other considerations demand them.

The use of higher grade bolts will be covered by Part 2 (Parallel shank bolts) and Part 3 (Waisted shank bolts), which are in course of preparation.

The metric values are given in SI units, details of which are to be found in BS 3763⁵⁾ and PD 5686⁶⁾.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ In course of preparation.

²⁾ BS 3294, "The use of high strength friction grip bolts in structural steelwork", Part 1, "General grade bolts".

³⁾ BS 3139, "High strength friction grip bolts", Part 1, "General grade bolts".

⁴⁾ BS 4395, "High strength friction grip bolts", Metric series, Part 1, "General grade".

⁵⁾ BS 3763, "International system (SI) units".

⁶⁾ PD 5686, "The use of SI units".

1 General

1.1 Scope

This Part of this British Standard specifies requirements for the use of high strength friction grip bolts of the general grade, as specified in BS 4395-1⁷⁾, in friction grip connections in structural steelwork which complies with the requirements of BS 449-2⁸⁾. The standard also specifies requirements for the use of high strength bolts as ordinary bolts (see 1.3).

1.2 Definitions

For the purposes of this Part of this British Standard the following definitions apply:

1.2.1

high strength friction grip bolts

bolts of high tensile steel, used in conjunction with high strength nuts and hardened steel washers, which are tightened to a specified minimum shank tension so that transverse or axial loads or both can be transferred between the connected parts otherwise than by shear in, or bearing on, the bolts

1.2.2

grip

the total thickness of steel parts, excluding washers, to be held together

1.2.3

ply

a single thickness of steel forming part of a structural joint

1.2.4

length of bolt

the overall dimension from the underside of the bolt head to the extreme end of the shank, including any chamfer or radius

1.2.5

effective interface

a common contact surface between two load-transmitting plies, excluding any packing pieces, through which the bolt passes

1.2.6

slip factor

the ratio of the load, per effective interface, required to produce slip in a pure shear joint to the nominal shank tension (i.e. proof load) induced in the bolt or bolts

1.2.7

load factor

the numerical value by which the load which would cause slip in a joint is divided to give the permissible working load on the joint

1.2.8

the engineer

the person responsible for the design and satisfactory completion of the structure, as covered by this specification

1.3 Conditions of use

General grade bolts which are intended for use, within the definition of high strength friction grip bolts, in a particular application with a tightening procedure shall be used in accordance with the requirements of clauses 2 to 5.

⁷⁾ BS 4395, "High strength friction grip bolts", Metric series, Part 1, "General grade".

⁸⁾ BS 449, "The use of structural steel in building. Part 2, Metric units".