

SINGAPORE STANDARD

SS EN 1993-1-8 : 2010

EN 1993-1-8 : 2005, IDT

(ICS 91.010.30)

Eurocode 3 : Design of steel structures –

Part 1-8 : Design of joints

This national standard is the identical implementation of EN 1993-1-8 : 2005 and is adopted with permission of CEN, Rue de Stassart 36, B-1050 Brussels

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Building and Construction Authority
Integrated Resource & Services
Maritime Production Research Pte Ltd
National University of Singapore
TTJ Design and Engineering Pte Ltd
TYH Consulting Engineers
T.Y.Lin International Pte Ltd

National Foreword

This Singapore Standard was prepared by the Technical Committee on Building Structure and Sub-structure under the purview of the Building and Construction Standards Committee.

This SS EN is the identical implementation of EN 1993-1-8:2005 'Eurocode 3 : Design of steel structures – Part 1-8 : Design of joints (incorporating the CEN Corrigenda December 2005 and July 2009) and is adopted with permission of CEN, Rue de Stassart 36, B-1050 Brussels. The text altered by the CEN Corrigenda December 2005 and July 2009 is indicated by AC1> <AC1 and AC2> <AC2 respectively.

Attention is drawn to the following:

- The comma has been used throughout as a decimal marker whereas in Singapore Standards, it is a practice to use a full point on the baseline as the decimal marker.
- The Singapore Standards which implement international or European publications referred to in this document may be found in the SS Electronic Catalogue at:
<http://www.singaporestandardseshop.sg>.

The EN gives values with notes indicating where national choices may be made. Where a normative part of the EN allows for national choice to be made, the range and possible choice will be given in the normative text, and a note will qualify it as a Nationally Determined Parameter (NDP). NDPs can be a specific value for a factor, a specific level or class, a particular method or a particular application rule if several are proposed in the EN.

The requirements of this SS EN 1993-1-8 : 2010 are to be read in conjunction with the Singapore National Annex (NA) to SS EN 1993-1-8 : 2010 which contains information on the Singapore Nationally Determined Parameters and is published separately.

National choice is allowed in EN 1993-1-8 through the following clauses:

- 1.2.6(Group 6: Rivets)
- 2.2(2)
- 3.1.1(3)
- 3.4.2(1)
- 5.2.1(2)
- 6.2.7.2(9)

At the time of publication, this standard is expected to be used as a reference in the Building and Construction Authority's 'Approved Document – Acceptable Solutions'.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. SPRING Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards are subject to periodic review to keep abreast of technological changes and new technical developments. The changes in Singapore Standards are documented through the issue of either amendments or revisions.*
2. *Compliance with a Singapore Standard does not exempt users from legal obligations.*

English version

Eurocode 3: Design of steel structures - Part 1-8: Design of joints

Eurocode 3: Calcul des structures en acier - Partie 1-8:
Calcul des assemblages

Eurocode 3: Bemessung und Konstruktion von Stahlbauten
- Teil 1-8: Bemessung von Anschlüssen

This European Standard was approved by CEN on 16 April 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard EN 1993, Eurocode 3: Design of steel structures, has been prepared by Technical Committee CEN/TC250 « Structural Eurocodes », the Secretariat of which is held by BSI. CEN/TC250 is responsible for all Structural Eurocodes.

This European Standard shall be given the status of a National Standard, either by publication of an identical text or by endorsement, at the latest by November 2005, and conflicting National Standards shall be withdrawn at latest by March 2010.

This Eurocode supersedes ENV 1993-1-1.

According to the CEN-CENELEC Internal Regulations, the National Standard Organizations of the following countries are bound to implement these European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Background to the Eurocode programme

In 1975, the Commission of the European Community decided on an action programme in the field of construction, based on article 95 of the Treaty. The objective of the programme was the elimination of technical obstacles to trade and the harmonization of technical specifications.

Within this action programme, the Commission took the initiative to establish a set of harmonized technical rules for the design of construction works which, in a first stage, would serve as an alternative to the national rules in force in the Member States and, ultimately, would replace them.

For fifteen years, the Commission, with the help of a Steering Committee with Representatives of Member States, conducted the development of the Eurocodes programme, which led to the first generation of European codes in the 1980s.

In 1989, the Commission and the Member States of the EU and EFTA decided, on the basis of an agreement¹ between the Commission and CEN, to transfer the preparation and the publication of the Eurocodes to CEN through a series of Mandates, in order to provide them with a future status of European Standard (EN). This links *de facto* the Eurocodes with the provisions of all the Council's Directives and/or Commission's Decisions dealing with European standards (*e.g.* the Council Directive 89/106/EEC on construction products - CPD - and Council Directives 93/37/EEC, 92/50/EEC and 89/440/EEC on public works and services and equivalent EFTA Directives initiated in pursuit of setting up the internal market).

The Structural Eurocode programme comprises the following standards generally consisting of a number of Parts:

EN 1990	Eurocode 0:	Basis of Structural Design
EN 1991	Eurocode 1:	Actions on structures
EN 1992	Eurocode 2:	Design of concrete structures
EN 1993	Eurocode 3:	Design of steel structures
EN 1994	Eurocode 4:	Design of composite steel and concrete structures
EN 1995	Eurocode 5:	Design of timber structures
EN 1996	Eurocode 6:	Design of masonry structures
EN 1997	Eurocode 7:	Geotechnical design
EN 1998	Eurocode 8:	Design of structures for earthquake resistance
EN 1999	Eurocode 9:	Design of aluminium structures

¹ Agreement between the Commission of the European Communities and the European Committee for Standardisation (CEN) concerning the work on EUROCODES for the design of building and civil engineering works (BC/CEN/03/89).

EN 1993-1-8:2005 (E)

Eurocode standards recognize the responsibility of regulatory authorities in each Member State and have safeguarded their right to determine values related to regulatory safety matters at national level where these continue to vary from State to State.

Status and field of application of eurocodes

The Member States of the EU and EFTA recognize that Eurocodes serve as reference documents for the following purposes :

- as a means to prove compliance of building and civil engineering works with the essential requirements of Council Directive 89/106/EEC, particularly Essential Requirement N°1 – Mechanical resistance and stability – and Essential Requirement N°2 – Safety in case of fire;
- as a basis for specifying contracts for construction works and related engineering services;
- as a framework for drawing up harmonized technical specifications for construction products (ENs and ETAs)

The Eurocodes, as far as they concern the construction works themselves, have a direct relationship with the Interpretative Documents² referred to in Article 12 of the CPD, although they are of a different nature from harmonized product standards³. Therefore, technical aspects arising from the Eurocodes work need to be adequately considered by CEN Technical Committees and/or EOTA Working Groups working on product standards with a view to achieving full compatibility of these technical specifications with the Eurocodes.

The Eurocode standards provide common structural design rules for everyday use for the design of whole structures and component products of both a traditional and an innovative nature. Unusual forms of construction or design conditions are not specifically covered and additional expert consideration will be required by the designer in such cases.

National Standards implementing Eurocodes

The National Standards implementing Eurocodes will comprise the full text of the Eurocode (including any annexes), as published by CEN, which may be preceded by a National title page and National foreword, and may be followed by a National annex.

The National annex may only contain information on those parameters which are left open in the Eurocode for national choice, known as Nationally Determined Parameters, to be used for the design of buildings and civil engineering works to be constructed in the country concerned, *i.e.* :

- values and/or classes where alternatives are given in the Eurocode,
- values to be used where a symbol only is given in the Eurocode,
- country specific data (geographical, climatic, etc.), *e.g.* snow map,
- the procedure to be used where alternative procedures are given in the Eurocode.

It may contain

- decisions on the application of informative annexes,
- references to non-contradictory complementary information to assist the user to apply the Eurocode.

Links between Eurocodes and harmonized technical specifications (ENs and ETAs) for products

² According to Art. 3.3 of the CPD, the essential requirements (ERs) shall be given concrete form in interpretative documents for the creation of the necessary links between the essential requirements and the mandates for harmonized ENs and ETAGs/ETAs.

³ According to Art. 12 of the CPD the interpretative documents shall :

- a) give concrete form to the essential requirements by harmonizing the terminology and the technical bases and indicating classes or levels for each requirement where necessary ;
- b) indicate methods of correlating these classes or levels of requirement with the technical specifications, *e.g.* methods of calculation and of proof, technical rules for project design, etc. ;
- c) serve as a reference for the establishment of harmonized standards and guidelines for European technical approvals.

The Eurocodes, *de facto*, play a similar role in the field of the ER 1 and a part of ER 2.

There is a need for consistency between the harmonized technical specifications for construction products and the technical rules for works⁴. Furthermore, all the information accompanying the CE Marking of the construction products which refer to Eurocodes should clearly mention which Nationally Determined Parameters have been taken into account.

National annex for EN 1993-1-8

This standard gives alternative procedures, values and recommendations with notes indicating where national choices may have to be made. The National Standard implementing EN 1993-1-8 should have a National Annex containing all Nationally Determined Parameters for the design of steel structures to be constructed in the relevant country.

National choice is allowed in EN 1993-1-8 through:

- 2.2(2)
- 1.2.6 (Group 6: Rivets)
- 3.1.1(3)
- 3.4.2(1)
- 5.2.1(2)
- 6.2.7.2(9)

⁴ see Art.3.3 and Art.12 of the CPD, as well as clauses 4.2, 4.3.1, 4.3.2 and 5.2 of ID 1.

1 Introduction

1.1 Scope

- (1) This part of EN 1993 gives design methods for the design of joints subject to predominantly static loading using steel grades S235, S275, ~~AC2~~S355, S420, S450 and S460 ~~AC2~~.

1.2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard, only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

1.2.1 Reference Standards, Group 1: Weldable structural steels

EN 10025-1:2004	Hot rolled products of structural steels. General technical delivery conditions
EN 10025-2:2004	Hot rolled products of structural steels. Technical delivery conditions for non-alloy structural steels
EN 10025-3:2004	Hot rolled products of structural steels. Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels
EN 10025-4:2004	Hot rolled products of structural steels. Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels
EN 10025-5:2004	Hot rolled products of structural steels. Technical delivery conditions for structural steels with improved atmospheric corrosion resistance
EN 10025-6:2004	Hot rolled products of structural steels. Technical delivery conditions for flat products of high yield strength structural steels in quenched and tempered condition

1.2.2 Reference Standards, Group 2: Tolerances, dimensions and technical delivery conditions

EN 10029:1991	Hot rolled steel plates 3 mm thick or above - Tolerances on dimensions, shape and mass
EN 10034:1993	Structural steel I- and H-sections - Tolerances on shape and dimensions
EN 10051:1991	Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels - Tolerances on dimensions and shape
EN 10055:1995	Hot rolled steel equal flange tees with radiused root and toes - Dimensions and tolerances on shape and dimensions
EN 10056-1:1995	Structural steel equal and unequal leg angles - Part 1: Dimensions
EN 10056-2:1993	Structural steel equal and unequal leg angles - Part 2: Tolerances on shape and dimensions
EN 10164:1993	Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions

1.2.3 Reference Standards, Group 3: Structural hollow sections

EN 10219-1:1997	Cold formed welded structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery requirements
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