

**SS EN 1993-1-7:2011(2023)**  
**EN 1993-1-7:2007, IDT**  
(ICS 91.010.30; 91.080.10)

**SINGAPORE STANDARD**

**Eurocode 3 : Design of steel structures**

– Part 1-7 : Plated structures subject to out of plane loading

This national standard is the identical implementation of EN 1993-1-7 : 2007 and is adopted with permission of CEN, Rue de la Science 23 B - 1040 Brussels

Confirmed 2023

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## **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 1993-1-7 : 2007 'Eurocode 3 : Design of steel structures – Part 1-7 : Plated structures subject to out of plane loading' (incorporating the CEN Corrigendum April 2009, denoted in the text by AC> <AC) and is adopted with permission of CEN, Rue de la Science 23 B - 1040 Brussels.

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: <https://www.singaporestandardseshop.sg>

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 as Recommended Values, 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.

### **Singapore National Annex to SS EN 1993-1-7**

To enable EN 1993-1-7 to be used in Singapore, the TC has decided that no National Annex will be issued and recommend the following:

- All the Recommended Values should be used;
- All Informative Annexes may be used; and
- No NCCI have currently been identified.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

#### **NOTE**

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as "mature standards". Mature standards will not be subject to further review unless there are requests to review such standards.*
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3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

English Version

**Eurocode 3 - Design of steel structures - Part 1-7: Plated  
structures subject to out of plane loading**

Eurocode 3 - Calcul des structures en acier - Partie 1-7:  
Résistance et stabilité des structures en plaques planes  
chargées hors de leur plan

Eurocode 3 - Bemessung und Konstruktion von  
Stahlbauten - Teil 1-7: Plattenförmige Bauteile mit  
Querbelastrung

This European Standard was approved by CEN on 12 June 2006.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

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



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<b>Content</b>	<b>Page</b>
<b>Foreword</b> .....	<b>3</b>
<b>1 General</b> .....	<b>4</b>
1.1 Scope .....	4
1.2 Normative references.....	4
1.3 Terms and definitions .....	5
1.4 Symbols .....	6
<b>2 Basis of design</b> .....	<b>9</b>
2.1 Requirements .....	9
2.2 Principles of limit state design.....	9
2.3 Actions.....	9
2.4 Design assisted by testing.....	10
<b>3 Material properties</b> .....	<b>10</b>
<b>4 Durability</b> .....	<b>10</b>
<b>5 Structural analysis</b> .....	<b>10</b>
5.1 General .....	10
5.2 Stress resultants in the plate.....	10
<b>6 Ultimate limit state</b> .....	<b>15</b>
6.1 General .....	15
6.2 Plastic limit .....	15
6.3 Cyclic plasticity .....	16
6.4 Buckling resistance.....	17
<b>7 Fatigue</b> .....	<b>18</b>
<b>8 Serviceability limit state</b> .....	<b>18</b>
8.1 General .....	18
8.2 Out of plane deflection .....	18
8.3 Excessive vibrations .....	18
<b>Annex A [informative] – Types of analysis for the design of plated structures</b> .....	<b>19</b>
A.1 General .....	19
A.2 Linear elastic plate analysis (LA).....	19
A.3 Geometrically nonlinear analysis (GNA) .....	19
A.4 Materially nonlinear analysis (MNA).....	20
A.5 Geometrically and materially nonlinear analysis (GMNA).....	20
A.6 Geometrically nonlinear analysis elastic with imperfections included (GNIA).....	20
A.7 Geometrically and materially nonlinear analysis with imperfections included (GMNIA).....	20
<b>Annex B [informative] – Internal stresses of unstiffened rectangular plates from small deflection theory</b> .....	<b>21</b>
B.1 General .....	21
B.2 Symbols .....	21
B.3 Uniformly distributed loading .....	21
B.4 Central patch loading.....	24
<b>Annex C [informative] – Internal stresses of unstiffened rectangular plates from large deflection theory</b> .....	<b>26</b>
C.1 General .....	26
C.2 Symbols .....	26
C.3 Uniformly distributed loading on the total surface of the place .....	26
C.4 Central patch loading.....	32

## Foreword

### Foreword

This European Standard EN 1993-1-7, Eurocode 3: Design of steel structures: Part 1-7 Plated structures subject to out of plane loading, 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 October 2007, and conflicting National Standards shall be withdrawn at latest by March 2010.

This Eurocode supersedes ENV 1993-1-7.

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

### National annex for EN 1993-1-7

This standard gives alternative procedures, values and recommendations with notes indicating where national choices may have to be made. The National Standard implementing EN 1993-1-7 should have a National Annex containing all Nationally Determined Parameters to be used for the design of steel structures to be constructed in the relevant country.

National choice is allowed in EN 1993-1-7 through:

- 6.3.2(4)

# 1 General

## 1.1 Scope

(1)P EN 1993-1-7 provides basic design rules for the structural design of unstiffened and stiffened plates which form part of plated structures such as silos, tanks or containers, that are loaded by out of plane actions. It is intended to be used in conjunction with EN 1993-1-1 and the relevant application standards.

(2) This document defines the design values of the resistances: the partial factor for resistances may be taken from National Annexes of the relevant application standards. Recommended values are given in the relevant application standards.

(3) This Standard is concerned with the requirements for design against the ultimate limit state of:

- plastic collapse;
- cyclic plasticity;
- buckling;
- fatigue.

(4) Overall equilibrium of the structure (sliding, uplifting, overturning) is not included in this Standard, but is treated in EN 1993-1-1. Special considerations for specific applications may be found in the relevant applications parts of EN 1993.

(5) The rules in this Standard refer to plate segments in plated structures which may be stiffened or unstiffened. These plate segments may be individual plates or parts of a plated structure. They are loaded by out of plane actions.

(6) For the verification of unstiffened and stiffened plated structures loaded only by in-plane effects see EN 1993-1-5. In EN 1993-1-7 rules for the interaction between the effects of inplane and out of plane loading are given.

(7) For the design rules for cold formed members and sheeting see EN 1993-1-3.

(8) The temperature range within which the rules of this Standard are allowed to be applied are defined in the relevant application parts of EN 1993.

(9) The rules in this Standard refer to structures constructed in compliance with the execution specification of EN 1090-2.

(10) Wind loading and bulk solids flow should be treated as quasi-static actions. For fatigue, the dynamic effects must be taken into account according to EN 1993-1-9. The stress resultants arising from the dynamic behaviour are treated in this part as quasi-static.

## 1.2 Normative references

(1) 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.

EN 1993	Eurocode 3: Design of steel structures:
	Part 1.1: General rules and rules for buildings
	Part 1.3: Cold-formed members and sheeting
	Part 1.4: Stainless steels
	Part 1.5: Plated structural elements