

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

**Eurokoodeks 3: Teraskonstruktsioonide projekteerimine
Osa 1-7: Põikkoormusega plaatkonstruktsioonide
projekteerimine**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard
EVS-EN 1993-1-7:2007+NA:2010 sisaldab Euroopa
standardi EN 1993-1-7:2007 identset ingliskeelset
teksti ning rahvuslikku lisa NA:2010.

Standard on kinnitatud Eesti Standardikeskuse
15.01.2010 käskkirjaga nr 5 ja on jõustunud
sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt
rahvuslikele liikmetele Euroopa standardi teksti
kättesaadavaks tegemise kuupäev on 18.04.2007.

Standard on kättesaadav Eesti Standardikeskusest.

This Estonian Standard
EVS-EN 1993-1-7:2007+NA:2010 consists of the
identical English text of the European Standard
EN 1993-1-7:2007 and the Estonian National Annex
NA:2010.

This standard is ratified with an order of the Estonian
Centre for Standardisation dated 15.01.2010 and has
been endorsed with a notification published in the
official bulletin of the Estonian centre for
Standardisation.

Date of Availability of the European Standard is
18.04.2007.

This standard is available from the Estonian Centre
for Standardisation.

ICS 91.010.30, 91.080.10

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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
Querbelaugung

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

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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of an identical text or by endorsement, at the latest by October 2007, and conflicting National Standards shall be withdrawn at latest by March 2010.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) 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

Part 1.6:	Strength and stability of shell structures
Part 1.8:	Design of joints
Part 1.9:	Fatigue strength of steel structures
Part 1.10:	Selection of steel for fracture toughness and through-thickness properties
Part 1.12:	Additional rules for the extension of EN 1993 up to steel grades S700
Part 4.1:	Silos
Part 4.2:	Tanks

1.3 Terms and definitions

- (1) The rules in EN 1990, clause 1.5 apply.
- (2) The following terms and definitions are supplementary to those used in EN 1993-1-1:

1.3.1 Structural forms and geometry

1.3.1.1 Plated structure

A structure that is built up from nominally flat plates which are joined together. The plates may be stiffened or unstiffened, see Figure 1.1.

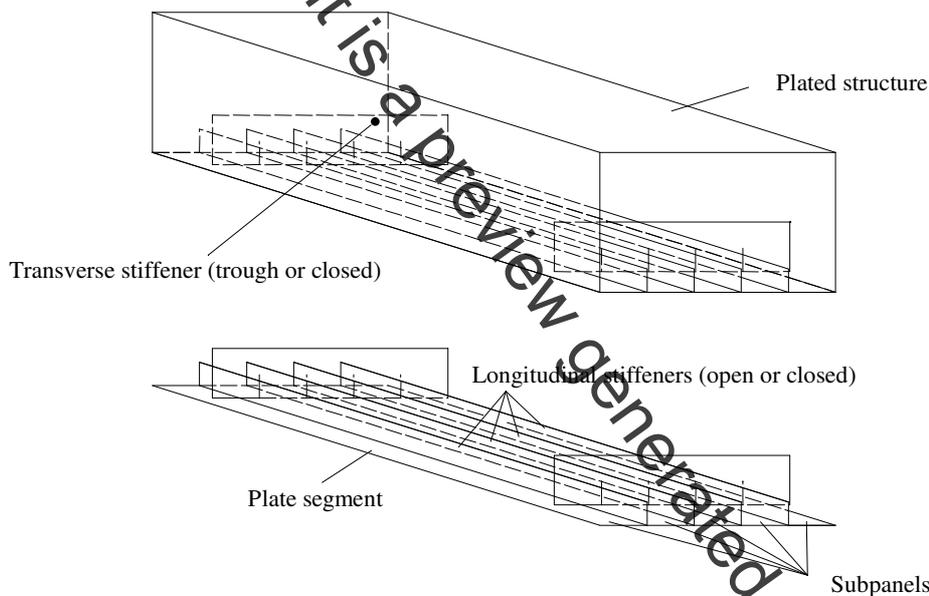


Figure 1.1: Components of a plated structure

1.3.1.2 Plate segment

A plate segment is a flat plate which may be unstiffened or stiffened. A plate segment should be regarded as an individual part of a plated structure.

1.3.1.3 Stiffener

A plate or a section attached to the plate with the purpose of preventing buckling of the plate or reinforcing it against local loads. A stiffener is denoted:

- longitudinal if its longitudinal direction is in the main direction of load transfer of the member of which it forms a part.
- transverse if its longitudinal direction is perpendicular to the main direction of load transfer of the member of which it forms a part.