

**Eurocode 3: Design of steel structures
Part 1-5: Plated structural elements**

**Eurokoodeks 3: Teraskonstruktsioonide projekteerimine
Osa 1-5: Tasapinnalised konstruktsioonielemendid**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard
EVS-EN 1993-1-5:2006+NA:2008 sisaldab Euroopa
standardi EN 1993-1-5:2006 identset ingliskeelset
teksti ning rahvuslikku lisa NA:2008.

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NA:2008.

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English Version

Eurocode 3 - Design of steel structures - Part 1-5: Plated
structural elements

Eurocode 3 - Calcul des structures en acier - Partie 1-5:
Plaques planes

Eurocode 3 - Bemessung und konstruktion von Stahlbauten
- Teil 1-5: Plattenbeulen

This European Standard was approved by CEN on 13 January 2006.

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Foreword

This European Standard EN 1993-1-5, Eurocode 3: Design of steel structures Part 1.5: Plated structural elements, 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of an identical text or by endorsement, at the latest by April 2007 and conflicting National Standards shall be withdrawn at latest by March 2010.

This Eurocode supersedes ENV 1993-1-5.

According to the CEN-CENELEC Internal Regulations, the National Standard Organizations of the following countries are bound to implement this 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

National annex for EN 1993-1-5

This standard gives alternative procedures, values and recommendations with notes indicating where national choices may have to be made. The National Standard implementing EN 1993-1-5 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 1993-1-5 through:

- 2.2(5)
- 3.3(1)
- 4.3(6)
- 5.1(2)
- 6.4(2)
- 8(2)
- 9.1(1)
- 9.2.1(9)
- 10(1)
- 10(5)
- C.2(1)
- C.5(2)
- C.8(1)
- C.9(3)
- D.2.2(2)

1 Introduction

1.1 Scope

- (1) EN 1993-1-5 gives design requirements of stiffened and unstiffened plates which are subject to in-plane forces.
- (2) Effects due to shear lag, in-plane load introduction and plate buckling for I-section girders and box girders are covered. Also covered are plated structural components subject to in-plane loads as in tanks and silos. The effects of out-of-plane loading are outside the scope of this document.

NOTE 1: The rules in this part complement the rules for class 1, 2, 3 and 4 sections, see EN 1993-1-1.

NOTE 2: For the design of slender plates which are subject to repeated direct stress and/or shear and also fatigue due to out-of-plane bending of plate elements (breathing) see EN 1993-2 and EN 1993-6.

NOTE 3: For the effects of out-of-plane loading and for the combination of in-plane effects and out-of-plane loading effects see EN 1993-2 and EN 1993-1-7.

NOTE 4: Single plate elements may be considered as flat where the curvature radius r satisfies:

$$r \geq \frac{a^2}{t} \quad (1.1)$$

where a is the panel width
 t is the plate thickness

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 1993-1-1 *Eurocode 3 :Design of steel structures: Part 1-1: General rules and rules for buildings*

1.3 Terms and definitions

For the purpose of this standard, the following terms and definitions apply.

1.3.1

elastic critical stress

stress in a component at which the component becomes unstable when using small deflection elastic theory of a perfect structure

1.3.2

membrane stress

stress at mid-plane of the plate

1.3.3

gross cross-section

the total cross-sectional area of a member but excluding discontinuous longitudinal stiffeners

1.3.4

effective cross-section and effective width

the gross cross-section or width reduced for the effects of plate buckling or shear lag or both; to distinguish between their effects the word “effective” is clarified as follows:

“effective^P” denotes effects of plate buckling