

Eurocode 3 – Stålkonstruktioner – Del 1-7: Styrke og stabilitet af pladekonstruktioner med tvær- belastning

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

DANSK STANDARD
Danish Standards

Kollegievej 6
DK-2920 Charlottenlund
Tel: +45 39 96 61 01
Fax: +45 39 96 61 02
dansk.standard@ds.dk
www.ds.dk

DS/EN 1993-1-7

København

DS projekt: M215350

ICS: 91.080.10

Første del af denne publikations betegnelse er:

DS/EN, hvilket betyder, at det er en europæisk standard, der har status som dansk standard.

Denne publikations overensstemmelse er:

IDT med: EN 1993-1-7:2007.

DS-publikationen er på engelsk.

Denne publikation erstatter: DS/ENV 1993-1-7:1999 .

DS-publikationstyper

Dansk Standard udgiver forskellige publikationstyper.

Typen på denne publikation fremgår af forsiden.

Der kan være tale om:

Dansk standard

- standard, der er udarbejdet på nationalt niveau, eller som er baseret på et andet lands nationale standard, eller
- standard, der er udarbejdet på internationalt og/eller europæisk niveau, og som har fået status som dansk standard

DS-information

- publikation, der er udarbejdet på nationalt niveau, og som ikke har opnået status som standard, eller
- publikation, der er udarbejdet på internationalt og/eller europæisk niveau, og som ikke har fået status som standard, fx en teknisk rapport, eller
- europæisk præstandard

DS-håndbog

- samling af standarder, eventuelt suppleret med informativt materiale

DS-hæfte

- publikation med informativt materiale

Til disse publikationstyper kan endvidere udgives

- tillæg og rettelsesblade

DS-publikationsform

Publikationstyperne udgives i forskellig form som henholdsvis

- fuldtekstpublikation (publikationen er trykt i sin helhed)
- godkendelsesblad (publikationen leveres i kopi med et trykt DS-omslag)
- elektronisk (publikationen leveres på et elektronisk medie)

DS-betegnelse

Alle DS-publikationers betegnelse begynder med DS efterfulgt af et eller flere præfikser og et nr., fx **DS 383**, **DS/EN 5414** osv. Hvis der efter nr. er angivet et **A** eller **Cor**, betyder det, enten at det er et **tillæg** eller et **rettelsesblad** til hovedstandard, eller at det er indført i hovedstandard.

DS-betegnelse angives på forsiden.

Overensstemmelse med anden publikation:

Overensstemmelse kan enten være IDT, EQV, NEQ eller MOD

- **IDT:** Når publikationen er identisk med en given publikation.
- **EQV:** Når publikationen teknisk er i overensstemmelse med en given publikation, men præsentationen er ændret.
- **NEQ:** Når publikationen teknisk eller præsentationsmæssigt ikke er i overensstemmelse med en given standard, men udarbejdet på baggrund af denne.
- **MOD:** Når publikationen er modificeret i forhold til en given publikation.

EUROPEAN STANDARD

EN 1993-1-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2007

ICS 91.010.30; 91.080.10

Supersedes ENV 1993-1-7:1999

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.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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