December 2010

DIN EN 1993-1-3

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ICS 91.010.30; 91.080.10

Supersedes: see below

Eurocode 3: Design of steel structures – Part 1-3: General rules – Supplementary rules for cold-formed members and sheeting (includes Corrigendum AC:2009) English translation of DIN EN 1993-1-3:2010-12

Eurocode 3: Bemessung und Konstruktion von Stahlbauten –
Teil 1-3: Allgemeine Regeln –
Ergänzende Regeln für kaltgeformte Bauteile und Bleche
(enthält Berichtigung AC:2009)
Englische Übersetzung von DIN EN 1993-1-3:2010-12

Eurocode 3: Calcul des structures en acier –
Partie 1-3: Règles générales –
Règles supplémentaires pour les profilés et plaques formés à froid
(Corrigendum AC:2009 inclus)
Traduction anglaise de DIN EN 1993-1-3:2010-12

Supersedes DIN EN 1993-1-3:2007-02;
together with DIN EN 1993-1-1:2010-12, DIN EN 1993-1-1/NA:2010-12, DIN EN 1993-1-3/NA:2010-12, DIN EN 1993-1-5:2010-12, DIN EN 1993-1-5/NA:2010-12, DIN EN 1993-1-8:2010-12, DIN EN 1993-1-8/NA:2010-12, DIN EN 1993-1-9:2010-12, DIN EN 1993-1-9/NA:2010-12, DIN EN 1993-1-10:2010-12, DIN EN 1993-1-10/NA:2010-12, DIN EN 1993-1-11:2010-12 and DIN EN 1993-1-11/NA:2010-12 supersedes DIN 18800-1:2008-11;
together with DIN EN 1993-1-1:2010-12, DIN EN 1993-1-1/NA:2010-12, DIN EN 1993-1-3/NA:2010-12, DIN EN 1993-1-5:2010-12 and DIN EN 1993-1-5/NA:2010-12 supersedes DIN 18800-2:2008-11;
together with DIN EN 1993-1-3/NA:2010-12, DIN EN 1993-1-5:2010-12 and DIN EN 1993-1-5/NA:2010-12 supersedes DIN 18800-3:2008-11;
supersedes DIN EN 1993-1-3 Corrigendum 1:2009-11;
partially supersedes DIN 18807-1:1987-06, DIN 18807-1/A1:2001-05, DIN 18807-2:1987-06 and DIN 18807-2/A1:2001-05

Document comprises 134 pages

Translation by DIN-Sprachendienst.
In case of doubt, the German-language original shall be considered authoritative.

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A comma is used as the decimal marker.

National foreword

This standard has been prepared by Technical Committee CEN/TC 250 “Structural Eurocodes” (Secretariat: BSI, United Kingdom).

The responsible German body involved in its preparation was the *Normenausschuss Bauwesen* (Building and Civil Engineering Standards Committee), Working Committee NA 005-08-16 AA *Tragwerksbemessung (Sp CEN/TC 250/SC 3).*

EN 1993-1-3 was approved by CEN on 16 January 2006.

This European Standard is part of a series of standards dealing with structural design (Eurocodes) which are intended to be used as a “package”. In Guidance Paper L on the application and use of Eurocodes, issued by the EU Commission, reference is made to transitional periods for the introduction of the Eurocodes in the Member states. The transitional periods are given in the Foreword of this standard.

In Germany, this standard is to be applied in conjunction with the National Annex.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. DIN [and/or DKE] shall not be held responsible for identifying any or all such patent rights.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌AC〉 〈AC▐.

Amendments

This standard differs from DIN V ENV 1993-1-3:2002-05 as follows:

a) the comments received from the national member bodies of CEN have been taken into account and the standard has been completely revised;

b) the prestandard status has been changed to that of a full standard.

Compared with DIN EN 1993-1-3:2007-02, DIN EN 1993-1-3 Corrigendum 1:2009-11, DIN 18800-1:2008-11, DIN 18800-2:2008-11, DIN 18800-3:2008-11, DIN 18807-1:1987-06, DIN 18807-1/A1:2001-05, DIN 18807-2:1987-06 and DIN 18807-2/A1:2001-05, the following corrections have been made:

a) the standard has been based on European design rules;

b) superseding notes have been corrected;

c) this standard is the consolidated version of the previous 2006 edition with Corrigendum AC:2009;

d) the title of the standard has been corrected;

e) the standard has been editorially revised.

Previous editions

DIN 1050: 1934-08, 1937-07, 1946-10, 1957-12, 1968-06
DIN 1073: 1928-04, 1931-09, 1941-01, 1974-07
DIN 4100: 1931-05, 1933-07, 1934-08, 1956-12, 1968-12
DIN 4101: 1937-07, 1974-07
DIN 4114-1: 1952-07
DIN 4114-2: 1953-02
DIN 18800-1: 1981-03, 2008-11
DIN 18800-1/A1: 1996-02
DIN 18800-2: 1990-11, 2008-11
DIN 18800-2/A1: 1996-02
DIN 18800-3: 1990-11, 2008-11
DIN 18800-3/A1: 1996-02
DIN 18807-1: 1987-06
DIN 18807-1/A1: 2001-05
DIN 18807-2: 1987-06
DIN 18807-2/A1: 2001-05
DIN V ENV 1993-1-3: 2002-05
DIN EN 1993-1-3: 2007-02
DIN EN 1993-1-3 Corrigendum 1: 2009-11

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1993-1-3

October 2006

+ AC

May 2009

ICS 91.010.30; 91.080.10

Supersedes ENV 1993-1-3:1996

English version

Eurocode 3: Design of steel structures — Part 1-3: General rules — Supplementary rules for cold-formed members and sheeting

Eurocode 3: Calcul des structures en acier — Partie 1-3: Règles générales — Règles supplémentaires pour les profilés et plaques formés à froid

Eurocode 3: Bemessung und Konstruktion von Stahlbauten — Teil 1-3: Allgemeine Regeln — Ergänzende Regeln für kaltgeformte Bauteile und Bleche

EN 1993-1-3:2006 was approved by CEN on 2006-01-16 and Amendment AC:2009 on 2009-05-13.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 1993-1-3:2006 + AC:2009 E

Contents

Foreword

This document (EN 1993-1-3:2006 + AC:2009) has been prepared by Technical Committee CEN/TC 250 "Structural Eurocodes", the secretariat of which is held by BSI.

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 the latest by March 2010.

This document supersedes ENV 1993-1-3:1996.

According to the CEN-CENELEC Internal Regulations, the National Standard Organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech 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 1993-1-3

This standard gives alternative procedures, values and recommendations for classes with notes indicating where national choices may have to be made. Therefore the National Standard implementing EN 1993-1-3 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 1993-1-3 through clauses:

- 2(3)P
- 2(5)
- 3.1(3) Note 1 and Note 2
- 3.2.4(1)
- 5.3(4)
- 8.3(5)
- 8.3(13), Table 8.1
- 8.3(13), Table 8.2
- 8.3(13), Table 8.3
- 8.3(13), Table 8.4
- 8.4(5)
- 8.5.1(4)
- 9(2)
- 10.1.1(1)
- 10.1.4.2(1)
- A.1(1), NOTE 2
- A.1(1), NOTE 3
- A.6.4(4)
- E(1)

1 Introduction

1.1 Scope

(1) EN 1993-1-3 gives design requirements for cold-formed [AC] *Deleted text* [AC] members and sheeting. It applies to cold-formed steel products made from coated or uncoated [AC] *Deleted text* [AC] hot or cold rolled sheet or strip, that have been cold-formed by such processes as cold-rolled forming or press-braking. It may also be used for the design of profiled steel sheeting for composite steel and concrete slabs at the construction stage, see EN 1994. The execution of steel structures made of cold-formed [AC] *Deleted text* [AC] members and sheeting is covered in EN 1090.

NOTE: The rules in this part complement the rules in other parts of EN 1993-1.

(2) Methods are also given for stressed-skin design using steel sheeting as a structural diaphragm.

(3) This part does not apply to cold-formed circular and rectangular structural hollow sections supplied to EN 10219, for which reference should be made to EN 1993-1-1 and EN 1993-1-8.

(4) EN 1993-1-3 gives methods for design by calculation and for design assisted by testing. The methods for design by calculation apply only within stated ranges of material properties and geometrical proportions for which sufficient experience and test evidence is available. These limitations do not apply to design assisted by testing.

(5) EN 1993-1-3 does not cover load arrangement for testing for loads during execution and maintenance.

(6) The calculation rules given in this standard are only valid if the tolerances of the cold formed members comply with EN 1090-2

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this European Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

However, parties to agreements based on this European Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

EN 1993 *Eurocode 3 – Design of steel structures*
Part 1-1 to part 1-12

EN 10002 *Metallic materials - Tensile testing:*
Part 1: *Method of test (at ambient temperature)*;

EN 10025-1 *Hot-rolled products of structural steels - Part 1: General delivery conditions;*

EN 10025-2 *Hot-rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels;*

EN 10025-3 *Hot-rolled products of structural steels - Part 3: Technical delivery conditions for normalized / normalized rolled weldable fine grain structural steels;*

EN 10025-4 *Hot-rolled products of structural steels - Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels;*

EN 10025-5 *Hot-rolled products of structural steels - Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance;*

EN 10143 *Continuously hot-dip metal coated steel sheet and strip - Tolerances on dimensions and shape*;

EN 10149 *Hot rolled flat products made of high yield strength steels for cold-forming:*
Part 2: *Delivery conditions for normalized/normalized rolled steels*;
Part 3: *Delivery conditions for thermomechanical rolled steels*;

EN 10204 *Metallic products. Types of inspection documents (includes amendment A 1:1995);*

EN 10268 *Cold-rolled flat products made of high yield strength micro-alloyed steels for cold forming - General delivery conditions;*

EN 10292 *Continuously hot-dip coated strip and sheet of steels with higher yield strength for cold forming - Technical delivery conditions;*

EN 10326 *Continuously hot-dip coated strip and sheet of structural steels - Technical delivery conditions;*

EN 10327 *Continuously hot-dip coated strip and sheet of low carbon steels for cold forming - Technical delivery conditions;*

EN-ISO 12944-2 *Paints and vanishes. Corrosion protection of steel structures by protective paint systems. Part 2: Classification of environments (ISO 12944-2:1998);*

EN 1090-2 *Execution of steel structures and aluminium structures Part 2: Technical requirements for steel structures:*

EN 1994 *Eurocode 4: Design of composite steel and concrete structures;*

EN ISO 1478 *Tapping screws thread;*

EN ISO 1479 *Hexagon head tapping screws;*

EN ISO 2702 *Heat-treated steel tapping screws - Mechanical properties;*

EN ISO 7049 *Cross recessed pan head tapping screws;*

EN ISO 10684 *Fasteners – hot deep galvanized coatings*

ISO 4997 *Cold reduced steel sheet of structural quality*;

EN 508-1 *Roofing products from metal sheet - Specification for self-supporting products of steel, aluminium or stainless steel sheet - Part 1: Steel;*

FEM 10.2.02 *Federation Europeenne de la manutention, Secion X, Equipment et proceedes de stockage, FEM 10.2.02, The design of static steel pallet racking, Racking design code, April 2001 Version 1.02.*

1.3 Terms and definitions

Supplementary to EN 1993-1-1, for the purposes of this Part 1-3 of EN 1993, the following terms and definitions apply:

1.3.1
basic material
The flat sheet steel material out of which cold-formed sections and profiled sheets are made by cold-forming.

1.3.2
basic yield strength
The tensile yield strength of the basic material.

1.3.3
diaphragm action
Structural behaviour involving in-plane shear in the sheeting.

1.3.4
liner tray
Profiled sheet with large lipped edge stiffeners, suitable for interlocking with adjacent liner trays to form a plane of ribbed sheeting that is capable of supporting a parallel plane of profiled sheeting spanning perpendicular to the span of the liner trays.

1.3.5
partial restraint
Restriction of the lateral or rotational movement, or the torsional or warping deformation, of a member or element, that increases its buckling resistance in a similar way to a spring support, but to a lesser extent than a rigid support.