

Eurocode 3 — Design of steel structures —

**Part 1-11: Design of structures with
tension components**

ICS 91.010.30; 91.080.10; 93.040

NO COPYING

This is a preview. Click here to purchase the full publication.



British Standards

National foreword

This British Standard is the UK implementation of EN 1993-1-11:2006, incorporating corrigendum April 2009.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN corrigendum. For example, text altered by April 2009 corrigendum is indicated by **[AC1]** **[AC1]**.

The structural Eurocodes are divided into packages by grouping Eurocodes for each of the main materials: concrete, steel, composite concrete and steel, timber, masonry and aluminium; this is to enable a common date of withdrawal (DOW) for all the relevant parts that are needed for a particular design. The conflicting national standards will be withdrawn at the end of the co-existence period, after all the EN Eurocodes of a package are available.

Following publication of the EN, there is a period allowed for national calibration during which the National Annex is issued, followed by a co-existence period of a maximum three years. During the co-existence period Member States are encouraged to adapt their national provisions. At the end of this co-existence period, the conflicting parts of national standard(s) will be withdrawn.

In the UK there are no conflicting national standards.

The UK participation in its preparation was entrusted by Technical Committee B/525, *Building and civil engineering structures*, to Subcommittee B/525/31, *Structural use of steel*.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Where a normative part of this EN allows for a choice to be made at the national level, 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.

To enable EN 1993-1-11 to be used in the UK, the NDPs have been published in a National Annex, which has been issued separately by BSI.

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

Compliance with a British Standard cannot confer immunity from legal obligations.

Amendments/corrigenda issued since publication

Date	Comments
28 February 2010	Implementation of CEN corrigendum April 2009

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2006

© BSI 2010

ISBN 978 0 580 66402 1

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1993-1-11

October 2006

ICS 91.010.30; 91.080.10; 93.040

Supersedes ENV 1993-2:1997
Incorporating corrigendum April 2009

English Version

Eurocode 3 - Design of steel structures - Part 1-11: Design of
structures with tension components

Eurocode 3 - Calcul des structures en acier - Partie 1-11:
Calcul des structures à câbles ou éléments tendus

Eurocode 3 - Bemessung und Konstruktion von
Stahlbauten - Teil 1-11: Bemessung und Konstruktion von
Tragwerken mit Zuggliedern aus Stahl

This European Standard was approved by CEN on 13 January 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of 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.



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

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

	Page
Contents	Page
1 General	4
1.1 Scope	4
1.2 Normative references.....	5
1.3 Terms and definitions	6
1.4 Symbols	7
2 Basis of design.....	8
2.1 General	8
2.2 Requirements.....	8
2.3 Actions.....	9
2.4 Design situations and partial factors.....	11
3 Material	11
3.1 Strength of steels and wires	11
3.2 Modulus of elasticity	11
3.3 Coefficient of thermal expansion	13
3.4 Cutting to length of Group B tension components	14
3.5 Lengths and fabrication tolerances	14
3.6 Friction coefficients	14
4 Durability of wires, ropes and strands.....	14
4.1 General	14
4.2 Corrosion protection of individual wires.....	15
4.3 Corrosion protection of the interior of Group B tension components	15
4.4 Corrosion protection of the exterior of Group B tension components	15
4.5 Corrosion protection of Group C tension components	16
4.6 Corrosion protection at connections	16
5 Structural analysis.....	16
5.1 General	16
5.2 Transient construction phase	16
5.3 Persistent design situation during service.....	17
5.4 Non-linear effects from deformations	17
6 Ultimate limit states.....	18
6.1 Tension rod systems	18
6.2 Prestressing bars and Group B and C components	18
6.3 Saddles.....	19
6.4 Clamps	22
7 Serviceability limit states	23
7.1 Serviceability criteria.....	23
7.2 Stress limits	23
8 Vibrations of cables	24
8.1 General	24
8.2 Measures to limit vibrations of cables	25
8.3 Estimation of risks	25
9 Fatigue	25
9.1 General	25
9.2 Fluctuating axial loads.....	26
Annex A (informative) Product requirements for tension components	27
Annex B (informative) Transport, storage, handling	30