BSI Standards Publication

Eurocode 1 — Actions on structures

Part 1-7: Accidental actions

bsi.

National foreword

This British Standard is the UK implementation of EN 1991-1-7:2025. It supersedes BS EN 1991-1-7:2006+A1:2014, which will be withdrawn on 30 March 2028.

The UK participation in its preparation was entrusted to Technical Committee B/525/1, Actions (loadings) and basis of design.

A list of organizations represented on this committee can be obtained on request to its committee manager.

National choice is allowed in this standard where explicitly stated within notes. The National Annex to this standard contains the national choices to be used for buildings and civil engineering works constructed in the UK.

The first generation of EN Eurocodes was published between 2002 and 2007, with conflicting British Standards withdrawn in 2010. This document forms part of the second generation of EN Eurocodes.

The second generation of EN Eurocodes is expected to be published between 2023 and 2026. These documents are being published as soon as they are available. This is being done to enable users to prepare for the transition from the first generation to second generation of EN Eurocodes.

UK adoptions of the first generation of EN Eurocodes will be withdrawn by BSI on 30 March 2028. Until that date, the first generation documents should be considered as the applicable standards for buildings and civil engineering works constructed in the UK unless otherwise specified by the relevant authority or in the specification for a particular project.

This standard is intended to be used with its National Annex and other referenced documents, including other second generation Eurocodes, as an interdependent suite of documents.

While the use of provisions in this standard in conjunction with first generation Eurocodes is not precluded, it should be undertaken with care and should only be done when users are satisfied that it will not result in a lower level of reliability than the minimum level set in the first generation Eurocodes and associated UK National Annexes.

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EUROPEAN STANDARD **EN 1991-1-7**

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 1991-1-7:2006

English Version

Eurocode 1 - Actions on structures - Part 1-7: Accidental actions

Eurocode 1 - Actions sur les structures - Partie 1-7: Actions accidentelles

Eurocode 1 - Einwirkungen auf Tragwerke - Teil 1-7: Außergewöhnliche Einwirkungen

This European Standard was approved by CEN on 20 July 2025.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

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

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European foreword

This document (EN 1991-1-7:2025) has been prepared by Technical Committee CEN/TC 250 “Structural Eurocodes”, the secretariat of which is held by BSI. CEN/TC 250 is responsible for all Structural Eurocodes and has been assigned responsibility for structural and geotechnical design matters by CEN.

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 September 2027, and conflicting national standards shall be withdrawn at the latest by March 2028.

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

This document supersedes EN 1991-1-7:2006.

The main changes compared to the previous edition are listed below:

a) transferring design strategies for robustness and related rules to EN 1990;

b) providing consistency between text and technical information on impact;

c) limiting the scope of Annex A to rules and actions for tying systems and key members; and

d) inserting technical clarifications in Annex C.

The first generation of EN Eurocodes was published between 2002 and 2007. This document forms part of the second generation of the Eurocodes, which have been prepared under Mandate M/515 issued to CEN by the European Commission and the European Free Trade Association.

The Eurocodes have been drafted to be used in conjunction with relevant execution, material, product and test standards, and to identify requirements for execution, materials, products and testing that are relied upon by the Eurocodes.

The Eurocodes recognize the responsibility of each Member State and have safeguarded their right to determine values related to regulatory safety matters at national level through the use of National Annexes.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

0 Introduction

0.1 Introduction to the Eurocodes

The structural Eurocodes comprise the following standards generally consisting of a number of Parts:

— EN 1990 Eurocode — Basis of structural and geotechnical design

— EN 1991 Eurocode 1 — Actions on structures

— EN 1992 Eurocode 2 — Design of concrete structures

— EN 1993 Eurocode 3 — Design of steel structures

— EN 1994 Eurocode 4 — Design of composite steel and concrete structure

— EN 1995 Eurocode 5 — Design of timber structures

— EN 1996 Eurocode 6 — Design of masonry structures

— EN 1997 Eurocode 7 — Geotechnical design

— EN 1998 Eurocode 8 — Design of structures for earthquake resistance

— EN 1999 Eurocode 9 — Design of aluminium structures

— EN 19100 Eurocode 10 — Design of glass structures

— New parts are under development, e.g. Eurocode for design of fibre-polymer composite structures and design of tensioned membrane structures

The Eurocodes are intended for use by designers, clients, manufacturers, constructors, relevant authorities (in exercising their duties in accordance with national or international regulations), educators, software developers, and committees drafting standards for related product, testing and execution standards.

NOTE Some aspects of design are most appropriately specified by relevant authorities or, where not specified, can be agreed on a project-specific basis between relevant parties such as designers and clients. The Eurocodes identify such aspects making explicit reference to relevant authorities and relevant parties.

0.2 Introduction to EN 1991 (all parts)

EN 1991 (all parts) specifies actions for the structural and geotechnical design of buildings, bridges and other civil engineering works, or parts thereof, including temporary structures, in conjunction with EN 1990 and the other Eurocodes.

EN 1991 does not cover the specific requirements of actions for seismic design. Provisions related to such requirements are given in EN 1998 (all parts), which complement and are consistent with EN 1991.

EN 1991 is also applicable to existing structures for:

— structural assessment,

— strengthening or repair,

— change of use.

NOTE 1 In these cases additional or amended provisions can be necessary.

EN 1991 is also applicable for the design of structures where materials or actions outside the scope of the other Eurocodes are involved.

NOTE 2 In this case additional or amended provisions can be necessary.

EN 1991 is subdivided in various parts:

EN 1991-1-1 Eurocode 1 — Actions on structures — Part 1-1: Specific weight of materials, self-weight of construction works and imposed loads for buildings

EN 1991-1-2 Eurocode 1 — Actions on structures — Part 1-2: Actions on structures exposed to fire

EN 1991-1-3 Eurocode 1 — Actions on structures — Part 1-3: Snow Loads

EN 1991-1-4 Eurocode 1 — Actions on structures — Part 1-4: Wind Actions

EN 1991-1-5 Eurocode 1 — Actions on structures — Part 1-5: Thermal Actions

EN 1991-1-6 Eurocode 1 — Actions on structures — Part 1-6: Actions during execution

EN 1991-1-7 Eurocode 1 — Actions on structures — Part 1-7: Accidental actions

EN 1991-1-8 Eurocode 1 — Actions on structures — Part 1-8: Actions from waves and currents on coastal structures

EN 1991-1-9 Eurocode 1 — Actions on structures — Part 1-9: Atmospheric icing

EN 1991-2 Eurocode 1 — Actions on structures — Part 2: Traffic loads on bridges and other civil engineering works

EN 1991-3 Eurocode 1 — Actions on structures — Part 3: Actions induced by cranes and machines

EN 1991-4 Eurocode 1 — Actions on structures — Part 4: Silos and tanks

0.3 Introduction to EN 1991-1-7

EN 1991-1-7 describes principles and application rules for the determination of accidental actions on buildings and civil engineering works. The following actions are included:

— impact forces from vehicles, rail traffic, ships and helicopters;

— actions due to internal explosions of combustible gases and dust as well as of vapour-air-mixture; and

— actions for tying systems and key members.

NOTE Other Eurocodes can cover specific accidental actions.

0.4 Verbal forms used in the Eurocodes

The verb “shall” expresses a requirement strictly to be followed and from which no deviation is permitted in order to comply with the Eurocodes.

The verb “should” expresses a highly recommended choice or course of action. Subject to national regulation and/or any relevant contractual provisions, alternative approaches could be used/adopted where technically justified.

The verb “may” expresses a course of action permissible within the limits of the Eurocodes.

The verb “can” expresses possibility and capability; it is used for statements of fact and clarification of concepts.

0.5 National Annex for EN 1991-1-7

National choice is allowed in this document where explicitly stated within notes. National choice includes the selection of values for Nationally Determined Parameters (NDPs).

The national standard implementing EN 1991-1-7 can have a National Annex containing all national choices to be used for the design of buildings and civil engineering works to be constructed in the relevant country.

When no national choice is given, the default choice given in this document is to be used.

When no national choice is made and no default is given in this document, the choice can be specified by a relevant authority or, where not specified, agreed for a specific project by appropriate parties.

National choice is allowed in EN 1991-1-7 through notes to the following clauses:

4.1(2)	4.1(3)	4.1(4)	4.1(5)
4.2(1) – 2 choices	5.1(1)	5.2(2)	5.3(4)
5.4.1(1) – 3 choices	5.4.1(2) – 2 choices	5.4.1(3)	5.4.2(2)
5.4.2(3)	5.4.2(5)	5.4.2(6)	5.5(2)
5.6.1(1)	5.6.2.2(1) – 2 choices	5.6.2.3(1)	5.6.2.3(2)
5.6.2.3(3)	5.6.2.3(4)	5.6.2.3(5)	5.6.2.4(1)
5.6.2.5(1)	5.6.3(1)	5.6.3(3)	5.7.1(3)
5.7.1(5)	5.7.2(1)	5.7.2(2)	5.7.2(3) – 2 choices
5.7.2(5)	5.7.2(6) – 2 choices	5.7.3(1)	5.7.3(2)
5.7.3(3)	5.7.3(5)	5.7.3(7) – 2 choices	5.7.3(9) – 2 choices
5.8(3)	6.3.1(1)	A.3.1(4)	A.3.2(3)
A.3.2(4)	A.3.3(1)	A.4.3(1) – 2 choices	A.5(1)
D.6(3)			

National choice is allowed in EN 1991-1-7 on the application of the following informative annexes:

Annex A	Annex B	Annex C	Annex D
Annex E			

The National Annex can contain, directly or by reference, non-contradictory complementary information for ease of implementation, provided it does not alter any provisions of the Eurocodes.

1 Scope

1.1 Scope of EN 1991-1-7

(1) EN 1991-1-7 provides actions and rules for safeguarding buildings and civil engineering works against identifiable accidental actions.

NOTE 1 Identifiable accidental actions include impact from vehicles and internal explosions.

NOTE 2 Rules on impact from vehicles travelling on a bridge deck are given in EN 1991-2.

(2) EN 1991-1-7 also covers: actions and rules for tying systems and key members; information on risk assessment; dynamic design for impact; actions for internal explosions; actions from debris.

(3) Actions from ship operations such as berthing and mooring are outside the scope of this document.

(4) Actions due to high explosives that detonate are outside the scope of this document.

1.2 Assumptions

(1) The general assumptions of EN 1990 apply to EN 1991-1-7.

(2) EN 1991-1-7 is intended to be used in conjunction with EN 1990, EN 1991 (all parts) and the other Eurocode parts for the design of structures.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE See the Bibliography for a list of other documents cited that are not normative references, including those referenced as recommendations (i.e. in “should” clauses), permissions (“may” clauses), possibilities (“can” clauses), and in notes.

EN 1990:2023,[1] *Eurocode — Basis of structural and geotechnical design*

EN 1991 (all parts), *Eurocode 1 — Actions on structures*

3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in EN 1990 and the following apply.

NOTE Other specific symbols, especially treated in informative annexes, are given within the text.

3.1 Terms and definitions

3.1.1 General terms relevant to accidental actions

3.1.1.1
burning velocity
velocity of flame propagation relative to that of the unburned dust, gas or vapour that is ahead of the flame front

[1] As impacted by EN 1990:2023/prA1:2024.