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BSI Standards Publication

## Crane safety — General design

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Part 2: Load actions

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## National foreword

This British Standard is the UK implementation of EN 13001-2:2021. It supersedes BS EN 13001-2:2014, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MHE/3/1, Crane design.

Users' attention is drawn to the fact that neither BS 2573-1:1983 nor BS 2573-2:1980 should be used in conjunction with the EN 13001 series as they are not complementary. The BS 2573 series will remain current until the UK committee has reviewed all published parts of the BS EN 13001 series and determined whether they provide a coherent package of standards in the UK.

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

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For the Great Britain market (England, Scotland and Wales), if the UK Government has designated this publication for conformity with UKCA marking legislation and has not amended the essential requirements of that legislation, Annex ZA/ZZ and any references to EU law in the publication should be read in accordance with the designation as applying to UK legislation in the same way as to EU law. Further information on designated standards can be found at [www.bsigroup.com/standardsandregulation](http://www.bsigroup.com/standardsandregulation).

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More information on legislation can be found at [www.gov.uk](http://www.gov.uk).

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2021.

**Amendments/corrigenda issued since publication**

Date	Text affected
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## EUROPÄISCHE NORM

March 2021

ICS 53.020.20

Supersedes EN 13001-2:2014

English Version

**Crane safety - General design - Part 2: Load actions**

Sécurité des appareils de levage à charge suspendue -  
Conception générale - Partie 2 : Charges

Kransicherheit - Konstruktion allgemein - Teil 2:  
Lasteinwirkungen

This European Standard was approved by CEN on 25 January 2021.

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, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (EN 13001-2:2021) has been prepared by Technical Committee CEN/TC 147 “Cranes — Safety”, the secretariat of which is held by DIN.

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 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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 13001-2:2014.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

CEN/TC 147 WG 2 has reviewed EN 13001-2:2014 to adapt the document to the technical progress, new requirements and changes in the document referred. The main topics and changes include:

- Cranes on vessels which are within the scope of the Directive 2016/1629/EU (Inland Waterway Vessels) and “European Standard laying down Technical Requirements for Inland Navigation vessels” (ES-TRIN:2019/1);
- Loads relevant to cranes on vessels were added;
- The clause on favourable/unfavourable masses and the clause on high risk applications including Annex D were modified;
- A new 4.3.6 for measured load effects was added;
- 4.3.8 on rigid body stability was modified;
- A new 4.2.1.5 added, on internal loads inside mechanisms;
- Requirements for loads on access ways were replaced by a reference to EN 13586:2004+A1:2008;
- Annex ZA has been revised.

This document is Part 2 of the EN 13001 series. The other parts are as follows:

- *Part 1: General principles and requirements*
- *Part 3-1: Limit states and proof of competence of steel structures*
- *Part 3-2: Limit states and proof of competence of wire ropes in reeving systems*
- *Part 3-3: Limit states and proof of competence of wheel/rail contacts*
- *Part 3-4: Limit states and proof of competence of machinery — Bearings*

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- *Part 3-5: Limit states and proof of competence of forged hooks and cast hooks*
- *Part 3-6: Limit states and proof of competence of machinery — Hydraulic cylinders*

For the relationship with other European Standards for cranes, see Annex E.

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, Turkey and the United Kingdom.



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## **Introduction**

This document has been prepared to be a harmonized standard to provide one means for the mechanical design and theoretical verification of cranes to conform to the essential health and safety requirements of the EU Directive 2006/42/EC (Machinery), as amended. This document also establishes interfaces between the user (purchaser) of the crane and the designer, as well as between the designer and the component manufacturer, in order to form a basis for selecting cranes and components.

This document is a type C standard as stated in the EN ISO 12100.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those, which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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## 1 Scope

This document specifies load actions and load combinations for the calculation of load effects as basis for the proof of competence of a crane and its main components. It will be used together with the other generic parts of the EN 13001 series of standards, see Annex E. As such they specify conditions and requirements on design to prevent mechanical hazards of cranes and provide a method of verification of those requirements.

NOTE Specific requirements for particular types of crane are given in the appropriate European product standards for the particular crane type, see Annex E.

The following is a list of significant hazardous situations and hazardous events that could result in risks to persons during normal use and reasonably foreseeable misuse. Clause 4 of this document provides means to reduce or eliminate the risks of mechanical failures due to the following:

- a) rigid body instability of the crane or its parts (tilting);
- b) exceeding the limits of strength (yield, ultimate, fatigue);
- c) elastic instability of the crane or its parts or components (buckling, bulging).

The hazards covered by this document are identified by Annex G.

This document is not applicable to cranes that are manufactured before the date of its publication as EN.

## 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.

<std>EN 13001-1:2015, *Cranes — General design — Part 1: General principles and requirements*</std>

<std>EN 13586:2004+A1:2008, *Cranes — Access*</std>

<std>ISO 4306-1:2007, *Cranes — Vocabulary — Part 1: General*</std>

## 3 Terms and definitions, symbols and abbreviations

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4306-1:2007, Clause 6 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1.1

##### **hoist load**

sum of the masses suspended from the crane, taken as the sum of payload, the fixed and non-fixed load lifting attachments and the suspended portion of the hoist medium

Note 1 to entry: "hoist load" is equivalent to "gross load" as defined in ISO 4306-1:2007.