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**BSI Standards Publication**

## **Cranes — General design**

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Part 3-5: Limit states and proof of competence of forged and cast hooks

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## National foreword

This British Standard is the UK implementation of EN 13001-3-5:2016+A1:2021. It supersedes BS EN 13001-3-5:2016, which is withdrawn.

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 BS 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.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

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

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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English Version

## Cranes - General design - Part 3-5: Limit states and proof of competence of forged and cast hooks

Appareils de levage à charge suspendue - Conception générale - Partie 3-5 : États limites et vérification des crochets forgés et moulés

Krane - Konstruktion allgemein - Teil 3-5: Grenzzustände und Sicherheitsnachweise von geschmiedeten und gegossenen Haken

This European Standard was approved by CEN on 19 May 2016 and includes Amendment 1 approved by CEN on 12 April 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.

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## European foreword

This document (EN 13001-3-5:2016+A1:2021) has been prepared by Technical Committee CEN/TC 147 "Crane — 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 November 2021, and conflicting national standards shall be withdrawn at the latest by November 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 A1 EN 13001-3-5:2016 A1.

This document includes Amendment 1 approved by CEN on 21 April 2021.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document has been prepared under a mandate 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.

A1 The major changes in this document compared to EN 13001-3-5:2016 are in 4.1, 4.2, 6.5.4, 6.6.4 and 8.2 so as to extend the scope of the standard to "cast hooks. A1

This European Standard is one part of the EN 13001 series. The other parts are as follows:

- *Part 1: General principles and requirements*
- *Part 2: Load actions*
- *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<sup>1</sup>*
- *Part 3-6: Limit states and proof of competence of machinery - Hydraulic cylinders<sup>2</sup>*

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

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<sup>1</sup> Currently at Enquiry stage.

<sup>2</sup> Currently at Enquiry stage.

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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 European Standard has been prepared to provide a means for the mechanical design and theoretical verification of cranes to conform to essential health and safety requirements. This European Standard also establishes interfaces between the user (purchaser) 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 European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this standard.

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.

## 1 Scope

This European Standard is to be used together with EN 13001-1 and EN 13001-2 and, as such, they specify general conditions, requirements and methods to prevent by design and theoretical verification, mechanical hazards in crane hooks.

**A1** It is intended to be used together with the other generic parts of EN 13001 series of standards, see Annex L. **A1**

This European Standard covers the following parts of hooks and types of hooks:

- **A1** bodies of any type of hooks made of steel forgings or steel castings, including stainless steel; **A1**
- machined shanks of hooks with a thread/nut suspension.

Principles of this European Standard can be applied to machined shanks of hooks in general. However, stress concentration factors relevant to designs not given in this standard would have to be determined and applied.

**A1** The hazards covered by this document are identified by Annex M. **A1**

NOTE 1 **A1** Plate hooks, which are those, assembled of one or several parallel parts of rolled steel plates, are not covered in this document. **A1**

The following is a list of significant hazardous situations and hazardous events that could result in risks to persons during normal use and foreseeable misuse. Clauses 4 to 8 of this document are necessary to reduce or eliminate the risks associated with the following hazards:

- a) **A1** exceeding the limits of yield strength, ultimate strength, fatigue strength, brittle fracture; **A1**
- b) exceeding temperature limits of material.

**A1** The requirements of this document are stated in the main body of the document and are applicable to hook designs in general. **A1**

The commonly used hook body and shank designs listed in Annexes A, B and F are only examples and should not be referred to as requirements of this European Standard. Annex I gives guidance for the selection of a hook size, where a hook body is in accordance with Annex A or B. The selection of hook form is not limited to those shown in Annexes A and B.

This European Standard is applicable to cranes, which are manufactured after the date of approval of this European Standard by CEN, and serves as a reference base for product standards of particular crane types.

NOTE 2 This part of EN 13001 deals only with the limit state method in accordance with EN 13001-1.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

**A1** EN 1369:2012, *Founding — Magnetic particle testing*

EN 1370:2011, *Founding — Examination of surface condition*