

Kraana ohutus. Üldine ehitus. Osa 2: Koormuse mõjud

Crane safety - General design - Part 2: Load actions

This document is a preview generated by EVS

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13001-2:2014 sisaldab Euroopa standardi EN 13001-2:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 13001-2:2014 consists of the English text of the European standard EN 13001-2:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 06.08.2014.	Date of Availability of the European standard is 06.08.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 53.020.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Aru 10, 10317 Tallinn, Eesti; www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:
Aru 10, 10317 Tallinn, Estonia; www.evs.ee; phone 605 5050; e-mail info@evs.ee

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 14 June 2014.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, 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: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms, definitions, symbols and abbreviations	5
3.1 Terms and definitions	5
3.2 Symbols and abbreviations	6
4 Safety requirements and/or measures	10
4.1 General.....	10
4.2 Loads	10
4.2.1 General.....	10
4.2.2 Regular loads	11
4.2.3 Occasional loads	18
4.2.4 Exceptional loads	25
4.3 Load combinations	33
4.3.1 General.....	33
4.3.2 High risk situations.....	34
4.3.3 Favourable and unfavourable masses	34
4.3.4 Partial safety factors for the mass of the crane	35
4.3.5 Partial safety factors to be applied to loads determined by displacements	36
4.3.6 Load combinations for the proof of competence.....	37
4.3.7 The proof of crane stability.....	40
Annex A (informative) Aerodynamic coefficients	42
A.1 General.....	42
A.2 Individual members	45
A.3 Plane and spatial lattice structure members	51
A.4 Structural members in multiple arrangement.....	53
Annex B (informative) Illustration of the types of hoist drives	55
Annex C (informative) Calculation of load factor for indirect lifting force limiter	58
Annex D (informative) Guidance on selection of the risk coefficient	60
Annex E (informative) Selection of a suitable set of crane standards for a given application	62
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	63
Bibliography	64

Foreword

This document (EN 13001-2:2014) has been prepared by Technical Committee CEN/TC 147 "Crane — Safety", 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 February 2015 and conflicting national standards shall be withdrawn at the latest by February 2015.

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

This document supersedes EN 13001-2:2011.

The major changes in this revision are in 4.2.2.2, 4.2.3.4, 4.2.4.10, 4.3.2, 4.3.4 and 4.3.7. There are new issues in 4.2.4.7, 4.2.4.8, Annex B, Annex C and Annex D.

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.

This European Standard is one Part of EN 13001. 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*
- *Part 3-5: Limit states and proof of competence of forged hooks*

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

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

Introduction

This European Standard 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 Machinery Directive, as amended. This standard 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 European Standard 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 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 that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard specifies load actions to be used together with the standard EN 13001-1 and EN 13001-3, and as such they specify conditions and requirements on design to prevent mechanical hazards of cranes, and provides a method of verification of those requirements.

NOTE Specific requirements for particular types of crane are given in the appropriate European Standard for the particular crane type.

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. Clause 4 of this standard is necessary to reduce or eliminate the risks associated with the following hazards:

- a) 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 (buckling, bulging).
- d) Exceeding temperature limits of material or components.
- e) Exceeding the deformation limits.

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

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.

EN 1990, *Eurocode - Basis of structural design*

EN 13001-1, *Cranes — General Design — Part 1: General principles and requirements*

ISO 4306-1:2007, *Cranes — Vocabulary — Part 1: General*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1990, Clause 6 of ISO 4306-1:2007 and the following apply.

3.1.1

hoist load

sum of the masses lifted by the crane, taken as the maximum that the crane is designed to lift in the configuration and operational conditions being considered

3.1.2

single failure proof system

force carrying arrangement of several components, arranged so that in case of a failure of any single component in the arrangement, the capability to carry the force is not lost