SLOVENSKI STANDARD
oSIST prEN 14439:2018

01-julij-2018

Dvigala (žerjavi) - Stolpna dvigala

Cranes - Tower cranes

Krane - Turmdrehkrane

Appareils de levage à charge suspendue - Grues à tour

Ta slovenski standard je istoveten z: **prEN 14439**

ICS:

53.020.20 Dvigala Cranes

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EUROPEAN STANDARD

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English Version

Cranes - Tower cranes

Appareils de levage à charge suspendue - Grues à tour

Krane - Turmdrehkrane

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 147.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 14439:2018) has been prepared by Technical Committee CEN/TC 147 “Cranes - Safety”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14439:2006+A2:2009.

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.

CEN/TC 147/WG 12 “Tower Cranes” has developed a revision of this document, which differs from EN 14439:2006+A2:2009 as follows:

— integration and rules for application of EN 13001 series of standards;

— revision of 5.2 Design requirements on the load bearing structure;

— revision of 5.4.4 Access;

— integration and rules for application of EN ISO 13849-1;

— revision of Annex D Additional requirements for climbing systems;

— addition of a new annex concerning calculation of standards values of the limit design stress range;

— integration of mobile self-erecting tower cranes, including introduction of a new dedicated Annex G;

— addition of a new annex concerning the requirements on a tower crane for installation of a powered access system.

To select a suitable set of crane standards for a given application see Annex I.

NOTE Some of the standards listed are in preparation.

Introduction

This is a harmonized European Standard to provide one means for tower cranes to conform with the relevant Essential Health and Safety Requirements of the Machinery Directive 2006/42/EC modified.

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 hazardous events are covered are indicated in the scope of this European 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 cranes that have been designed and built according to the provisions of this type C standard.

1 Scope

This document specifies safety requirements:

— for tower cranes;

— for climbing systems used with the masts of tower cranes;

— for the installation of a powered access systems on tower cranes.

This document applies to tower cranes for construction work, which are either erected by parts or self-erecting cranes, including mobile self-erecting tower cranes. Tower cranes for construction work are exclusively equipped with a hook as load-handling device.

Applications when the crane is not equipped with a hook, or when there is a sudden release of the load, are not covered by this standard. This document is not applicable to mobile cranes, mobile harbour cranes, crawler cranes, slewing jib cranes, bridge and gantry cranes, offshore cranes, floating cranes, loader cranes, hand operated cranes or railway cranes.

This document deals with all significant hazards, hazardous situations and events relevant to tower cranes, when used as intended and under conditions foreseen by the manufacturer. This document specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards (see Clause 4).

The significant hazards covered by this document are identified in Clause 4.

This European Standard covers hazards related to the lifting of persons using a climbing system. The lifting of persons by the tower crane itself is not included.

The requirements related to Electromagnetic compatibility (EMC), the specific hazards due to external influence on electrical equipment, potentially explosive atmospheres and ionising radiation are not covered by this document.

This document is not applicable to tower cranes and climbing systems which are manufactured before the date of publication by CEN of this document.

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.

EN 2, *Classification of fires*

EN 294, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

EN 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 547-1, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 626-1, *Safety of machinery — Reduction of risk to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

EN 795:2012, *Personal fall protection equipment - Anchor devices*

EN 811, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*

EN 894-3, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 1005-3, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

EN 12077-2:1998+A1:2008, *Cranes safety — Requirements for health and safety — Part 2: Limiting and indicating devices*

EN 12644-1:2001+A1:2008, *Cranes — Information for use and testing — Part 1: Instructions*

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

EN 13001-2:2014, *Crane safety — General design — Part 2: Load actions*

EN 13001-3-1:2012+A2:2018, *Cranes — General Design — Part 3-1: Limit States and proof of competence of steel structures*

EN 13001-3-2, *Cranes — General design — Part 3-2: Limit states and proof of competence of wire ropes in reeving systems*

EN 13001-3-3, *Cranes — General design — Part 3-3: Limit states and proof of competence of wheel/rail contacts*

EN 13001-3-5, *Cranes — General design — Part 3-5: Limit states and proof of competence of forged hooks*

EN 13135:2013+A1:2018, *Cranes — Safety — Design — Requirements for equipment*

EN 13557:2003+A2:2008, *Cranes — Controls and control stations*

EN 13586:2004+A1:2008, *Cranes — Access*

prEN 17076:2018, *Tower cranes — Anti-collision systems — Safety requirements*

EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204 32)*

EN 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310 2)*

EN 62745, *Safety of machinery — Requirements for cableless control systems of machinery (IEC 62745)*

EN 82079-1, *Preparation of instructions for use — Structuring, content and presentation — Part 1: General principles and detailed requirements*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 6385:2016, *Ergonomics principles in the design of work systems (ISO 6385:2016)*

EN ISO 7250, *Basic human body measurements for technological design (ISO 7250)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work staxtion and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11203:2009, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203:1995)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1)*

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1)*

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 3864 (all parts), *Graphical symbols — Safety colours and safety signs*

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

ISO 4306-3, *Cranes — Vocabulary — Part 3: Tower cranes*

ISO 7752-3, *Cranes — Control layout and characteristics — Part 3: Tower cranes*

ISO 8566-3, *Cranes — Cabins and control stations — Part 3: Tower cranes*

ISO 12488-1, *Cranes — Tolerances for wheels and travel and traversing tracks — Part 1: General*

ISO 13200, *Cranes — Safety signs and hazard pictorials — General principles*

FEM 1.001, *Rules for the design of hoisting appliances*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in in EN ISO 12100, ISO 4306-1 and ISO 4306-3, ISO 4306-3/A1 and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
rated capacity
maximum net load that the crane is designed to lift for a given crane configuration, load location and operating conditions

Note 1 to entry: The maximum net load is composed of the pay load and the mass of the non-fixed load-lifting attachment(s).

Note 2 to entry: The net load is considered to be a static load.

3.2
tower crane
power-driven slewing jib type crane with the jib located at the top of a tower which stays approximately vertical in the working position

Note 1 to entry: A tower crane is equipped with means for raising and lowering suspended loads and for the movement of such loads by changing the load-lifting radius, travelling of the load, slewing or travelling of the complete appliance. Some tower cranes perform several, but not necessarily all of these movements.

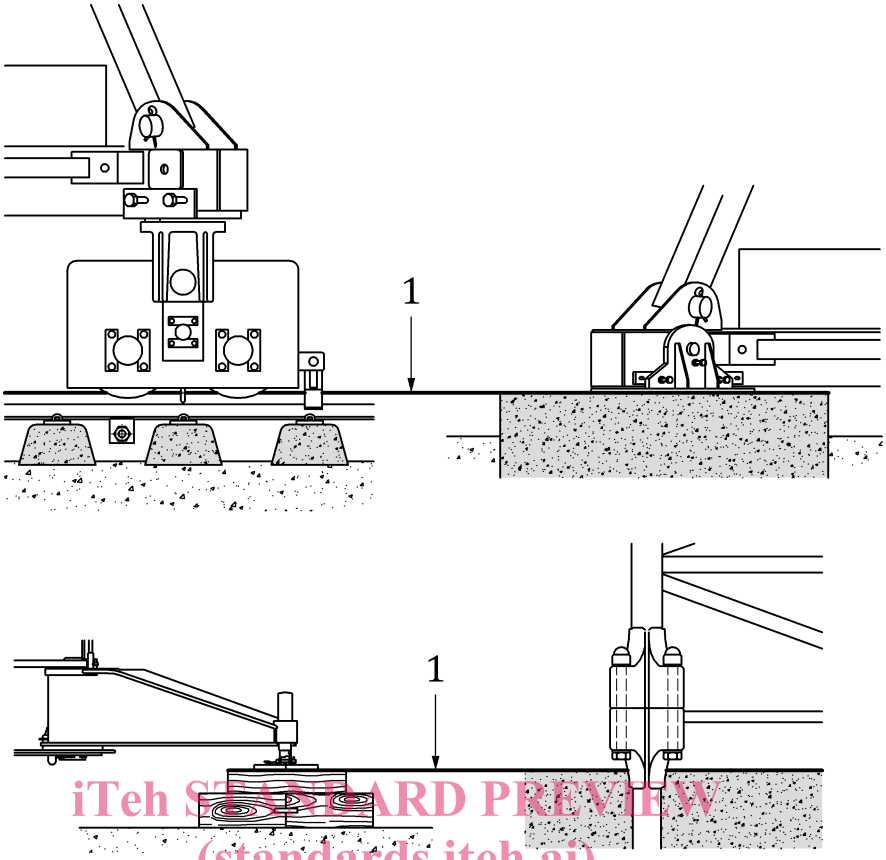
3.2.1
tower crane erected from parts
tower crane assembled from component parts where the design of the crane allows the crane to remain in the erected position in out-of-service conditions and to be dismantled for movement to another site

3.2.2
self-erecting tower crane
tower crane which is transported to site and mostly assembled without use of a separate lifting appliance, where the design of the crane allows the crane to remain in the erected position in out-of-service conditions and to be lowered for transportation to another site

3.2.3
mobile self-erecting tower crane
self-erecting tower crane mounted on a self-propelled chassis and designed for a significantly lower load spectrum compared to tower cranes according to 3.2.1 and 3.2.2

3.3
crane reference bottom level
interface of an erected tower crane with the supporting structure or rail track (see Figure 1)

Note 1 to entry: The top level of a concrete foundation is considered the crane reference bottom level.



Key

1 crane reference bottom level

Figure 1 — Crane reference bottom level

3.4
working range limiting device
set of components installed on the same crane whose combined actions enable management of prohibited zones only

[prEN 17076:2018, 3.7]

3.5
anti-collision system
network of anti-collision devices that enable management of interference zones and/or prohibited zones, in which each anti-collision device is an input device for the other anti-collision devices within this network

[prEN 17076:2018, 3.5]

3.6
climbing system
specific equipment used with a top slewing tower crane to increase or to decrease the height of the crane

Note 1 to entry: Generally the climbing system is raised/lowered by hydraulic cylinder(s) powered by a hydraulic power pack.