



SLOVENSKI STANDARD
oSIST prEN 13000:2020
01-september-2020

Žerjavi - Mobilni žerjavi

Cranes - Mobile cranes

Krane - Fahrzeugkrane

Appareils de levage à charge suspendue - Grues mobiles

Ta slovenski standard je istoveten z: prEN 13000

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ICS:

53.020.20 Dvigala Cranes

oSIST prEN 13000:2020 **en,fr,de**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 13000

June 2020

ICS 53.020.20

Will supersede EN 13000:2010+A1:2014

English Version

Cranes - Mobile cranes

Appareils de levage à charge suspendue - Grues
mobiles

Krane - Fahrzeugkrane

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.

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COMITÉ EUROPÉEN DE NORMALISATION
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Contents	Page
European foreword.....	5
Introduction	6
1 Scope	7
2 Normative references.....	8
3 Terms and definitions	13
4 Safety requirements and/or protective measures	16
4.1 Structures and components	16
4.1.1 General.....	16
4.1.2 Load effects.....	17
4.1.3 Limit states	22
4.2 Equipment and devices.....	23
4.2.1 General principles.....	23
4.2.2 Control station.....	24
4.2.3 Protection against falling objects.....	27
4.2.4 Seats	27
4.2.5 Controls and control systems	27
4.2.6 Limiting and indicating devices.....	29
4.2.7 Steering system.....	37
4.2.8 Braking systems	38
4.2.9 Protection devices	40
4.2.10 Hydraulic and pneumatic systems and components.....	43
4.2.11 Pressure vessels and fuel tanks.....	45
4.2.12 Electric and electronic components and related phenomena	45
4.2.13 Hooks and hook blocks	46
4.2.14 Specific requirements for spare tyres/wheels.....	46
4.2.15 Specific requirements for pin jointed jib/fly jib connections.....	46
4.2.16 Requirements for securing counterweights.....	46
4.3 Visibility.....	46
4.3.1 General.....	46
4.3.2 Crane operator's field of view.....	47
4.3.3 Viewing persons when slewing the crane	47
4.3.4 Lighting.....	48
4.4 Noise and noise reduction	48
4.5 Fire protection	48
4.5.1 Fire resistance.....	48
4.5.2 Fire extinguisher	48
4.6 Requirements for transport and travel.....	49
4.6.1 General.....	49
4.6.2 Separately transported parts	49
4.7 Roll over and tip over protection	49
5 Verification.....	49
5.1 Methods of verification	49
5.2 Test procedures and conditions	52
5.2.1 General.....	52
5.2.2 Conceptual verification by calculation.....	52
5.2.3 Conceptual verification by experiment.....	52

5.2.4	Examination after test.....	52
5.2.5	Test report	52
5.3	Verification based on noise emission values.....	53
6	Information for use.....	53
6.1	Format of instruction	53
6.1.1	General	53
6.1.2	Noise reduction by information	53
6.1.3	Technical data and information	53
6.2	Instructions for use.....	55
6.2.1	General	55
6.2.2	Crane operator instructions	55
6.3	Instructions for assembly, erection, disassembly and transport.....	58
6.4	Instructions for maintenance and inspection	59
6.4.1	General	59
6.4.2	Instructions for maintenance.....	59
6.4.3	Instructions for inspection.....	60
6.5	Instructions for training.....	62
6.6	Instructions for spare parts	62
6.7	Instructions for disposal	62
7	Marking	62
7.1	Machine marking	62
7.2	Information and warning	63
7.3	Graphic symbols	63
7.4	Marking of crane parts	63
7.5	Marking of outriggers	63
7.6	Marking event recorder	63
Annex A (normative)	Examples of mobile crane types.....	64
Annex B (informative)	Major parts	69
B.1	Major parts of telescopic cranes	69
B.2	Major parts of lattice boom cranes.....	71
Annex C (normative)	List of hazards	73
Annex D (normative)	Visibiliy.....	82
Annex E (normative)	Crane operator's seat dimensions	84
E.1	General	84
E.2	Dimensions of crane operator's seat.....	84
E.3	Other dimensions or adjustments.....	84
Annex F (normative)	Outdoor noise testing	86
F.1	Noise test code for mobile cranes.....	86
F.1.1	Introduction.....	86
F.1.2	Normative references	86
F.1.3	Terms and definitions.....	86
F.1.4	Description of machinery family.....	86
F.1.5	Configuration	86
F.1.6	Sound power level determination.....	87
F.1.7	Emission sound pressure level determination.....	90

prEN 13000:2020 (E)

F.1.8	Information on measurement uncertainties	91
F.1.9	Information to be recorded	91
F.1.10	Information to be reported	91
F.2	Test report.....	91
F.2.1	General data.....	92
F.2.2	Measurements per motion.....	93
Annex G	(normative) Limit values for structural and fine grain steel types	95
Annex H	(informative) Slew angle related capacities	96
Annex I	(normative) Proof of competence	97
I.1	General.....	97
I.2	Proof of competence for steel structures	97
I.3	Proof of competence for non-steel structures.....	98
I.4	Proof of competence for load bearing components.....	98
I.4.1	General.....	98
I.4.2	Proof of competence for mechanisms.....	98
I.4.3	Proof of competence for ropes	98
I.4.4	Proof of competence for chains.....	98
I.4.5	Proof of competence for other components.....	99
I.5	Proof of competence of stability against tipping of the crane	99
I.6	Proof of competence – experimental	99
I.6.1	Structural tests.....	99
I.6.2	Rigid body stability tests	99
Annex J	(normative) Test of steering systems for off-road mobile cranes.....	100
J.1	Test conditions.....	100
J.2	Test procedure	100
J.3	Permitted steering control effort.....	100
Annex K	(informative) Wind speed as a function of elevation.....	101
Annex L	(informative) Impact pressure as a function of elevation	103
Annex M	(normative) Simplified method to determine the maximum allowed wind speed	105
Annex N	(informative) Typical shapes and corresponding c_w values	107
Annex O	(normative) Efficiency of sheave sets.....	108
Annex P	(informative) Test procedures: Selection of load cases.....	109
Annex Q	(normative) Test certificate.....	110
Annex R	(normative) Load assumption for elements of access and egress	111
Annex S	(informative) Selection of a suitable set of crane standards for a given application	112
Annex ZA	(informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered	114
Bibliography	122

European foreword

This document (prEN 13000:2020) 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 13000:2010+A1:2014.

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.

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

This document has been prepared by Product Working Group CEN/TC 147/WG 11, *Mobile Cranes*, the secretariat of which is held by DIN.

CEN/TC 147 WG 11 has completely reviewed EN 13000:2010+A1:2014 to adapt the standard to the technical progress, to new requirements and to changes in standards referenced; the main changes of this new edition prEN 13000:2020 are:

- the scope has been reviewed with the intent to differentiate clearly in between different products and their related standards;
- the definition of mobile crane was clarified, a definition for mobile harbour crane was added;
- references to FEM standards for calculation have been transferred to references to the EN 13001 family, related Annexes have been deleted accordingly;
- the content of several FEM guidelines has been reviewed and additional requirements have been introduced into this document as appropriate (e.g. access and egress, inspection of hoses);
- the concept of the tipping angle was extended to 360° around the crane to cover sideways stability for long and slender boom systems;
- requirements related to slew angle related capacities have been introduced;
- safety functions shall be designed according to EN ISO 13849 instead of EN 954;
- addition of requirements for position monitoring of moveable outriggers and crawlers;
- new requirements for counterweight indication for certain crane types as operational aid;
- new requirements for securing counterweights;
- introduction of remote controls for operation of outriggers;
- new requirements on visibility when operating the crane;
- Annex ZA and Annex C has been substantially revised.

prEN 13000:2020 (E)**Introduction**

This document is a type C standard.

This document has been prepared to provide one means for mobile cranes to conform to the essential health and safety requirements of the Machinery Directive.

The machinery concerned and the extent to which hazards, hazardous situations and events 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 applies to mobile cranes as defined in 3.16, with following characteristics:

- mobile cranes can operate on tyres, crawlers or with other mobile arrangements. In fixed positions, they can be supported by outriggers or other accessories increasing their stability;
- the superstructure of mobile cranes can be of the type of full circle slewing, of limited slewing or non-slewing. It is normally equipped with one or more hoists and/or hydraulic cylinders for lifting and lowering the boom and the load;
- mobile cranes can be equipped either with telescopic booms, with articulated booms, with lattice booms – or a combination of these – of such a design that they can readily be lowered;
- loads can be handled by hook block assemblies or other load-lifting attachments for special services.

This document is applicable to the design, build, installation of safety devices, information for use, maintenance and testing of mobile cranes.

This document is not applicable for the additional hazards related to the mounting a mobile crane on other chassis (e.g. railcars, portals, pontoons). Examples of mobile crane types and their major components are given in Annex A, B.1 and B.2.

This document is not applicable to:

- loader cranes (see EN 12999);
- off-shore cranes (see EN 13852-1);
- floating cranes (see EN 13852-2);
- slewing jib crane (see EN 14985);
- variable reach truck (see EN 1459);

NOTE 1 Variable Reach Trucks are commonly known as telehandlers.

- to cranes, installed on an agricultural tractor, intended to tow a trailer which has capability to carry goods;
- mobile self-erecting tower cranes (see EN 14439);
- earth-moving machinery used for object handling (see EN 474-series).

This document does not cover hazards related to the lifting of persons.

NOTE 2 The use of mobile cranes for the lifting of persons is subject to specific national regulations.

This document does not cover hazards related to the combination of a mobile crane with other machinery.

This document does not cover hazards related to the use of the mobile crane in potential explosive atmosphere.

For duty cycle work such as grab, magnet, piling or similar work, additional provisions are required which are outside the scope of this document.

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

prEN 13000:2020 (E)

This document is not applicable to mobile cranes which are manufactured before the date of publication of this document by CEN.

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 2:1992,¹⁾ *Classification of fires*

EN 547-1:1996+A1:2008, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 842:1996+A1:2008, *Safety of machinery — Visual danger signals — General requirements, design and testing*

EN 853:2015, *Rubber hoses and hose assemblies — Wire braid reinforced hydraulic type — Specification*

EN 854:2015, *Rubber hoses and hose assemblies — Textile reinforced hydraulic type — Specification*

EN 856:2015+AC:2019, *Rubber hoses and hose assemblies — Rubber-covered spiral wire reinforced hydraulic type — Specification*

EN 894-2:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3:2000+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 1005-3:2002+A1:2008, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

EN 1837:1999+A1:2009, *Safety of machinery — Integral lighting of machines*

EN 1993-1-6:2007,²⁾ *Eurocode 3 — Design of steel structures — Part 1-6: Strength and Stability of Shell Structures*

EN 1993-1-8:2005,³⁾ *Eurocode 3: Design of steel structures — Part 1-8: Design of joints*

EN 10025-2:2019, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

¹⁾ As impacted by EN 2:1992/A1:2004.

²⁾ As impacted by EN 1993-1-6:2007/AC:2009 and EN 1993-1-6:2007/A1:2017.

³⁾ As impacted by EN 1993-1-8:2005/AC:2009.

EN 10025-3:2019, *Hot rolled products of structural steels — Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels*

EN 10025-6:2019, *Hot rolled products of structural steels — Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition*

EN 10149-2:2013, *Hot rolled flat products made of high yield strength steels for cold forming — Part 2: Technical delivery conditions for thermomechanically rolled steels*

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

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

EN 14502-2:2005+A1:2008, *Cranes — Equipment for the lifting of persons — Part 2: Elevating control stations*

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

EN IEC 61000-6-2:2019, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments (IEC 61000-6-2:2016)*

EN 61000-6-4:2007,⁴⁾ *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments (IEC 61000-6-4:2006)*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN 61310-2:2008, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310-2:2007)*

EN ISO 3411:2007, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope (ISO 3411:2007)*

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 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

⁴⁾ As impacted by EN 61000-6-4:2007/A11:2011.

prEN 13000:2020 (E)

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

EN ISO 5349-1:2001, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 1: General requirements (ISO 5349-1:2001)*

EN ISO 5349-2:2001,⁵⁾ *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 2: Practical guidance for measurement at the workplace (ISO 5349-2:2001)*

EN ISO 5353:1998, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point (ISO 5353:1995)*

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

EN ISO 6683:2008, *Earth-moving machinery — Seat belts and seat belt anchorages — Performance requirements and tests (ISO 6683:2005)*

EN ISO 7096:2020, *Earth-moving machinery — Laboratory evaluation of operator seat vibration (ISO 7096:2020)*

EN ISO 7250-1:2017, *Basic human body measurements for technological design — Part 1: Body measurement definitions and landmarks (ISO 7250-1:2017)*

EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)*

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

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

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

EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN ISO 13854:2019, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017)*

⁵⁾ As impacted by EN ISO 5349-2:2001/A1:2015.

EN ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*

EN ISO 14118:2018, *Safety of machinery — Prevention of unexpected start-up (ISO 14118:2017)*

EN ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

EN ISO 14123-1:2015, *Safety of machinery — Reduction of risks to health resulting from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers (ISO 14123-1:2015)*

EN ISO 19353:2019, *Safety of machinery — Fire prevention and fire protection (ISO 19353:2019)*

ISO 2631-1:1997,⁶⁾ *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 4301-1:2016, *Cranes — Classification — Part 1: General*

ISO 4301-2:2009, *Cranes — Classification — Part 2: Mobile cranes*

ISO 4305:2014,⁷⁾ *Mobile cranes — Determination of stability*

ISO 4309:2017, *Cranes — Wire ropes — Care and maintenance, inspection and discard*

ISO 4310:2009, *Cranes — Test code and procedures*

ISO 7000:2019, *Graphical symbols for use on equipment — Registered symbols*

ISO 7010:2019,⁸⁾ *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 7296-1:1991,⁹⁾ *Cranes — Graphic symbols — Part 1: General*

ISO 7296-2:2020, *Cranes — Graphic symbols — Part 2: Mobile cranes*

ISO 7752-2:2011, *Cranes — Control layout and characteristics — Part 2: Basic arrangement and requirements for mobile cranes*

ISO 8566-2:2016, *Cranes — Cabins and control stations — Part 2: Mobile cranes*

⁶⁾ As impacted by ISO 2631-1:1997/Amd 1:2010.

⁷⁾ As impacted by ISO 4305:2014/Amd 1:2016.

⁸⁾ As impacted by ISO 7010:2019/Amd 1:2020.

⁹⁾ As impacted by ISO 7296-1:1991/Amd 1:1996.

prEN 13000:2020 (E)

ISO 8686-2:2018, *Cranes — Design principles for loads and load combinations — Part 2: Mobile cranes*

ISO 10245-2:2014,¹⁰⁾ *Cranes — Limiting and indicating devices — Part 2: Mobile cranes*

ISO 11660-2:2015, *Cranes — Access, guards and restraints — Part 2: Mobile cranes*

ISO 11662-1:1995, *Mobile cranes— Experimental determination of crane performance — Part 1: Tipping loads and radii*

ISO 11662-2:2014, *Mobile cranes — Experimental determination of crane performance — Part 2: Structural competence under static loading*

ISO 12480-1:1997, *Cranes — Safe use — Part 1: General*

ISO 13200:1995, *Cranes — Safety signs and hazard pictorials — General principles*

ISO 16625:2013, *Cranes and hoists — Selection of wire ropes, drums and sheaves*

IEC 62745:2017, *Safety of machinery — Requirements for cableless control systems of machinery*

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¹⁰⁾ As impacted by ISO 10245-2:2014/Amd 1:2015.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

angle indicator

device to display the actual angle of parts of the crane

EXAMPLES Boom angle indicator, fixed fly jib angle indicator, luffing fly jib indicator and/or mast angle indicator

3.2

angle limiter

device to limit the motion of parts of the crane regarding their angles

EXAMPLES Boom angle limiter, fly jib angle limiter and/or mast angle limiter

3.3

boom length indicator

device to display the actual boom length

3.4

cabin

control station with protective enclosure

Note 1 to entry: See 3.6, 3.9 and 3.10.

3.5

configuration

combination of structural members, counterweights, support or outrigger position, hook block reeving and similar items assembled, positioned and erected according to manufacturer's instructions and ready for operation

3.6

control station

permanent position of controls on or off the crane

3.7

crane

machine for cyclic lifting or cyclic lifting and handling of loads suspended on hooks or other load handling devices, whether manufactured to an individual design, in series or from prefabricated components

Note 1 to entry: Suspended may include additional means fitted to prevent swinging, rotation of the load, etc.

3.8

crane level indicator

device to indicate the levelled position of the crane