SLOVENSKI STANDARD
SIST EN 13852-3:2021

01-junij-2021

Dvigala (žerjavi) - Dvigala na plavajočih objektih - 3. del: Lahka dvigala na plavajočih objektih

Cranes - Offshore cranes - Part 3: Light offshore cranes

Krane - Offshore-Krane - Teil 3: Offshore-Krane mit kleiner Kapazität

Appareils de levage à charge suspendue - Grues off-shore - Partie 3 : Grues off-shore légères (potence off-shore)

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ICS:

47.020.40	Dvigalna oprema in oprema za pretovor	Lifting and cargo handling equipment
53.020.20	Dvigala	Cranes

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EUROPEAN STANDARD

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Cranes - Offshore cranes - Part 3: Light offshore cranes

Appareils de levage à charge suspendue - Grues off-shore - Partie 3 : Grues off-shore légères (potence off-shore)

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This European Standard was approved by CEN on 8 February 2021.

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

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European foreword

This document (EN 13852-3:2021) 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of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.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 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 or ZB, which are integral parts of this document.

This document is one part of EN 13852. The parts are the following ones:

— *Part 1: General purpose offshore cranes*;

— *Part 2: Floating cranes*;

— *Part 3: Light offshore cranes*.

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.

Introduction

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

This document has been prepared to provide one means for light offshore 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 hazardous events are covered and are indicated in the scope of this document (see Clause 1).

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 document applies to light offshore cranes including their supporting pedestals and structures.

NOTE Supporting pedestal and structures such as columns and boom rests, are covered by this document to the extent where their main purpose is to support the crane.

This document is applicable to light offshore cranes, whose structures are made of steel, and fulfil all of the following characteristics:

— maximum rated capacity 15 tonnes or maximum static load moment 3 000 kNm;

— limitation for off-board lifting operation up to H_s = 2,0 m and wind speed 15 m/s (3 s gust);

— maximum number of working cycles class U_1 ($C \leq 3{,}15 \times 10^4$) according to EN 13001-1.

This document provides requirements for all significant hazards, hazardous situations and events relevant to light offshore cranes for lifting of goods and lifting of persons, when used as intended and under conditions foreseen by the risk assessment (see Clause 4).

This document is applicable to light offshore cranes, which are manufactured after the date of approval by CEN of this document.

This document is not applicable for:

a) transportation, assembly, disabling, scrapping, installation or erecting of the crane;

b) any item attached to the hook, such as loads, non-fixed load lifting attachments, lifting accessories, baskets, carriers and containers;

c) lifting operations in ambient temperatures below –20 °C;

d) lifting operations in ambient temperatures above 45 °C;

e) lifting operations involving more than one crane;

f) accidental loads as result of collisions, earthquakes, explosions, etc., which are not covered by exceptional loads defined in Table B.7;

g) emergency personnel rescue operations (except training);

h) subsea lifting operations;

i) general purpose offshore cranes (covered by EN 13852-1), floating cranes and motion compensated cranes.

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

EN 614-2:2000+A1:2008, *Safety of machinery — Ergonomic design principles — Part 2: Interactions between the design of machinery and work tasks*

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

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

EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

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 1127-1:2019, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 1837:2020, *Safety of machinery — Integral lighting of machines*

EN 10204:2004, *Metallic products — Types of inspection documents*

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

EN 12385-1:2002+A1:2008, *Steel wire ropes — Safety — Part 1: General requirements*

EN 12385-2:2002+A1:2008, *Steel wire ropes — Safety — Part 2: Definitions, designation and classification*

EN 12385-3:2020, *Steel wire ropes — Safety — Part 3: Information for use and maintenance*

EN 12385-4:2002+A1:2008, *Steel wire ropes — Safety — Part 4: Stranded ropes for general lifting applications*

EN 12464-2:2014, *Light and lighting — Lighting of work places — Part 2: Outdoor work places*

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

EN 12644-2:2000+A1:2008, *Cranes — Information for use and testing — Part 2: Marking*

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 structure*

EN 13001-3-2:2014, *Cranes — General design — Part 3-2: Limit states and proof of competence of wire ropes in reeving systems*

EN 13001-3-3:2014, *Cranes — General design — Part 3-3: Limit states and proof of competence of wheel/rail contacts*

EN 13001-3-4:2018, *Cranes — General design — Part 3-4: Limit states and proof of competence of machinery bearings*

EN 13001-3-5:2016, *Cranes — General design — Part 3-5: Limit states and proof of competence of forged hooks*

EN 13001-3-6:2018, *Cranes — General design — Part 3-6: Limit states and proof of competence of machinery — Hydraulic cylinders*

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

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

EN 13586:2020, *Cranes — Access*

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

EN 14502-1:2010, *Cranes — Equipment for the lifting of persons — Part 1: Suspended baskets*

EN IEC 60079-0:2018, *Explosive atmospheres — Part 0: Equipment — General requirements (IEC 60079-0:2017)*

EN 60079-1:2014,[1] *Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures "d" (IEC 60079-1:2014)*

EN 60079-2:2014, *Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure "p" (IEC 60079-2:2014)*

EN 60079-5:2015, *Explosive atmospheres — Part 5: Equipment protection by powder filling "q" (IEC 60079-5:2015)*

EN 60079-6:2015, *Explosive atmospheres — Part 6: Equipment protection by liquid immersion "o" (IEC 60079-6:2015)*

EN 60079-7:2015,[2] *Explosive atmospheres — Part 7: Equipment protection by increased safety "e" (IEC 60079-7:2015)*

EN 60079-11:2012, *Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i" (IEC 60079-11:2011)*

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[1] This document is impacted by EN 60079-1:2014/AC:2018-09.

[2] This document is impacted by EN 60079-7:2015/A1:2018.

EN 60079-14:2014, *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14:2013)*

EN 60079-18:2015,[3] *Explosive atmospheres — Part 18: Equipment protection by encapsulation "m" (IEC 60079-18:2014)*

EN 60079-25:2010,[4] *Explosive atmospheres — Part 25: Intrinsically safe electrical systems (IEC 60079-25:2010)*

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 IEC 61000-6-4:2019, *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments (IEC 61000-6-4:2018)*

EN ISO 898-1:2013, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread (ISO 898-1:2013)*

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 3834-1:2005, *Quality requirements for fusion welding of metallic materials — Part 1: Criteria for the selection of the appropriate level of quality requirements (ISO 3834-1:2005)*

EN ISO 3834-2:2005, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements (ISO 3834-2:2005)*

EN ISO 3834-3:2005, *Quality requirements for fusion welding of metallic materials — Part 3: Standard quality requirements (ISO 3834-3:2005)*

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 (ISO 4414:2010)*

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

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

[3] This document is impacted by EN 60079-18:2010/A1:2017 and EN 60079-18:2010/AC:2018-09.

[4] This document is impacted by EN 60079-25:2010/AC:2013.

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

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

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

EN ISO 15614-1:2017, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2017, Corrected version 2017-10-01)*

EN ISO 15614-11:2002, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 11: Electron and laser beam welding (ISO 15614-11:2002)*

EN ISO 15614-12:2014, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 12: Spot, seam and projection welding (ISO 15614-12:2014)*

EN ISO 15614-13:2012, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 13: Upset (resistance butt) and flash welding (ISO 15614-13:2012)*

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

EN ISO 80079-36:2016, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements (ISO 80079-36:2016)*

EN ISO 80079-37:2016, *Explosive atmospheres — Part 37: Non-electrical equipment for explosive atmospheres — Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k" (ISO 80079-37:2016)*

EN 60529:1991,[5] *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

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)*

[5] As impacted by EN60529:1991/AC:2006-12, EN60529:1991/A1:2000, EN60529:1991/A2:2013 and EN60529:1991/A2:2013/AC:2019-02.

EN 61310-3:2008, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators (IEC 61310-3:2007)*

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

ISO 3864-2:2016, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*

ISO 3864-3:2012, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

ISO 5817:2014, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

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

ISO 9927-1:2013, *Cranes — Inspections — Part 1: General*

ISO 12478-1:1997, *Cranes — Maintenance manual — Part 1: General*

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

ISO 12482:2014, *Cranes — Monitoring for crane design working period*

EN ISO 12944-1:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 1: General introduction (ISO 12944-1:2017)*

EN ISO 12944-2:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments (ISO 12944-2:2017)*

EN ISO 12944-3:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 3: Design considerations (ISO 12944-3:2017)*

EN ISO 12944-4:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 4: Types of surface and surface preparation (ISO 12944-4:2017)*

EN ISO 12944-5:2019, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems (ISO 12944-5:2019)*

EN ISO 12944-6:2018, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 6: Laboratory performance test methods (ISO 12944-6:2018)*

EN ISO 12944-7:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 7: Execution and supervision of paint work (ISO 12944-7:2017)*

EN ISO 12944-8:2017, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 8: Development of specifications for new work and maintenance (ISO 12944-8:2017)*

EN ISO 12944-9:2018, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures (ISO 12944-9:2018)*

ISO 17635:2016, *Non-destructive testing of welds — General rules for metallic materials*

ISO 20332:2016, *Cranes — Proof of competence of steel structures*

ISO 23815-1:2007, *Cranes —Maintenance — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions in EN ISO 12100 and the following apply.

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

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

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

3.1
actual hook load
total static weight of the load including any equipment placed between the load and the hook

3.2
automatic overload protection system
AOPS
system that automatically safeguards and protects the crane during overload in off-board lifts by allowing the hook to be pulled away from the crane, without causing significant damage to the crane

3.3
component
single part or assembly of parts of a crane, which is subjected to load effects

Note 1 to entry: Examples of components are wire ropes, pendant bars, rope sheaves, axles, gears, couplings, brakes, hoists, hydraulic cylinders, shafts, shackles, swivels and pins.

3.4
primary component
component (usually in the main load path) which is essential for the mechanical and structural integrity of the crane

Note 1 to entry: Examples of primary components are boom section, slewing bearing, hoist rope and hook.

3.5
secondary component
component that is not a primary component

Note 1 to entry: Examples of secondary components are walkways and their supports.

3.6
crane stiffness
value representing the rigidity of the crane in terms of a vertical force applied at the hook divided by the resulting vertical deflection at the hook

3.7
dynamic coefficient
Φ_{2n}
ratio between the maximum dynamic load at the hook and the actual hook load for any given configuration or operating condition

3.8
emergency operation system
EOS
back-up system for limited operation of the crane, if the normal system of operation is out-of-service

3.9
folding
motion to fold or unfold a knuckle boom assembly

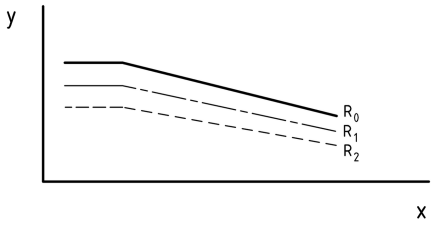
3.10
light offshore crane
smaller, low class working cycle, offshore crane for sporadic use and long inactive periods without attendance or maintenance

3.11
hazardous area
area in which an explosive gas atmosphere is present or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of the equipment

3.12
hoisting
moving the hook in vertical direction

3.13
load chart
diagram or table showing the rated capacity relative to the radius, configuration, environmental conditions, out of plane influences and type of operation

Note 1 to entry: An example is given in Figure 1 showing rated capacity for off-board lifts to and from the deck of supply vessels.



Key

X	radius
Y	rated capacity
R_0	rated capacity for on-board lifts
R_1	rated capacity for off-board lifts in significant wave height H_s = 1 m
R_2	rated capacity for off-board lifts in significant wave height H_s = 2 m

Figure 1 — Load chart