

April 2021

ICS 47.020.40; 53.020.20

Will supersede EN 13852-1:2013

English Version

Cranes - Offshore cranes - Part 1: General-purpose offshore cranes

Appareils de levage à charge suspendue - Grues off-shore - Partie 1 : Grues off-shore pour usage général

Krane - Offshore-Krane - Teil 1: Offshore-Krane für allgemeine Verwendung

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.

CEN members are the national standards bodies of 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 United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents		Page
European foreword.....		8
Introduction		9
1	Scope	10
2	Normative references.....	10
3	Terms and definitions	15
4	List of significant hazards	20
5	Safety requirements and/or protective measures	27
5.1	General.....	27
5.1.1	Design	27
5.1.2	Exchange of information.....	27
5.1.3	Offshore marine environment.....	28
5.1.4	Fitness for purpose.....	28
5.1.5	Power supply	28
5.1.6	Hazardous area	29
5.1.7	High risk application.....	29
5.1.8	Security of automation and control systems.....	29
5.1.9	Environmental footprint	30
5.1.10	Safety functions.....	30
5.2	Strength, stability and fatigue	32
5.2.1	General principles and requirements.....	32
5.2.2	Service classification.....	32
5.2.3	Loads and load combinations	33
5.2.4	Limit states and proof of competence.....	34
5.2.5	Failure mode analysis.....	35
5.2.6	Load charts	35
5.2.7	Material selection.....	35
5.3	Control system	36
5.3.1	General.....	36
5.3.2	Start and stop functions.....	36
5.3.3	Prevention of unexpected start-up.....	37
5.3.4	Mode selector	37
5.3.5	Main motion controls.....	38
5.3.6	Remote controls (optional)	38
5.3.7	Minimum hook velocities.....	38
5.3.8	Response time	38
5.3.9	Control instrumentation.....	39
5.3.10	Location of consoles.....	39
5.3.11	Motion compensation	39
5.3.12	Crane assistant functions	39
5.4	Electrical equipment.....	39
5.4.1	General.....	39
5.4.2	Isolation of incoming supplies	40
5.4.3	Interface connections	40
5.4.4	Enclosures.....	40
5.4.5	Ingress protection.....	40
5.4.6	Cables.....	41

5.4.7	Protective earthing	41
5.4.8	Protection by automatic disconnection of supply	41
5.4.9	Protection against electric shock by direct contact	41
5.4.10	Hazardous areas	41
5.4.11	Electromagnetic compatibility	41
5.5	Mechanical equipment	41
5.5.1	General	41
5.5.2	Bearings	42
5.5.3	Couplings, splines and gears.....	42
5.5.4	Brakes	42
5.5.5	Hoist and luffing wire rope drives.....	42
5.5.6	Drums for wire ropes	42
5.5.7	Wire ropes.....	43
5.5.8	Wire rope terminations.....	43
5.5.9	Wire rope sheaves.....	43
5.5.10	Wear protectors	44
5.5.11	Slewing drives.....	44
5.5.12	Travelling drives.....	44
5.5.13	Telescopic drives	44
5.5.14	Folding and cylinder luffing drives	44
5.5.15	Fixed load lifting attachments	45
5.5.16	Bolt assemblies.....	46
5.5.17	Double means of securing	46
5.6	Fluid power systems.....	46
5.6.1	General	46
5.6.2	Hydraulic systems	46
5.6.3	Hydraulic reservoirs	46
5.6.4	Hydraulic cylinders.....	47
5.6.5	Load holding devices	47
5.6.6	Accumulators	47
5.6.7	Hoses, tubes and fittings	47
5.6.8	Sink rate for boom systems.....	48
5.6.9	Pneumatic systems.....	48
5.7	Safeguarding.....	48
5.7.1	General	48
5.7.2	External acoustic warning device.....	48
5.7.3	Control system indicator.....	48
5.7.4	Wind indicator	48
5.7.5	Hoist drum motion indicator.....	49
5.7.6	Rated capacity indicator (RCI).....	49
5.7.7	Motion limiters	49
5.7.8	Rated capacity limiter (RCL).....	50
5.7.9	Slack wire rope detection	50
5.7.10	Boom backstop	50
5.7.11	Motion detection system (MDS)	50
5.7.12	Automatic Overload Protection System (AOPS)	51
5.7.13	Manual Overload Protection System (MOPS)	54
5.7.14	Lateral boom protection system (LBPS)	55
5.7.15	Emergency operation system (EOS).....	55
5.7.16	Emergency load lowering (ELL)	57
5.7.17	Emergency stop	57
5.7.18	Fire prevention and fire protection.....	57
5.8	Installation interface.....	58

5.8.1	General.....	58
5.8.2	Pedestal and pedestal adaptor.....	58
5.8.3	Boom rest.....	58
5.8.4	Access.....	58
5.8.5	Laydown areas and blind zones.....	58
5.8.6	Crane restriction charts.....	58
5.8.7	Dropped object protection.....	59
5.8.8	Lighting.....	59
5.8.9	Power connections.....	59
5.8.10	Uninterrupted Power Supply (UPS).....	59
5.8.11	Signal and communication connections.....	59
5.8.12	Ignition source control.....	59
5.8.13	Emergency shut down (ESD).....	60
5.9	User interface.....	60
5.9.1	General.....	60
5.9.2	Ergonomy.....	60
5.9.3	Access and escape.....	60
5.9.4	Control station.....	60
5.9.5	Remote console.....	63
5.9.6	Communications.....	63
5.9.7	Machinery and drive rooms.....	63
5.9.8	Enclosed spaces.....	63
5.9.9	Lighting.....	64
5.9.10	Noise reduction at source by design.....	64
5.9.11	Noise reduction by information.....	64
5.9.12	Vibrations.....	64
5.9.13	Guards and falling hazards.....	65
5.9.14	Edges, angles and surfaces.....	65
5.9.15	Hot surfaces.....	65
5.9.16	Hazardous substances.....	66
5.9.17	Arrangements for stowing and maintenance.....	66
5.9.18	Component and equipment identification.....	66
5.9.19	Dropped objects.....	67
5.9.20	Warnings.....	67
5.9.21	Data recorder.....	67
5.9.22	Software access.....	68
5.10	Fabrication.....	68
5.10.1	General.....	68
5.10.2	Component traceability.....	69
5.10.3	Quality assurance.....	69
5.10.4	Material certification.....	69
5.10.5	Welding.....	69
5.10.6	Bolted connections.....	69
5.10.7	Corrosion protection.....	69
5.11	Lifting of persons.....	70
5.11.1	General.....	70
5.11.2	Rated capacity.....	70
5.11.3	Control system.....	70
5.11.4	Mode selector for lifting of persons.....	70
5.11.5	Back-up brake.....	71
5.11.6	Back-up motion limiters.....	71
5.11.7	Cylinders.....	71
5.11.8	Reeving systems for luffing.....	71

6	Verification of the safety requirements and/or protective measures	72
6.1	General	72
6.1.1	Verification	72
6.1.2	Documentation	72
6.1.3	Verification methods.....	72
6.2	Testing.....	77
6.2.1	General	77
6.2.2	Function test.....	77
6.2.3	Load test.....	77
6.2.4	Load test points	78
6.2.5	Noise emission tests	78
6.2.6	Test acceptance criteria	80
7	Information for use.....	80
7.1	General	80
7.1.1	Provisions of an instruction for use.....	80
7.1.2	Installation.....	80
7.1.3	Additional information.....	81
7.2	Operation.....	81
7.2.1	General	81
7.2.2	Checks before starting operation	82
7.2.3	Checks during operation.....	83
7.2.4	Crane out of service	83
7.2.5	Lifting of persons (if part of the intended use).....	83
7.3	Maintenance	85
7.3.1	General	85
7.3.2	Inspections.....	85
7.3.3	Enhanced inspection and maintenance.....	86
7.4	Marking.....	86
7.4.1	Manufacturer's plate	86
7.4.2	Rated capacity information.....	86
7.4.3	Components.....	86
Annex A	(informative) Selection of a suitable set of crane standards for a given application	87
Annex B	(normative) Determination of factors.....	89
B.1	Calculation of the dynamic factor Φ_{2n} by the simplified method	89
B.2	Motion response analysis	91
B.3	Offlead and sidelead	91
B.4	Hook velocity.....	92
B.4.1	Hoisting velocity	92
B.4.2	Horizontal hook velocity.....	92
B.5	Load combinations.....	93
Annex C	(normative) Environmental influences.....	98
C.1	General	98
C.2	Atmosphere	98
C.3	Temperature	98
C.4	Wind	99

C.4.1	Wind velocities.....	99
C.5	Installation motions.....	99
C.5.1	Inclination.....	99
C.5.2	Accelerations.....	99
C.5.3	Mean accelerations.....	100
C.5.4	Ice and snow loads.....	100
Annex D (normative)	Failure mode analysis.....	102
D.1	General.....	102
D.2	Failure mode charts.....	102
Annex E (normative)	Control station information.....	103
E.1	General.....	103
E.2	Primary information for control station.....	103
E.3	Remote control (on-board lift).....	104
E.4	Additional information for control station.....	105
Annex F (normative)	Requirements for brakes.....	106
Annex G (normative)	Ranking of means of safeguarding.....	108
Annex H (normative)	Safety functions and required performance levels.....	109
H.1	Required performance levels.....	109
Annex I (informative)	Typical general-purpose offshore cranes and terminology.....	111
Annex J (normative)	Excursion envelopes.....	115
Annex K (normative)	Noise test code (deleted).....	116
Annex L (normative)	Equipment for use in a hazardous area.....	117
L.1	General.....	117
L.2	Avoidance or reduction of ignition sources.....	117
L.3	Electrical equipment.....	117
L.4	Non-electrical equipment.....	117
L.5	Electrostatic discharge.....	118
Annex M (informative)	Offshore crane data sheet.....	119
Annex N (informative)	Crane assistant functions.....	127
N.1	General.....	127
N.2	Levels of automation.....	127
N.3	Examples of crane assisting functions.....	127
N.3.1	Deck motion detection.....	127
N.3.2	Hook position detection.....	127
N.3.3	Lift-off and landing assistant.....	128
N.3.4	Anti-swing assistant.....	128

N.3.5	People detection	128
N.3.6	Handsfree slinging	128
N.3.7	Collision preventer	128
N.3.8	Remote/automated inspection, test and diagnostics.....	128
Annex ZA	(informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered.....	129
Annex ZB	(informative) Relationship between this European Standard and the Essential requirements of EU Directive 2014/34/EU	133
Bibliography	138

European foreword

This document (prEN 13852-1:2021) 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 supersedes EN 13852-1:2013.

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* (the present document);
- *Part 2: Floating cranes*;
- *Part 3: Light offshore cranes*.

This document is a full revision of EN 13852-1:2013.

Introduction

This document is a type C standard as defined in EN ISO 12100:2010.

This document has been prepared to provide one means for general purpose 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 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.