



SLOVENSKI STANDARD
oSIST prEN 13852-1:2011
01-julij-2011

Žerjavi - Žerjavi na plavajočih objektih - 1. del: Žerjavi na plavajočih objektih za splošne namene

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

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

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

Ta slovenski standard je istoveten z: prEN 13852-1

ICS:

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

oSIST prEN 13852-1:2011

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 13852-1

March 2011

ICS 47.020.40; 53.020.20

Will supersede EN 13852-1:2004

English Version

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

Appareils de levage à charge suspendue - Grues offshore -
Partie 1: Grues offshore 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland 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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	5
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	11
4 List of significant hazards	15
5 Safety requirements and/or protective measures	19
5.1 General.....	19
5.2 Strength and stability	19
5.2.1 Selection of classification parameters	19
5.2.2 In-service loads.....	19
5.2.3 Out of service loads	21
5.2.4 Failure mode analysis	21
5.2.5 Seismic loads	21
5.2.6 Load combinations	21
5.2.7 Load charts.....	21
5.2.8 Materials	21
5.3 Equipment and components	21
5.3.1 Electrotechnical equipment.....	21
5.3.2 Non-electrotechnical equipment.....	22
5.3.3 Power requirements	22
5.3.4 Slewing drives.....	22
5.3.5 Slewing bearings	22
5.3.6 Slewing bearing fasteners	23
5.3.7 Winches and brakes	23
5.3.8 Wire rope termination.....	23
5.3.9 Wire rope fastening to the drum	23
5.3.10 Wire ropes	24
5.3.11 Blocks and hooks	24
5.3.12 Hydraulic cylinders.....	25
5.3.13 Constant tension systems/motion compensators/shock absorbers	25
5.4 Drive systems.....	25
5.4.1 Electromagnetic compatibility.....	25
5.4.2 Pneumatic systems	25
5.4.3 Hydraulic systems	25
5.4.4 Electrical systems.....	26
5.5 Control station	26
5.5.1 General.....	26
5.5.2 Control cabin.....	26
5.5.3 Windows	26
5.5.4 Crane operator's seat.....	27
5.5.5 Cabin interior.....	27
5.5.6 Cabin instrumentation.....	27
5.5.7 Communications.....	27
5.5.8 Machinery house and other enclosed spaces	27
5.6 Noise reduction.....	27
5.6.1 Noise reduction at source by design.....	27
5.6.2 Noise reduction by information.....	27
5.7 Access, guards etc.	28

5.7.1	Access	28
5.7.2	Guards	28
5.7.3	Hazardous substances	28
5.7.4	Dropped objects	28
5.7.5	Lifting arrangements for maintenance	28
5.8	Controls, indicators and limiting devices	28
5.8.1	General	28
5.8.2	Controls	29
5.8.3	Indicators	29
5.8.4	Limiting devices	31
5.9	Protection systems	32
5.9.1	Overload and over-moment protection	32
5.9.2	Emergency operation system	35
5.9.3	Emergency stop	37
5.9.4	Fire protection	37
5.9.5	Protective earthing	38
5.9.6	Lighting	38
5.10	Lifting of personnel	38
5.10.1	General	38
5.10.2	Rated capacity	38
5.10.3	Secondary brake	38
5.10.4	Cylinders	39
5.10.5	Mode selection for personnel lifting	39
5.10.6	Secondary motion limiters	39
6	Verification of the safety requirements and/or protective measures	39
6.1	General	39
6.2	Testing	42
6.2.1	General	42
6.2.2	Function test	43
6.2.3	Installation test	43
6.2.4	Test acceptance criteria	44
6.2.5	Test load	44
7	Information for use	44
7.1	Documentation	44
7.2	Operation	45
7.2.1	General	45
7.2.2	Checks before starting operation	45
7.2.3	Checks during operation	46
7.2.4	Crane out of service	46
7.2.5	Lifting of personnel (if part of the intended use)	46
7.3	Maintenance	47
7.3.1	Inspections	48
7.4	Marking	48
7.4.1	Manufacturer's plate	48
7.4.2	Rated capacity information	48
7.4.3	Components	48
Annex A (informative) Selection of a suitable set of crane standards for a given application		49
Annex B (normative) Determination of factors		50
Annex C (normative) Environmental influences		57
Annex D (normative) Failure mode analysis		60
Annex E (normative) Material selection		62
Annex F (normative) Control station instrumentation		67
Annex G (normative) Wire rope safety factors		68
Annex H (normative) Slewing bearings		70

prEN 13852-1:2011 (E)

Annex I (normative) Requirements for brakes	71
Annex J (normative) Ranking of safety systems	72
Annex K (normative) Required performance levels (PLr) for SRP/CS according to EN ISO 13849-1:2008	73
Annex L (informative) Typical general-purpose offshore cranes and terminology	74
Annex M (normative) Design excursion envelopes	79
Annex N (normative) Noise test code	80
Annex O (normative) Equipment for use in a hazardous area	89
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	90

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13852-1:2013](https://standards.iteh.ai/catalog/standards/sist/34e9013a-b814-4ec5-b574-99af74f7ea46/sist-en-13852-1-2013)

<https://standards.iteh.ai/catalog/standards/sist/34e9013a-b814-4ec5-b574-99af74f7ea46/sist-en-13852-1-2013>

Foreword

This document (prEN 13852-1:2011) 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 13852-1:2004.

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13852-1:2013

<https://standards.iteh.ai/catalog/standards/sist/34e9013a-b814-4ec5-b574-99af74f7ea46/sist-en-13852-1-2013>

Introduction

This European Standard has been prepared to be a harmonised standard to provide one means for general-purpose offshore cranes to conform to the essential health and safety requirements of the Machinery Directive, as mentioned in Annex ZA.

Absolute safety of cranes cannot be ensured by design alone, as their operation depends on the skill of operators, maintenance personnel and inspectors as well as on the numerous technical parameters relating to the crane and its operating environment, which can have large scatter.

As many of the hazards related to general-purpose offshore cranes relate to their operating environment and use, it is assumed in the preparation of this European Standard that all the relevant information relating to the use and operating environment of the crane has been exchanged between the manufacturer and user (as recommended in ISO 9374-1:1989 and ISO 9374-4:1998) covering such issues as, for example:

- clearances;
- requirements concerning protection against hazardous environments;
- processed materials, such as potentially flammable or explosive material (e.g. hydrocarbons, powder type materials, etc).

This European Standard is a type C standard as stated in EN ISO 12100-1:2001.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered and 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 machines that have been designed and built according to the provisions of this type C standard.

This standard is one part of EN 13852. The other part is:

Part 2: Floating Cranes

Note 1: A floating crane is a crane mounted on a vessel or barge designed for its support and transport, primarily intended for construction/deconstruction operations in a marine environment .

Note 2: EN 13852-2 is not a harmonized standard.

1 Scope

This European Standard specifies the requirements for general-purpose offshore cranes including their supporting pedestals or structures.

The standard is not applicable to general - purpose offshore cranes covered by the scope of this standard which are manufactured before the date of its publication as EN.

This European Standard does not cover use of - or hazards relating to use of the following:

- a) fabrication, transportation, assembly, dismantling, disabling, scrapping or changing the configuration of the crane;
- b) lifting accessories, i.e. any item between the hook and the load;
- c) design temperature below -40 °C;
- d) operations at an ambient temperature above 40 °C;
- e) lifting operations involving more than one crane;
- f) accidental loads due to collisions;
- g) hand powered cranes and other cranes with a rated capacity less than 2 t or outreach less than 8 m;
- h) rescue operations;
- i) subsea lifting operations.

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

This standard includes requirements for the lifting of personnel by a general – purpose offshore crane.

2 Normative references

The following referenced documents are indispensable for the application 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 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 894-3:2000 + A1:2008 Safety of machinery – Ergonomic requirements for the design of displays and control actuators – Part 3: Control actuators

EN 953:1997 Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards

EN 982:1996 + A1: 2008 Safety of machinery – Safety requirements for fluid power systems and their components – Hydraulics

EN 983:1996 + A1: 2008 Safety of machinery – Safety requirements for fluid power systems and their components – Pneumatics

prEN 13852-1:2011 (E)

- EN 1993-1-1:2005 Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings
- EN 1005-3:2002 + A1:2008 Safety of machinery – Human physical performance – Part 3: Recommended force limits for machinery operation
- EN 1127-1:2007 Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology
- EN 10025-1: 2004 Hot rolled products of structural steels - Part 1: General technical delivery conditions
- EN 10025-2:2004 Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels
- EN 10025-3:2004 Hot rolled products of structural steels - Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels
- EN 10025-4:2004 Hot rolled products of structural steels - Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels
- EN 10025-5:2004 Hot rolled products of structural steels - Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance
- EN 10025-6:2004 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 10083-2:2006 Steels for quenching and tempering - Part 2: Technical delivery conditions for non alloy steels
- 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 12385-3:2004 A1:2008 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 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 13001-1:2004 / AC: 2008 Cranes - General design - Part 1: General principles and requirements
- EN 13001-2:2004 / A2: 2009 Cranes - General design - Part 2: Load actions
- EN 13135-1:2003/AC: 2006 Cranes - Safety - Design - Requirements for equipment - Part 1: Electrotechnical equipment – (Corrigendum AC: 2006 incorporated)
- EN 13135-2:2004 / AC: 2005 Cranes - Equipment - Part 2: Non-electrotechnical equipment
- EN 13411-3:2004 +A1:2008 Terminations for steel wire ropes - Safety - Part 3: Ferrules and ferrule-securing

- EN 13411-4:2002 +A1:2008 *Terminations for steel wire ropes – Safety – Part 4: Metal and resin socketing*
- EN 13411-6:2004 + A1:2008 *Terminations for steel wire ropes – Safety – Part 6: Asymmetric wedge socket*
- EN 13411-7:2006 + A1:2008 *Terminations for steel wire ropes – Safety – Part 7: Symmetric wedge socket*
- EN 13463-1:2001/ AC: 2002 *Non-electrical equipment for potentially explosive atmospheres - Part 1: Basic method and requirements – (Corrigendum AC: 2002 incorporated)*
- EN 13557:2003 + A1:2008 *Cranes – Controls and control stations*
- EN 13586:2004 + A1:2008 *Cranes – Access*
- EN 14502-1:2005 *Cranes – Equipment for the lifting of persons – Part 1: Suspended baskets*
- EN 50015:1998 *Electrical apparatus for potentially explosive atmospheres - Oil immersion "o"*
- EN 50017:1998 *Electrical apparatus for potentially explosive atmospheres – Powder filling «q»*
- EN 60079-0:2004 *Electrical apparatus for explosive gas atmospheres - Part 0: General requirements*
- EN 60079-1:2007 *Explosive atmospheres -- Part 1: Equipment protection by flameproof enclosures "d"*
- EN 60079-2:2004 *Electrical apparatus for explosive gas atmospheres -- Part 2: Pressurized enclosures "p"*
- EN 60079-7:2003 *Electrical apparatus for explosive gas atmospheres -- Part 7: Increased safety "e"*
- EN 60079-11:2007 *Explosive atmospheres -- Part 11: Equipment protection by intrinsic safety "i"*
- EN 60079-14:2008 *Explosive atmospheres -- Part 14: Electrical installations design, selection and erection*
- EN 60079-15:2005 *Electrical apparatus for explosive gas atmospheres -- Part 15: Construction, test and marking of type of protection "n" electrical apparatus*
- EN 60079-18:2004 *Electrical apparatus for explosive gas atmospheres -- Part 18: Construction, test and marking of type of protection encapsulation "m" electrical apparatus*
- EN 60079-25:2004 *Electrical apparatus for explosive gas atmospheres -- Part 25: Intrinsically safe systems*
- EN 60204-32:2008 *Safety of machinery - Electrical equipment of machines -- Part 32: Requirements for hoisting machines*
- IEC 60529:2001 *Degrees of protection provided by enclosures (IP Code)*
- IEC 61000-6-2:2005 *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*
- EN 61000-6-4:2006 *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments*
- EN 61310-1:2008 *Safety of machinery – Indication, marking and actuation – Part 1: Requirements for visual, acoustic and tactile signals*
- EN 61310-2:2007 *Safety of machinery – Indication, marking and actuation – Part 2: Requirements for marking*

prEN 13852-1:2011 (E)

EN 61310-3:2007 Safety of machinery – Indication, marking and actuation – Part 3: Requirements for location and operation of actuators

EN ISO 898-1:1999 Mechanical properties of fasteners made of carbon steel and alloy – Part 1: Bolts, screws and studs (ISO 899-1:1999)

EN ISO 3744:1995 Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane

EN ISO 4871:1996 Acoustics – Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)

EN ISO 7731:2005 Ergonomics – Danger signals for public and work areas - Auditory danger signals

EN ISO 11201:1995/AC: 1997 Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at a work station and at other specified positions - Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)

EN ISO 11688-1:1998 Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning (ISO/TR 11688-1:1995)

EN ISO 11688-2:2000 Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 2: Introduction to the physics of low-noise design (ISO/TR 11688-2:1998)

EN ISO 12100-1:2003 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1:2003)

EN ISO 12100-2:2003 Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)

EN ISO 13850:2008 Safety of machinery - Emergency stop - Principles for design (ISO 13850:2006)

EN ISO 14121-1:2007 Safety of machinery – Risk assessment – Part 1: Principles

ISO 8566-1:1992 Cranes – Cabins – Part 1: General

ISO 9374-1:1989 Cranes -- Information to be provided -- Part 1: General

ISO 9374-4:1998 Cranes -- Information to be provided -- Part 4: Jib cranes

ISO 9927-1:2009 Cranes – Inspections – Part 1: General

ISO 12478-1:2008 Cranes – Maintenance manual – Part 1: General

ISO 12480-1:1997 Cranes – Safe use – Part 1: General

ISO 12482-1:2008 Cranes – Condition monitoring – Part 1: General

ISO 13849-1:2008 Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2006)

CEN/TS 13001-3-1:2004 Cranes - General design - Part 3-1: Limit states and proof of competence of steel structures

CEN/TS 13001-3-2:2004 Cranes - General design - Part 3-2: Limit states and proof of competence of wire ropes in reeving systems

prCEN/TS 13001-3-5 *Cranes – General design – Part 3-5:Limit states and proof of competence of forged hooks*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003 and the following apply. Additional terms and definitions specifically addressed in this document are added below.

NOTE Definitions are in alphabetical order for the English language version only.

3.1

automatic overload protection system (AOPS)

system that automatically safeguards and protects the crane against the effects of a gross overload during operation by allowing the hook to be pulled away from the crane in downwards direction within specified offlead and sidelead angles, without causing significant damage to the crane.

3.2

actual hook load

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

3.3

component

single part or assembly of parts of a crane, which is subjected to load effects (wire ropes, stationary or running, traverse beams, pendant bars, sheaves, axles, gears, couplings, brakes, hoists, hydraulic cylinders, shafts, shackles, swivels and pins etc.)

3.3.1

primary component

component which is essential for the mechanical and structural integrity of the crane, e.g. boom and a-frame lacing members

3.3.2

secondary component

any component that is not a primary component

3.4

crane stiffness

vertical static force applied at the hook required to produce unit vertical deflection assuming the pedestal support structure to be rigid

3.5

design load

maximum theoretical load ($R_0 \times \Phi_0$) that can be safely lifted by the crane at any given radius in the design condition such that the permissible stresses are not exceeded,

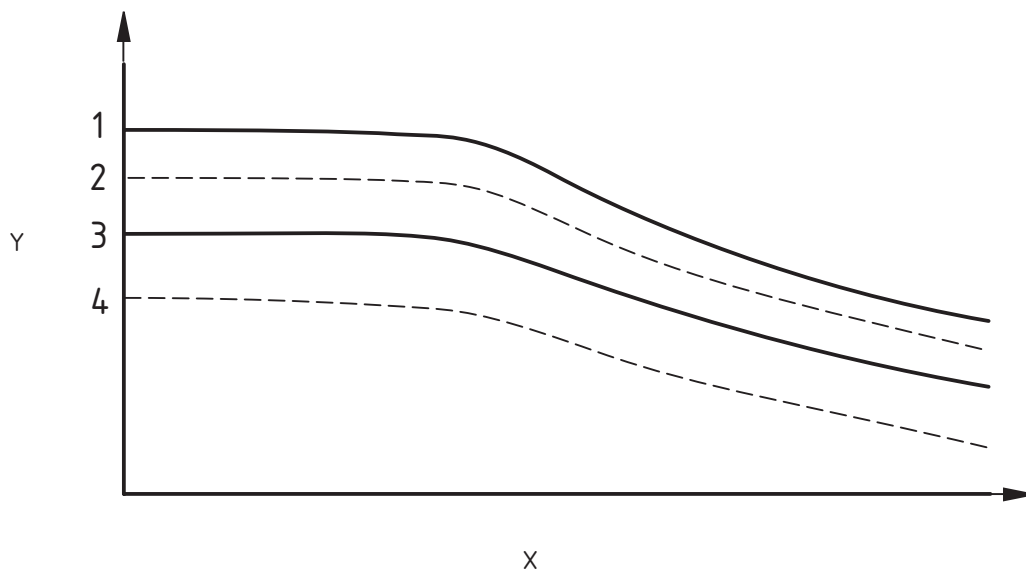
NOTE See Figure 1

3.6

design moment

maximum moment caused by the design load multiplied by radius

NOTE See Figure 1

**KEY**

X radius

Y load

1 design load $R_0 \times \Phi_0$ 2 operational load $R_n \times \Phi_n$ 3 internal lift R_0 <https://standards.iteh.ai/catalog/standards/sist/34e9013a-b814-4ec5-b574-99af74f7ea46/sist-en-13852-1-2013>4 offshore lift R_n iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13852-1:2013

Figure 1 — Design load and design moment

3.7 design temperature (T_d)
the lowest mean daily temperature. The design temperature is a reference temperature used as a criterion for the selection of materials.

3.8 dynamic coefficient (Φ_n)
ratio between the maximum dynamic load at the hook and the actual hook load for any given configuration or operating condition

3.9 emergency operation system (EOS)
a back-up system for limited operation of the crane, if the normal system of operation is inoperative

3.10 folding
motion from a mechanical system, which enable the knuckle boom assembly to be folded or unfolded

3.11**general-purpose offshore crane**

slewing crane mounted on an offshore installation, for which the duties include load handling to and from sea surface, supply vessels, barges or semi-submersibles

3.12**hazardous area**

area in which a potentially explosive atmosphere (gas and/or dust) can be present

3.13**hoisting**

motion from a mechanical system, which enable the hook to be hoisted and lowered

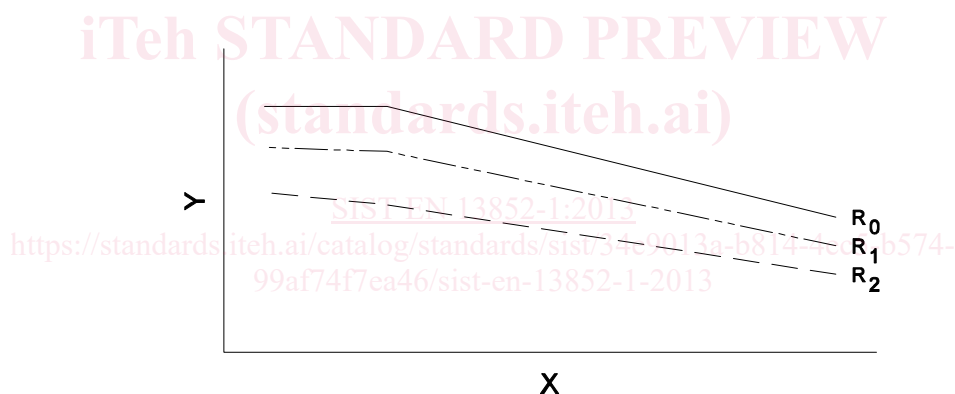
3.14**internal lift**

lifting from and to the unit on which the crane is mounted (onboard lift)

3.15**load chart**

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

NOTE An example is given in Figure 2 showing rated capacity for offshore lifts to and from the deck of supply vessels at 3 fall hoist reeving. Maximum 1° trim and 2° heel, maximum wind speed 25 m/s.

**KEY**

X radius

Y rated capacity

R_0 rated capacity for internal lifts

R_1 rated capacity for offshore lifts with wave height $H_{1/3} = 1$ m

R_2 rated capacity for offshore lifts with wave height $H_{1/3} = 2$ m

Figure 2 — Load chart

3.16**lowest mean daily temperature**

lowest value on the annual mean daily temperature curve for a specific area

3.17**luffing**

motion from a mechanical system which enable the boom to be raised or lowered