



SLOVENSKI STANDARD

oSIST prEN 13155:2011

01-november-2011

Žerjavi - Snemljiva dvigalna sredstva

Cranes - Non-fixed load lifting attachments

Krane - Sicherheit - Lose Lastaufnahmemittel

Appareils de levage à charge suspendue - Equipements amovibles de prise de charge

Ta slovenski standard je istoveten z: prEN 13155 rev

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53.020.30 Pribor za dvigalno opremo Accessories for lifting
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EUROPEAN STANDARD
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Cranes - Non-fixed load lifting attachments

Appareils de levage à charge suspendue - Equipements
amovibles de prise de charge

Krane - Sicherheit - Lose Lastaufnahmemittel

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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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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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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prEN 13155:2011 (E)

Foreword

This document (prEN 13155:2011) 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 13155:2003+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, see informative Annex ZA, which is an integral part of this document.

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Introduction

This European Standard has been prepared to be a harmonized standard to provide one means for non-fixed load lifting attachments used on cranes to conform with the essential health and safety requirements of the Machinery Directive, as amended.

This European Standard is a type C standard as stated in EN 1070.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this 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 non-fixed load lifting attachments which have been designed and built according to the provisions of this type C standard.

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1 Scope

This European Standard specifies safety requirements for the following non-fixed load lifting attachments for cranes, hoists and manually controlled load manipulating devices:

- plate clamps;
- vacuum lifters;
- self priming;
- non-self priming (pump, venturi, turbine);
- electric lifting magnets (battery fed and mains-fed);
- permanent lifting magnets;
- electro-permanent lifting magnets;
- lifting beams;
- C-hooks;
- lifting forks;
- clamps;
- elevators (manually or remotely operated);

defined in clause 3.

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NOTE: Elevators in this context are collar shaped clamps used in the offshore drilling industry to handle drill pipes and other tubular components.

This standard does not specify the additional requirements for:

- non fixed load lifting attachments in direct contact with foodstuffs or pharmaceuticals requiring a high level of cleanliness for hygiene reasons;
- hazards resulting from handling specific hazardous materials (e.g. explosives, hot molten masses, radiating materials);
- hazards caused by operation in an explosive atmosphere;
- hazards caused by noise;
- electrical hazards;
- hazards due to hydraulic and pneumatic components.

This standard does not cover the hazards related to mechanical strength of structural elements of attachments designed for more than 20 000 lifting cycles.

NOTE The coefficient of utilization specified in clause 5.1.1 ensures that no fatigue verification is needed for less than 20 000 cycles. This is in accordance with the well accepted calculation codes e.g. FEM 1001.

This standard does not cover attachments intended to lift above people.

This standard does not cover slings, ladles, expanding mandrels, buckets, grabs, or grab buckets.

The hazards covered by this European Standard are identified in clause 4.

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

This European Standard is applicable to non-fixed load lifting attachments which are manufactured after the date of approval by CEN of this standard.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 287-1, *Approval testing of welders for fusion welding — Part 1: Steels*

EN 349:1993, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 457, *Safety of machinery — Auditory danger signals — General requirements, design and testing*

EN 818-4, *Short link chain for lifting purposes — Safety — Part 4: Chain slings — Grade 8*

EN 818-5, *Short link chain for lifting purposes — Safety — Part 5: Chain slings — Grade 4*

EN 842, *Safety of machinery — Visual danger signals — General requirements, design and testing*

EN 981, *Safety of machinery - System of auditory and visual danger and information signals*

EN 1070: 1998, *Safety of machinery — Terminology*

EN 1492-1, *Textile slings — Safety — Part 1: Flat woven webbing slings, made of man-made fibres, for general purpose use*

EN 1492-2, *Textile slings — Safety — Part 2: Roundslings, made of man-made fibres, for general purpose use*

ENV 1993-1-1: 1992, *Eurocode 3: Design of steel structures — Part 1-1: General rules and rules for buildings*

EN 10025, *Hot-rolled products of non alloy structural steels — Technical delivery conditions*

EN 10045-1, *Metallic materials — Charpy impact test — Part 1: Test method*

EN 13414-1, *Steel wire rope slings — Safety — Part 1: Slings for general lifting service*

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

EN 25817, *Arc-welded joints in steel — Guidance on quality levels for imperfections (ISO 5817:1992)*

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 13535:2000, *Petroleum and natural gas industries - Drilling and production equipment - Hoisting equipment (ISO 13535:2000)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070:1998 and the following terms and definitions apply:

- 3.1**
adhesion force
force required to remove the load from a vacuum lifter
- 3.2**
building area
area where buildings, bridges, roads etc are being erected or renovated or demolished
NOTE In these areas the environment is permanently changing. Any risks are higher than in plants or warehouses.
- 3.3**
C-hook
equipment in the form of a 'C' used for lifting hollow loads e.g. coils, pipes



Figure 1 — Example of a C-hook
<https://standards.iteh.ai/catalog/standards/sist/d7dd7517-de2b-46de-8c27-411ed3c48b73/osist-pren-13155-2011>

- 3.4**
coefficient of utilisation
arithmetic ratio between the maximum load held by the lifting attachment and its working load limit
- 3.5**
clamp
equipment used to handle loads by clamping on a specific part of the load.

NOTE Clamps are also known as tongs. For definition of plate clamps see 3.12.

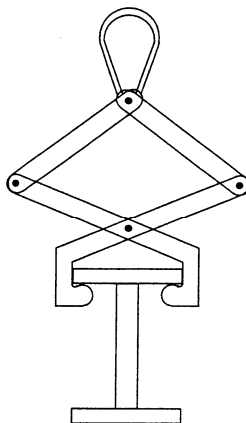


Figure 2 — Example of a clamp

3.6**individual verification**

verification carried out on every item produced

3.7**lifting beam**

equipment consisting of one or more members equipped with attachment points to facilitate the handling of loads which require support at several points

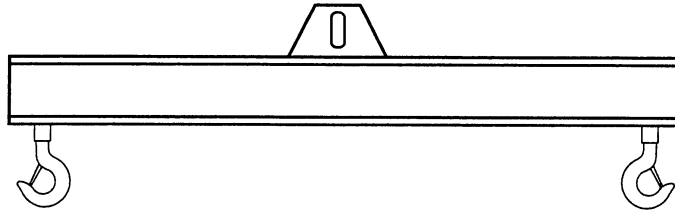


Figure 3 — Example of a lifting beam

3.8**lifting forks**

equipment consisting of two or more arms fixed to an upright with an upper arm, essentially to lift palletised or similar loads

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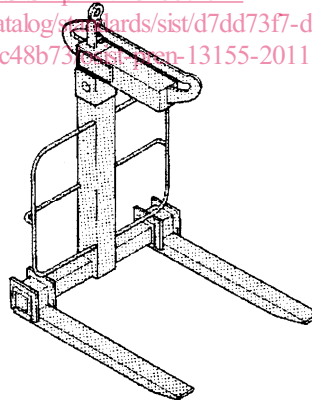


Figure 4 — Example of lifting forks

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3.9 lifting magnet

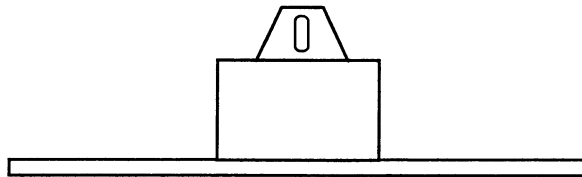


Figure 5 — Example of a lifting magnet

3.9.1 electric lifting magnet

equipment with a magnetic field generated by an electric current creating sufficient force for gripping, holding and handling loads with ferro-magnetic properties.

3.9.2 permanent lifting magnet

equipment with a permanent magnetic field which creates sufficient force for gripping, holding and handling loads with ferro-magnetic properties. The magnetic field is controlled by mechanical means

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3.9.3 electro-permanent lifting magnet

equipment with a permanent magnetic field which creates sufficient force for gripping, holding and handling loads with ferro-magnetic properties. The magnetic field is controlled by an electric current which is not required to sustain the magnetic field

NOTE Electro-permanent lifting magnets can be energized by the mains or by battery or stand-alone generator.

3.10 No-go area

area from which persons are excluded during normal operation

3.11 non-fixed load lifting attachment

lifting attachment which can be fitted directly or indirectly to the hook or any other coupling device of a crane, hoist or manually controlled manipulating device by the user without affecting the integrity of the crane, hoist or manually controlled manipulating device

3.12**plate clamps**

non powered equipment used to handle steel plates by clamping them between jaws.

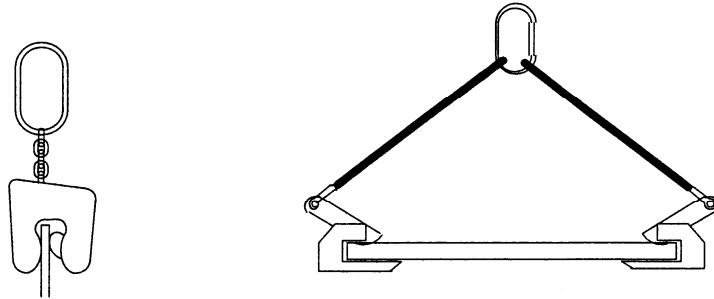


Figure 6 — Example of plate clamps

3.13**positive holding device**

device making a direct mechanical connection to the load and which does not rely solely on friction, suction or magnetic adhesion to the load

3.14**secondary positive holding device**

device to hold loads if the primary holding means fails and which does not rely on friction, suction or magnetic adhesion to the load

3.15**tear-off force**

force applied at a right angle to the plane of the magnet poles which is required to detach the load from the switched-on magnet

3.16**two-action control**

control which, in order to be operative, requires the performance of two separate actions with one or two hands, such as:

- a) operation of two separate hold-to-run controls;
- b) sequential operation of two movements of a control device;
- c) previous unlocking of the control with self-locking in the neutral position.

3.17**type verification**

verification carried out on one or more samples representative of a particular design and size of product before it is first placed on the market

NOTE Although the term "type verification" is normally associated with series produced equipment, for the purpose of this standard it also applies to single unit produced attachment.

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3.18

vacuum lifter (suction pad)

equipment which includes one or several suction pads operating by vacuum

3.18.1

self priming vacuum lifter

vacuum lifter using the load to create the vacuum

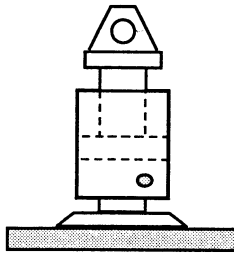


Figure 7 — Example of a self priming vacuum lifter

3.18.2

non self priming vacuum lifter

vacuum lifter using an external source of energy

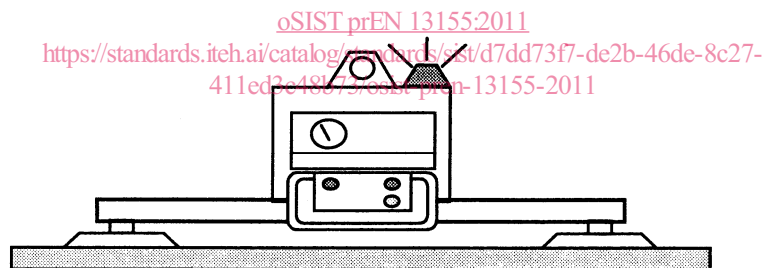


Figure 8 — Example of a non self priming vacuum lifter

3.19

working load limit

maximum load that the non-fixed load lifting attachment is designed to lift under the conditions specified by the manufacturer

3.20

Elevator

Clamp used in the offshore drilling industry to handle drill pipes and other tubular components.

NOTE: Elevators are hinged, circular or horseshoe shaped devices with suspension points (“handles” or “ears”) for handling of drill pipes and other tubular components (e.g. casings, conductors). An elevator is suspended from a “Derrick Drilling Machine” (DDM - often named “Top Drive”), below a hoisting machine, by use of elevator links (“bails”). Opening, closing, locking and unlocking of the elevator may be manually or remotely operated.

Elevators are distinguished by their opening mechanism and their load holding principle, as well as their size.

The different opening mechanisms are:

- Side door elevators:
 - The load bearing ring consists of a half circle (fixed part) with suspension points, and a hinged door with locking mechanism.
- Double door elevators:
 - The load bearing ring consists of a half circle (fixed part) with suspension points and two hinged doors with locking mechanism located centrally between the hinges.
- Center latch elevators:
 - The load bearing ring consists of two equal half circles with hinge and locking mechanism placed diametrically opposite from each other. A suspension point is placed on each half circle part.
- Horse shoe shaped elevators:
 - The load bearing sector is less than 360 degrees. Locking elements are provided to keep the tubular in place. Suspension points are placed on each side of the horse shoe.

The different load holding principles are: prEN 13155:2011

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- Collar type elevators: [411ed3c48b73/osist-pren-13155-2011](https://standards.iteh.ai/catalog/standards/sist/d7dd73f7-de2b-46de-8c27-411ed3c48b73/osist-pren-13155-2011)
 - Elevators closing around tubular components with larger diameter in the end. A shoulder on the elevator prevents the larger end of the tubular component passing through the elevator.
- 18° type elevators (“bottleneck elevators”):
 - Elevators with a tapered inside surface that matches tubular components with 18° tapered outside surface.
- Slip type elevators (“spider type elevators”):
 - Elevators with wedge shaped insert elements to hold tubular components with a smooth surface

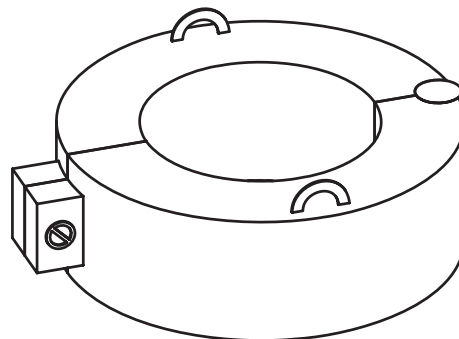


Figure 9 — Example of elevator