KRAANAD. OHUTUS. KINNITUSETA KOORMUSE TÕSTMISE VAHENDID

Crane - Safety - Non-fixed load lifting attachments

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13155:2020+A1:2025 sisaldab Euroopa standardi EN 13155:2020+A1:2025 ingliskeelset teksti.	This Estonian standard EVS-EN 13155:2020+A1:2025 consists of the English text of the European standard EN 13155:2020+A1:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 18.06.2025.	Date of Availability of the European standard is 18.06.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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European foreword

[A1] This document (EN 13155:2020+A1:2025) has been prepared by Technical Committee CEN/TC 147 “Cranes - Safety”, the secretariat of which is held by SFS.

This document supersedes EN 13155:2020.

The main modifications between EN 13155:2020 and EN 13155:2020+A1:2025 concern:

— there are two distinct verification methods, by calculation and test or by test only. The errors associated with each of these verification methods have been rectified;

— the verification by test only requires testing to the elastic condition, 2 × WLL without permanent deformation and yielded condition, 3 × WLL without releasing the load;

— the verification by calculation makes allowance for lower working coefficients for certain technically justified cases;

— load testing using a scaled load factor dependent on working load limit has been included to verify calculated mechanical strength.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document. [A1]

The main modifications between EN 13155:2003+A2:2009 and EN 13155:2020 concern:

— general requirement to introduce the reference to EN 13001-1 and –2 for the calculation;

— vacuum lifters;

— lifting magnet;

— the addition to the scope of lifting insert systems for lifting prefabricated concrete products;

— reduction of load changes from 20 000 to 16 000 in all clauses.

[A1] Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom. [A1]

Introduction

〈A1〉 This document 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 document is a type C standard as stated in EN ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards 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 non-fixed load lifting attachments which have been designed and built according to the provisions of this type C standard. 〈A1〉

1 Scope

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

a) plate clamps;

b) vacuum lifters:

   1) self-priming;

   2) non-self-priming (pump, venturi, turbine);

c) lifting magnets:

   1) electric lifting magnets (battery fed and mains-fed);

   2) permanent lifting magnets;

   3) electro-permanent lifting magnets;

d) lifting beams;

e) C-hooks;

f) lifting forks;

g) clamps;

h) lifting insert systems for use in normal weight concrete,

as defined in Clause 3.

This document does not give 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;

— hazards relating to the lifting of persons;

— electrical hazards;

— hazards due to hydraulic and pneumatic components.

For high risk applications not covered by this standard, ▌A1⟩ EN 13001-2:2021 ⟨A1▐, 4.3.2 gives guidance to deal with them.

This document covers the proof of static strength, the elastic stability and the proof of fatigue strength.

This document does not generally applies to attachments intended to lift above people. Some attachments are suitable for that purpose if equipped with additional safety features. In such cases the additional safety features are specified in the specific requirements.

This document does not cover slings, ladles, expanding mandrels, buckets, grabs, or grab buckets. This document does not cover power operated container handling spreaders, which are in the scope of EN 15056.

This document is not applicable to non-fixed load attachments manufactured before the date of its publication.

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.

〚A1〉 EN 206:2016+A2:2021, *Concrete — Specification, performance, production and conformity* 〈A1〛

EN 818-4:1996+A1:2008, *Short link chain for lifting purposes — Safety — Part 4: Chain slings — Grade 8*

EN 818-5:1999+A1:2008, *Short link chain for lifting purposes — Safety — Part 5: Chain slings — Grade 4*

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

EN 981:1996+A1:2008, *Safety of machinery — System of auditory and visual danger and information signals*

EN 1492-1:2000+A1:2008, *Textile slings — Safety — Part 1: Flat woven webbing slings made of man-made fibres for general purpose use*

EN 1492-2:2000+A1:2008, *Textile slings — Safety — Part 2: Roundslings made of man-made fibres for general purpose use*

EN 1492-4:2004+A1:2008, *Textile slings — Safety — Part 4: Lifting slings for general service made from natural and man-made fibre ropes*

EN 1677-1:2000+A1:2008, *Components for slings — Safety — Part 1: Forged steel components, Grade 8*

EN 1677-2:2000+A1:2008, *Components for slings — Safety — Part 2: Forged steel lifting hooks with latch, Grade 8*

EN 1677-3:2001+A1:2008, *Components for slings — Safety — Part 3: Forged steel self-locking hooks — Grade 8*

EN 1677-4:2000+A1:2008, *Components for slings — Safety — Part 4: Links, Grade 8*

EN 1677-5:2001+A1:2008, *Components for slings — Safety — Part 5: Forged steel lifting hooks with latch — Grade 4*

EN 1677-6:2001+A1:2008, *Components for slings — Safety — Part 6: Links - Grade 4*

EN 10029:2010, *Hot-rolled steel plates 3 mm thick or above — Tolerances on dimensions and shape*

EN 10034:1993, *Structural steel I and H sections — Tolerances on shape and dimensions*

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

EN 13001-1:2015, *Cranes — General design — Part 1: General principles and requirements*

[A1] EN 13001-2:2021, *Cranes safety — General design — Part 2: Load actions* [A1]

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

[A1] EN 13369:2023, *Common rules for precast concrete products* [A1]

EN 13414-1:2003+A2:2008, *Steel wire rope slings — Safety — Part 1: Slings for general lifting service*

[A1] EN 13557:2024, *Cranes — Control devices and control stations* [A1]

[A1] EN 13889:2003+A1:2008, *Forged steel shackles for general lifting purposes — Dee shackles and bow shackles — Grade 6 — Safety* [A1]

[A1] EN ISO 3266:2010, *Forged steel eyebolts grade 4 for general lifting purposes (ISO 3266:2010)* [A1]

[A1] EN ISO 3266:2010/A1:2015, Forged steel eyebolts grade 4 for general lifting purposes *(ISO 3266:2010/Amd 1:2015)* [A1]

[A1] EN ISO 5817:2023, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections (ISO 5817:2023)* [A1]

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

EN ISO 9606-1:2017, *Qualification testing of welders — Fusion welding — Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012 and Cor 2:2013)*

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

[A1] EN ISO 13849-1:2023, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2023)* [A1]

[A1] EN ISO 13854:2019, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017)* [A1]

[A1] EN ISO 15609-1:2019, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2019)*

EN ISO 15609-2:2019, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 2: Gas welding (ISO 15609-2:2019)*

EN ISO 15609-3:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 3: Electron beam welding (ISO 15609-3:2004)*

EN ISO 15609-4:2009, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 4: Laser beam welding (ISO 15609-4:2009)*

EN ISO 15609-5:2011, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding (ISO 15609-5:2011, Corrected version 2011-12-01)*

EN ISO 15609-6:2013, *Specification and qualification of welding procedures for metallic materials — welding procedure specification — Part 6: Laser arc hybrid welding (ISO 15609-6:2013)* 〈A1〉

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

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

3.1
adhesion force
force required to remove the load from a vacuum lifter

3.2
C-hook
equipment in the form of a 'C' used for lifting hollow loads

(see Figure 1)

EXAMPLE Examples of hollow loads are coils and pipes.

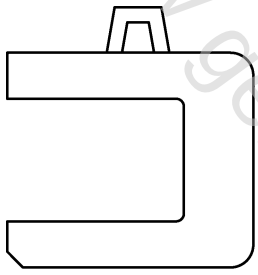

Figure 1 — Example of a C-hook

3.3
working coefficient
arithmetic ratio between the maximum load which a load lifting attachment is able to hold and the working load limit marked

3.4
clamp
equipment used to handle loads by clamping on a specific part of the load

(see Figure 2)

Note 1 to entry: Clamps are also known as tongs. For a definition of plate clamps see 3.5.