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Continuous handling equipment and systems - Safety requirements for equipment for mechanical handling of unit loads

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

Continuous handling equipment and systems - Safety requirements for equipment for mechanical handling of unit loads

Équipements et systèmes de manutention continue - Prescriptions de sécurité pour les équipements de manutention mécanique des charges isolées

Stetigförderer und Systeme - Sicherheitsanforderungen an mechanische Fördereinrichtungen für Stückgut

This European Standard was approved by CEN on 14 February 2022.

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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 619:2022) has been prepared by Technical Committee CEN/TC 148 “Continuous handling equipment and systems - Safety”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

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 supersedes EN 619:2002+A1:2010.

This document has been prepared under a Standardization Request 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.

This document forms part of a series of five standards the titles of which are given below:

— EN 617, *Continuous handling equipment and systems — Safety and EMC requirements for the equipment for the storage of bulk materials in silos, bunkers, bins and hoppers;*

— EN 618, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors;*

— EN 619, *Continuous handling equipment and systems — Safety requirements for equipment for mechanical handling of unit loads;*

— EN 620, *Continuous handling equipment and systems — Safety requirements for fixed belt conveyors for bulk material;*

— EN 741, *Continuous handling equipment and systems — Safety requirements for systems and their components for pneumatic handling of bulk materials.*

The Annexes C, D and E are normative, the Annexes A, B, F and ZA are informative.

Significant technical changes between this European standard and the previous edition:

1) standard adapted to CEN Guide 414:2017;

2) extension of Scope: telescopic conveyor, sorter, vertical switch conveyor, check-in conveyor, reclaim conveyor, rail guided floor track conveyors;

3) introduction of area concept;

4) preventing of access across the load entry/exit points in dependence of different areas;

5) the maximum speeds depending on the mass and on the different areas has been specified;

6) requirements for noise reduction and determination of noise test code;

7) list of required performance levels for safety related parts of control systems;

8) verification of safety requirements and/or measures has been improved;

9) figures in the annexes have been added/updated;

10) safety requirements/measures for the single types of conveyors have been described more detailed.

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, Turkey and the United Kingdom.

Introduction

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, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

List of abbreviations

ESPE	Electro-Sensitive Protective Equipment (AOPD and AOPDDR)
AOPD	Active Opotoelectronic Protective Device (e.g. light barriers)
AOPDDR	Active Optoelectronic Protective Device responsive to Diffuse Reflection (e.g. laser-scanner)
UL	Unit Load
EMC	Electro Magnetic Compatibility
PL_r	Performance Level required
VTD	Vertical Transfer Device
DCV	Destinated Coded Vehicle
TC	Transfer Car
OHC	Overhead Conveyor

1 Scope

This document deals with requirements for machine design, transport, installation, commissioning, operation, adjustment, maintenance and cleaning to minimize the hazards listed in Annex F. These hazards can arise during the operation and maintenance of continuous handling equipment and systems when carried out in accordance with the specifications given by the manufacturer or his authorized representative. This document deals with safety related technical verification during commissioning.

This document applies to mechanical handling devices as defined in Clause 3, singly or combined to form a conveyor system, and designed exclusively for moving unit loads continuously on a predefined route from the loading to the unloading points, possibly with varying speed or cyclically. In general, it also applies to conveyors which are built into machines or attached to machines if not stated otherwise in a machine specific standard.

Safety requirements and/or measures in this document apply to equipment used in all environments. However, additional risk assessments and safety measures need to be considered for uses in severe conditions, e.g.

— freezer applications,

— high temperatures,

— corrosive environments,

— strong magnetic fields,

— potentially explosive atmospheres,

— radioactive conditions and loads the nature of which could lead to a dangerous situation (e.g. molten metal, acids/bases, especially brittle loads, explosives),

— operation on ships and earthquake effects and

— contact with foodstuff.

This document does not cover hazards during decommissioning.

This document does not apply to conveying equipment and systems used underground or in public areas and to aircraft ground support equipment. In public areas only baggage carousels and check-in conveyors for airports are dealt with in this document.

NOTE Aircraft ground support equipment is covered by the standards of CEN/TC 274.

This document is not applicable to continuous handling equipment and systems 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.

EN 81-20:2020, *Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 20: Passenger and goods passenger lifts*

EN 341:2011, *Personal fall protection equipment — Descender devices for rescue*

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

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

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 1005-2:2003+A1:2008, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery*

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

EN 13155:2020, *Crane — Safety — Non-fixed load lifting attachments*

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

EN 13414-3:2003+A1:2008, *Steel wire rope slings — Safety — Part 3: Grommets and cable-laid slings*

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

EN 60204-1:2018, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2016)*

EN 60529:1991,[1] *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 60947-5-5:1997,[2] *Low-voltage switchgear and control gear — Part 5-5: Control circuit devices and switching elements — Electrical emergency stop device with mechanical latching function (IEC 60947-5-5:1997)*

EN IEC 61000-6-2:2019, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity standard for industrial environments (IEC 61000-6-2:2016)*

EN IEC 61496-1:2020, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2020)*

[1] As impacted by EN 60529:1991/A1:2000, EN 60529:1991/A2:2013, EN 60529:1991/corrigendum May 1993, EN 60529:1991/A2:2013/AC:2019-02 and EN 60529:1991/AC:2016-12.
[2] As impacted by EN 60947-5-5:1997/A1:2005, EN 60947-5-5:1997/A11:2013 and EN 60947-5-5:1997/A2:2017.

EN IEC 61496-2:2020, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs) (IEC 61496-2:2020)*

EN IEC 61496-3:2019, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Particular requirements for active opto-electronic protective devices responsive to diffuse Reflection (AOPDDR) (IEC 61496-3:2018)*

EN IEC 61800-1:2021, *Adjustable speed electrical power drive systems — Part 1: General requirements — Rating specifications for low voltage adjustable speed DC power drive systems (IEC 61800-1:2021)*

EN IEC 61800-2:2021, *Adjustable speed electrical power drive systems — Part 2: General requirements — Rating specifications for low voltage adjustable speed AC power drive systems (IEC 61800-2:2021)*

EN ISO 3266:2010,[3] *Forged steel eyebolts grade 4 for general lifting purposes (ISO 3266:2010)*

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 7010:2020,[4] *Graphical symbols — Safety colours and safety signs — Registered safety signs (ISO 7010:2019, Corrected version 2020-06)*

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

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*

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

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

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 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)*

[3] As impacted by EN ISO 3266:2010/A1:2015.
[4] As impacted by EN ISO 7010:2020/A1:2020.

EN ISO 13851:2019, *Safety of machinery — Two-hand control devices — Principles for design and selection (ISO 13851:2019)*

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

EN ISO 13855:2010, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)*

EN ISO 13856-1:2013, *Safety of machinery — Pressure-sensitive protective devices — Part 1: General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors (ISO 13856-1:2013)*

EN ISO 13856-2:2013, *Safety of machinery — Pressure-sensitive protective devices — Part 2: General principles for design and testing of pressure-sensitive edges and pressure-sensitive bars (ISO 13856-2:2013)*

EN ISO 13856-3:2013, *Safety of machinery — Pressure-sensitive protective devices — Part 3: General principles for design and testing of pressure-sensitive bumpers, plates, wires and similar devices (ISO 13856-3:2013)*

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

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection (ISO 14119:2013)*

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 14122-1:2016, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access (ISO 14122-1:2016)*

EN ISO 14122-2:2016, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2016)*

EN ISO 14122-3:2016, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2016)*

EN ISO 14122-4:2016, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders (ISO 14122-4:2016)*

ISO 4309:2017, *Cranes — Wire ropes — Care and maintenance, inspection and discard*

ISO/TS 19837:2018, *Safety of machinery — Trapped key interlocking devices — Principles for design and selection*