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Tail lifts - Platform lifts for mounting on wheeled vehicles - Safety requirements - Part 1: Tail lifts for goods

Hubladebühnen - Plattformliffe für die Anbringung an Radfahrzeugen - Sicherheitsanforderungen - Teil 1: Hubladebühnen für Güter

Hayons élévateurs - Plates-formes élévatrices à monter sur véhicules roulants - Exigences de sécurité - Partie 1 : Hayons élévateurs pour marchandises

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53.020.99 Druga dvigalna oprema Other lifting equipment

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Tail lifts - Platform lifts for mounting on wheeled vehicles - Safety requirements - Part 1: Tail lifts for goods

Hayons élévateurs - Plates-formes élévatrices à monter
sur véhicules roulants - Exigences de sécurité -
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Hubladebühnen - Plattformlifte für die Anbringung an
Radfahrzeugen - Sicherheitsanforderungen - Teil 1:
Hubladebühnen für Güter

This European Standard was approved by CEN on 11 July 2021.

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EN 1756-1:2021 (E)**European foreword**

This document (EN 1756-1:2021) has been prepared by Technical Committee CEN/TC 98 “Lifting platforms”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by February 2022, and conflicting national standards shall be withdrawn at the latest by February 2022.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 1756-1:2001+A1:2008.

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) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

The following significant changes, compared to the previous edition, have been made:

- the introduction of new terms and changed definitions for some existing terms;
- the introduction of Performance level as a concept for safety;
- support for cableless mobile control systems.

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.

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.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this document.

While producing this document, it was assumed that:

- only trained persons operate the machine;
- components without specific requirements are:
 - designed in accordance with the usual engineering practice and calculation codes, including all failure modes;
 - of sound mechanical and electrical construction;
 - made of materials, with adequate strength and of suitable quality;
 - free of defects;
- harmful materials, such as asbestos are not used;
- components are kept in good repair and working order, so that the required dimensions remain fulfilled despite wear;
- by design of the load bearing elements, a safe operation of the machine is ensured for loading ranging from zero to 100 % of the rated possibilities and during the tests;

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- with the exception of the items listed below, a mechanical device built according to good practice and the requirements in this document, will not deteriorate to a point of creating a hazard without the possibility of detection;
- the equipment is capable of operating correctly within a temperature range of -15 °C to $+40\text{ °C}$;
- a negotiation takes place between the manufacturer of the tail lift and the installer for the characteristics of the supporting wheeled vehicle (see also Clause 6), the fitting of the tail lift on the vehicle and between the installer and the user relating to the specific conditions of the use, places of use of the machinery, also some of the characteristics of the vehicle, the appropriate language;
- the working area is adequately lit (if lighting is not provided with the tail lift);
- if the place of installation allows a vertical falling height of persons of more than 3 m notwithstanding the limited travel height indicated in the scope, means external to the machine are used to limit this falling height to 3 m.

Provision is made in this document to protect against falling hazards where the risk of falling exceeds 2 m. However, accidents statistics show that people fall from the raised tail lift during loading/unloading the vehicle also for lifting heights below 2 m. The present state of the art does not allow a proven, universal solution to the prevention of falling suitable for all tail lift applications, without the introduction of other hazards.

The European safety organisations and manufacturers are continuing to review and test such solutions. Meanwhile, methods of mitigating these risks are shown in informative Annex J. For lifts where the risk of falling exceeds 2 m, refer to the requirements of 5.2.

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1 Scope

This document specifies safety requirements for design of tail lifts as defined in 3.1 for mounting on wheeled goods vehicles. It also specifies the verification of such tail lifts and the safety information that has to be provided for their use.

This document deals with the technical requirements to minimize the hazards listed in Clause 4 which can arise during the operation of tail lifts when carried out in accordance with the specifications as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer or his authorized representative.

It applies to tail lifts:

- used for the purpose of loading and/or unloading such vehicles;
- intended to be fitted, temporarily or permanently, either inside or on the front, side or rear of the wheeled vehicle;
- driven either by hand or power operated;
- equipped with a platform to support loads which comprise goods, an operator, or a combination of the two;
- with a maximum lifting height not exceeding 3 m above ground when the platform is unloaded;
- rotary type with a maximum lifting height not exceeding 2 m;
- used as a link bridge when intended by the manufacturer.

NOTE A tail lift is not to be confused with a link bridge attached to a loading dock which is included within the definition of a dock leveller and is outside the scope of this document.

Loading and/or unloading operations include the use of a tail lift to lift and/or lower loads.

This document does not establish the additional requirements for:

- the risk of falling when operating under 2 m height;
- overloading at vehicle floor level;
- drive system with lead screw and nuts;
- operation in severe conditions (e.g. extreme environmental conditions such as freezer applications, high temperatures, corrosive environment, tropical environment, contaminating environments, strong magnetic fields);
- operations subject to special rules (e.g. potentially explosive atmospheres);
- supply by electrical networks and the electrical circuit;
- power take off part of the system;
- electromagnetic compatibility (emission-immunity);
- static electricity problems;
- handling of loads the nature of which could lead to dangerous situations (e.g. molten metal, acids/bases, radiating materials, especially brittle loads);

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- hazards occurring during installation, transportation, decommissioning;
- hazards occurring when handling suspended loads which can swing freely;
- requirement related to the use on public roads;
- wind pressure in and out of use;
- direct contact with foodstuffs;
- earthquake;
- lightning.

This document is not applicable to tail lifts manufactured before the publication of this document.

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 1005-3:2002+A1:2008, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN 61310-2:2008, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310-2:2007)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

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

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 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

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

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

EN ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*

DIN 51130:2014, *Testing of floor coverings — Determination of the anti-slip property — Workrooms and fields of activities with slip danger — Walking method — Ramp test*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

ISO and IEC maintain terminological 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

tail lift

lifting device intended for installation on or in a wheeled vehicle and which is used for loading and/or unloading this vehicle

Note 1 to entry: The device consists essentially of a platform, a drive system, supporting elements and one or more control positions.

Note 2 to entry: Examples of tail lift mechanisms and types can be found in Annex A.

3.2

light tail lift

tail lift whose nominal load does not exceed 500 kg, usually used in installations where there are spatial limitations, making the addition of safety valves impractical

3.3

link bridge

application of a tail lift in which the platform is used to span from its associated vehicle, to any elevated position (e.g. a dock or another vehicle), for the purpose of transferring loads to or from the vehicle

3.4

wheeled vehicle

vehicle, or vehicle body which is intended for carrying goods and/or persons, for road, off road or rail transport, but excluding aircraft ground support equipment and/or marine applications

3.5

operator

any person given the task of operating the tail lift

3.6

travelling position

any configuration which the tail lift is intended to have while the vehicle is in motion

3.7

working position

any configuration of the tail lift in which the platform is intended to handle a load in an operating position

3.8

operating position

any configuration of the tail lift other than its travelling position

3.8.1

deploying

any movement of the platform from stowed position to normal operating position

EN 1756-1:2021 (E)**3.8.2****stowing**

any movement of the platform from normal operating position to stowed position

3.8.3**tilting**

any angular movement to adjust the platform when it is in normal operating position

3.8.4**opening**

any movement of the platform between a vertical travelling position and a horizontal operating position

3.8.5**closing**

any movement of the platform from a horizontal operating position to a vertical travelling position

3.9**danger zone**

any zone on, under or in the path of the platform as well as around any part of the mechanism in which a person is exposed to risk of injury or damage to health

Note 1 to entry: This definition shall not preclude the platform being a working area.

3.10**platform width**

dimension of the platform measured parallel to the edge adjacent to the vehicle

Note 1 to entry: Platform width shall be measured as in Figure 1.

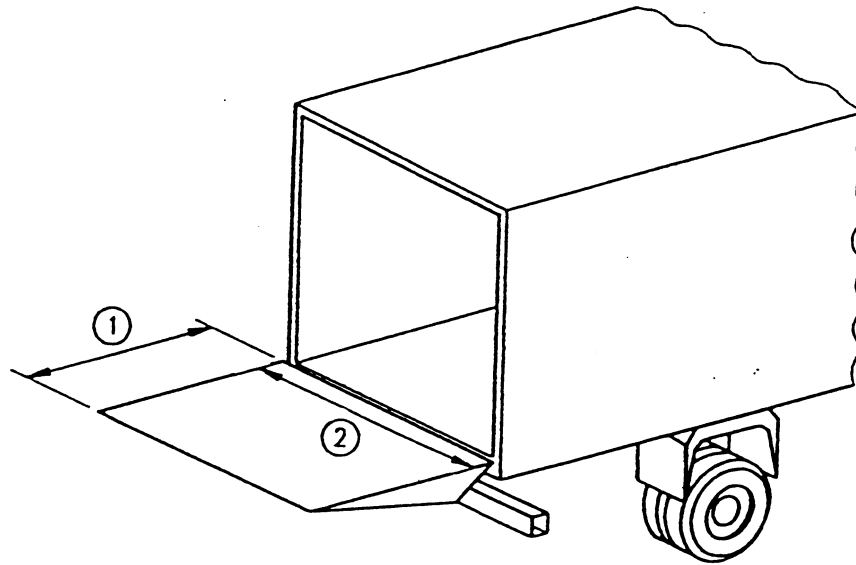
3.11**platform depth**

dimension of the platform measured perpendicularly to the edge adjacent to the vehicle

Note 1 to entry: Platform depth shall be measured as in Figure 1.

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**Key**

- 1 platform depth
- 2 platform width

Figure 1 — Platform width and depth
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3.12**platform vertical travel distance**

distance between the lowest and the highest positions respectively the platform can assume when its surface is horizontal

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Note 1 to entry: See Figure 2.

Note 2 to entry: The travel distance is a different concept from the height.