

SLOVENSKI STANDARD

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Nadomešča:

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Vozila za talni transport - Varnostne zahteve in preverjanje - 1. del: Dodatne zahteve za vozila za talni transport z lastnim pogonom, razen za vozila brez voznika, vozila s spremenljivim dosegom ter tovorna in osebna vozila

Industrial trucks - Safety requirements and verification - Part 1: Supplementary requirements for self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks

iTeh STANDARD PREVIEW

Sicherheit von Flurförderzeugen (Sicherheitsanforderungen und Verifizierung - Teil 1: Zusätzliche Anforderungen für motorkraftbetriebene Flurförderzeuge mit Ausnahme von fahrerlosen Flurförderzeugen, Staplern mit veränderlicher Reichweite und Lasten- und Personentransportfahrzeugen)

Chariots de manutention - Exigence de sécurité et vérifications - Partie 1 : Exigences supplémentaires pour les chariots autres que les chariots sans conducteur, les chariots à portée variable et les chariots porteurs de charge

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ICS:

53.060

Industrijski tovornjaki

Industrial trucks

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EUROPEAN STANDARD

EN 16307-1

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Industrial trucks - Safety requirements and verification - Part 1: Supplementary requirements for self-propelled industrial trucks, other than driverless trucks, variable- reach trucks and burden-carrier trucks

Chariots de manutention - Exigence de sécurité et
vérifications - Partie 1 : Exigences supplémentaires
pour les chariots autres que les chariots sans
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Sicherheit von Flurförderzeugen -
Sicherheitsanforderungen und Verifizierung - Teil 1:
Zusätzliche Anforderungen für motorkraftbetriebene
Flurförderzeuge mit Ausnahme von fahrerlosen
Flurförderzeugen, Staplern mit veränderlicher
Reichweite und Lasten- und
Personentransportfahrzeugen

This European Standard was approved by CEN on 12 July 2020.

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<https://standards.iteh.ai/catalog/standards/sist/08f600e2-fefd-48b4-959a->

This European Standard exists 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.

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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 16307-1:2020) has been prepared by Technical Committee CEN/TC 150 "Industrial trucks - Safety", the secretariat of which is held by BSI.

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 2021, and conflicting national standards shall be withdrawn at the latest by February 2021.

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 16307-1:2013+A1:2015.

The main changes with respect to the first edition are as follows:

- a) requirements in respect to visibility (see 4.12) have been changed;
- b) requirements for the operator restraint system (see 4.16) have been added.

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.

This document is based on ISO/TS 3691-7, *Industrial trucks — Safety requirements and verification — Part 7: Regional requirements for countries within the European Community* and is limited to self-propelled industrial trucks.

EN 16307 consists of the following parts, under the general title *Industrial trucks — Safety requirements and verification*:

- *Part 1: Supplementary requirements for self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks*
- *Part 2: Supplementary requirements for self-propelled variable-reach trucks*
- *Part 3: Supplementary requirements for trucks with elevating operator position and trucks specifically designed to travel with elevated loads (additional requirements to EN 16307-1)*
- *Part 5: Supplementary requirements for pedestrian-propelled trucks*
- *Part 6: Supplementary requirements for burden and personnel carriers*

This document is intended to be used with EN ISO 3691-1, *Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks*.

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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.

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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).

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

The machines 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 EN 16307 series of standards covers safety requirements and their verification for industrial trucks as defined in ISO 5053-1 that are not covered exhaustively by the EN ISO 3691 series.

EN 16307-1:2020 (E)**1 Scope**

This document gives requirements for the types of industrial trucks specified in the scope of EN ISO 3691-1:2015¹⁾.

This document is intended to be used in conjunction with EN ISO 3691-1:2015. These requirements are supplementary to those stated in EN ISO 3691-1:2015.

This document deals with the following significant hazards, hazardous situations or hazardous events relevant, when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer:

- electrical requirements;
- noise emissions;
- vibration;
- visibility;
- electromagnetic radiation.

This document defines supplementary requirements to EN ISO 3691-1:2015:

- travel speed;
- brakes;
- travel and braking controls - additional operation from alongside pedestrian-controlled and stand-on trucks;
- lift chains;
- mast tilt and carriage isolation;
- operator's seat;
- operator restraint system;
- protection against crushing, shearing and trapping;
- information for use (instruction handbook and marking).

Annex A (informative) contains the list of significant hazards covered by this document.

1) This document is impacted by the corrigendum EN ISO 3691-1:2015/AC:2016 and the amendment EN ISO 3691-1:2015/A1:2020.

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 1175-1:1998+A1:2010, *Safety of industrial trucks — Electrical requirements — Part 1: General requirements for battery powered trucks*

EN 1175-2:1998+A1:2010, *Safety of industrial trucks — Electrical requirements — Part 2: General requirements of internal combustion engine powered trucks*

EN 1175-3:1998+A1:2010, *Safety of industrial trucks — Electrical requirements — Part 3: Specific requirements for the electric power transmission systems of internal combustion engine powered trucks*

EN 12053:2001+A1:2008, *Safety of industrial trucks — Test methods for measuring noise emissions*

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

EN 12895:2015+A1:2019, *Industrial trucks — Electromagnetic compatibility*

EN 13059:2002+A1:2008, *Safety of industrial trucks — Test methods for measuring vibration*

EN 13490:2001+A1:2008, *Mechanical vibration — Industrial trucks — Laboratory evaluation and specification of operator seat vibration*

EN 16203:2014, *Safety of Industrial Trucks — Dynamic tests for verification of lateral stability — Counterbalanced Trucks*

EN 16842-1:2018, *Powered industrial trucks — Visibility — Test methods and verification — Part 1: General requirements*

EN 16842-2:2018, *Powered industrial trucks — Visibility — Test methods and verification — Part 2: Sit-on counterbalance trucks and rough terrain masted trucks up to and including 10 000 kg capacity*

EN 16842-3:2018, *Powered industrial trucks — Visibility — Test methods and verification — Part 3: Reach trucks up to and including 10 000 kg capacity*

EN 16842-6:2018, *Powered industrial trucks — Visibility — Test methods and verification — Part 6: Sit-on counterbalance trucks and rough terrain masted trucks greater than 10000 kg capacity*

EN 16842-7:2018, *Powered industrial trucks — Visibility — Test methods and verification — Part 7: Variable-reach and masted container trucks handling freight containers of 6 m (20 ft) length and longer*

EN ISO 3691-1:2015²⁾, *Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks (ISO 3691-1:2011)*

2) This document is impacted by the corrigendum EN ISO 3691-1:2015/AC:2016 and the amendment EN ISO 3691-1:2015/A1:2020.

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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 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

ISO 5053-1:2020, *Industrial trucks — Vocabulary — Part 1: Types of industrial trucks*

ISO 6292:2020, *Powered industrial trucks and tractors — Brake performance and component strength*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, ISO 5053-1:2020 and EN ISO 3691-1:2015 and the following apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp/ui>

3.1 operator restraint system
device or system that is permanently installed to keep the operator within the protective structure of the truck

EXAMPLE Seat belt, cabin door.

[SOURCE: EN 17314:2020, 3.1, modified. Note 1: “The restraint system can be composed of several parts” replaced with “EXAMPLE: Seat belt, cabin door” and Note 2 deleted.]

4 Safety requirements and/or protective measures**4.1 General**

Machinery shall comply with the safety requirements and/or protective measures of 4.2 to 4.16. In addition, the machine shall be designed according to the principles of EN ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

The following applies to the self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks, dealt with in EN ISO 3691-1:2015. These are additional to the requirements of EN ISO 3691-1:2015 and, in certain instances, replace them.

4.2 Electrical requirements

Electrical systems and equipment shall be in accordance with the relevant part(s) of EN 1175:1998+A1:2010.

4.3 Travel speed

The requirements of EN ISO 3691-1:2015, 4.2.3 shall apply, except the reference to ISO/TS 3691-8, with the following addition:

The travel speed of variable-speed pedestrian-controlled trucks operating on level ground shall not exceed 6 km/h.

The maximum speed on level ground of stand-on trucks and pedestrian-controlled trucks fitted with a foldable platform when the operator is on the platform shall not exceed 16 km/h.

4.4 Brakes

The requirements of EN ISO 3691-1:2015, 4.3.1 shall apply, except the reference to ISO/TS 3691-8, with the following addition:

The parking and service brakes of trucks that can travel with an elevated operator position and/or elevated load above 500 mm, and up to and including 1 200 mm, are subject to the following requirements:

- for travel speeds up to and including 9 km/h, parking brakes shall be in accordance with ISO 6292:2020, 6.2.2 a), and service brakes shall comply with the specifications of ISO 6292:2020, Table 2, Group C;
- for travel speeds above 9 km/h, parking brakes shall be in accordance with ISO 6292:2020, 6.2.2 b) and service brakes shall comply with the specifications of ISO 6292:2020, Table 2, Group A1.

4.5 Travel and braking controls - additional operation from alongside pedestrian-controlled and stand-on trucks

The requirements of EN ISO 3691-1:2015, 4.4.2.7 shall apply, except the reference to ISO/TS 3691-8, with the following addition:

Low-lift order-picking trucks provided with a system that allows operating while walking alongside the truck are subject to the following requirements:

- activation of the travel control device from outside of the truck shall only be possible when the truck is stationary;
- the travel control shall be a hold-to-run control and the speed shall not exceed 4 km/h while operating the travel control from outside of the truck;
- braking function shall be automatically applied when travel control device is released.

4.6 Lift chains

The requirements of EN ISO 3691-1:2015, 4.6.1 shall apply, except the reference to ISO/TS 3691-8, with the following addition:

The minimum safety factor of the lifting mechanism, K_1 , shall be as follows:

- for trucks $\leq 10\ 000$ kg rated capacity:

$$K_1 \geq 5$$