



SLOVENSKI STANDARD
SIST EN 1526:1998+A1:2008
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Varnost vozil za talni transport - Dodatne zahteve za avtomatiko na vozilih

Safety of industrial trucks - Additional requirements for automated functions on trucks

Sicherheit von Flurförderzeugen - Zusätzliche Anforderungen für automatische Funktionen von Flurförderzeugen

Sécurité des chariots de manutention - Prescriptions complémentaires pour les fonctions automatiques des chariots
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ICS:

53.060 Industrijski tovornjaki Industrial trucks

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EUROPEAN STANDARD

EN 1526:1997+A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2008

ICS 53.060

Supersedes EN 1526:1997

English Version

Safety of industrial trucks - Additional requirements for automated functions on trucks

Sécurité des chariots de manutention - Prescriptions complémentaires pour les fonctions automatiques des chariots

Sicherheit von Flurförderzeugen - Zusätzliche Anforderungen für automatische Funktionen von Flurförderzeugen

This European Standard was approved by CEN on 22 June 1997 and includes Amendment 1 approved by CEN on 15 June 2008.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 1526:1997+A1:2008) 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 January 2009, and conflicting national standards shall be withdrawn at the latest by January 2009.

This document includes Amendment 1, approved by CEN on 2008-06-15.

This document supersedes EN 1526:1997.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 and A1.

This European Standard is one of a series of standards for the safety of industrial trucks.

Safety of industrial trucks – Self-propelled trucks up to and including 10 000 kg capacity and industrial tractors with drawbar pull up to and including 20 000 N.

prEN 1726-1, Part 1: General requirements

prEN 1726-2, Part 2: Additional requirements for trucks with elevating operator position and trucks specifically designed to travel with elevated loads

prEN 1551, Safety of Industrial Trucks, self propelled trucks over 10 000 kg capacity

prEN 1459, Safety of Industrial Trucks, self propelled variable reach trucks
Safety of Industrial Trucks, pedestrian propelled trucks

prEN 1757-1, Part 1, Stacker trucks

prEN 1757-2, Part 2, Pallet trucks with a lift height up to 300 mm

prEN 1757-3, Part 3, Platform trucks

prEN 1757-4, Part 4, Scissor lift pallet trucks

prEN 1525, Safety of Industrial trucks, driverless trucks and their systems

prEN 1526, Safety of Industrial trucks, additional requirements for automated functions on trucks
Safety of Industrial trucks, electrical requirements for trucks

prEN 1175-1, Part 1, Battery-powered trucks

prEN 1175-2, Part 2, General requirements for internal combustion engine powered trucks

prEN 1175-3, Part 3, Specific requirements for the electric power transmission systems of internal combustion engine powered trucks

prEN 1755, Safety of industrial trucks, operation in potentially explosive atmospheres

prEN 12053, Safety of industrial trucks, test methods for measuring noise emissions

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prEN/ISO 13564, Safety of industrial trucks, test method for measuring visibility from self-propelled trucks

This European Standard 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).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A1**

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

This European Standard is a type C standard as stated in EN 292-1. This standard has been prepared to be a harmonised standard to provide one means of conforming to the essential safety requirements of the Machinery Directive and associated EFTA regulations.

The extent to which hazards are covered is indicated in the scope of this standard. In addition, automated functions of trucks should comply as appropriate with EN 292 for hazards which are not covered by this standard.

1 Scope

1.1 This European Standard deals with the controls and control systems for automated functions of industrial trucks with an operator (hereinafter referred to as "trucks").

1.2 The control system is generally part of the truck but can include components external to the truck, eg for the guidance means for automated steering.

1.3 This European Standard deals with the technical requirements to minimise the specific hazards listed in clause 4 which can arise during the commissioning, operation and maintenance of automated functions of trucks when carried out in accordance with the specifications given by the manufacturer or his authorised representative. In addition, trucks should comply as appropriate with EN 292 for hazards not covered by this standard or the applicable companion standards.

1.4 This European Standard is not applicable to safety equipment (e.g. devices for height limitation, speed limitation) used to override driver control.

1.5 This European Standard deals with the hazards related to the controls and control systems for the following automated functions:

- Steering (direct mechanical guidance is excluded);
- Travel;
- Lifting and lowering operations;
- Load manipulations, e.g. rotation, reach, slewing, tilting, clamping;
- Combination and/or sequence of the above movements.

This standard must be used in conjunction with one or more of the applicable companion standards listed in the Foreword.

1.6 This European standard does not establish the additional requirements for the following:

- a) Operation in severe conditions (e.g. extreme climates, freezer applications, strong magnetic fields);
- b) Operation in environments subject to special rules (e.g. potentially explosive atmospheres);

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- c) Electromagnetic compatibility;
- d) Transportation of passengers;
- e) Handling of loads the nature of which could lead to dangerous situations (e.g. molten metals, acids/bases, radiating materials).

Limitations in the scopes of the applicable companion standards also apply to this standard.

2 Normative references

This European standard incorporates, by dated or undated reference, provisions from other publication. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of, any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication applies.

EN 292-1:1991, *Safety of machinery, basic concepts, general principles for design – Part 1: Basic terminology, methodology.*

EN 292-2:1991, *Safety of machinery, basic concepts, general principles for design – Part 2: Technical principles and specifications.*

EN 954-1:1996, *Safety of machinery, safety related parts of control systems – Part 1: General principles of design.*

prEN 1175-1, *Safety of industrial trucks, electrical requirements for trucks – Part 1: Battery powered trucks.*

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3 Definitions

[SIST EN 1526:1998+A1:2008](https://standards.iteh.ai/catalog/standards/sist/c0333a7c-98f1-434a-a1d8-3e5855628f11/standards/1526-1998a1-2008)

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For the purposes of this standard, the following definitions apply.

3.1**Automated function**

a movement for transport or positioning of the truck and/or load initiated by the operator but not requiring continued action by the operator.

3.2**Automated lifting and lowering**

An automated system which controls intended vertical movements and/or positioning of the load carrying device to a pre-selected height.

3.3**Automated load manipulation**

An automated system which controls load movements (e.g. rotation, reach, slewing, tilting, luffing, telescoping, clamping).

3.4**Automated steering**

An automated system which takes control of the steering and keeps the truck on a predetermined path. Direct mechanical guidance (e.g. rail) is excluded.

3.5**Automated steering acquisition**

The system condition when automated steering has been selected but the operator is still positioning the truck to acquire the guidance means, i.e. the operator still has control of the manual truck steering system.

3.6**Automated travel**

An automated system which takes control of the speed and direction of travel and/or positioning of the truck.

3.7**Sequenced automated functions**

Functions where the subsequent movement can commence only after the completion of the previous movement.

3.8**Combined automated control**

An automated system which takes control of two or more functions simultaneously.

3.9**Competent person**

Designated person, suitably trained and qualified by knowledge and practical experience, and in possession of the necessary instructions to enable the assigned task to be carried out.

4 List of hazards

The following hazards are applicable in the situations described and could involve risks to persons if not reduced or eliminated. The corresponding requirements are designed to limit the risk or reduce these hazards in each situation.

<u>Hazard</u>	<u>Corresponding requirement</u>
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4.1 Crushing	
— Due to failure of the truck to stop	5.2.1, 5.2.3, 5.6.2
— From collapse of racking due to contact with truck	5.2.1, 5.2.3, 5.6.1, 5.6.4, 5.6.5, 5.6.6
4.2 Impact	
— From falling loads or parts of loads	5.2.1, 5.2.3, 5.6.3, 5.6.4, 5.6.5, 5.6.6
— From collapse of racking	5.2.1, 5.2.3, 5.6.4, 5.6.5, 5.6.6
— From controls or tillers	5.5.2
4.3 Electrical contact direct or indirect due to an unexpected electrical fault	
	5.2.1
4.4 Electromagnetic radiation	
	Not dealt with
4.5 Programming errors	
	Not dealt with
4.6 Human errors	
— Dangerous operation of the truck by unauthorised personnel	5.3.1, 5.3.3
— Accidental operation of controls	5.3.1, 5.3.3, 5.3.4, 5.3.5, 5.5.1, 5.6.1.3