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Elektriohutussnõuded. Osa 2:
Sisepõlemismootoriga mootorkärudele esitatavad
üldnõuded KONSOLIDEERITUD TEKST**

Safety of industrial trucks - Electrical requirements -
Part 2: General requirements of internal combustion
engine powered trucks CONSOLIDATED TEXT

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1175-2:1999+A1:2010 sisaldab Euroopa standardi EN 1175-2:1998+A1:2010 ingliskeelset teksti.</p> <p>Standard on kinnitatud Eesti Standardikeskuse 31.12.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 03.11.2010.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1175-2:1999+A1:2010 consists of the English text of the European standard EN 1175-2:1998+A1:2010.</p> <p>This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p> <p>Date of Availability of the European standard text 03.11.2010.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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ICS 53.060

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English Version

**Safety of industrial trucks - Electrical requirements - Part 2:
General requirements of internal combustion engine powered
trucks**

Sécurité des chariots de manutention - Prescriptions
électriques - Partie 2: Prescriptions générales des chariots
équipés d'un moteur thermique

Sicherheit von Flurförderzeugen - Elektrische
Anforderungen - Teil 2: Allgemeine Anforderungen für
Flurförderzeuge mit Verbrennungsmotoren

This European Standard was approved by CEN on 23 November 1997 and includes Amendment 1 approved by CEN on 26 September 2010.

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.

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Foreword

This document (EN 1175-2:1998+A1:2010) 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 May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

A1 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. **A1**

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A1 The main changes compared to the previous version are:

- modification of Annex ZA;
- minor technical changes in 5.3;
- requirements for radiation and software parameters;
- reference to EN 292-1 be replaced with EN ISO 12100-1:2003, EN 292-2 be replaced with EN ISO 12100-2:2003 and EN 954-1 be replaced with EN ISO 13849-1:2008. **A1**

This document includes Amendment 1, approved by CEN on 2010-09-26.

This document supersedes EN 1175-2:1998.

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This European Standard is one of a package of standards for the safety of industrial trucks:

A1 prEN 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 (ISO/DIS 3691-1:2008)* **A1**

A1 EN 1726-2 **A1** Safety of industrial trucks - Self propelled trucks up to and including 10 000 kg capacity and tractors with a drawbar pull up to and including 20 000 N - Part 2: Additional requirements for trucks with elevating operator position and trucks specially designed to travel with elevated load

A1 EN 1551 **A1** Safety of industrial trucks - Self propelled trucks over 10 000 kg capacity

A1 EN 1459 **A1** Safety of industrial trucks - **A1** Self propelled variable **A1** reach trucks

EN ISO 3691-5, *Industrial trucks — Safety requirements and verification — Part 5: Pedestrian-propelled trucks (ISO 3691-5:2009)*

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EN 1757-3 Safety of industrial trucks; pedestrian controlled manual and semi manual trucks - Part 3 - Platform trucks

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EN 1525 Safety of industrial trucks - Driverless trucks and their systems

EN 1175-1 Safety of industrial trucks - Electrical requirements -
Part 1 - General requirements for battery powered trucks

EN 1175-2 Safety of industrial trucks - Electrical requirements -
Part 2: General requirements for internal combustion engine powered trucks

EN 1175-3 Safety of industrial trucks - Electrical requirements - Part 3 - Specific requirements for the electric power transmission systems of internal combustion engine powered trucks

EN 1526 Safety of industrial trucks - Automated functions of trucks

EN 1755 Safety of industrial trucks - Operation in potentially explosive atmospheres; Use in flammable gas, vapour, mist and dust

EN 12053 Safety of industrial trucks - Test methods for measuring noise emissions

prEN ISO/DIS 13564 Test method for measuring visibility from self-propelled trucks

EN 13059 Safety of industrial trucks - Test methods for measuring vibration

EN 12895 Industrial trucks - Electromagnetic compatibility

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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, Croatia, 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.

0 Introduction

A1 This European Standard is a type C standard as stated in EN ISO 12100-1:2003. **A1** This standard has been prepared to be a harmonized standard to provide one means of conforming with the electrical aspects of the Essential Safety Requirements of the Machinery Directive and associated EFTA Regulations. Electrical installations complying with this standard are deemed to satisfy these requirements.

The extent to which hazards are covered is indicated in the scope of this standard. **A1** In addition, machinery should comply as appropriate with EN ISO 12100-2:2003 for hazards which are not covered by this European Standard. **A1**

1 Scope

1.1 This standard specifies the electrical and related mechanical safety requirements for the design and construction of the electrical installation in internal combustion engine powered trucks (hereinafter referred to as "trucks") with starter battery nominal voltages up to and including 24 V.

NOTE 1 Part 3 of this standard details specific electrical requirements for electrical power transmission systems of internal combustion engine powered trucks.

NOTE 2 Reference is made to this standard in other standards which cover the non-electrical requirements of the various industrial truck types.

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A1 NOTE 3 The special requirements for operation in potentially explosive atmospheres are not covered in this European Standard. **A1**

1.2 The requirements of this standard are applicable, when trucks are operated under the following climatic conditions:

- Maximum ambient temperature, continuous duty: +40°C;
- Lowest ambient temperature: -20 °C;
- Service altitude: up to 2000 m;
- Relative humidity: in the range 30 % to 95 % (non condensing).

1.3 This standard covers specific hazards which could occur during the intended use of trucks. **A1** For hazards occurring during construction, transportation, commissioning, decommissioning and disposal, reference should be made to EN ISO 12100-2:2003. **A1**

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. 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 European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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EN 1050:1996

Safety of machinery - Principles for risk assessment

EN 12895:2000, *Industrial trucks — Electromagnetic compatibility* ^(A1)

EN 60947-5-1:1991 Low-voltage switchgear and controlgear
Part 5: Control circuit devices and switching elements
Section one: Electromechanical control circuit devices (IEC 947-5-1:1990)

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology* (ISO 12100-1:2003)

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles* (ISO 12100-2:2003)

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design* (ISO 13849-1:2006) ^(A1)

ISO 5053:1987 Powered industrial trucks - Terminology

3 Definitions

For the purposes of this standard, definitions given in ISO 5053:1987 apply together with the following:

3.1
nominal battery voltage
the total number of battery cells connected in series multiplied by 2 V for conventional lead acid batteries and by 1,2 V for alkaline batteries. For other types of batteries corresponding definitions apply

4 ^(A1) List of significant hazards ^(A1)

The following significant hazards from Annex A of EN 1050:1996 (within brackets) 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 remove the hazard in each situation.

Hazard		Corresponding requirements	
4.1	Mechanical hazards (1)		
4.1.1	Crushing hazard (1.1)	5.1.2	Battery constrain
4.1.2	Impact by collision (1.6)	5.3.4	Speed limitation
4.1.2.1	- when driven by the operator	5.3.5	Steering control
4.1.3	Loss of stability (1.11)		
	- from excess speed		
	- from faulty battery mass		
4.2	Electrical hazards (2)	5.1.1	Battery insulation
4.2.1	Electric shock (2.1)	5.2	Protection of circuits
4.2.2	Short circuit		