



SLOVENSKI STANDARD

SIST EN 1726-2:2002

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Safety of Industrial Trucks - Self-propelled trucks up to and including 10000 kg capacity and tractors with a drawbar pull up to and including 20000 N - Part 2: Additional requirements for trucks with elevating operator position and trucks specifically designed to travel with elevated loads (standards.iteh.ai)

Sicherheit von Flurförderzeugen - Motorkraftbetriebene Flurförderzeuge bis einschließlich 10 000 kg Tragfähigkeit und Schlepper bis einschließlich 20 000 N Zugkraft - Teil 2: Zusätzliche Anforderungen für Flurförderzeuge mit hebbarem Fahrerplatz und Flurförderzeuge, die zum Fahren mit angehobener Last gebaut sind

Sécurité des chariots de manutention - Chariots automoteurs de capacité n'excédant pas 10 000 kg et tracteurs dont l'effort au crochet est inférieur ou égal a 20 000 N - Partie 2: Dispositions supplémentaires pour les chariots a poste de conduite élevable et les chariots conçus spécialement pour circuler avec la charge en position élevée

Ta slovenski standard je istoveten z: EN 1726-2:2000

ICS:

53.060 Industrijski tovornjaki Industrial trucks

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ICS 53.060

English version

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 specifically designed to travel with elevated loads

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This European Standard was approved by CEN on 9 April 2000.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
 COMITÉ EUROPÉEN DE NORMALISATION
 EUROPÄISCHES KOMITEE FÜR NORMUNG

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FOREWORD

This European Standard 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 March 2001, and conflicting national standards shall be withdrawn at the latest by March 2001.

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).

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

This European Standard is one of a series of European Standards for the safety of Industrial trucks.

EN 1175-1	Safety of industrial trucks - Part 1: Electrical requirements for battery-powered trucks
EN 1175-2	Safety of industrial trucks - Part 2: Electrical requirements for internal combustion engine powered trucks
EN 1175-3	Safety of industrial trucks - Part 3: Electrical requirements for electrical power transmission systems of internal combustion engine powered trucks
EN 1459	Safety of industrial trucks - Variable reach trucks
EN 1525	Safety of industrial trucks - Driverless industrial trucks and their systems
EN 1526	Safety of industrial trucks - Automated functions for industrial trucks
EN 1551	Safety of industrial trucks - Self propelled trucks over 10 000 kg capacity
EN 1726-1	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 1 : General requirements
EN 1726-2	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
EN 1755	Safety of industrial trucks - Operation in potentially explosive atmospheres; industrial trucks for use in flammable gas, vapour, mist and dust
prEN 1757-1	Safety of industrial trucks - Pedestrian controlled manual and semi-manual trucks Part 1: Stacker trucks
prEN 1757-2	Safety of industrial trucks - Pedestrian controlled manual and semi-manual trucks Part 2: Pallet trucks with lift height up to 300 mm
prEN 1757-3	Safety of industrial trucks - Pedestrian controlled manual and semi-manual trucks Part 3: Platform trucks
prEN 1757-4	Safety of industrial trucks - Pedestrian controlled manual and semi-manual trucks Part 4: Pallet-trucks with scissors lift
prEN 12053	Safety of industrial trucks - Noise measurement of industrial trucks; sound pressure level at the operator's position and sound power level for the environment
prEN ISO 13564	Safety of industrial trucks - Visibility test method (ISO/DIS 13564 : 1996)
prEN 13059	Safety of industrial trucks - Test method for measuring vibration

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the 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 with 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, industrial trucks shall comply as appropriate with EN 292-1 for hazards which are not covered by this standard.

1 SCOPE

1.1 This European Standard is applicable, in addition to EN 1726-1 to industrial trucks designed to travel indoors on smooth level prepared surfaces and equipped with vertical, non tilting mast.

a) with an elevating operator position, as defined in 3.1.3.1.6 and 3.1.3.3 of ISO 5053, where the elevating operator position and the load handling device lifts simultaneously to a height of more than 1 200 mm above ground level

and

b) with a load handling device elevated more than 1 200 mm as defined in 3.1.3.1.10 of ISO 5053

For both types of truck the load handling device can be elevated, lowered or horizontally displaced, laden or unladen, while the truck is travelling.

Trucks can be used in guidance systems, without guidance systems or in both systems, and are not intended to tow or push.

1.2 This European Standard covers the technical requirements necessary to minimise the specific hazards listed in clause 4 which could occur during normal operation and maintenance (in accordance with the data given by the manufacturer or his authorised representative) of industrial trucks.

This European Standard does not cover those requirements to minimise hazards which may occur:

- during construction
- when handling suspended loads which may swing freely
- when using trucks on public roads
- when using a work platform fitted to a truck not specifically designed to elevate persons
- when using trucks see 1.1 with tiltable mast.

This European Standard does not repeat all technical rules which are state of the art and which are applicable to the material used to construct the industrial truck. Reference should be made to EN 292-2.

1.3 This European Standard applies to industrial trucks equipped with load handling devices for normal industrial duties, e.g. fork arms and platforms, or attachments for specified applications. Fork arms, load platforms and integrated attachments are considered to be parts of the industrial truck.

Attachments mounted on the load carrier or on the fork arms which are removable by the user are not considered to be part of the industrial truck. For attachments the appropriate clauses of this standard are applicable.

1.4 Where industrial trucks are required to operate in severe conditions (e.g. in extreme climates, in freezer applications, strong magnetic fields) special precautions may be necessary. These are not covered by this standard.

1.5 For trucks with elevating operator position up to and including 1 200 mm and/or trucks especially designed to travel with elevated load up to and including 1 200 mm the requirements of EN 1726-1 apply.

2 NORMATIVE REFERENCES

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

EN 292-1: 1991	Safety of machinery - Basic concepts - General principles for design Part 1: Basic terminology, methodology
EN 292-2: 1991/ A2: 1997	Safety of machinery - Basic concepts - General principles for design Part 2: Technical principles and specifications
EN 341: 1992	Personal protective equipment against falls from a height - Descender devices
EN 574: 1996	Safety of machinery - Two-hand control devices – Functional aspects – Principles for design
EN 954-1: 1996	Safety of machinery – Safety related parts of control systems – General principles for design
EN 1050: 1996	Safety of machinery - Principles for risk assessment
EN 1175-1:1998	Safety of Industrial trucks – Electrical requirements – General requirements for battery powered trucks
EN 1526:1997	Safety of Industrial trucks - Additional requirements for automated functions on trucks
EN 1726-1:1998	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 1 : General requirements
ISO 2860: 1992	Earth-moving machinery – Minimum access dimensions
ISO 5053: 1987	Powered industrial trucks - Terminology
ISO 6292:1996	Powered industrial trucks and tractors - Brake performance and component strength

3 TERMS AND DEFINITIONS

For the purposes of this standard the terms and definitions of the industrial trucks and their components given in ISO 5053 apply together with the following

3.1 Operating with elevated load

The load handling device is designed to be elevated, lowered or horizontally displaced at more than 1 200 mm above ground level whilst the truck is travelling, laden or unladen.

3.2 Elevating operator position

Normal operating position which can be elevated more than 1 200 mm from ground level to the floor of the operator platform, truck.

3.3 Guidance system

The system which guides the truck on a predetermined path by external means not directly controlled by the operator.

3.4 Aisles

The operating area of the truck between the racks.

Note: Aisles can be so designed and dimensioned to accept entry of free ranging trucks or trucks operating with guidance systems.

3.5 Horizontal Displacement

Any horizontal, lateral, reach or rotational movement of the load handling device in relation to the truck or any combination of these movements.

4 LIST OF HAZARDS

The following hazards from annex A of EN 1050:1996 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.

Hazard		Corresponding requirement
4.1	Mechanical hazards	
4.1.1	Crushing hazard	5.2 Brakes 5.3.2 Brakes 5.3.3 Controls 5.3.5 Operator position 5.3.6 Protective devices 5.4 Optical warning devices 7.1 Instruction handbook 7.2 Information plates 7.3.2 Safety clearance
4.1.2	Shearing hazard	5.2 Brakes 5.3.2 Brakes 5.3.3 Controls 5.3.5 Operator position 5.4 Optical warning device 7.1 Instruction handbook 7.3 Installation information
4.1.3	Cutting or severing hazard	- Not covered by this standard
4.1.4	Entanglement hazard	- Not covered by this standard
4.1.5	Drawing-in or trapping hazard	5.3.3.3 Two hand control
4.1.6	Impact hazard	
	- from mechanical failure	5.3.4 Systems for lifting and lowering 6.2 Structural verification 7.1.2 Operation of the truck
	- from unstable loads	5.3.4 Systems for lifting and lowering 5.3.6 Protective devices
	- from road debris	- Not covered by this standard
	- from lifting or transporting a truck	- Not covered by this standard
4.1.7	Stabbing or puncture hazard	- Not covered by this standard
4.1.8	Friction or abrasion hazard	- Not applicable
4.1.9	High pressure fluid ejection	- Not covered by this standard
4.1.10	Ejection of parts	- see 4.10.2
4.1.11	Loss of stability	5.1 Modes of operation 5.5 Stability 7.1.2 Operation of the truck 7.3 Installation information
4.1.12	Slip, trip and fall hazards	5.3.5 Operator position 5.3.7 Emergency egress 7.1 Instruction handbook
4.2	Electrical hazards	
4.2.1	Electrical contact	- Not covered by this standard
4.2.2	Electrostatic phenomena	- Not covered by this standard
4.2.3	Thermal radiation	- Not applicable
4.2.4	External influences	- Not covered by this standard

Hazard		Corresponding requirement
4.3	Thermal hazards	
4.3.1	Burns and scalds	- Not covered by this standard
4.3.2	Severe climatic conditions	- Not covered by this standard
4.4	Hazards generated by noise	
4.4.1	Hearing loss	- Not covered by this standard
4.4.2	Interference with speech	- Not covered by this standard
4.5	Hazards generated by vibration	- Not covered by this standard
4.6	Hazards generated by radiation	- Not covered by this standard
4.7	Hazards generated by materials	
4.7.1	Contact or inhalation	- Not covered by this standard
4.7.2	Fire or explosion	- Not covered by this standard
4.7.3	Biological and microbiological hazards	- Not applicable
4.8	Hazards due to neglect of ergonomics	
4.8.1	Unhealthy postures or excess effort	- Not covered by this standard
4.8.2	Inadequacy with human anatomy & comfort	- Not covered by this standard
4.8.3	Neglected use of personal protection equipment	- Not applicable
4.8.4	Inadequate local lighting	- Not covered by this standard
4.8.5	Mental overload or underload	- Not applicable
4.8.6	Human errors	7.1 Instruction handbook 7.2 Information plates
4.9	Hazard combinations	- Not applicable
4.10	Hazards due to functional disorders	
4.10.1	Failure of energy supply	5.3.2 Brakes
4.10.2	Ejection of parts	- Not applicable
4.10.3	Failure of control system	5.2 Brakes 5.3.4 Systems for lifting and lowering 5.3.6.2 Emergency lowering control
4.10.4	Errors of fitting	- Not covered by this standard
4.10.5	Loss of machinery stability	- see 4.1.11
4.11	Hazards due to missing safety means	- Not applicable
Additional hazards due to mobility		
4.12	Inadequate lighting of moving/working area	see 4.8.4

Hazard		Corresponding requirement	
4.13	Hazards due to sudden movement, instability etc. during handling	7.1	Instruction handbook
4.14	Inadequate/inergonomic design of driving/operating position		
4.14.1	Hazards due to dangerous environments (contact with moving parts, exhaust gases etc.)	5.3.3.3 5.3.5	Two hand control Operator position
4.14.2	Inadequate visibility from operator's position - on pedestrian-controlled trucks	- -	Not covered by this standard Not applicable
4.14.3	Inadequate seat/seating	-	Not covered by this standard
4.14.4	Inadequate ergonomic design/ positioning of controls	-	Not covered by this standard
4.14.5	Starting/moving of self-propelled machinery - Layout of pedals - Additional operator positions	- 5.3.3.2	Not covered by this standard Additional operator positions
4.14.6	Road traffic of self-propelled machinery	-	Not covered by this standard
4.14.7	Movement of pedestrian-controlled machinery	-	Not applicable
4.15	Mechanical hazards		
4.15.1	Hazards to exposed persons due to uncontrolled movement	5.3.3.3 5.3.4.2 5.3.4.5	Two hand control Hydraulic lifting systems Slack wire ropes/chains
4.15.2	Hazards due to break-up and/or ejection of parts	-	Not applicable
4.15.3	Hazards due to rolling over (deflection limiting volume; DLV)	-	Not applicable
4.15.4	Hazards due to falling objects (DLV)	5.3.6.1	Overhead guard
4.15.5	Inadequate means of access	-	Not covered by this standard
4.15.6	Hazards caused due to towing, coupling connecting, transmission etc.	-	Not covered by this standard
4.15.7	Hazards due to batteries, fire, emissions etc.	-	Not covered by this standard

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Additional hazards due to lifting operation

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4.16.1	Lack of stability	-	see 4.1.11
4.16.2	Derailment of machinery	-	Not applicable
4.16.3	Loss of mechanical strength of machinery and lifting accessories	5.3.4 5.3.4.4 5.3.6.2 6.1 6.2 7.1.3	Systems for lifting and lowering Ropes/chains employed Emergency lowering control Verification, General Structural verification Service and maintenance of the truck

Hazard		Corresponding requirement
4.16.4 Hazards caused by uncontrolled movement	5.2 5.3.4	Brakes Systems for lifting and lowering
4.17 Inadequate view of trajectories of the moving parts	-	Not covered by this standard
4.18 Hazards caused by lightning	-	Not applicable
4.19 Hazards due to loading/overloading	5.5 6.1 7.1.3	Stability Verification, General Service and maintenance of the truck
4.20 Hazards due to pressure vessels	-	Not covered by this standard

5 REQUIREMENTS

5.1 Modes of operation

5.1.1 Trucks free ranging outside the stacking aisles or in aisles without guidance systems designed to travel with elevated load and/or elevating operator position shall:

- be automatically prevented from travelling above 4 km/h when the operator position and/or the load handling device is elevated more than 1 200 mm up to and including 3 000 mm above the ground level and the steered wheel(s) is turned to not more than 10 degrees from a straight ahead position. The travelling speed is restricted to not more than 2,5 km/h at these elevations when the steered wheel(s) is turned to more than 10 degrees from a straight ahead position (see Table 1). The deceleration of the travelling speed shall be gradual.
- have travel speed restricted to not more than 2,5 km/h when the operating position and/or the load handling device is elevated more than 3 000 mm above the ground level (see Table 1).

5.1.2 Guided trucks operating in aisles with a non mechanical guidance system shall comply with the automatic steering requirements of EN 1526.

5.1.3 Whilst the truck is lifting, lowering or travelling at more than 2,5 km/h, it shall not be possible for any part of the lateral reach mechanism to intrude into the racking space. When this lateral reach mechanism is extended or extending, travelling speed shall be restricted to 2,5 km/h.

5.1.4 When a truck is designed for lateral and front stacking it shall have a device which automatically prevents:

- travelling at more than 2,5 km/h when the load handling device is in the forward position;
- turning of the load handling device in its forward position with a travelling speed of more than 2,5 km/h.

These requirements do not apply when the stability of the truck is maintained by the means described in 5.5.3.