SLOVENSKI STANDARD
SIST EN 13524:2004+A1:2009

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Stroji za vzdrževanje avtocest - Varnostne zahteve

Highway maintenance machines - Safety requirements

Maschinen für den Straßenbetriebsdienst - Sicherheitsanforderungen

Machines de maintenance des routes - Exigences de sécurité

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EUROPEAN STANDARD

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English Version

Highway maintenance machines - Safety requirements

Machines de maintenance des routes - Exigences de sécurité

Maschinen für den Straßenbetriebsdienst - Sicherheitsanforderungen

This European Standard was approved by CEN on 6 December 2002 and includes Amendment 1 approved by CEN on 24 November 2008.

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

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Contents

Foreword

This document (EN 13524:2003+A1:2009) has been prepared by Technical Committee CEN/TC 151 “Construction equipment and building material machines – Safety“, 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of an identical text or by endorsement, at the latest by July 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-11-24.

This document supersedes EN 13524:2003.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] 〈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 EC Directive(s).

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

The Annex A is informative and contains „Attachment plate of truck“. The Annex B is normative and contains “Stipulations on the design and testing of mowing and mulching machines”.

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.

0 Introduction

This European Standard is a Type C-standard as stated in [A1] EN ISO 12100 [A1].

[A1] When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

The machinery concerned and the extent to which hazards, hazardous situations and events are indicated in the scope of this European Standard. [A1]

1 Scope

This European Standard applies to machines used for highway maintenance which are attached to or mounted on carrier vehicles and which are defined in clause 3. Directives and standards for the vehicular truck chassis aspect, termed 'carrier vehicle' in this standard, would be those relevant to that equipment, even where specific modifications have been made to adapt the machines for highway maintenance application. The use in public road traffic is governed by the national regulations.

This European Standard deals with all significant hazards identified through a risk assessment pertinent to highway maintenance machines, when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). This European Standard does not deal with significant hazards associated with [A1] *deleted text* [A1] EMC. This European Standard specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards associated with machine operation, setting and adjustments, load discharge and routine maintenance.

This European Standard does not include requirements for the carrier vehicles (e.g. trucks, tractors, construction machines, industrial trucks) as well as their demountable bodywork. These are covered in directives related to the construction of vehicles. Demountable bodywork systems are specified in other standards.

This European Standard does not deal with:

— walker-operated an hand-held machines;

— machines for the maintenance of sports grounds;

— machines for agriculture, horticulture and forestry;

— winter-service machines;

— street-cleansing machines, except sweepers in compliance with 3.9;

— earth-moving machinery;

— pit and sewer cleaning vehicles/-machines;

— lifting platforms;

— refuse-collecting vehicles;

— bridge-inspection equipment;

— loading cranes;

— wood-choppers (bush wood choppers).

A machine which is a combination of several parts with different uses should conform to all the standards referring to the corresponding parts of the machine.

This European Standard does not deal with the risks associated with the operation of machines in potentially explosive atmospheres.

This standard applies to machines manufactured after the date of approval of this standard through CEN.

2 Normative references

A1⟩ The following referenced documents are indispensable for the application 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. ⟨A1

A1⟩ *deleted text* ⟨A1

A1⟩ EN 953:1997 ⟨A1, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 982:1996, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*

A1⟩ *deleted text* ⟨A1

A1⟩ EN ISO 2867:2006 ⟨A1, *Earth-moving machinery — Access systems (*A1⟩ *ISO 2867:2006* ⟨A1*)*

A1⟩ 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 13732-1:2006, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)* ⟨A1

ISO 730-1:1994[1], *Agricultural wheeled tractors — Rear-mounted three-point linkage — Part 1: Categories 1, 2, 3 and 4*

ISO 2758:2001, *Paper — Determination of bursting strength*

ISO 3416:1986, *Textile floor coverings — Determination of thickness loss after prolonged, heavy static loading*

A1⟩ ISO 6750:2005 ⟨A1, *Earth-moving machinery — Operation and maintenance — Format and content of manuals*

A1⟩ *deleted text* ⟨A1

A1⟩ ISO 11001-1:1993, *Agricultural wheeled tractors and implements — Three-point hitch couplers — Part 1: U-frame coupler*

ISO 11001-2:1993, *Agricultural wheeled tractors and implements — Three-point hitch couplers — Part 2: A-frame coupler*

A1⟩ [1] Under revision. ⟨A1

ISO 11001-3:1993, *Agricultural wheeled tractors and implements — Three-point hitch couplers — Part 3: Link coupler*

ISO 11001-4:1994[1)], *Agricultural wheeled tractors and implements — Three-point hitch couplers — Part 4: Bar coupler* A1

3 Terms and definitions

A1 For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply. A1

3.1
machine for highway maintenance
machine situated at the traffic surface which, from this position, prepares the traffic surface and its neighbouring areas

3.2
traffic surface
paved area where there is vehicular and/or pedestrian traffic. Not included are rail tracks which are solely for rail-mounted traffic, and traffic areas inside buildings and in underground mines

3.3
mulching machine
machine for reducing and/or shredding vegetation, working in a direction of motion substantially parallel and close to the ground

3.4
mowing machine
machine for cutting vegetation, working in a direction of motion substantially parallel and close to the ground

3.5
hedge-cutting machine
machine for cutting vegetation that operates not only close to the ground but can be used also, for example, for cutting hedges

3.6
verge mower
machine for removing growth on verges

3.7
ditch-maintenance machine
machine for keeping ditches clear

3.8
cleansing machine
machine for cleaning highway equipment such as delineators, traffic signs, tunnel walls

3.9
mechanical sweeper
machine for cleaning traffic areas. Machines within the scope of this standard are sweeper attachments which are not within the scope of EN 13019 (e.g. front-mounted sweepers)

3.10
ground-boring machine
machine for boring holes of low depth in the ground, e.g. for erecting posts. Machines within the scope of this standard are ground-boring attachments which are not within the scope of EN 791

3.11
refuse-collection machine
machine that collects refuse and convey it to a receptacle or unloading point by means of a material handling device, so far as it is not in the scope of standard series EN 1501

3.12
weeding machine
machine for mechanical removal of undesired vegetation on paved surfaces using rotating brushes

3.13
boom
equipment that is located between the carrier vehicle and a machine listed under 3.3 to 3.12, serving as positioning devices

3.14
operating area
operating area is that area in or immediately around the machine within which the work procedures are carried out (e.g. mowing of vegetation)

4 List of significant hazards

This clause contains all hazards and hazardous situations as far as they are dealt with in this European Standard, identified by risk assessments significant to this type of machinery that require action to eliminate or reduce risk.

Table 1 — List of significant hazards

	Hazards	Location of hazard	relevant for machine	Dealt with in clause
1.1	Crushing hazard	Persons in danger zone	all	A1 5.5 A1
		Coupling area of machines	all	A1 5.16 A1
				A1 5.7 A1
1.2	Shearing hazard	Operating area of rotating/oscillating tools; Moving elements; Slewing area of machines and machine parts	all	A1 5.16 A1
1.3	Cutting or severing hazard	Operating area of cutting machinery	3.4 3.5	A1 5.16 A1
1.4	Entanglement hazard	Operating area of rotating machinery; Rotating or oscillating machine parts	all	A1 5.16 A1
1.5	Drawing-in or trapping hazard	Operating area of rotating machinery; Rotary or oscillating machine parts	all	A1 5.16 A1
A1 1.6	High pressure fluid ejection or ejection hazard	Power transmission lines	all	5.13.1 5.13.2 A1

Table 1 *(continued)*

	Hazards	Location of hazard	relevant for machine	Dealt with in clause
2	Burns, scalds and other injuries by a possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions and also by the radiation of heat sources	Engine cooling systems; Exhaust system	all	5.6
3	Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	Workplace	3.3 3.4 3.6 3.7 3.8 3.9 3.11 3.12	6
4	Human error, human behaviour	Operating area of the machines	all	6
5	Inadequate design, location or identification of manual controls	Operating area of the machines	all	5.3 5.15
6.1	Failure/disorder of the control system	Operating area of the machines	all	5.9 5.12
6.2	Restoration of energy supply after an interruption	Operating area of the machines	all	5.15 6
7	Falling or ejected objects or fluids	Operating area of rotating machinery	3.3 3.4 3.6 3.7	5.14 5.16
8	Hazards generated by noise, resulting in:		all	
8.1	Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness)		all	5.18
8.2	Interference with speech communication, acoustic signals etc.		all	5.18
9	Hazards generated by vibration		all	
9.1	Whole body vibration, particularly when combined with poor postures		all	5.19
10	Loss of stability/overturning of machinery	Impermissible combinations; Supporting equipment	all all	5.2 5.11
11	Slip, trip and fall of persons (related to machinery)	Access steps	3.13	5.4
12	Movement without all parts in a safe position	Movable machine parts	all	5.10 5.11

5 Safety requirements and/or measures

5.1 [A1] General [A1]

The machines shall comply with the safety requirements and/or measures of this clause. In addition the machines shall be designed to comply with the requirements of [A1] EN ISO 12100-1 and EN ISO 12100-2 [A1] for hazards that are relevant but not significant and therefore are not dealt with in this standard.

For the application of the reference standards [A1] *deleted text* [A1] EN 953, EN 982 [A1], [A1] EN 983 [A1] and EN ISO 13732-1 [A1] which are used in this standard, the manufacturer shall carry out an adequate risk assessment relating to those requirements for which a special safety measure or category is necessary.

NOTE This specific risk assessment should be part of the general risk assessment relating to the hazards not covered by this standard.

Where the means of reducing the risk is by a safe system of working the machinery, the manufacturer shall include in the Information for use details of the system and of the elements of training required by the operating personnel.

5.2 Combination of carrier vehicle and machine for highway maintenance

The design of the highway maintenance machines shall conform to the requirements of the carrier vehicle defined by its manufacturer.

[A1] The assembled machine (carrier vehicle and the attached machine(s)) shall not cause any deterioration in safety provisions such as braking, operator's view, stability during transportation, assembly, use, dismantling and any other action. [A1]

5.3 Controls

a) Controls of command devices which require a float setting or pressure setting.

   Controls for elevating and slewing devices shall be designed so that they automatically return to zero position when released. This does not apply to elevating devices that necessitate a float or pressure position or a proportional control according to their function and also does not apply to continuously operating mechanisms such as hydraulic motors.

b) Protection against actuation of controls by unauthorized person.

   Controls shall be lockable by the operator when leaving the workplace by the use of:

   — guards, or,

   — mechanical locking means, or,

   — locking through key-operated switches.

c) Controls shall be positioned outside of the hazard zone. Hazardous conditions that are not protected shall be observable by the operator during the operation of the controls.

5.4 Access and walkways

Where equipment requiring regular access and walking on is inaccessible from the ground level, access ladders, walkways and standing areas complying with EN ISO 2867 shall be provided.

The bottom step or rung of a ladder shall not be more than 650 mm away from the ground level.