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Mobile road construction machinery - Safety - Part 6: Specific requirements for paver-finishers

Bewegliche Straßenbaumaschinen - Sicherheit - Teil 6: Besondere Anforderungen an Straßenfertiger

Machines mobiles pour la construction de routes - Sécurité - Partie 6 : Prescriptions spécifiques pour finisseurs

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Mobile road construction machinery - Safety - Part 6: Specific requirements for paver-finishers

Machines mobiles pour la construction de routes - Sécurité
- Partie 6 : Prescriptions spécifiques pour finisseurs

Bewegliche Straßenbaumaschinen - Sicherheit - Teil 6:
Besondere Anforderungen an Straßenfertiger

This European Standard was approved by CEN on 17 August 2006.

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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 Central Secretariat has the same status as the official versions.

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EN 500-6:2006 (E)**Foreword**

This document (EN 500-6:2006) 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of an identical text or by endorsement, at the latest by April 2007, and conflicting national standards shall be withdrawn at the latest by October 2008..

This document supersedes ENV 500-6:1995.

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.

EN 500 “Mobile road construction machinery — Safety” comprises the following parts:

- Part 1: Common requirements;
- Part 2: Specific requirements for road-milling machines;
- Part 3: Specific requirements for soil-stabilising machines and recycling machines;
- Part 4: Specific requirements for compaction machines;
- Part 6: Specific requirements for paver-finishers;

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100-1.

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

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.

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EN 500-6:2006 (E)**1 Scope**

This part of EN 500 specifies the safety requirements for paver-finishers as defined in Clause 3 and deals with the significant hazards relevant to these machines, when they are used as intended and under conditions of misuse which are reasonably foreseeable. This part of EN 500 contains additional requirements to EN 500-1 "Common requirements".

If internal and/or external vibrators are used for concrete paving, then prEN 12649 applies.

2 Normative references

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.

EN 500-1:2006, *Mobile road construction machinery — Safety — Part 1: Common requirements*

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

EN ISO 3450:1996, *Earth-moving machinery — Braking systems of rubber-tyred machines — Systems and performance requirements and test procedures (ISO 3450:1996)*

EN ISO 3744:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*

EN ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)*

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

3 Terms and definitions

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

3.1 paver-finisher

mobile self-propelled machine (either rubber-tyred or crawler-mounted) specifically designed to receive, convey, distribute, profile and compact paving material (see Figures D.1 and D.2)

3.1.1 pre-compaction screed paver-finisher

machine that compacts the construction material by the weight of the screed (pre-compacting system) (see Figure D.3)

3.1.2 compaction screed paver-finisher

machine fitted with, in addition to the pre-compacting system, a single additional compaction system which may consist of vibrators or tamper bars (see Figures D.4 and D.5)

3.1.3**high-compaction screed paver-finisher**

machine fitted with, in addition to the pre-compacting system, at least two compaction systems which may consist of vibrators, tamper bars or pressure bars (see Figures D.6 and D.7)

3.2**slipform paver**

machine on three or four crawlers intended to move and to guide a mould that extrudes pre-vibrated concrete to make either continuous works, such as borders, inserts, paving stones, or layers of continuous concrete (see Figures D.8 and D.9)

4 List of significant hazards

Annex F of EN 500-1:2006 applies with the following exception:

Table 1

5	Hazards generated by vibration
5.1	Hand-arm vibrations

5 Safety requirements and/or protective measures**5.1 Lighting, signalling and marking lights and reflex-reflector devices**

5.2 of EN 500-1:2006 applies.

5.2 Operation and handling

5.3 of EN 500-1:2006 applies.

5.3 Operator's station

5.4 of EN 500-1:2006 applies with the following exception:

- 5.4.1 of EN 500-1:2006, fifth and sixth indent, applies only for forward measurement;
- 5.4.2 of EN 500-1:2006, first paragraph, does not apply for paver-finishers.

5.4 Operator's seat

5.5 of EN 500-1:2006 applies.

5.5 Controls and indicators

5.6 of EN 500-1:2006 applies with the following addition:

- the extending or closing of the telescopic screed shall not be induced simultaneously from both the operator's station and the remote control area. Controls for the regulation of the telescopic screeds shall be designed in such a manner as to ensure that they return to neutral when released (hold-to-run control).

5.6 Starting

5.7 of EN 500-1:2006 applies.

EN 500-6:2006 (E)**5.7 Stopping**

5.8 of EN 500-1:2006 applies with the following addition:

- braking systems of rubber-tyred paver-finishers shall comply with Annex A.

5.8 Access systems to operator's station and to maintenance points

5.9 of EN 500-1:2006 applies with the following exception and addition:

- the height of the first step (600 mm) for access to the operator's position can be exceeded in transport position.

5.9 does not apply for access systems leading to service points in the area of the material hopper.

Walkways shall be fitted to the screed sections and shall cover the operating width of the screed.

5.9 Protection

5.10 of EN 500-1:2006 applies with the following addition:

- screeds shall be provided with a locking device to ensure safe elevation.

The spreader augers from which mechanical hazard emanates within the width of the basic machine shall be fitted with fixed guards according to 3.2 of EN 953:1997, e.g. by gratings.

When the spreader augers extend beyond the width of the basic machine, they shall at least be protected by guard-rails.

When paver-finishers are designed for use on rails, all wheels in each direction of travel shall be provided with foot-guards. The distance between the foot-guards and upper edge of the rail shall not exceed 20 mm.

5.10 Pressurised systems

5.11 of EN 500-1:2006 applies.

5.11 Fire protection

5.12 of EN 500-1:2006 applies.

5.12 Hot surfaces

5.13 of EN 500-1:2006 applies.

5.13 Signal devices and warning signs

5.14 of EN 500-1:2006 applies with the following addition:

- telescopic screeds used on paver-finishers which could form crushing or shearing zones during their operation shall be fitted with yellow flashing lights. Those flashing lights shall be located close to the crushing or shearing zones and shall be activated automatically when the screeds are extended or retracted.

5.14 Liquid gas units

5.15 of EN 500-1:2006 applies.

5.15 Electrical and electronic systems

5.16 of EN 500-1:2006 applies.

5.16 Electro-magnetic compatibility (EMC)

5.17 of EN 500-1:2006 applies with the following addition:

- the antenna shall be located successively on the left- and right-hand sides of the paver-finisher, with the antenna parallel to the plane of the longitudinal symmetry of the paver-finisher and in line with the SIP.

5.17 Noise and vibration

5.18.2 and 5.18.3 of EN 500-1:2006 apply with the following addition:

- for the determination of the noise values, Annex B applies to paver-finishers and Annex C applies to slipform pavers.

5.18 Conveyors

Hopper conveyors need not to comply with 5.19 of EN 500-1:2006.

6 Verification of safety requirements and/or protective measures

Clause 6 of EN 500-1:2006 applies.

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7 Information for the user

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7.1 Warning signals and devices

Annex E of EN 500-1:2006 applies.

7.2 Instruction handbook

7.2 of EN 500-1:2006 applies with the following additions:

- information for a safe cleaning of the hopper and auger;
- information for a safe handling of gas bottles.

7.3 Marking

7.3 of EN 500-1:2006 applies.

Annex A (normative)

Braking systems of rubber-tyred paver-finishers – Performance requirements and test procedures

A.1 Scope

This annex specifies the performance requirements and test procedures of brake systems for rubber-tyred paver-finishers.

The brake systems shall meet the requirements of EN ISO 3450 with the following additions and exceptions:

A.2 Machine mass

A.2.1 General

Clause 3 of EN ISO 3450:1996 applies with the following addition:

A.2.2 Operating mass

Operating mass in the heaviest version of the paver-finisher, including canopy or cabin with all their components and mountings and by considering all working elements to be fitted for the maximum working width approved by the manufacturer of the machine, including operator of 75 kg, half-full fuel tank and full lubricating system, hydraulic oil system and cooling system. If equipped, with half-full tanks for emulsion and emulsion solvent.

A.3 General requirements

A.3.1 General

Clause 5 of EN ISO 3450:1996 applies with the following addition:

A.3.2 Disconnection

If a device is fitted for disconnection, such as a clutch or a gearbox, then this shall only be operated at standstill.

The brake systems are permitted to be effective via gear components and chains and to possess only one braking surface for all wheels slowed down.

A.3.3 Service brake system

On machines with a hydrostatic traction drive developing a maximum speed of no more than 25 km/h, this hydrostatic traction drive can at the same time be used as a service brake. After standstill, an unintentional movement shall not be possible.