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Stroji za zemeljska dela - Varnost - 6. del: Zahteve za prekucnike

Earth-moving machinery - Safety - Part 6: Requirements for dumpers

Erdbaumaschinen - Sicherheit - Teil 6: Anforderungen für Muldenfahrzeuge

Engins de terrassement - Sécurité - Partie 6: Prescriptions applicables aux tombereaux

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Earth-moving machinery - Safety - Part 6: Requirements for dumpers

Engins de terrassement - Sécurité - Partie 6: Prescriptions applicables aux tombereaux

Erdbaumaschinen - Sicherheit - Teil 6: Anforderungen für Muldenfahrzeuge

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Foreword

This document (EN 474-6:2006+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of an identical text or by endorsement, at the latest by August 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-12-20.

This document supersedes [A1] EN 474-6:2006 [A1].

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 EU Directive.

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

For bibliographic references, see [A1] EN 474-1:2006+A1:2009 [A1].

EN 474 "Earth-moving machinery — Safety" comprises the following parts:

— Part 1: General requirements

— Part 2: Requirements for tractor-dozers

— Part 3: Requirements for loaders

— Part 4: Requirements for backhoe-loaders

— Part 5: Requirements for hydraulic excavators

— Part 6: Requirements for dumpers

— Part 7: Requirements for scrapers

— Part 8: Requirements for graders

— Part 9: Requirements for pipelayers

— Part 10: Requirements for trenchers

— Part 11: Requirements for earth and landfill compactors

— Part 12: Requirements for cable excavators

This European Standard is intended for use in combination with Part 1 of the series.

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.

Introduction

This part of EN 474 is a type C standard as stated in EN ISO 12100-1:2003.

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

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.

1 Scope

This part of EN 474 deals with all significant hazards, hazardous situations and events relevant to wheel and crawler dumpers as defined in EN ISO 6165:2006, including compact dumpers, and compact dumpers with standing operator when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). The requirements of this part are complementary to common requirements formulated in ⟩A1⟨ EN 474-1:2006+A1:2009 ⟩A1⟨.

This part does not repeat the requirements from ⟩A1⟨ EN 474-1:2006+A1:2009 ⟩A1⟨, but adds or replaces the requirements for application for dumpers.

This part specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards, hazardous situations and events during commissioning, operation and maintenance of dumpers.

Pedestrian controlled dumpers are excluded from the scope of this European Standard.

This European Standard is not applicable to dumpers, manufactured before the date of publication of this European Standard by CEN.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

⟩A1⟨ EN 474-1:2006+A1:2009 ⟩A1⟨, *Earth-moving machinery — Safety — Part 1: General requirements*

⟩A1⟨ *deleted text* ⟩A1⟨

⟩A1⟨ EN ISO 3449:2008 ⟩A1⟨, *Earth-moving machinery — Falling-object protective structures - Laboratory tests and performance requirements (ISO 3449:2005)*

⟩A1⟨ EN ISO 3164:2008 ⟩A1⟨, *Earth-moving machinery — Laboratory evaluations of protective structures — Specifications for deflecting-limiting volume (ISO 3164:1995)*

⟩A1⟨ EN ISO 3471:2008, *Earth-moving machinery - Roll-over protective structures - Laboratory tests and performance requirements (ISO 3471:2008)* ⟩A1⟨

⟩A1⟨ EN ISO 7096:2008 ⟩A1⟨, *Earth-moving machinery — Laboratory evaluation of operator seat vibration (ISO 7096:2000)*

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

ISO 10268:1993, *Earth-moving machinery — Retarders for dumpers and tractor-scrapers — Performance tests*

ISO 10570:2004, *Earth-moving machinery — Articulated frame lock — Performance requirements*

ISO 13333:1994, *Earth-moving machinery — Dumper body support and operator's cab tilt support devices*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in ⟩A1⟨ EN 474-1:2006+A1:2009 ⟩A1⟨, EN ISO 12100-1:2003 and the following apply.

NOTE 1 Terminology for dumpers is specified in ISO 7132:2003 and is illustrated in Annex B of this European Standard.

NOTE 2 Definitions used in EN and ISO standards referred to in this European Standard are also valid for this document.

3.1
dumper
self-propelled crawler or wheeled machine, with an open body, which transports and dumps or spreads material (see EN ISO 6165:2006 and Figures B.1 and B.2)

NOTE Except for compact dumpers, loading is performed by other machines or equipment.

3.2
rigid frame dumper
dumper with a rigid frame and wheel or crawler steering (see EN ISO 6165:2006, Figure B.1and Figure B.3)

3.3
articulated frame dumper
dumper with an articulated frame for steering (see EN ISO 6165:2006 and Figure B.2)

3.4
swing dumper
dumper having a 360° swing upper structure (see EN ISO 6165:2006)

NOTE The upper structure comprises a rigid frame, open body and operator's station; the under-carriage consists of a track type or wheeled unit.

3.5
compact dumper
articulated or rigid dumper having an operating mass (see [A1] ISO 6016:2008 [A1]) of 4 500 kg or less (see EN ISO 6165:2006 and Figures B.4, B.5 and B.6)

NOTE A compact dumper may have integral self-loading equipment.

3.6
self-loading equipment
integral mounted bucket-supporting structure and linkage permanently fitted to the dumper enabling it to fill its own open body with material (see Figure B.6)

4 List of additional significant hazards

See Annex A.

NOTE Annex A (normative) contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

5 Requirements and/or measures

5.1 General

Dumpers shall comply with the requirements of [A1] EN 474-1:2006+A1:2009 [A1], as far as not modified or replaced by the requirements of this part.

5.2 Dump body

5.2.1 Control device

When the content of the body can be dumped manually, the control device shall be designed and placed so that the opening and closing can be actuated safely, e.g. from the operator's position or from a side different from the tipping direction.

5.2.2 Body lowering

In case of loss of energy, lowering the body to the transport position (frame) shall be possible in a safe way without special tools ,e.g. by a manually operated valve.

5.2.3 Body down indicator

Dumpers shall have the following provisions:

— a device preventing travelling with a speed higher than 10 km/h when the body is not completely lowered;

— an audible and/or visible warning device functioning when the body is not in a lowered position and the transmission is engaged.

Compact dumpers are excluded from this requirement.

5.2.4 Body support device

A mechanical body support device shall be provided to support the body in lifted position during service, maintenance and other non-operational purposes. The device shall meet the requirements in ISO 13333:1994.

5.2.5 Sticking load

Where there is a risk of loosing stability while dumping due to the load freezing to the body, provisions shall be made to assist discharge of the load.

NOTE A solution is to provide an exhaust heating system for the dump body.

Compact dumpers are excluded from this requirement.

5.3 Retarder

Dumpers, except compact dumpers and crawler dumpers, shall be equipped with a retarder system, which meets the requirements of ISO 10268:1993.

5.4 Articulated frame lock

〚A1〛 EN 474-1:2006+A1:2009 〚A1〛, 5.14.5 applies with the following exceptions:

The articulated frame lock device shall meet the requirements in ISO 10570:2004 except that the requirement for articulated dumpers is limited to a steering torque (expressed in Newton per metre) of 4,0 times the steering torque for the unloaded machine.

This articulated frame lock device shall be tested to withstand a force of 1,2 times or more of the steering force calculated from the maximum force of the calculated steering moment.

5.5 Roll-over protective structures (ROPS)

〚A1〛 EN 474-1:2006+A1:2009 〚A1〛, 5.3.3 applies with the following additions/exceptions for compact dumpers: