



**SLOVENSKI STANDARD**  
**SIST EN 474-3:2007+A1:2009**  
**01-maj-2009**

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**Stroji za zemeljska dela - Varnost - 3. del: Zahteve za nakladalnike**

Earth-moving machinery - Safety - Part 3: Requirements for loaders

Erdbaumaschinen - Sicherheit - Teil 3: Anforderungen für Lader

Engins de terrassement - Sécurité - Partie 3: Prescriptions applicables aux chargeuses

**Ta slovenski standard je istoveten z: EN 474-3:2006+A1:2009**

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EUROPEAN STANDARD

**EN 474-3:2006+A1**

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**Earth-moving machinery - Safety - Part 3: Requirements for loaders**

Engins de terrassement - Sécurité - Partie 3: Prescriptions applicables aux chargeuses

Erdbaumaschinen - Sicherheit - Teil 3: Anforderungen für Lader

This European Standard was approved by CEN on 17 April 2006 and includes Amendment 1 approved by CEN on 20 December 2008.

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**EN 474-3:2006+A1:2009 (E)****Foreword**

This document (EN 474-3:2006+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of an identical text or by endorsement, at the latest by August 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.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  $\square_{A1}$  EN 474-3:2006  $\square_{A1}$ .

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\square_{A1}$   $\square_{A1}$ .

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.

$\square_{A1}$  For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.  $\square_{A1}$

For bibliographic references, see  $\square_{A1}$  EN 474-1:2006+A1:2009  $\square_{A1}$ .

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

- Part 1: General requirements [SIST EN 474-3:2007+A1:2009](https://standards.iteh.ai/catalog/standards/sist/5caed098-a155-4f37-93d4-16427a2aa3a8/sist-en-474-3-2007a1-2009)
- 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.

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**EN 474-3:2006+A1:2009 (E)****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 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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## 1 Scope

This part of EN 474 deals with all significant hazards, hazardous situations and events relevant to loaders as defined in EN ISO 6165:2006, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This part also deals with fork application, single heavy object handling application, object handling application and log handling.

The requirements of this part are complementary to the common requirements formulated in <sup>A1</sup>EN 474-1:2006+A1:2009 <sup>A1</sup>.

This part does not repeat the requirements from <sup>A1</sup>EN 474-1:2006+A1:2009 <sup>A1</sup>, but adds or replaces the requirements for application for loaders.

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 loaders.

This European Standard is not applicable to loaders 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.

<sup>A1</sup>EN 474-1:2006+A1:2009 <sup>A1</sup>, *Earth-moving machinery — Safety — Part 1: General requirements*

<https://standards.iteh.ai/catalog/standards/sist/5caed098-a155-4f37-93d4->

<sup>A1</sup>EN ISO 2867:2008, *Earth-moving machinery — Access systems (ISO 2867:2006, including Cor 1:2008)* <sup>A1</sup>

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

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

<sup>A1</sup>EN ISO 3457:2008 <sup>A1</sup>, *Earth-moving machinery — Guards — Definitions and requirements (ISO 3457:2003)*

<sup>A1</sup>EN ISO 6682:2008 <sup>A1</sup>, *Earth-moving machinery — Zones of comfort and reach for controls (ISO 6682:1986 including Amendment 1:1989)*

<sup>A1</sup>EN ISO 7096:2008 <sup>A1</sup>, *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 2330:2002, *Fork-lift trucks — Fork arms — Technical characteristics and testing*

<sup>A1</sup>ISO 6016:2008 <sup>A1</sup>, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

ISO 7546:1983, *Earth-moving machinery — Loader and front loading excavator buckets — Volumetric ratings*

**EN 474-3:2006+A1:2009 (E)**

ISO 14397-1:2007, *Earth-moving machinery — Loaders and backhoe loaders — Part 1: Calculation of rated operating capacity and test method for verifying calculated tipping load*

**3 Terms and definitions**

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

Terminology for loaders is specified in ISO 7131:1997 and the most common loaders are illustrated in Annex B of this European Standard.

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

**3.1 loader**

self-propelled crawler or wheeled machine, having a front-mounted equipment primarily designed for loading operation (bucket use), which loads or excavates through forward motion of the machine

NOTE 1 A loader work cycle normally comprises filling, elevating, transporting and discharging material.

NOTE 2 Derivative machinery; loaders can also be used for derivative application (see EN 474-1:2006+A1:2009, 3.1.2).

**3.2 compact loader**

loader with an operating mass (see ISO 6016:2008) of 4 500 kg or less, designed to work in confined spaces with the associated needs for greater manoeuvrability

**3.3 skid steer loader**

loader normally having an operator's station between attachment-supporting structures and steered by using variation of speed and/or direction of rotation between traction drives on opposite sides of a machine with fixed axles

**3.4 swing loader**

loader having a swing type lift arm with a swinging angle to the left and right from a straight position

NOTE A swing loader work cycle is normally similar to a loader cycle but additionally work can be done offset of the machine track.

**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 Safety requirements and/or measures****5.1 General**

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

## 5.2 Loaders with front access

### 5.2.1 General

For loaders with front access the reference to  $\text{A1}$  EN ISO 2867:2008  $\text{A1}$  applies with the deviations given in 5.2.2 and 5.2.3.

### 5.2.2 Primary access opening

The primary opening shall not be less than:

- opening height 875 mm;
- opening width 550 mm.

### 5.2.3 Alternative egress opening (emergency exit)

An alternative opening shall be provided.

Minimum dimension of the emergency exit shall comply with  $\text{A1}$  11.2 b) of EN ISO 2867:2008  $\text{A1}$ .

## 5.3 Operator's seat

$\text{A1}$  EN 474-1:2006+A1:2009  $\text{A1}$ , 5.4.1 applies with the addition that the seat shall meet the requirements of the following input spectral class according to  $\text{A1}$  EN ISO 7096:2008  $\text{A1}$ :

- EM3 for wheel loaders greater than 4 500 kg;
- EM6 for crawler loaders; [SIST EN 474-3:2007+A1:2009  
https://standards.iteh.ai/catalog/standards/sist/5caed098-a155-4f37-93d4-2009](https://standards.iteh.ai/catalog/standards/sist/5caed098-a155-4f37-93d4-2009)
- EM8 for compact wheel loaders less or equal than 4 500 kg;
- EM9 for skid steer loaders.

## 5.4 Rear window(s)

The requirements of  $\text{A1}$  EN 474-1:2006+A1:2009  $\text{A1}$ , 5.3.2.7 and 5.3.2.9 for the rear window(s) apply, with the exception that no motorized wiper(s) and washers are required for loaders with a cab width less than or equal to 750 mm measured outside of the cab in the height of SIP.

## 5.5 Protection

### 5.5.1 Roll-over protective structures (ROPS)

$\text{A1}$  EN 474-1:2006+A1:2009  $\text{A1}$ , 5.3.3, applies with the following addition for compact loaders:

The portion of deflection-limiting volume (DLV) above the LA (SIP) line according to  $\text{A1}$  EN ISO 3164:2008  $\text{A1}$  is allowed to deviate (lean) up to 15° laterally as shown in Figure 1, when the minimum energy requirement is met. Portion below the LA (SIP) line of DLV can be disregarded.