



SLOVENSKI STANDARD
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Stroji za zemeljska dela - Varnost - 11. del: Zahteve za kompaktorje zemlje in odpadkov

Earth-moving machinery - Safety - Part 11: Requirements for earth- and landfill compactors

Erdbaumaschinen - Sicherheit - Teil 11: Anforderungen für Erd- und Müllverdichter

Engins de terrassement - Sécurité - Partie 11: Prescriptions applicables aux compacteurs de remblais et de déchets

Ta slovenski standard je istoveten z: EN 474-11:2022

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ICS:

53.100

Stroji za zemeljska dela

Earth-moving machinery

SIST EN 474-11:2022

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EUROPEAN STANDARD

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Earth-moving machinery - Safety - Part 11: Requirements for earth- and landfill compactors

Engins de terrassement - Sécurité - Partie 11 :
Prescriptions applicables aux compacteurs de remblais
et de déchets

Erdbaumaschinen - Sicherheit - Teil 11: Anforderungen
für Erd- und Müllverdichter

This European Standard was approved by CEN on 14 February 2022.

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

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European foreword

This document (EN 474-11:2022) 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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by March 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 474-11:2006+A1:2008.

This document has been prepared under a standardization request 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.

For bibliographic references, see EN 474-1:2022.

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
- Part 13: Requirements for rollers

This document is intended for use in combination with part 1 of the series.

EN 474-11:2022 (E)

The main differences between this document and EN 474-11:2006+A1:2008 are as follows:

- a) scope has been aligned to distinct rammer compactor dealt with by ISO/TC 195 from machinery dealt with by this document (modified);
- b) safety-related functions of control systems (excluded);
- c) normative references (Clause 2) (updated);
- d) terms and definitions (Clause 3) (updated);
- e) all earth- and landfill-compactors shall be fitted with a cab (added);
- f) requirement for cab-protection (4.2.2.2) (modified);
- g) requirement for Deodorising filter (4.2.2.3) (modified);
- h) requirement for the Primary Access Opening (Cab Door protection) (modified);
- i) operator's seat input spectral class shall be EM3 for earth- and landfill compactors (4.3) (added);
- j) requirements for braking systems (4.5 and Annex B) (modified);
- k) lifting operations requirements for earth- and landfill compactors (4.7) (excluded);
- l) Fenders requirement for earth- and landfill compactors (4.8) (excluded);
- m) verification methods table (Clause 5) (added);
- n) requirement for Information for use (Clause 6) (modified);
- o) list of significant hazards (Annex A) (updated);
- p) Annex ZA (updated).

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

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

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

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EN 474-11:2022 (E)**1 Scope**

This document, together with EN 474-1:2022, deals with all significant hazards for earth-moving machinery, earth- and landfill compactors when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer associated with the whole life time of the machine (see Annex A).

The requirements of this part are complementary to the common requirements formulated in EN 474-1:2022. This document does not repeat the requirements of EN 474-1:2022, but supplements or modifies the requirements for application for earth moving machinery – earth- and landfill compactors.

Rammer compactors and vibratory plates are excluded from this document.

This document does not provide requirements for main electrical circuits and drives of machinery when the primary source of energy is an external electrical supply.

The following significant and relevant hazards are not covered in this document:

- Laser;
- Lightning.

This document does not provide performance requirements for safety related functions of control system(s). This document is not applicable to earth- and landfill compactors manufactured before the date of publication of this document by CEN.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 474-1:2022, *Earth-moving machinery — Safety — Part 1: General requirements*

EN ISO 3450:2011, *Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems (ISO 3450:2011)*

EN ISO 5010:2019, *Earth-moving machinery — Wheeled machines — Steering requirements (ISO 5010:2019)*

EN ISO 7096:2020, *Earth-moving machinery — Laboratory evaluation of operator seat vibration (ISO 7096:2020)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

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

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*

ISO 14397-1:2007/Amd 1:2019, *Earth-moving machinery — Loaders and backhoe loaders — Part 1: Calculation of rated operating capacity and test method for verifying calculated tipping load – Amendment 1*

ISO 13539:1998, *Earth-moving machinery — Trenchers — Definitions and commercial specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 474-1:2022, ISO 13539:1998 and EN ISO 12100:2010 and the following apply.

NOTE Terminology for earth- and landfill compactors is specified in ISO 8811:2000 and illustrated in Annex C of this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

landfill compactor

self-propelled, wheeled compaction machine having front-mounted attachment with a dozing or loading equipment and wheels provided with means to crush and compact waste material, which also moves, grades and loads soil, landfill or sanitary (refuse) materials through its own motion

[SOURCE: EN ISO 6165:2012, 4.9, modified]

3.2

earth compactor

self-propelled, wheeled compaction machine having front-mounted equipment with a dozing or loading attachment and wheels provided with the means to move and grade soil and loose rock, through its own motion

3.3

dozing equipment

equipment as defined in ISO 6747:2013, 3.1.6 with augmented functionality to move or grade material through a motion of the machine

3.4

loading equipment

equipment for loading, transporting, distributing, filling and grading material

3.5

steel-wheel

drum affixed to the axles equipped with choppers, padfoot, sheepfoot or grid surface on a steel drum, etc. which are used to cut, demolish or compact material

4 Safety requirements and/or protective/risk reduction measures

4.1 General

4.1.1 Context

Earth- and landfill compactors shall comply with the safety requirements and/or protective/risk reduction measures of this clause. In addition, the machines shall be designed according to the principles of EN ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

4.1.2 Specific relation to EN 474-1

Earth- and landfill compactors shall comply with the requirements of EN 474-1:2022, as far as not modified or replaced by the requirements of this part.

EN 474-11:2022 (E)**4.2 Operator's station****4.2.1 General**

EN 474-1:2022, 4.3 applies with the additions in 4.2.2 to 4.3.

4.2.2 Operator's station equipped with a cab**4.2.2.1 General**

EN 474-1:2022, 4.3.1.1, first paragraph shall be replaced by:

All earth- and landfill compactor shall be fitted with a cab.

4.2.2.2 Cab protection

The bottom part of the cab shall be able to protect the operator against penetrating material.

This protection shall be established preferably by armouring either the floor plates of the cabin, or by similar structural elements of the machine-frame located under the cab and covering the floor-area of the cab in total.

The resistibility of this protection shall be equal or higher to a comparable system established by a fine-grain steel-plate, if clamped in from all sides. The representative thickness of the fine-grain construction steel-plate, or steel-structure of this comparable system shall have a total work piece thickness of > 6 mm.

NOTE The design of the protective device is not limited to a special material. However, the reference level for the comparable system is based on the material properties of sheet metal EN 10149-2 - S355MC with material characteristic according to steel key 1.0976 under consideration of the related assembly situation.

Alternative materials shall have at least the same protection characteristics as the system described above.

Irrespective of the material used and the various cabin-designs applied, the protection shall meet at least the requirements of a fixed guard as defined in ISO 14120:2015, 3.2.

4.2.2.3 Deodorising filter <https://standards.iteh.ai/catalog/standards/sist/a3a4b3be-2d2f-483e-ae6d-77d5b4b1ae61/sist-en-474-11-2022>

EN 474-1:2022, 4.3.2.1.2 applies with the addition that provision shall be made for the installation of a deodorising filter.

NOTE See ISO 11155-2 for further reference.

4.2.2.4 Primary access opening

EN 474-1:2022, 4.3.2.5 applies with the addition that:

— if the primary access opening is equipped with a cab-door;

and

— if the lower part of this cab-door on an earth- and landfill compactor is fitted with glass;

the lower part of the cab-door shall be protected by an additional guard in accordance with EN 474-1:2022, 4.3.2.5, 4th paragraph.

4.3 Seat

EN 474-1:2022, 4.4 shall apply with the following modification:

EN 474-1:2022, 4.4.1.4 shall apply with the addition that the operator's seat shall meet EN ISO 7096:2020 for the input spectral class EM3.

4.4 Steering system

EN 474-1:2022, 4.6 shall apply with the following modification:

EN 474-1:2022, 4.6.2 shall apply with the addition that the steering test on earth- and landfill compactors shall be conducted in accordance with EN ISO 5010:2019 and with pneumatic rubber tyres fitted for testing purposes, instead of compactor steel-wheels.

4.5 Braking system

EN 474-1:2022, 4.7 applies with those modifications as given in Annex B.

4.6 Stability

EN 474-1:2022, 4.11 applies with the following additions for machines with loading equipment:

All rated capacities as defined hereafter are based on tests and/or calculations of machines being on level and firm supporting surface.

The mass of the load, its density and the location of its centre of gravity as well as the mass of the attachment and the equipment, if fitted, shall be included in the determination of the rated operating load and the size/capacity of the attachment.

To provide sufficient stability the rated operating load requirements in the intended operating applications shall be determined as follows:

- tipping load and rated operating load shall be determined according to ISO 14397-1:2007 and ISO 14397-1:2007/Amd 1:2019;
- volumetric rating of the bucket shall be determined according to ISO 7546:1983.

NOTE See EN 474-3:2022, 5.6.2 for the effect on stability of particular applications.

The mass, volumetric rating of bucket and density of the material have to be taken into account when the bucket capacity is selected for a specific application.

4.7 Lifting operation

EN 474-1:2022, 4.12 does not apply.

4.8 Protective measures and devices

EN 474-1:2022, 4.14 shall apply with the following modification:

EN 474-1:2022, 4.14.4 does not apply.

5 Verification of the safety requirements and/or protective/risk reduction measures

Safety requirements and/or protective/risk reduction measures of Clause 4 of this document shall be verified according to Table 1.

Table 1 sets out verification methods which shall be applied for each safety requirement in this document.

Where X(s) is indicated in the table, the corresponding verification method(s) shall be applied.

Table 1 shall be read in conjunction with the corresponding clauses.

Table 1 includes the following verification methods:

- a) calculation: to establish that the requirements of this document have been met;