SLOVENSKI STANDARD
oSIST prEN 474-12:2017

01-junij-2017

Stroji za zemeljska dela - Varnost - 12. del: Zahteve za bagre s kablom

Earth-moving machinery - Safety - Part 12: Requirements for cable excavators

Engins de terrassement - Sécurité - Partie 12 : Prescriptions applicables aux pelles à câbles

Ta slovenski standard je istoveten z: **prEN 474-12**

ICS:

53.100	Stroji za zemeljska dela	Earth-moving machinery

oSIST prEN 474-12:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 474-12

March 2017

ICS 53.100

Will supersede EN 474-12:2006+A1:2008

English Version

Earth-moving machinery - Safety - Part 12: Requirements for cable excavators

Engins de terrassement - Sécurité - Partie 12 : Prescriptions applicables aux pelles à câbles

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 151.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (prEN 474-12:2017) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 474-12:2006+A1:2008.

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.

For bibliographic references, see prEN 474-1:2017.

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

Introduction

This part of prEN 474 is a type C standard as stated in EN ISO 12100:2010.

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 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 document, together with part 1, deals with all significant hazards for earth-moving machinery – cable-excavators (as defined in EN ISO 6165) 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 Clause 4).

This European Standard applies also to cable excavators, their undercarriage and upper-structure, if intended for use in combination with other equipment or attachment, such as lifting operation, extracting equipment and moving equipment (e.g. rail track, walking legs, pontoon, ship) or stationary undercarriage. Drilling and foundation equipment (covered by EN 16228-1:2014 to EN 16228-7:2014) are not dealt with in this standard.

The requirements of this part are complementary to the common requirements formulated in prEN 474-1. This document does not repeat the requirements from prEN 474-1, but adds or replaces the requirements for application for earth moving machinery – cable-excavators.

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

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 474-1:2017, *Earth-moving machinery — Safety — Part 1: General requirements*

EN 16228-1:2014, *Drilling and foundation equipment — Safety — Part 1: Common requirements*

EN 13000:2010+A1:2014, *Cranes — Mobile cranes*

EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines*

EN ISO 6165:2012, *Earth-moving machinery — Basic types — Identification and terms and definitions (ISO 6165:2012)*

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

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

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

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

ISO 10262:1998, *Earth-moving machinery — Hydraulic excavators — Laboratory tests and performance requirements for operator protective guards*

ISO 10567:2007, *Earth-moving machinery — Hydraulic excavators — Lift capacity*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 474-1:2017, EN ISO 12100:2010 and the following apply.

Note 1 to entry: Terminology for hydraulic excavators are specified in ISO 7135:2009 and illustrated in Annex C of this European Standard.

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

3.1
cable excavator
excavator (see EN ISO 6165:2012), having a mainly wire rope-operated upper structure primarily designed for excavating (e.g. with a dragline bucket, a front shovel or grab), for compacting material (e.g. with a compaction plate), for demolition work (e.g. by hook or ball) and for material handling with special equipment and attachment

Note 1 to entry: Cable excavators are earth-moving machines designed and constructed for this purpose. The determination of the intended use by the machine manufacturer is significant for classification. Terms such as e.g. "heavy duty crawler-crane" do not change the intended use determined by the machine manufacturer.

3.2
boom hoist system
consists of the boom and its adjustment mechanism, (e.g. lower-, intermediate- and head-section, the A-frame system and the boom hoist winch system, hydraulic-mechanical adjustment mechanism)

3.3
lift system
consists of the main winch system used for earth-moving-, demolition-, compaction- and lifting operation (e. g. with hook assembly) application

3.4
lifting and lowering operation
lifting and lowering of a load without disengaging the lifting drum and the lift drive system

3.5
free-fall
state of complete or partially controlled disengagement of the lifting drum and the lift drive system

3.6
free-fall function
function to enable free-fall

3.7
free-fall operation
state of the machine in which the free fall function can be activated

3.8
free-fall brake
mechanism where the drive can be disconnected from the drum

3.9
line pull
pulling force applied to a rope/cable

3.10
slow-release device
release of the load is made by a device in the machine and not directly linked to the released part of the load

Note 1 to entry: e.g. disengagement of the free fall system of the machine

3.11
quick-release device
release of the load is made by a device directly linked to the released part of the load

Note 1 to entry: e.g. mechanical unlock of the lifted load

3.12
hoisting ropes
ropes designed to lift the load, mainly in vertical direction

3.13
digging ropes
ropes designed to pull the load, located on the ground (e.g. dragline bucket), mainly in horizontal/not vertical direction

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

Cable excavators shall comply with the requirements of prEN 474-1:2017, as far as not modified or replaced by the requirements of this part.

5.2 Operator's station

5.2.1 General

prEN 474-1:2017, 5.3 shall apply with the following modifications:

5.2.2 Roll-over protective structures (ROPS)

prEN 474-1:2017, 5.3.3 does not apply for cable excavators.

5.2.3 Operator's protective guard

prEN 474-1:2017, 5.3.4 shall be replaced by the following:

Cable excavators shall be designed so that an operator’s protective structure (top and front guard) can be fitted.

A protective structure (top and front guard) shall be offered by the manufacturer and selected by the user according to the existing risk of the application. The protective structures shall be in accordance with ISO 10262:1998 (see Clause 7).

5.2.4 Operator's seat, vibrations

prEN 474-1:2017, 5.4.1.4 shall apply with the following additions:

The seat shall meet the requirements of EN ISO 7096:2008, the input spectral class shall meet the class EM 6 for the test excitation vibrations.

5.2.5 Visibility on stabilizers

Control devices (except remote controls) for extending/retracting the stabilizers (e.g. outriggers, retractable crawlers) beams shall be in a position or provided with means where the movements of the stabilizers can clearly be seen by the operator and from where crushing of the operator is not possible.

If the horizontal movement of the stabilizers is controlled from a fixed control on the ground level, it shall only be possible to affect that movement on the side where the controls are situated.

5.3 Operator's controls and indicators

5.3.1 Controls for driving and steering

prEN 474-1:2017, 5.5.1 d) and 5.6.1 shall apply with the following addition:

The movements of the controls for driving and steering do not need to correspond to the intended direction of movement if the upper structure is not in the normal driving direction.

5.3.2 Operating mode

Cable excavators intended for use in different modes shall be fitted with a lockable operating mode selector for at least:

a) excavator operation mode;

NOTE Excavator operation mode may include e.g. excavating, compaction, demolition.

b) lifting operation mode.

The activation of the selected operation mode shall be optically indicated at the operator's station(s).

5.4 Swing brakes

Cable excavators shall be equipped with swing service and swing parking brake systems, which shall meet the performance requirements as defined in Annex B.

5.5 Lift system

5.5.1 Lifting and lowering operation

The lift system of cable excavators shall be fitted with a brake, which actuates immediately after releasing operational controls (e.g. levers or pedals).

In case of loss of energy during the lifting and lowering operation, the brake system shall act automatically.

The stability of the machine shall not be put at risk during this operation and the structure (e.g. boom, rope) shall not permanently deform.

The holding brake for hoisting and for derricking systems operated by winches shall be able to

exert a restraining torque at least 33 % greater than the maximum torque transmitted from the rope drum to the brake under working or erection conditions, whichever is greater.

Where the drive can be disconnected from the drum (e.g. by free fall brake) free fall of the load and/or parts of the cable excavator shall be avoided by adequate means (e.g. interlocking arrangement).

5.5.2 Free-fall

5.5.2.1 General

The free fall system shall be designed that an uncontrolled run-up or run-off of the rope is avoided, e.g. by a rope guide.

There shall be a specific lockable selector (e.g. could be integrated in the mode selector according to 5.3.2) to enable/disable the free-fall operation.

NOTE Either one selector for all winches or one selector per winch.

If the lifting operation mode is selected, the control system shall be designed in such a way that the free-fall function is not possible to be activated.

The procedure of free-fall operation and the activation is shown in Figure 1 and described in 5.5.2.3 to 5.5.2.5.