Mobiilsed tõsteplatvormid töötajatele. Konstruktsiooniarvutused. Stabiilsuskriteerium. Ehitus. Ohutus. Kontroll ja katsetamine

Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 280:2013 sisaldab Euroopa standardi EN 280:2013 ingliskeelset teksti.	This Estonian standard EVS-EN 280:2013 consists of the English text of the European standard EN 280:2013.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.07.2013.	Date of Availability of the European standard is 24.07.2013.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Võtmesõnad: accident prevention, computation, design, elevators, inspection, mobile equipment, platforms, safety requirements, stability, tests,

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 280

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English Version

Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests

Plates-formes élévatrices mobiles de personnel - Calculs de conception - Critères de stabilité - Construction - Sécurité - Examens et essais

Fahrbare Hubarbeitsbühnen - Berechnung - Standsicherheit - Bau - Sicherheit - Prüfungen

This European Standard was approved by CEN on 21 May 2013.

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Foreword

This document (EN 280:2013) has been prepared by Technical Committee CEN/TC 98 “Lifting platforms”, 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of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2015.

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

This document supersedes EN 280:2001+A2:2009.

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.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

EN 280:2013 includes the following major changes with respect to EN 280:2001+A2:2009:

- Entry 1.4: the groups into which MEWPs are divided have been précised;
- Subclause 5.3 "Chassis and stabilisers" has been totally restructured and new requirements have been added;
- Entry 5.3.1.2: requirements for inclination have been reviewed;
- Entry 5.3.1.18: requirements for rail mounted MEWPs have been included;
- Subclause 5.3.2.3: requirements for MEWPs equipped with one or more oscillating axles have been included;
- Entry 5.4.1.7: variable working envelope by manual selection of more than one rated load has been précised;
- Entry 5.6.1: adjustments of the platform levels have been included;
- Entry 5.6.3: on work platforms with fixed guard handrails minimum dimensions of openings for the purpose of access to it have been added;
- Entry 5.6.14: "Anchorage(s) for the connection of a restraint device" has been added;
- Entry 5.6.15: requirements with regard to vibrations have been included;
- Entry 5.6.16: requirements for protection of operators on the platform have been added;
- Entry 5.6.17: requirements for "Exchangeable work platforms" have been included;
- Entry 5.7.9 "Overriding of emergency stops respectively safety functions…" has been totally revised;
- Subclause 5.11: for safety-related parts of control systems (SRP/CS) that perform the relevant safety function the references to categories according to EN 954-1 (see Table 4) have been replaced by references to performance levels according to EN ISO 13849-1;

- Subclause 6.1.4.2: requirements for platform with extension have been added;

- New Annex F "Additional requirements for wireless controls and control systems" has been added.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This standard is a type C standard as stated in EN ISO 12100:2010.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous 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.

The object of this European Standard is to define rules for safeguarding persons and objects against the risk of accidents associated with the operation of Mobile Elevating Work Platforms (MEWPs).

— This European Standard does not repeat all the general technical rules applicable to every electrical, mechanical or structural component.

— The safety requirements of this European Standard have been drawn up on the basis that MEWPs are periodically maintained according to manufacturers' instructions, working conditions, frequency of use and national regulations.

It is also assumed that MEWPs are checked for function daily before start of work and are not put into operation unless all required control and safety devices are available and in working order.

If a MEWP is seldom used, the checks may be made before start of work.

Furthermore it is assumed that persons on the work platform in case of power supply failure are not incapacitated and can assist in the emergency lowering.

— As far as possible this European Standard sets out only the requirements that materials and equipment need to meet in the interest of safety, and it is assumed that persons operating MEWPs are adequately trained.

— Where for clarity an example of a safety measure is given in the text, this does not need to be considered as the only possible solution. Any other solution leading to the same risk reduction is permissible if an equivalent level of safety is achieved.

— As no satisfactory explanation could be found for the dynamic factors used for stability calculations in previous national standards, the results of the tests carried out by the former CEN/TC 98/WG 1 to determine a suitable factor and stability calculation method for MEWPs have been adopted. The test method is described in Annex B (informative) as a guide for manufacturers wishing to use higher or lower operating speeds and to take advantage of developments in control systems.

Similarly, to avoid the unexplained inconsistencies in coefficients of utilisation for wire ropes found in other standards for lifting devices, appropriate extracts of the widely accepted standard DIN 15020-1 have been taken into 5.5.2 and Annex C (normative) with a worked example in Annex D (informative).

1 Scope

1.1 This European Standard specifies safety requirements and measures for all types and sizes of Mobile Elevating Work Platform (MEWP, see 3.1) intended to move persons to working positions where they are carrying out work from the work platform (WP) with the intention that persons are getting on and off the work platform only at access positions at ground level or on the chassis.

NOTE Machines designed for the handling of goods which are equipped with work platforms as interchangeable equipment are regarded as MEWPs.

1.2 This European Standard is applicable to the structural design calculations and stability criteria, construction, safety examinations and tests before MEWPs are first put into service. It identifies the hazards arising from the use of MEWPs and describes methods for the elimination or reduction of these hazards.

It does not cover the hazards arising from:

a) use in potentially explosive atmospheres;

b) electromagnetic incompatibility;

c) work from the platform on external live electric systems;

d) use of compressed gases for load bearing components;

e) getting on and off the work platform at changing levels;

f) specific applications (e.g. railway, ships) covered by National or local regulations.

1.3 This European Standard does not apply to:

a) machinery serving fixed landings (see e.g. EN 81-1 and EN 81-2, EN 12159);

b) fire-fighting and fire rescue appliances (see e.g. EN 1777);

c) unguided work cages suspended from lifting appliances (see e.g. EN 1808);

d) elevating operator position on rail dependent storage and retrieval equipment (see EN 528);

e) tail lifts (see EN 1756-1 and EN 1756-2);

f) mast climbing work platforms (see EN 1495);

g) fairground equipment;

h) lifting tables (see EN 1570-1);

i) aircraft ground support equipment (see e.g. EN 1915-1 and EN 1915-2);

j) elevating operator positions on industrial trucks (see EN 1726-2).

1.4 Classification:

MEWPs are divided into two main groups:

a) Group A: MEWPs where the vertical projection of the centre of the area of the platform in all platform configurations at the maximum chassis inclination specified by the manufacturer is always inside the tipping lines.

b) Group B: All other MEWPs.

Relating to travelling, MEWPs are divided into three types:

1) Type 1: Travelling is only allowed with the MEWP in its transport configuration;

2) Type 2: Travelling with raised work platform is controlled from a point of control at the chassis;

3) Type 3: Travelling with raised work platform is controlled from a point of control at the work platform.

NOTE Type 2 and type 3 can be combined.

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.

EN 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 12385-4, *Steel wire ropes — Safety — Part 4: Stranded ropes for general lifting applications*

EN 14033-1, *Railway applications — Track — Railbound construction and maintenance machines — Part 1: Technical requirements for running*

EN 14033-2:2008+A1:2011, *Railway applications — Track — Railbound construction and maintenance machines — Part 2: Technical requirements for working*

EN 15746-1:2010+A1:2011, *Railway applications — Track — Road-rail machines and associated equipment — Part 1: Technical requirements for running and working*

EN 15954-1:2013, *Railway applications — Track — Trailers and associated equipment — Part 1: Technical requirements for running and working*

EN 15955-1:2013, *Railway applications — Track — Demountable machines and associated equipment — Part 1: Technical requirements for running and working*

EN 60068-2-64, *Environmental testing — Part 2-64: Tests — Test Fh: Vibration, broadband random and guidance (IEC 60068-2-64)*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

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

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

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

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13849-2, *Safety of machinery — Safety related parts of control systems — Part 2: Validation (ISO 13849-2)*

EN ISO 13850, *Safety of machinery — Emergency stop — Principles for design (ISO 13850)*

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857)*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 4302, *Cranes — Wind load assessment*

ISO 4305, *Mobile cranes — Determination of stability*

ISO 4309, *Cranes — Wire ropes — Care and maintenance, inspection and discard*

3 Terms and definitions

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

3.1
mobile elevating work platform
MEWP
mobile machine that is intended to move persons to working positions where they are carrying out work from the work platform with the intention that persons are getting on and off the work platform only at access positions at ground level or on the chassis and which consists as a minimum of a work platform with controls, an extending structure and a chassis

3.2
work platform
fenced platform or a cage which can be moved under load to the required working position and from which erection, repair, inspection or similar work can be carried out

Note 1 to entry: See Figure 1.

3.3
extending structure
structure which is connected to the chassis and supports the work platform and which allows movement of the work platform to its required position

Note 1 to entry: See Figure 1.

Note 2 to entry: It may, for example, be a single or a telescoping or an articulating boom or ladder, or a scissors mechanism or any combination of them, and may or may not slew on the base.

3.4
chassis
base of the MEWP, which may be pulled, pushed, self-propelled, etc.

Note 1 to entry: See Figure 1.

3.5
stabilisers
devices and systems used to stabilise MEWPs by supporting and/or levelling the complete MEWP or the extending structure, e.g. jacks, suspension locking devices, extending axles

Note 1 to entry: See Figure 1.

3.6
access position
position(s) to provide access to and from the work platform

Note 1 to entry: Access position and transport configuration can be identical.