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Kmetijski stroji - Grobe terenske delovne platforme za dejavnosti v sadovnjakih (WPO) - Varnost

Agricultural machinery - Rough-terrain Work Platforms for Orchard's operations (WPO) - Safety

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Landmaschinen - Geländearbeitsbühnen für Obstplantagearbeiten (WPO) - Sicherheit

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European foreword

This document (EN 16952:2018) has been prepared by Technical Committee CEN/TC 144 “Tractors and machinery for agriculture and forestry”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by December 2018 and conflicting national standards shall be withdrawn at the latest by December 2018.

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.

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

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Introduction

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

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

Significant hazards that are common to all the agricultural machines (self-propelled, mounted, semi-mounted and trailed) are dealt with in EN ISO 4254-1.

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.

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.

1 Scope

1.1 This European Standard, when used together with EN ISO 4254-1 and EN 15811, specifies safety requirements and measures for self-propelled rough-terrain work platforms for orchard's operations (WPO) operating at a maximum of 3 m high as defined in 3.1, 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, used in agriculture, designed to work on unimproved natural terrain and/or disturbed terrain and intended to move at least two persons to working positions in an orchard where they are carrying out fruit picking, thinning out, pruning, or other operations related to orchard from the work platform.

NOTE For examples of rough-terrain work platforms for orchard's operations (WPO), see Figures E.1 to E.3.

This European Standard describes methods for the elimination or reduction of hazards arising from the intended use of these machines in the course of normal operation and service, except hazards related to conveyor belts and elevators for the bin. In addition, it specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

When requirements of this document are different from those which are stated in EN ISO 4254-1, the requirements of this document take precedence over the requirements of EN ISO 4254-1 for machines that have been designed and built according to the provisions of this document.

This European Standard, taken together with EN ISO 4254-1 and EN 15811, deals with all the significant hazards, hazardous situations and events (as listed in Table 1) relevant to WPOs, when they are used as intended and under the conditions of misuse foreseeable by the manufacturer.

It does not cover the hazards arising from:

a) use in potentially explosive atmospheres;

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

c) environmental aspects;

d) road safety.

1.2 This European Standard does not apply to:

a) Mobile Elevating Work Platforms (MEWPs) (see EN 280);

NOTE 1 Figure E.4 gives an example of this type of machine.

b) boom-type MEWPs (see EN 280);

NOTE 2 Figure E.5 and E.6 give examples of this type of machine.

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

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

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

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

g) elevating operator positions on industrial trucks (see EN ISO 3691-3);

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

i) machines having centre of the area of the platform outside the tipping lines.

NOTE 3 Figure E.7 gives an example of this type of machine.

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 349:1993+A1:2008, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body*

EN 15811:2014, *Agricultural machinery - Fixed guards and interlocked guards with or without guard locking for moving transmission parts (ISO/TS 28923:2012, modified)*

EN 60204-1:2006, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016)*

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

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN ISO 4254-1:2015, *Agricultural machinery - Safety - Part 1: General requirements (ISO 4254-1:2013)*

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

EN ISO 14982:2009, *Agricultural and forestry machinery - Electromagnetic compatibility - Test methods and acceptance criteria (ISO 14982:1998)*

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

EN ISO 13849-2:2012, *Safety of machinery - Safety-related parts of control systems - Part 2: Validation (ISO 13849-2:2012)*

EN ISO 13850:2015, *Safety of machinery - Emergency stop function - Principles for design (ISO 13850:2015)*

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

ISO 525:2013, *Bonded abrasive products - General requirements*

ISO 845:2006, *Cellular plastics and rubbers - Determination of apparent density*

ISO 3864-1:2011, *Graphical symbols - Safety colours and safety signs - Part 1: Design principles for safety signs and safety markings*

ISO 4302:2016, *Cranes - Wind load assessment*

ISO 4305:2014, *Mobile cranes - Determination of stability*

ISO 16001:2017, *Earth-moving machinery - Object detection systems and visibility aids - Performance requirements and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN ISO 4254-1:2015 and the following apply.

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

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

3.1
rough-terrain work platforms for orchard's operations (WPO)
self-propelled machine used in agriculture, designed to work on unimproved natural terrain and/or disturbed terrain, which consists as a minimum of a work platform with controls, an extending structure and a chassis, where the vertical projection of the center 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, for which travelling is allowed with lowered and with raised work platform and it is controlled from a point of control at the chassis or at the work platform, which is intended to move at least two persons to working positions in an orchard where they are carrying out fruit picking, thinning out, pruning, or other operations related to the orchard from the work platform

Note 1 to entry: See Figure 1.

3.2
work platform
fenced platform or a cage which can be moved under load to the required working position and from which carrying out fruit picking, thinning out, pruning, or other operations related to orchard's upkeep can be carried out

Note 1 to entry: See Figure 1.

3.3
platform extension
extension
part of the work platform which can shift laterally in respect of the direction of motion of the WPO, and which extends the work platform in order to facilitate the approach to the orchard to perform the necessary operations

3.4
extending structure
structure which is connected to the chassis and supports the work platform. It allows vertical movement of the work platform to its required position

Note 1 to entry: Example of extending structure: scissors mechanism.

Note 2 to entry: See Figure 1.

3.5
chassis
base of the WPO

Note 1 to entry: See Figure 1.

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

3.7
transport position
position of the elements of the WPO prescribed by the manufacturer in which the WPO is intended to travel without working on the trees and the extensions are retracted

3.8
lowering
all operations to move the work platform to a lower level

3.9
raising
all operations to move the work platform to a higher level

3.10
self-levelling rough-terrain work platforms for orchard's operations (self-levelling WPO)
WPO which can compensate variation of terrain slope with variation of work platform's inclination in respect of a longitudinal or transversal axis, or both

3.11
rated load
load for which the WPO has been designed for normal operation and which is composed of persons, tools and products acting vertically on the work platform

Note 1 to entry: A WPO usually has more than one rated load (e.g. for work platform and platform extensions if any, or for transport and working position).

3.12
load cycle
cycle starting from the access position, carrying out work and returning to the access position

3.13
type test
test on the representative model of a new design or one incorporating significant changes to an existing design, carried out by or on behalf of the manufacturer or his authorized representative

3.14
load sensing system
system of monitoring the vertical load and vertical forces on the work platform

Note 1 to entry: The system includes the measuring device(s), the way the measuring devices are incorporated in the machinery and the signal processing system.

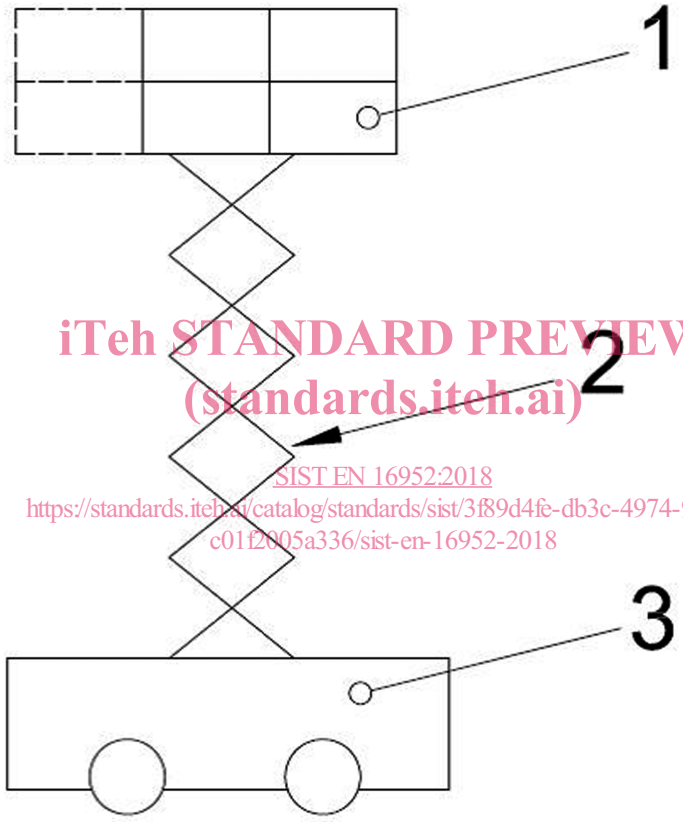
3.15
wireless control
means by which the WPO operator's commands are transmitted without any physical connection for at least part of the distance between the control console and the rest of the control system

3.16
working space
area in which the work platform is designed to work within the specified loads and forces under normal operating conditions

Note 1 to entry: WPO usually have more than one working space.

3.17
elevator for the bin
front or rear mounted lifting equipment provided to move the bin from ground to the platform and vice-versa

Note 1 to entry: Fork lift is a possible elevator for the bin.



Key
1 work platform (see 3.2)
2 extending structure (see 3.4)
3 chassis (see 3.5)

Figure 1 — Illustration of some definitions

3.18
side limit slope
maximum slope in degrees perpendicular to the longitudinal axis of the WPO that can be achieved without tipping of the WPO

3.19
longitudinal limit slope
maximum slope in degrees with the longitudinal axis of the WPO parallel to the slope that can be achieved without tipping of the WPO

3.20
maximum lateral operating slope
slope 50 (%) of the side limit slope

3.21
maximum longitudinal operating slope
slope 50 (%) of the longitudinal limit slope

3.22
maximum operating slope
minimum value of the maximum lateral operating slope and the maximum longitudinal operating slope

3.23
automatic mode
form of control of the machine which allows travelling in forward direction without continuous action of the operator on a dedicated control

4 List of significant hazards

Hazards have been identified by the risk assessment procedure and the corresponding requirements formulated (see Table 1).

A hazard which is not considered significant and for which, therefore, no requirements are formulated, is shown in the Corresponding Requirements column as NS (not significant).

Table 1 — List of significant hazards

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2015	Clause/subclause of this Standard
A.1	**Mechanical hazard**			
A.1.1	Crushing hazard	— Controls	4.5.3; 5.1.3.2; 5.1.8; 6.1	5.3.12; 5.4.3.2; 5.6.10; 5.7
		— Boarding means	4.7.1.1.2; 4.7.1.2.5; 4.7.2; 4.8	No requirements in addition to those in EN ISO 4254-1:2015
		— Platforms	4.7.2	5.4, 5.5, 5.6
		— Power transmission	6.4	5.4
		— Working tools	4.10	NS
		—Service/maintenance	4.11; 4.17.1; 4.17.3; 4.9.2; 4.9.3	5.4.4
		—Roll-over	5.1.2.3; 5.7	5.2; 5.3; 5.4.1; 5.4.2
		—Shearing/pinching points	5.1.4	5.4.3
		— Moving the machine	5.2	5.3;
		— Stability	6.2	5.2; 5.3; 5.4.1, 5.4.2
		— Mounting of machines	6.2.2; 6.2.3; 6.3	5.6.11

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2015	Clause/subclause of this Standard
A.1.2	Shearing hazard	— Controls	4.5.3; 5.1.3.2; 5.1.8; 6.1	5.4.3.2; 5.7
		— Boarding means	4.7.1.1.2; 4.7.1.2.5; 4.7.2; 4.8	No requirements in addition to those in EN ISO 4254-1:2015
		— Platforms	4.7.2.2	5.4, 5.5, 5.6
		— Power transmission	6.4	5.4
		— Working tools	4.10	NS
		—Service/maintenance	4.11; 4.17.1; 4.17.3; 4.9.2; 4.9.3	5.4.4,
		—Roll-over	5.1.2.3; 5.7	5.2; 5.3; 5.4.1; 5.4.2
		—Shearing/pinching points	5.1.4	5.4.3
		— Moving the machine	5.2	5.3
		— Stability	6.2	5.2; 5.3; 5.4.1, 5.4.2
		— Mounting of machines	6.2.2; 6.2.3; 6.3	5.6.11
A.1.3	Cutting or severing hazard	— Working tools	4.9.2; 4.9.3	NS
A.1.4	Entanglement hazard	— Power transmission	6.4	5.3.9
		— Working tools	4.9.2; 4.9.3	NS
		— Starting/stopping the engine	5.1.8	NS
A.1.5	Drawing-in or trapping hazard	— Power transmission	6.4	5.4.3; 5.5
		— Working tools	4.9.2; 4.9.3	NS
		— Starting/stopping the engine	5.1.8	NS
A.1.6	Impact hazard	— Boarding means	4.7.1.2.5	5.1; 5.6.3
		— Folding elements	4.9.2; 4.9.3	5.6
		— Steering	5.1.3.1	NS
A.1.7	Stabbing or puncture hazard	— Working tools	4.9.2; 4.9.3	NS
A.1.8	Friction or abrasion hazard	— Controls	4.5.3; 5.1.3.2	5.7.7
		— Electrical equipment	4.12	5.8.4
		— Boarding means	4.7.1.1.2	No requirements in addition to those in EN ISO 4254-1:2015
A.1.9	High-pressure fluid injection or ejection hazard	— Hydraulic components	4.13; 6.5	5.9; 5.10

No. [a]	Hazard	Hazardous situation and event	Clause/subclause of EN ISO 4254-1:2015	Clause/subclause of this Standard
A.2	**Electrical hazards**			
A.2.1	Contact of persons with live parts (direct contact)	— Electrical equipment	4.12; 5.3; 6.5	5.8
A.2.2	Contact of persons with parts which have become live under fault y conditions (indirect contact)	— Electrical equipment	4.12.1	5.8
A.2.3	Approach to live parts under high voltage	— Overhead power lines	8.2.3; 8.3.4	No requirements in addition to those in EN ISO 4254-1:2015
A.2.4	Thermal radiation or other phenomena such as the projection of molten particles and chemical effects from short circuits, overloads, etc.	— Electrical equipment	4.12.2; 5.3.1	5.8
A.2.5	Electromagnetic phenomena	— Electrical equipment	4.18	5.8.6
A.3	Thermal hazards			
	Burns, scalds and other injuries by possible contact of persons with objects or materials with an extreme high or low temperature, by f lames or explosions and also by the radiation of heat sources	— Operating fluids	4.15	5.3.10
		— Cab material	5.1.6	5.6.2
		— Hot surfaces	5.5	No requirements in addition to those in EN ISO 4254-1:2015