SLOVENSKI STANDARD
SIST EN 13448:2002+A1:2010

01-februar-2010

Kmetijski in gozdarski stroji - Medvrstne zastiralne kosilnice - Varnost

Agricultural and forestry machinery - Inter-row mowing units - Safety

Land- und forstwirtschaftliche Maschinen - Zwischenreihenmäher - Sicherheit

Matériel agricole et forestier - Faucheuses interlignes - Sécurité

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ICS:

65.060.50 Oprema za spravilo pridelkov Harvesting equipment

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EUROPEAN STANDARD

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English Version

Agricultural and forestry machinery - Inter-row mowing units - Safety

Matériel agricole et forestier - Faucheuses interlignes - Sécurité

Land- und forstwirtschaftliche Maschinen - Zwischenreihenmäher - Sicherheit

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 13448:2001+A1:2009) 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of an identical text or by endorsement, at the latest by March 2010, and conflicting national standards shall be withdrawn at the latest by March 2010.

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 includes Amendment 1, approved by CEN on 2009-08-10.

This document supersedes EN 13448:2001.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] ⟨A1⟩.

This European Standard 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).

[A1] For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A1]

Annex A is normative and contains the "List of hazards".

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.

Introduction

This document is a type C standard as stated in EN 1070.

The machinery concerned and the extent to which hazards are covered is indicated in the scope of this standard. These hazards are specific to inter-row mowing units.

The hazards that are common to all agriculture machines (self-propelled, mounted, semi-mounted and trailed) are dealt with in EN 1553:1999.

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.

1 Scope

This European Standard specifies the safety requirements and test methods for the design and construction of inter-row mowing units with vertical spindles mounted on grass cutting machines such as flail mowers, used in agriculture, forestry and landscaping to cut the grass in the area between two successive obstruction.

It describes methods for elimination or reduction of risks arising from their use.

In addition, it specifies the type of information on safe working practices to be provided by the manufacturer.

This standard is not applicable to rotary mowers and flail-mowers which are covered by EN 745.

Environmental aspects have not been considered in this standard.

This European Standard is not applicable to inter-row mowing units which are manufactured before the date of publication of this document by CEN.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-1:1991, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology.*

EN 292-2:1991, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles and specifications (including amendment A1:1995).*

EN 294:1994, *Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs.*

EN 745, *Agricultural machinery – Rotary mowers and flail mowers – Safety.*

EN 1070, *Safety of machinery – Terminology.*

EN 1553:1999, *Agricultural machinery – Agricultural self-propelled, mounted, semi-mounted and trailed machines – Common safety requirements.*

EN ISO 3457:1995, *Earth-moving machinery – Guards and shields – Definitions and specifications.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070 apply together with the following:

3.1
inter-row mowing unit
rotary mower with vertical spindles equipped with pivoting boom, which allows grass cutting in the area between two successive obstructions (e.g. trees, posts, etc.) (see Figure 1)

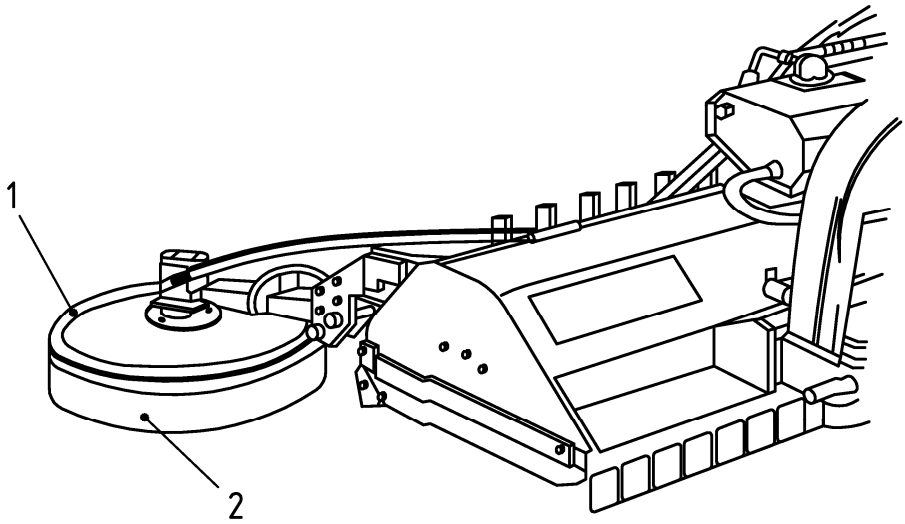
3.2
pivoting boom
device which allows the inter-row mowing unit to perform lateral translation movements parallel to the ground, thus allowing cutting within the area between two successive obstructions which would not be possible using fixed mowing machines (see Figure 1)

3.3
sensor
device controlling boom movement, mounted forward of the inter-row mowing unit

NOTE The device may be formed of a metal rod which, when pushed backwards on encountering an obstruction, sends a command causing the boom to retract. Immediately after the obstacle has been passed, the sensor returns to its original position, and the boom returns to the working position.

3.4
target
device which registers the number of impacts of objects propelled by the mowing unit

3.5
danger zone
area surrounding the machine with a radius of 50 m as measured from the centre of the unit



Key

1 Blade enclosure
2 Lateral protection

Figure 1 — Inter-row mowing unit

4 List of hazards

The hazards, among those which appear in EN 292-1 and EN 292-2 and are considered applicable to machines covered by the standard are listed in annex A.

Annex A also indicates the hazards which have not been dealt with.

5 Safety requirements and/or measures

5.1 General

Machinery shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN 292 for hazards which are not dealt with by this standard and especially with annex A of EN 292-2:1991/A1:1995 when EN 292 does not give precise requirements.

Unless otherwise specified in this standard, the machine shall comply with the requirements of EN 1553:1999 and EN 745 and with Tables 1, 3, 4 and 6 of EN 294:1992.

5.2 Protection of cutting elements

The machine shall be equipped with an imperforate blade enclosure which fully covers the cutting elements, capable of ensuring a safety distance of at least 50 mm beyond the external trajectory of the cutting elements and which extend at least 3 mm below the plane of the blade tip circle (see Figure 2).

The blade enclosure shall be free of protrusions and sharp edges and, in the case of a mechanical pivoting boom, the device which allows the unit to rotate idly when it encounters an obstruction shall be designed, so that the rotary movement of the cutting elements is not imparted to the blade enclosure itself.

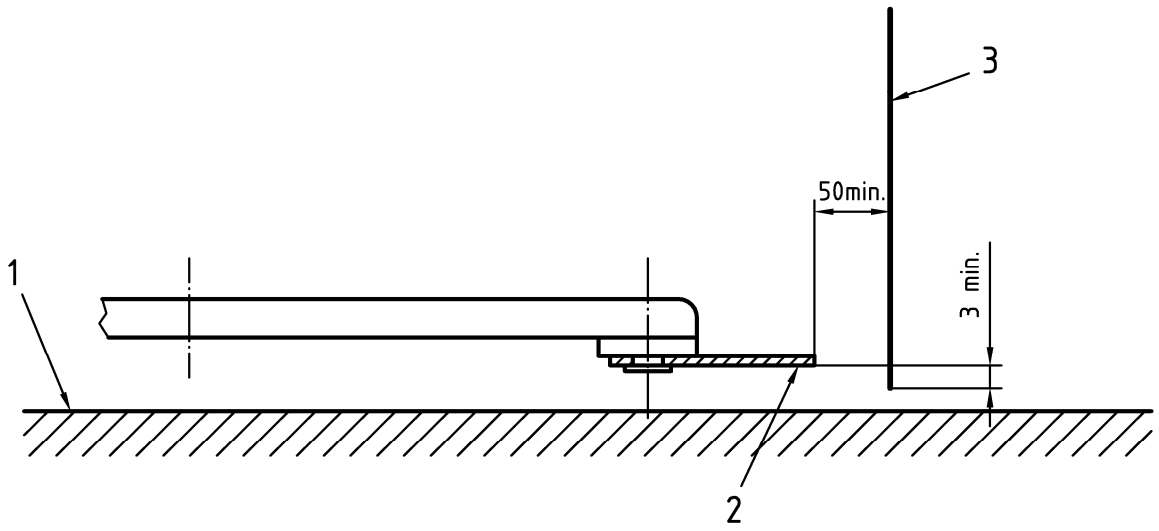
The blade enclosure and the parts of the machine ensuring the guarding shall withstand a vertical downwards load of 1200 N, and, in order to resist to the forces generated when the blade enclosure hits an obstruction, shall additionally withstand the following horizontal loads:

— 600 N for machines intended to be used with a tractor whose maximum power as given in the instruction handbook is less or equal to 37 kW;

— 1 000 N for the other machines.

These requirements shall be checked by the test procedure and the test acceptance defined in EN 1553:1999, annex B.

Dimensions in millimetres



Key

1 Ground
2 Blade tip circle
3 Blade enclosure

Figure 2

5.3 Hose protection

In the case of hydraulically or pneumatically operated inter-row mowing units, pipes and hoses shall be fitted, assembled and if necessary retained to minimise contact with hot surfaces, friction and other unintentional exterior damage. Visual inspection of hoses and fittings shall be possible except those located inside frames.

Hydraulic hoses containing fluid with a pressure of more than 5 MPa (50 bar) and/or having a temperature over 50 °C, and which are located within 1 m of the operator, shall be guarded in accordance with EN ISO 3457:1995, 4.9.

Any part or component which may divert a possible jet of fluid can be considered as a sufficient protection device.

5.4 Thrown objects

The possibility that objects propelled by the rapid rotary action of the cutting elements during operation, which may constitute a hazard and risk of injury to the operator, shall be prevented.

Tests shall be performed in accordance with the indications given in clause 6.

5.5 Requirements for pivoting booms

Requirements for the pivoting boom including its strength, mounting, control system and control devices will be added at a future revision of the standard.

5.6 Noise

Noise emission from inter-row mowing units shall be measured according to EN 1553:1999, annex D.

Noise will be fully dealt with at a future revision of the standard.

6 Test methods – Thrown object test

NOTE Round Robin tests will be carried out based on this test method. The results of these tests will possibly indicate the need for the revision of this standard.

6.1 General test conditions

During the tests, the inter-row mowing unit shall be operated at the rotation frequency recommended by the manufacturer, e.g. at a power take-off rotation frequency of 540 min^{-1} or 1 000 min^{-1}.

All the tests shall be performed using the same safety guard.

Adjustable devices which may influence the efficiency of the safety guard shall be located in the least favourable position.

During the tests, the forward travel speed shall not be more than 8 km/h.

6.2 Target

The target shall be sited on natural, compact, level land.

6.2.1 Target for a rotary inter-row mower hitched to the rear of a tractor

The target consists of four vertical panels (see Figure 3) which shall comply with the specifications in 6.2.3.

Panels 2 and 4 shall be 4 000 mm long.

The length of panels 1 and 3 depends on the tractor-mower group.

Panel 1 shall be perpendicular to panel 2. Panels 2 and 4 shall be parallel to the longitudinal axis of the tractor.

Panel 2 shall be positioned at a distance of 1 000 mm from the external trajectory of the mowing unit.

Panel 3 connects panels 2 and 4 and shall be perpendicular to them.

6.2.2 Reference lines

Two reference lines traced along the target at 600 mm and 1 200 mm from the ground level shall show three zones called:

— lower zone, between 0 mm and 600 mm;

— middle zone, between 600 mm and 1 200 mm;

— upper zone, between 1 200 mm and 2 000 mm.

Vertical lines shall be traced on the targets and divide them into vertical sectors each 1 000 mm wide. Increasing numbers shall identify each sector. The first sector of panel 1 shall be number 1. Numbering shall be clockwise.

6.2.3 Composition of the target

The panels shall be constructed on a rigid frame, on which is fixed a sheet of Kraft paper having an area mass of 120 g/m^2.

6.3 Test material

The test material mixture shall be formed as follows:

— 50% sand;

— 25% gravel of grain size from 8 mm to 16 mm (excluded);

— 25% gravel of grain size from 16 mm to 31,5 mm (excluded).

Dimensions in millimetres

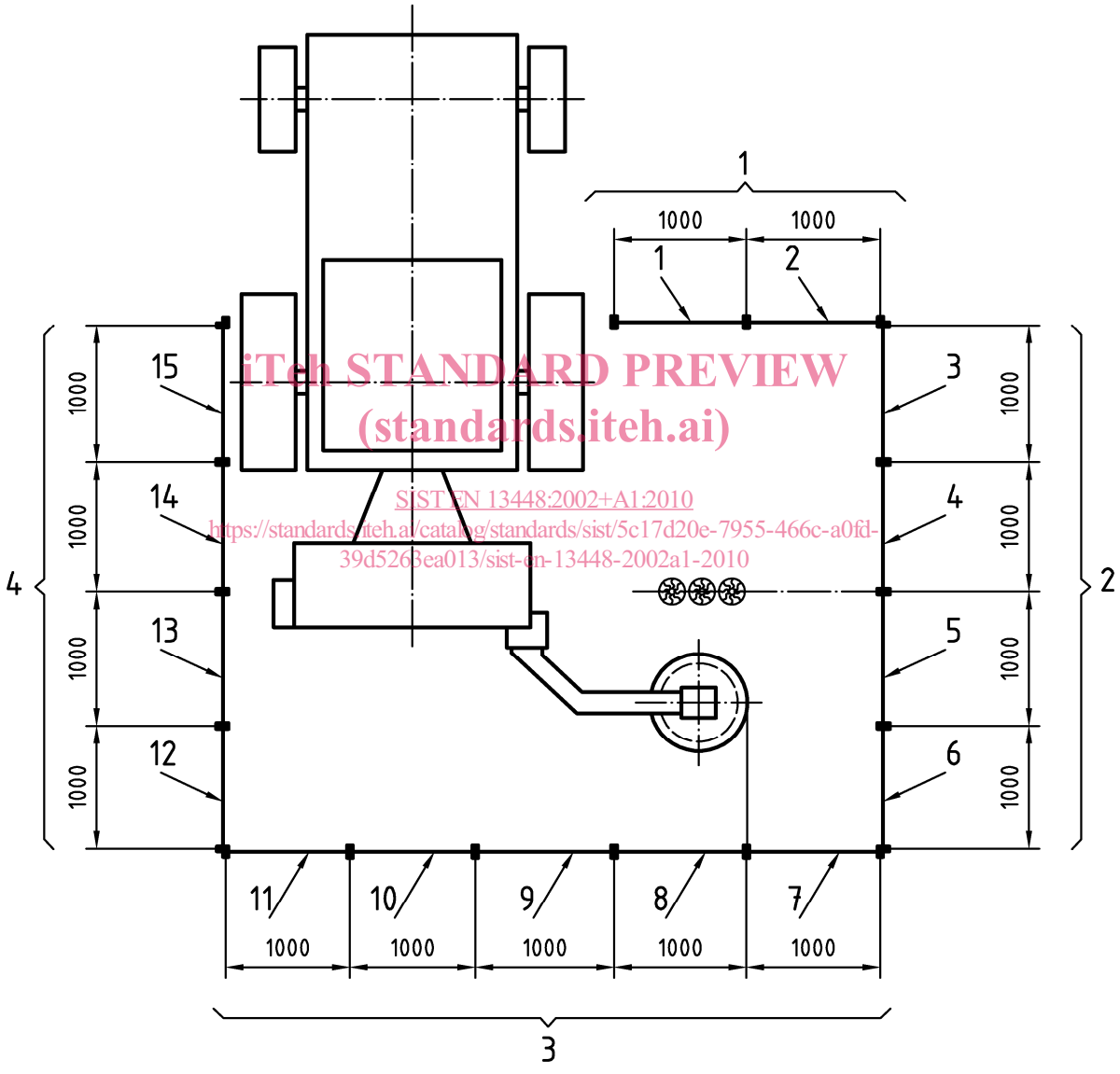


Figure 3 — Target positioning for the thrown-objects tests