



SLOVENSKI STANDARD
SIST EN 1374:2001+A1:2010
01-julij-2010

Kmetijski stroji - Vgrajeni odjemalniki za okrogle silose - Varnost

Agricultural machinery - Silos stationary unloaders for round silos - Safety

Landmaschinen - Stationäre Entnahmegeräte für Rundsilos - Sicherheit

Matériel agricole - Désileuses stationnaires pour silos cylindriques - Sécurité

Ta slovenski standard je istoveten z: EN 1374:2000+A1:2010

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ICS:

65.040.20	Poslopja in naprave za predelavo in skladiščenje kmetijskih pridelkov	Buildings and installations for processing and storage of agricultural produce
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EUROPEAN STANDARD

EN 1374:2000+A1

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ICS 65.040.20

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Agricultural machinery - Silos stationary unloaders for round silos - SafetyMatériel agricole - Désileuses stationnaires pour silos
cylindriques - SécuritéLandmaschinen - Stationäre Entnahmegereäte für Rundsilos
- Sicherheit

This European Standard was approved by CEN on 9 April 2000 and includes Corrigendum 1 issued by CEN on 21 July 2004 and Amendment 1 approved by CEN on 21 February 2010.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 1374:2000+A1:2010) 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of an identical text or by endorsement, at the latest by October 2010, and conflicting national standards shall be withdrawn at the latest by October 2010.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 Corrigendum 1 issued by CEN on 2004-07-21 and Amendment 1, approved by CEN on 2010-02-21.

This European Standard supersedes EN 1374:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags \boxed{AC} \boxed{AC} .

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).

$\boxed{A_1}$ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. $\boxed{A_1}$

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

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, Croatia, 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.

EN 1374:2000+A1:2010 (E)**Introduction**

A1 This document is a type C standard as stated 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.

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. **A1**

Silo unloaders shall comply as appropriate with **A1** EN ISO 12100 **A1** for hazards which are not covered by this standard.

1 Scope

This European Standard specifies safety requirements for the design and construction of unloaders mounted in stationary round silos for the removal of the silage and similar materials. It applies to electrically powered, slowly rotating unloaders which operate on top surface of the stored silage surface.

It describes methods for the elimination or reduction of hazards for which specific requirements on unloaders, as defined in 3 and shown in Annex B, are necessary. In addition, it specifies the type of information to be provided by the manufacturer on safe working practices.

The **A1** document **A1** only deals with the hazards generated by the silo unloader and not with those of the silo system itself (e.g. hazards arising from generated gases).

A1 This document is not applicable to noise and fire hazards and hazards related to the foreseeable misuse. **A1**

The **A1** document **A1** does not deal with technical requirements for installation or removal of the unloader from one silo to another.

The list of significant hazards dealt with in this **A1** document **A1** is given in annex A. Annex A also indicates the hazards which have not been dealt with.

The environmental aspects have not been considered in this **A1** document **A1**.

This **A1** document **A1** applies primarily to machines which are manufactured after the date of issue of this **A1** document **A1**.

NOTE Directive 94/9/EC concerning equipment and protective systems intended for use in potentially explosive atmospheres can be applicable to the type of machine or equipment covered by this European Standard. The present **A1** document **A1** is not intended to provide means of complying with the essential health and safety requirements of Directive 94/9/EC.

2 Normative references

A1 The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. **A1**

A1 EN 954-1:1996, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

EN 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

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

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

EN 60947-4-1:2001, *Low-voltage switchgear and control gear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (IEC 60947-4-1:2000)*

EN 60947-5-1:2004, *Low-voltage switchgear and control gear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices (IEC 60947-5-1:2003)*

EN ISO 4254-1:2009, *Agricultural machinery — Safety — Part 1: General requirements (ISO 4254-1:2008)*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

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

HD 22.4 S4:2004, *Cables of rated voltages up to and including 450/750 V and having crosslinked insulation — Part 4: Cords and flexible cables*

HD 60364-7-705:2007, *Low-voltage electrical installations — Part 7-705: Requirements for special installations or locations — Agricultural and horticultural premises (IEC 60364-7-705:2006, modified) ^{A1}*

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3 Terms and definitions

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^{A1} For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply. ^{A1}

3.1

silos unloader

machine for unloading silage from inside of a stationary silo of essentially circular cross-section. It is set upon the surface of the silage, whereby the silage cutting tools rotate around a vertical axis during extraction of the silage e.g. by chain or screw conveyors. The cut silage is removed from the silo by a blower. The rotational rate is max. 5°/s (See Annex B for examples of such machines).

NOTE The cut silage is handled simultaneously out of the silo. Silo unloaders can also be used to distribute the silage during filling the silo.

3.2

cutting arm

part of the unloader carrying the silage cutting tools

3.3

drive roller

powered roller which drives on the silage top surface making the cutting arm rotate around the vertical axis of the silo

3.4

silage cutting tool

cutting tool attached to a chain or a screw conveyor for cutting and extracting the silage

EN 1374:2000+A1:2010 (E)**3.5****slipping connection**

device for continuously maintaining electrical connections between the moving cutting arm and the non-rotating part of the silo unloader

4 Mechanical safety requirements**4.1 General**

A1 The machine shall be designed according to the principles of risk reduction specified in EN ISO 12100-1:2003, Clause 5. Unless otherwise specified in this document, safety distances shall comply with the requirements given in EN ISO 13857:2008, Tables 1, 3, 4 or 6. **A1**

A1 *deleted text* **A1**

4.2 Protection against hazards generated by silage cutting tools and drive rollers

The total overall length of the silage cutting tools forming the cutting arm shall be guarded at the front, at the back and from above (see Figure 1a). The vertical distance between the lower edge of the front and back guards and the lower edge of the silage cutting tools shall be a maximum of 125 mm, and the horizontal distance between the periphery of the silage cutting tools and the front and back guards shall be a minimum of 200 mm.

The guard shall be radially adjustable so that a gap of no more than 60 mm is left between the end of the guard and to the surface of the inner wall of the silo (see Figure B.1).

A1 In addition, at the rear of the cutting arm a deterring/impeding device (see 3.27 in EN ISO 12100-1:2003) shall be located at a maximum height of 400 mm above the silage top surface, and a horizontal distance of not less than 300 mm from the periphery of the silage cutting tools. **A1**

The guard at the rear of the unloader may be modified to include a hinged flap that rests on the cut surface of the silage (see Figure 1 b).

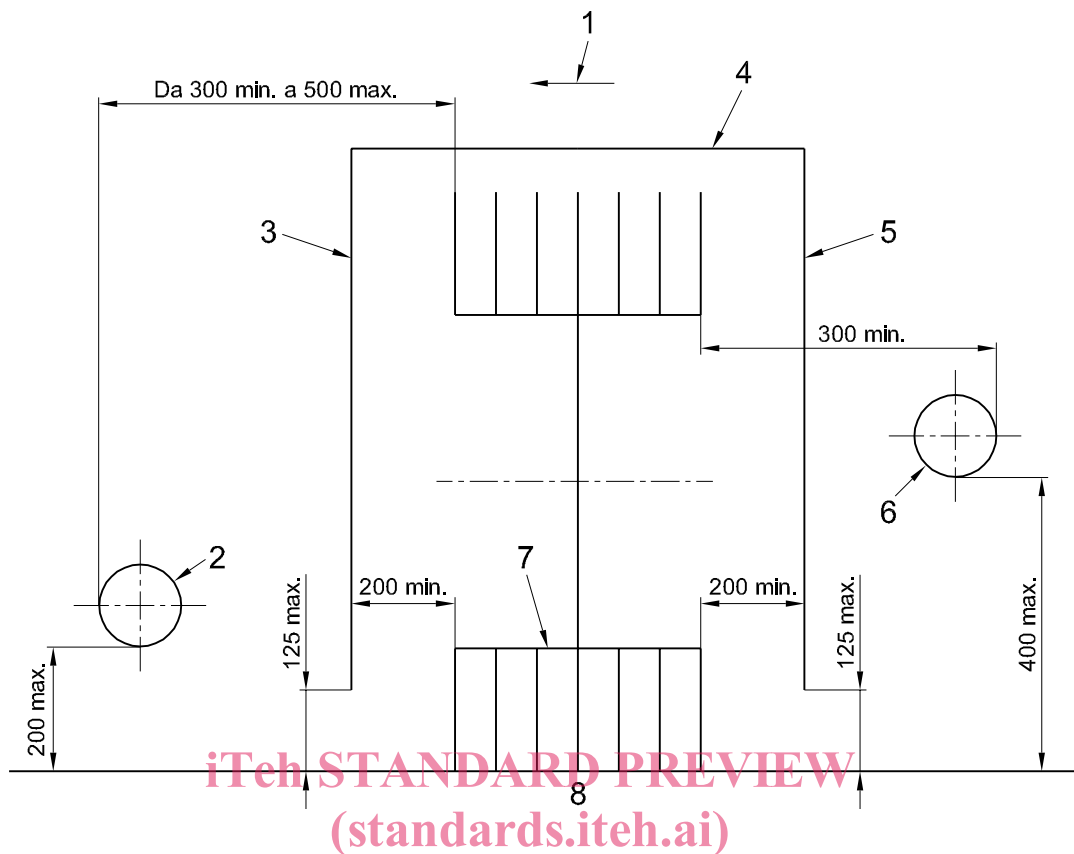
A1 A trip device, extending the full width of the cutting arm shall be located in front (relative to the normal direction of working) of each cutting arm and drive roller to prevent overrunning of persons. Rotation shall stop within 1° after activation of the trip device. **A1**

This device shall be mounted at a maximum height of 200 mm above the lower edge of the silage cutting tools and at a horizontal distance of between 300 mm and 500 mm in front of the leading edge of the silage cutting tools and drive roller.

The trip device on the drive roller shall be located in accordance with Figure 2.

A1 Guards and trip devices shall withstand horizontal forces of 600 N and vertical forces of 900 N. The test method shall be in accordance with Annex C of EN ISO 4254-1:2009. **A1**

Dimensions in millimetres

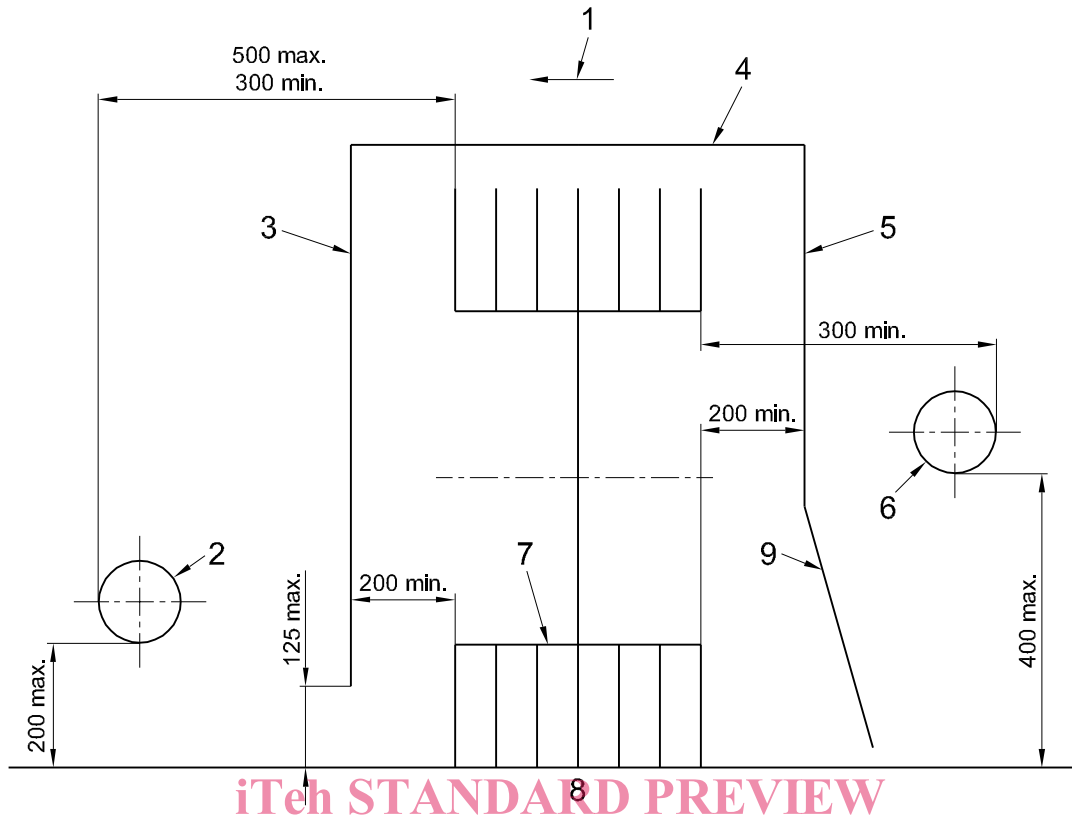


Key

- 1 Working direction
- 2 Trip device
- 3 Front guard
- 4 Guard, topside

- 5 Back guard
- 6 Deterring/Impeding device
- 7 Cutting tool
- 8 Silage

Figure 1 a — Protection of silage cutting tools with deterring device



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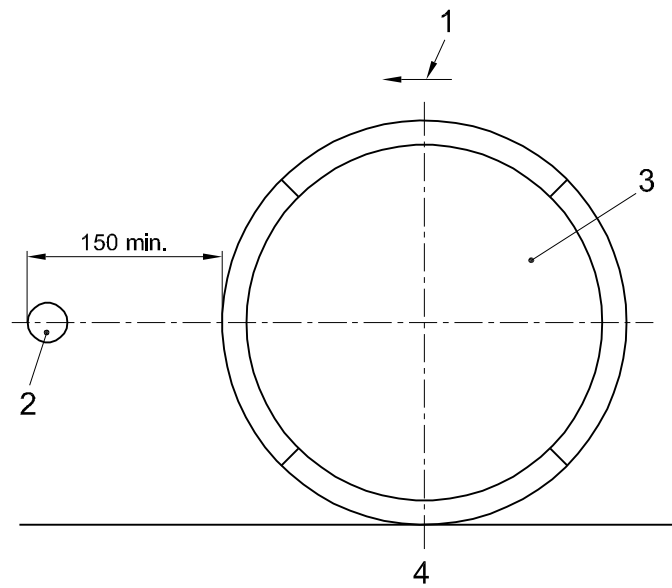
Key

- | | | | |
|---|-------------------|---|---------------------------|
| 1 | Working direction | 6 | Deterring/Impeding device |
| 2 | Trip device | 7 | Cutting tool |
| 3 | Front guard | 8 | Silage |
| 4 | Guard, topside | 9 | Flap |
| 5 | Back guard | | |

Figure 1 b — Protection of silage cutting tools with hinged flap

If the non-rotating part of the unloader is supported by fixed arms at the inner wall of the silo the following provisions shall be made to prevent of crushing (see Figure 3) :

- a distance between the fixed arms and the top of the rotating cutting arm of at least 500 mm; and
- a free passage height of the fixed arms above the lower edge of the tools of at least 1 250 mm.

**Key**

- 1 Working direction
- 2 Trip device
- 3 Drive roller
- 4 Silage

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Figure 2 — Protection of drive roller

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