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**Kmetijski stroji - Varnost - 17. del: Stroji za pobiranje gomoljnic (ISO/DIS 4254-17:2018)**

Agricultural machinery - Safety - Part 17: Root crop harvesters (ISO/DIS 4254-17:2018)

Landmaschinen - Sicherheit - Teil 17: Hackfruchterntemaschinen (ISO/DIS 4254-17:2018)

**iTeh STANDARD PREVIEW**

Matériel agricole - Sécurité - Partie 17: Matériel de récolte de pommes de terre, de betteraves à sucre et fourragères (ISO/DIS 4254-17:2018)

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**ICS:**

65.060.50 Oprema za spravilo pridelkov Harvesting equipment

**oSIST prEN ISO 4254-17:2018**

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## Agricultural machinery — Safety —

### Part 17: Root crop harvesters

*Matériel agricole — Sécurité —**Partie 17: Matériel de récolte de pommes de terre, de betteraves à sucre et fourragères*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 7, *Equipment for harvesting and conservation*.

A list of all parts in the ISO 4254- series can be found on the ISO website.

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# Agricultural machinery — Safety —

## Part 17: Root crop harvesters

### 1 Scope

This part of ISO 4254, intended to be used together with ISO 4254-1, specifies the safety requirements and their verification for the design and construction of the following types of root crop harvesting machines trailed, mounted or self-propelled:

- sieving harvesters,
- root lifting harvesters,
- top lifting harvesters,

which carry out more than one of the following operations: haulm/leaf topping, digging/taking-in/lifting, cleaning, conveying and unloading of root crops.

This standard is also applicable for haulm/leaf toppers used individually.

This standard is not applicable to cleaner-loaders which operate from a heap of beet, as on these type of machines additional hazards are present not dealt with in this standard.

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

The list of significant hazards dealt with in this standard is given in [Annex A](#). [Annex A](#) also indicates the hazards which have not been dealt with.

Environmental aspects have not been considered in this standard.

This standard applies primarily to machines which are manufactured after the date of issue of the standard.

### 2 Normative references

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

ISO 4254-1:2013, *Agricultural machinery — Safety — Part 1: General requirements*

ISO 9533:2010, *Earth-moving machinery — Machine-mounted audible travel alarms and forward horns — Test methods and performance criteria*

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

ISO 13850:2006, *Safety of machinery - Emergency stop - Principles for design*

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

EN 547:1996+A1:2008, *Safety of machinery - Human body measurements - Part 3: Anthropometric data*

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### 3 Terms and definitions

For the purposes of this standard, the terms and definitions given in ISO 12100:2010 apply together with the following.

Note 1 to entry Examples of machine and components, illustrating the following definitions, are given in [Annex B](#).

**3.1  
sieving harvester**  
harvesting machine which digs the crops together with a bed of soil and which separates the crops from the soil by sieving. These machines are typically used for harvesting of potatoes.

**3.2  
root lifting harvester**  
harvesting machine which lifts individual crops of a row and which separates remaining adhering soil from the crops. These machines are typically used for harvesting of beets.

**3.3  
top lifting harvester**  
harvesting machine which lifts crops of a row mainly by the leaf or haulm by using a clamping belt and which separates remaining adhering soil from the crops. These machines are typically used for harvesting of carrots or leeks.

**3.4  
haulm/leaf conveying device**  
device for transport of haulms/leaves to haulm/leaf spreader or to the loading device, if any, or to the outside of the machine

**3.5  
cleaning device**  
device mainly intended to separate the crop from the soil adhering to it

**3.6  
crop conveying device**  
device which transports the crop from one part of the machine to another

**3.7  
unloading device**  
device which transfers the crop out of the machine

**3.8  
bunker**  
device to collect the crop on the machine which can be equipped with a system to raise and combined with an unloading device

**3.9  
haulm/leaf topping device**  
device to remove and to evacuate the haulm/leaf prior to lifting the crop. This device can be used also individually as haulm/leaf topper.

**3.9.1  
rotor**  
rotating device intended to remove the haulm/leaf of crops and/or to clean the top part of the crop still in the ground

**3.9.2  
leaf spreading device**  
device which distributes leaves evenly on the soil surface

**3.9.3****haulm spreading device**

device which distributes haulms evenly on the soil surface

**3.10****haulm devining device**

device to separate haulm from the potatoes after lifting

**3.11****digging device**

device of a sieving harvester to dig the crop together with soil from the field

**3.12****clod and stone removal devices**

devices to remove unwanted soil, stones and clods from the lifted crop

**3.13****sorting platform**

workplace for sorting on the machine

**3.14****packing platform**

workplace on the machine for manual packing of crops in bags or boxes with an area for transfer of the bags or boxes to a transport vehicle

**3.15****haulm/leaf loading device**

device which transports haulms/leaves collected at the conveyor outlet

**3.16****root lifting device**

device of a root lifting harvester which extracts roots crops from the soil

**3.17****haulm/leaf cutting device**

device to remove the haulm/leaf by cutting after lifting the crop located just at the beginning of the clamping belt

**3.19****haulm/leaf removing device**

device to remove the residual haulm/leaf after lifting the crop located in upper area of the clamping belt

**3.20****top lifting device**

clamping belt in combination with a share as support for lifting the crop from the soil by lifting the crop by the haulm/leaf

**3.21****Inspection platform**

workplace on the machine for observing of the crop flow and the quality of the crop harvested

## **4 Safety requirements and/or protective/risk reduction measures for all machines**

### **4.1 General**

**4.1.1** Machinery shall comply with the safety requirements and/or protective/risk reduction measures of this clause. In addition, the machine shall be designed in accordance with the principles of

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ISO 12100:2010, Clause 4, for hazards relevant, but not significant, which are not dealt with by this part of ISO 4254.

**4.1.2** Except where otherwise specified in this part of ISO 4254, the machine shall comply with the requirements of ISO 4254-1 and with [Tables 1, 3, 4 and 6](#) of ISO 13857:2008 as appropriate.

**4.2 Controls**

**4.2.1** The starting and the stopping of the moving parts shall be controllable only from the driver's station of the self-propelled machine and in case of trailed and mounted machines only from the driver's station of the towing machine. If this is not possible for particular functions or not useful (e.g. for removing of blockages), the controls for these particular functions may be located on the machine provided they can be operated from a safe position.

**4.2.2** The lowering of the bunker shall be controllable from the driver's station and the control shall be of hold-to-run-type.

**4.2.3** On machines with a sorting platform, emergency stop equipment complying with ISO 13850 shall be accessible from each workplace to stop the conveyor of the sorting platform. The accessibility shall be determined according to EN 547-3+A1.

The controls for the adjustment of moving parts shall be located so that they can be operated from the driver's station and/or the sorting platform and with the guards in guarding position. The operator's manual shall include an appropriate notice on the need to adjust the driving speed and/or the speed of the functional components of the machine to the conditions of work.

**4.3 Visibility**

**4.3.1** Self-propelled machines shall be fitted with an audible warning alarm complying with ISO 9533. This alarm shall be automatically engaged during reversing manoeuvres.

**4.3.2** This alarm is not required if the machine is equipped with a closed-circuit television (CCTV) which permits the driver to have a clear view on the rear of the machine.

**4.3.3** In direction of travel lateral visibility to view the outermost edges of the machine shall be provided. If this is not possible by direct view, mirrors or any other equivalent means shall be provided.

**4.4 Haulm/leaf topping device****4.4.1 Protection against unintentional contact with the rotating tools****4.4.1.1 General**

Machines shall be designed or guarded in such a way that any unintentional contact with the rotating tools at the front, at the rear, at the sides and on the top is avoided.

**4.4.1.2 Protection on the top, at the front and the rear**

**4.4.1.2.1** On the top, the protection shall be achieved by an imperforate guard. The front and rear edge of these imperforate guards shall be located at a maximum height of 400 mm from the lowest point of the tools path and at a minimum horizontal distance of 200 mm from the tools path (see Figure 1a).

**4.4.1.2.2** The protection at the front and the rear shall be achieved by the extension of upper imperforate guard to the front and to the rear (see Figure 1a).

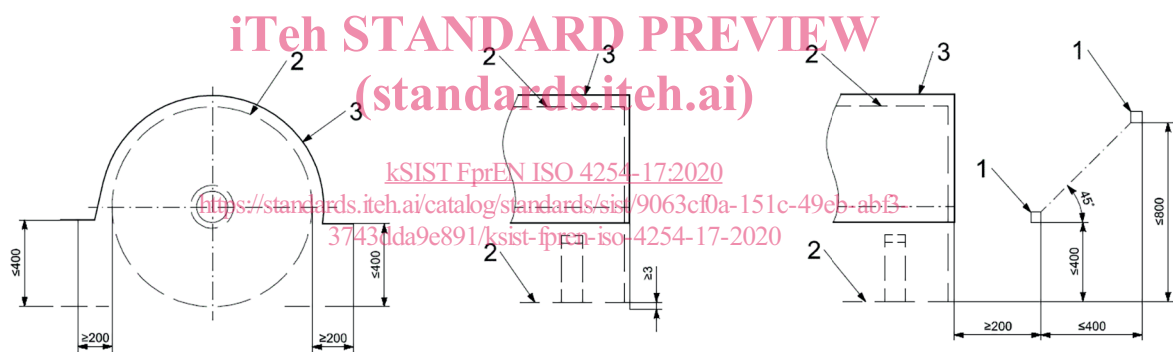
**4.4.1.3 Protection at the sides**

**4.4.1.3.1** In the accessible zone the lateral protection shall be:

- an imperforate guard, located near the tools and in such a way that its lower edge extends by a minimum of 3 mm below the tools path (see Figure 1b); or
- in case the lower edge of the imperforate guard does not extend by a minimum of 3 mm below the tools path, the lower edge of this imperforate guard shall be located at a maximum height of 400 mm from the lowest point of the tools path and additionally by a barrier located at a maximum height of 400 mm from the lowest point of the tools path and at a minimum horizontal distance of 200 mm from the tools path (see Figure 1c). If the height of the barrier is more than 400 mm from the lowest point of the tools path the barrier shall be located along a contour with angle of 45° to the exterior whereby the maximum height of the barrier shall not exceed 800 mm. Barriers at the sides can be foldable for transport. They shall remain attached to the machine and shall be kept fixed in their position. The operation of the tools shall be avoided when the barrier is not in protective position (e.g. by restriction of the function of the machine components in this situation); or
- a combination of these two previous protective devices.

**4.4.1.3.2** The projection on a horizontal plane of these protective devices shall be continuous.

Dimensions in millimetres



**Figure 1 a - Protection at the top, front and rear by an imperforate guard**

**Figure 1 b - Protection at the sides by an imperforate guard**

**Figure 1c - Protection at the sides by a barrier**

**Key**

- 1 - barrier
- 2 - tools path
- 3 - imperforate guard

**Figure 1 — Haulm/leaf topping device - Protective devices**

**4.4.2 Haulm/leaf conveying device**

**4.4.2.1** Any mobile elements of the haulm/leaf conveying device located less than 850 mm from the outer contour of the machine shall be guarded except the ejection outlet. There shall be no crushing and shearing points at the ejection outlet.

**4.4.2.2** For this purpose the ejection outlet shall be fitted with:

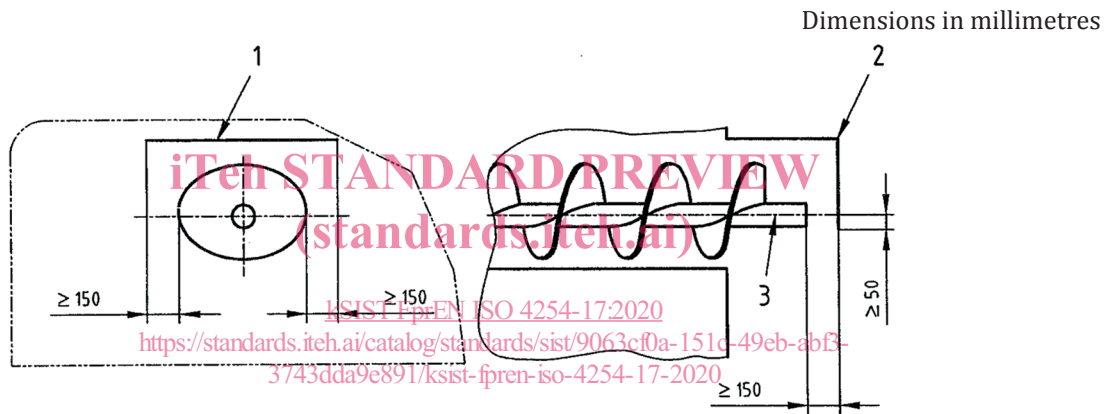
- a protective device composed of:

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- a) on the top, an imperforate guard which extends beyond the outer part of the haulm/leaf conveying device by a minimum of 150 mm (see Figure 2). When a conveyor belt is used, the lower edge of the top guard shall be placed at 200 mm maximum above the upper plane of the conveyor belt (see Figure 3);
- b) at the outer point of the haulm/leaf conveying device:
  - when an auger is used, a fixed guard, the lower end of which shall extend at least 50 mm below the axis of the screw (see Figure 2);
  - when a conveyor belt is used, a barrier located in the horizontal plane at 150 mm minimum from any mobile part of the conveyor and in the vertical plane at 200 mm maximum above the upper plane of the conveyor belt (see Figure 4).

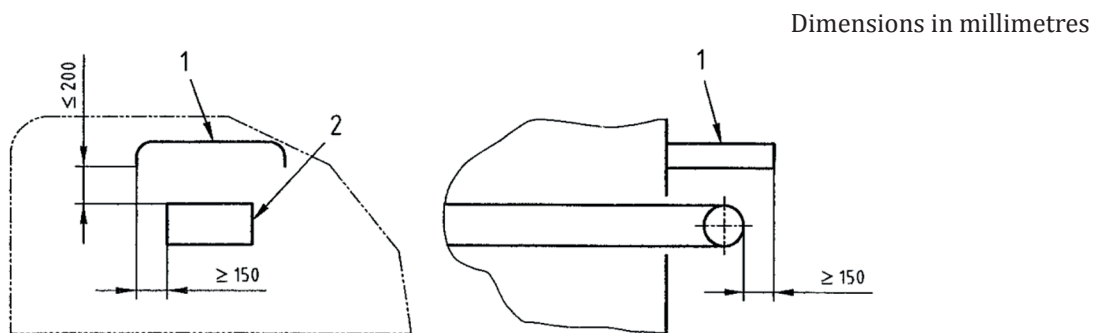
The lateral part of the conveying belt itself shall be guarded against unintentional contact.

- or
- a mobile guard which completely seals the ejection outlet and automatically returns to the closed position when no more material is ejected (see Figure 5).



- Key**
- 1 – imperforate top guard
  - 2 – fixed guard
  - 3 – axis of the screw

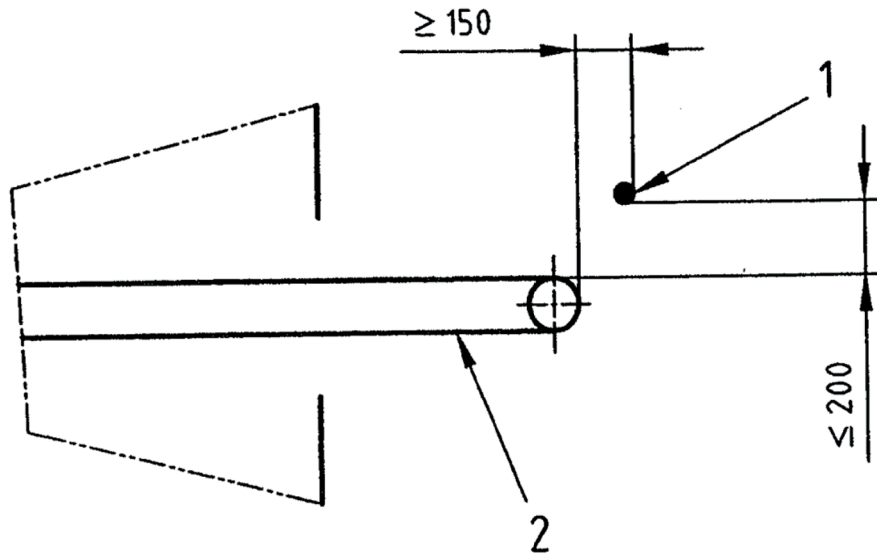
Figure 2



- Key**
- 1 – imperforate top guard
  - 2 – conveyor belt

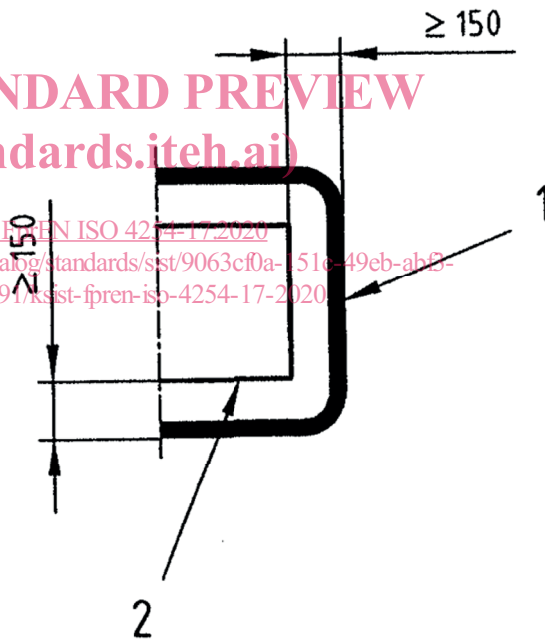
Figure 3

Dimensions in millimetres



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**Key**

- 1 - barrier
- 2 - conveyor belt

**Figure 4**