



SLOVENSKI STANDARD
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Kmetijski stroji - Varnost - 19. del: Stroji za mešanje krme (ISO/DIS 4254-19:2023)

Agricultural machinery - Safety - Part 19: Feed mixing machines (ISO/DIS 4254-19:2023)

Landmaschinen - Sicherheit - Teil 19: Futtermischwagen (ISO/DIS 4254-19:2023)

Matériel agricole - Sécurité - Partie 19: Machines de mélange des aliments (ISO/DIS 4254-19:2023)

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ICS:

65.060.99	Drugi kmetijski stroji in oprema	Other agricultural machines and equipment
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Agricultural machinery — Safety —

Part 19: Feed mixing machines

*Matériel agricole — Sécurité —**Partie 19: Machines de mélange des aliments*

ICS: 65.060.99

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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).

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

For an explanation of 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 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 3, Safety and comfort.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

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

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 organisations, 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.

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

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

NOTE Examples of machine and components, illustrating the terms and definitions in [Clause 3](#), are given in [Annex B](#).

Agricultural machinery — Safety —

Part 19: Feed mixing machines

1 Scope

This document, used together with ISO 4254-1, specifies the safety requirements and their verification for the design and construction of feed processing machines (for example feed mixers, bale processors, silage block cutters). Feed processing machines can be stationary, mounted, semi-mounted, interchangeable towed or self-propelled machines that have a combination of two or more of the following functions: loading, mixing, chopping and distributing materials used for animal feed or bedding. In addition, it specifies the type of information on safe working practices to be provided by the manufacturer.

This document does not apply to:

- machines which pick up crop material directly from the field;
- loading cranes not attached to a feed processing machine;
- Autonomous feed processing machines (including robotic feed systems dealt with in ISO 3991 (under preparation))

This document deals with the significant hazards, hazardous situations and events relevant to machines for loading, mixing and/or chopping and distributing silage and/or other feedstuffs, when they are used as intended and under the conditions foreseen by the manufacturer as listed in [Annex A](#), except for the hazards arising from:

- failure of the control circuit;
- inadequate seating;
- inadequate lighting;
- travelling of machinery related to road safety;
- break-up of parts rotating at high speed;

It is not applicable to environmental hazards (except noise).

This document is not applicable to machines manufactured before the date of publication of this document.

Examples of machines and components covered by this document are shown in [Annex B](#).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3600:2015, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Operator's manuals — Content and format*

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

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

ISO 13851:2019, *Safety of machinery — Two-hand control devices — Principles for design and selection*

ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 15817:2012, *Earth-moving machinery — Safety requirements for remote operator control systems*

3 Terms and definitions

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

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

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

3.1 Machines

3.1.1 feed processor

machine with a chamber and powered mixing/chopping device(s) for blending of feed stocks and supplements, and a means for dispensing the blended material

Note 1 to entry: The mixing/chopping devices can consist of, but are not limited to, rotating augers, rotors (for example paddles, ribbons, bars, knives), or a combination of augers and rotors.

3.1.2 bale processor

device with an open-top chamber and powered chopping elements intended to chop baled materials and distribute the processed material

3.1.3 silage block cutter

device with cutting edge(s) that is used to cut a block of material from the remaining material and transport the material for processing or distribution while maintaining the material density and form

3.2 Functions

3.2.1 mixing

operation to blend two or more different materials to create a mixture

3.2.2 chopping

operation to break up or reduce the size of the constituent elements of a mass of material

3.2.3 cutting

operation to sever a portion of material from the remaining material

3.3 loading device

element or set of elements attached to the machine that moves material into the chamber

3.3.1**loading crane**

powered crane, attached to the machine, comprising a column, which pivots about a base, and a boom system which is attached to the top of the column for loading material into the chamber

[SOURCE: EN 12999:2011, definition 3.1.1 modified]

3.3.2**loading door**

moveable portion of the chamber that opens to serve a loading function of the machine and closes during mixing or processing of material

3.3.3**loading conveyor**

powered mechanism that continually moves material into the chamber

3.4**cutting/loading device**

element or set of elements attached to the machine that alone or in combination, serve the functions of a cutting device and a loading device.

3.5**mixing/chopping device**

element or set of elements that performs the mixing and/or chopping function(s) on the material in the chamber

3.6**cutting device**

element or set of elements attached to the machine that performs the cutting function

3.7**distribution device**

powered element or set of elements, attached to the machine, which moves the material from the chamber to a desired location (for example conveyor, belt, auger, distributor cylinder, impeller, blower)

3.8**unloading door**

moveable portion of the chamber that opens to unload material

3.9**moving floor**

powered conveyor for moving the material within the chamber or on the loading door

3.10**workstation**

position on the machine, other than the operator's station, from which control of at least some machine functions is possible

3.11**operator's station**

position of the operator during machine operations including transport

4 Safety requirements and/or protective risk reduction measures

4.1 General

4.1.1 Machinery shall comply with the safety requirements or protective risk reduction measures of this clause. In addition, the machine shall be designed according to the principles of relevant parts of ISO 12100 for hazards relevant but not significant, which are not dealt with by this document.

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4.1.2 Unless otherwise specified in this document, the machines shall comply with the requirements of ISO 4254-1 and with ISO 13857:2019, Table 1, Table 3, Table 4 and Table 6 as appropriate.

4.2 Machine controls

4.2.1 Controls located on the workstation or in the operator's station

4.2.1.1 Controls shall be designed so that the operator can reach them where intended, for example by means of an adjustable position.

4.2.1.2 It shall not be possible for the operator to reach unguarded moving working elements while actuating the control.

4.2.1.3 It shall not be possible to reach the manual controls from inside the mixing/chopping chamber(s).

4.2.1.4 Stop controls shall have priority over all other controls.

4.2.1.5 Workstation controls shall be hold-to-run.

4.2.1.6 It shall be possible to deactivate workstation functions to limit control to the operator's station only.

4.2.1.7 Two-hand controls shall comply with ISO 13851.

4.2.2 Remote controls

Remote operator-controlled machinery shall comply with the requirements as specified in ISO 15817.

4.2.3 Emergency stop

An emergency stop control according to ISO 4254-1:2013, 4.19 shall be installed on self-propelled machines

4.3 Visibility

4.3.1 Visibility of work areas of cutting, loading and cutting/loading devices

4.3.1.1 For work area at front of the machine

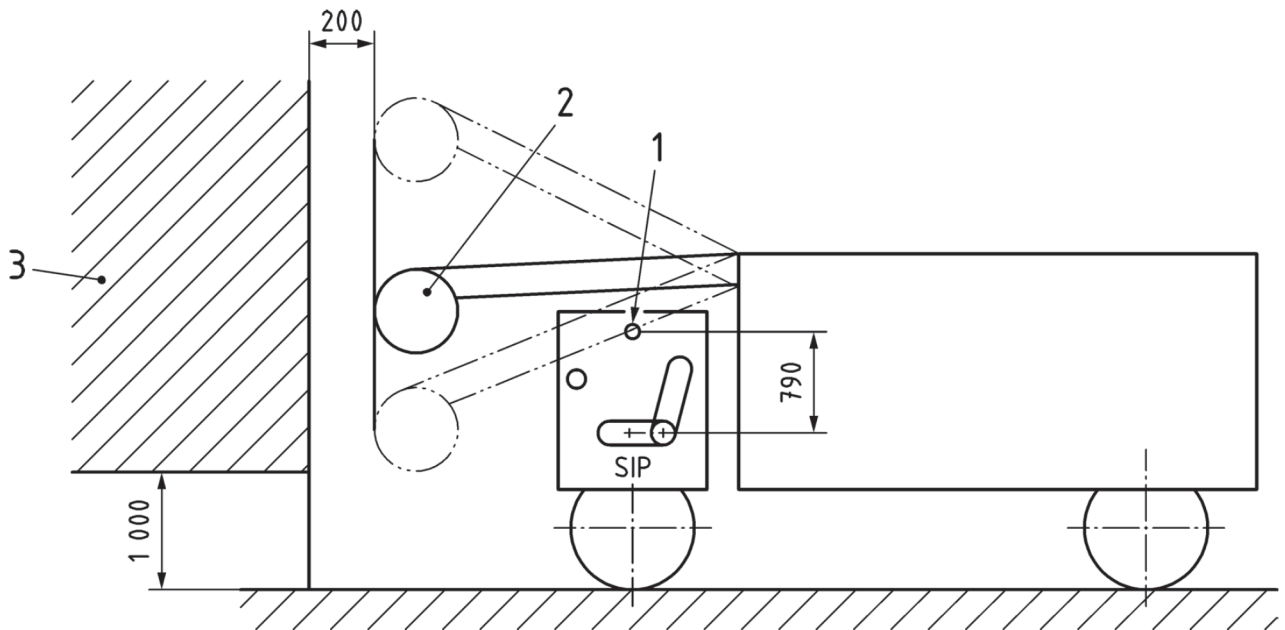
The operator shall have visibility of the work area at the front of the machine from the operator's station and/or the workstation.

The width of the work area is the entire width of any cutting, loading, and cutting/loading devices, including any entrapment zones.

The height of the work area extends from the highest working position of any cutting, loading, and cutting/loading devices to a height of 1 m or less from the ground when the machine is in its loading position.

The location of the work area is 200 mm measured from the edge of any cutting, loading, and cutting/loading devices (see [Figure 1](#)). If direct visibility cannot be achieved, devices such as mirrors or closed-circuit television (CCTV) shall be used to ensure indirect visibility.

Dimensions in millimetres

**Key**

- 1 eye position
- 2 cutting/loading device
- 3 visibility zone

Figure 1 — Checking of the direct visibility of a self-propelled machine

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4.3.1.2 For work area at rear of the machine

The operator shall have visibility of the work area at the rear of the machine from the operator's station and/or the workstation.

The width of the work area is the entire width of any cutting, loading, and cutting/loading devices, including any entrapment zones [see *d2* of [Figure 2b](#)) and [2d](#)].

The height of the work area extends from the highest working position of any cutting, loading, and cutting/loading devices to a height of 1,5 m or less from the ground when the machine is in its loading position.

NOTE The height of 1,5 m is under further investigation and could be replaced by 1,0 m in the future.

The location of the work area is 200 mm to the rear of:

- the edge of any cutting, loading, and cutting/loading devices;
- the machine when the loading door is closed.

If direct visibility of the work area cannot be achieved, at least one of the following shall be achieved:

- indirect visibility through the use of devices such as mirrors or closed-circuit television (CCTV) and a sound and/or light signal emitted during actuation of cutting, loading, and cutting/loading devices; or
- a device(s) to detect persons in the hazard zone and inform the operator.

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4.3.1.3 For work areas at sides of machine

The operator shall have visibility of the work area at the side of the machine from the operator's station and/or the workstation.

The width of the work area is 200 mm measured from the sides of any cutting, loading, and cutting/loading devices of the machine [see d_4 in [Figures 2b\)](#) and [2d\)](#)].

The height of the work area extends from the highest working position of any cutting, loading, and cutting/loading devices to a height of 1,5 m or less from the ground when the machine is in its loading position.

The location of the work area is 200 mm to the rear of:

- the edge of any cutting, loading, and cutting/loading devices; or
- the machine when the loading door is closed.

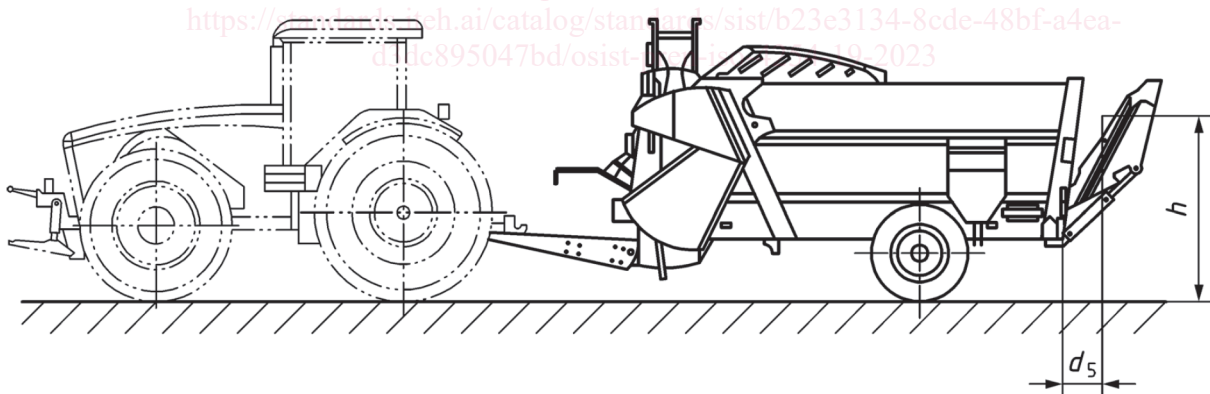
If direct visibility of the work area cannot be achieved, at least one of the following shall be achieved:

- indirect visibility through the use of devices such as mirrors or closed-circuit television (CCTV) and a sound and/or light signal emitted during actuation of cutting, loading, and cutting/loading devices;
- a device(s) to detect persons in the hazard zone and inform the operator.

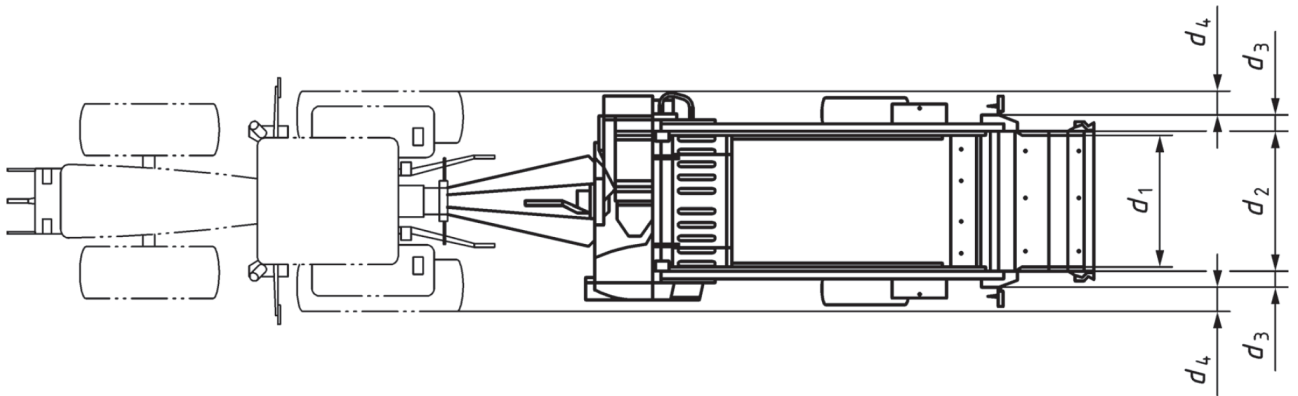
Verification: shall be by measurement on an empty machine.

4.3.1.4 Operator's eye position (standards.iteh.ai)

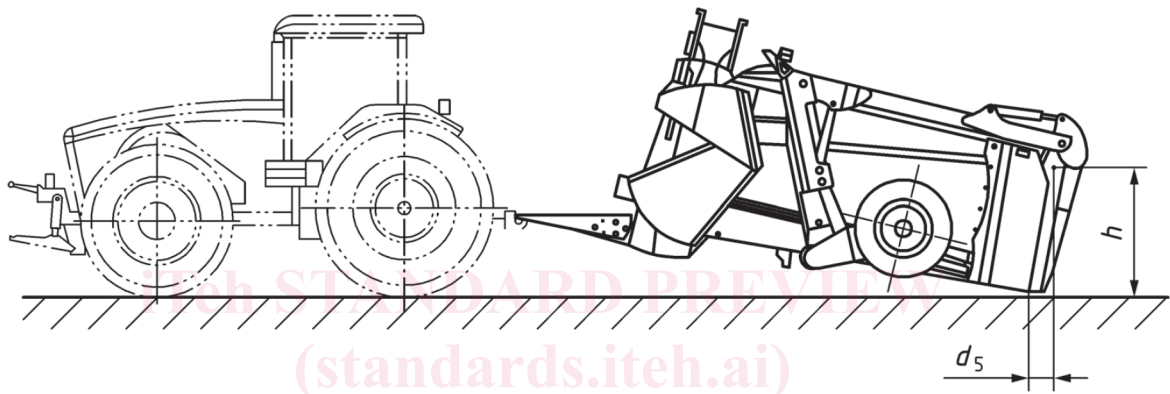
The position of the operator's eye is defined as shown in [Figure 1](#) and [Figure 3](#). A lateral displacement of the eye of the operator is allowed within ± 300 mm from the centre position.



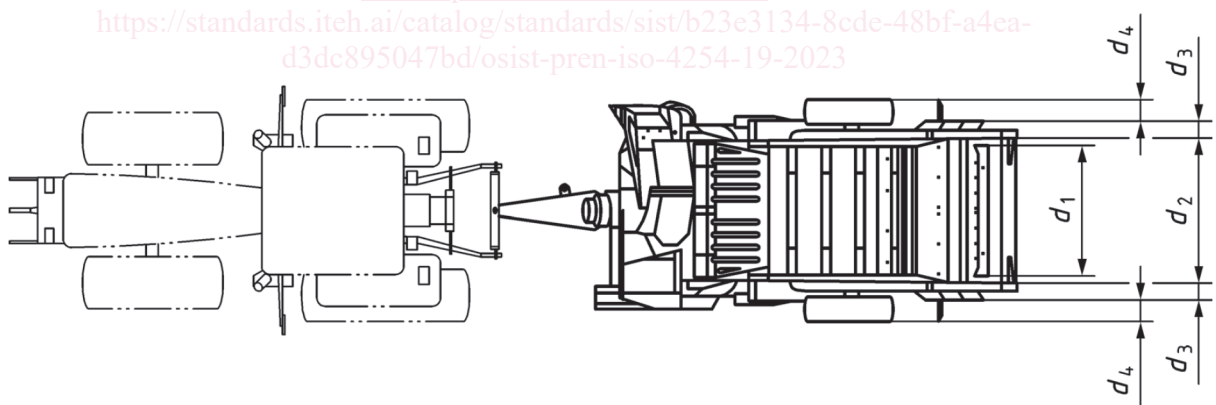
a) Checking of the visibility for trailed machines with loading door - side view



b) Checking of the visibility for trailed machines with loading door - top view



c) Checking of the visibility for trailed machines with cutting/loading tools - side view



d) Checking of the visibility for trailed machines with cutting/loading tools

Key

- h highest position to a minimum height of 1,5 m from the ground of the work area of the cutting/loading tools and the loading door
- d_1 width of the loading tools
- d_2 width of the visibility area - interior width of the machine
- d_3 excluded width of the visibility area (sides of the machine)
- d_4 width of the visibility area on sideways = 200 mm
- d_5 length of the visibility area to rear = 200 mm

Figure 2 — Checking of the visibility for trailed machines