



**SLOVENSKI STANDARD**  
**SIST EN 706:1996+A1:2009**

**01-november-2009**

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**Kmetijski stroji - Trgalniki listov na vinski trti - Varnost**

Agricultural machinery - Vine shoot tipping machines - Safety

Landmaschinen - Reblaubschneidegeräte - Sicherheit

Matériel agricole - Rogneuses à vignes - Sécurité

**Ta slovenski standard je istoveten z: EN 706:1996+A1:2009**

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**ICS:**

65.060.60	Vinogradniška in vinarska oprema	Viticultural and wine-making equipment
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 706:1996+A1**

July 2009

ICS 65.060.50

Supersedes EN 706:1996

English Version

## Agricultural machinery - Vine shoot tipping machines - Safety

Matériel agricole - Rogneuses à vignes - Sécurité

Landmaschinen - Reblaubschneidegeräte - Sicherheit

This European Standard was approved by CEN on 11 July 1996 and includes Amendment 1 approved by CEN on 23 May 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 706:1996+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of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

This document includes Amendment 1, approved by CEN on 2009-05-23.

This European Standard supersedes EN 706:1996.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\square_{A1}$   $\square_{A1}$ .

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).

$\square_{A1}$  For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.  $\square_{A1}$

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.

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**EN 706:1996+A1:2009 (E)****Introduction**

The extent to which hazards are covered is indicated in the scope of this standard. These hazards are specific to vine shoot tipping machines.

The hazards that are common to all the agricultural and forestry machines will be dealt with in a general standard currently in preparation.

Machines shall comply as appropriate with EN 292 for hazards which are not dealt with and especially with annex A of EN 292-2:1991/A1:1995 when EN 292 does not give precise requirements.

**1 Scope**

This standard specifies safety requirements and their verification for design and construction of self-propelled, mounted or semi-mounted vine shoot tipping machines. These mobile machines are used for trimming vineyard and other fruit trees that grow in the same way (trellising plants) and similar applications. Their cutting tools are either:

- High speed rotative blades (which cut by impact), or
- Rotative blade and counter blade (which cut by shearing), or
- Reciprocating cutting bar (which cuts by shearing).

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This standard does not apply to: <https://standards.iteh.ai/catalog/standards/sist/1f88731c-5fc3-44ce-bd0c-06b081eb3fa0/sist-en-706-1996a1-2009>

- Tipping machines for free standing fruit bushes,
- Walk-behind pedestrian controlled machines,
- Machines intended to be mounted on walk-behind pedestrian controlled machines,
- Hand-held machines.

NOTE 1 Machines intended to be mounted on walk-behind pedestrian controlled machines will be dealt with in the next revision of this standard.

This standard describes methods for the elimination or reduction of risks which need specific requirements for vine shoot tipping machines. It does not deal with general hazards, particularly general hazards related to mobility, including those specific to self-propelled machines. These aspects will be dealt with in another standard produced by CEN/TC 144 (see introduction).

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.

NOTE 2 This standard does not deal with:

- the location and the operation of the controls;
- the adaptability and the setting up of mounted machines on tractors or other vehicles.

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

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.

EN 165:1994, *Personal eye protection – Vocabulary*.

EN 166:1994, *Personal eye protection – Specifications*.

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 (and amendment A1:1995)*.

EN 294:1992, *Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs*.

EN 10025:1990, *Hot rolled products of non-alloy structural steels – Technical delivery conditions*.

EN 25353:1988, *Earth-moving machinery and tractors and machinery for agriculture and forestry – Seat index point*.

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## 3 Safety requirements and/or measures

### 3.1 General

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

### 3.2 Protection whilst handling and during storage

A machine whose mass is lower than 40 kg, which can be manually installed, shall be fitted with handles located in such a way they ensure safe handling and that during this operation the operator does not have any contact with the cutting tools.

A machine whose mass is equal to or greater than 40 kg shall be fitted with hooking points to enable the use of lifting equipment.

A machine shall either have attachments for suspending it when the machine is not being used or shall be designed to be stored on supports supplied by the manufacturer.

Movable or self-closing (retractable) guards for the cutting tools shall be provided by the manufacturer for when the machine is not in use.

## EN 706:1996+A1:2009 (E)

### 3.3 Protection against hazards associated with moving power transmission parts

To ensure protection against hazards related to accessible moving power transmission parts, the machine shall be fitted with fixed guards (according to 3.22.1 of EN 292-1:1991).

When frequent access is foreseen, the machine shall be fitted with guards needing a tool for their opening. These guards shall remain attached to the machine when opened (for example by means of hinges) and automatically lock in the closed position without the use of a tool.

If this type of guard is not used, the machine shall be fitted with:

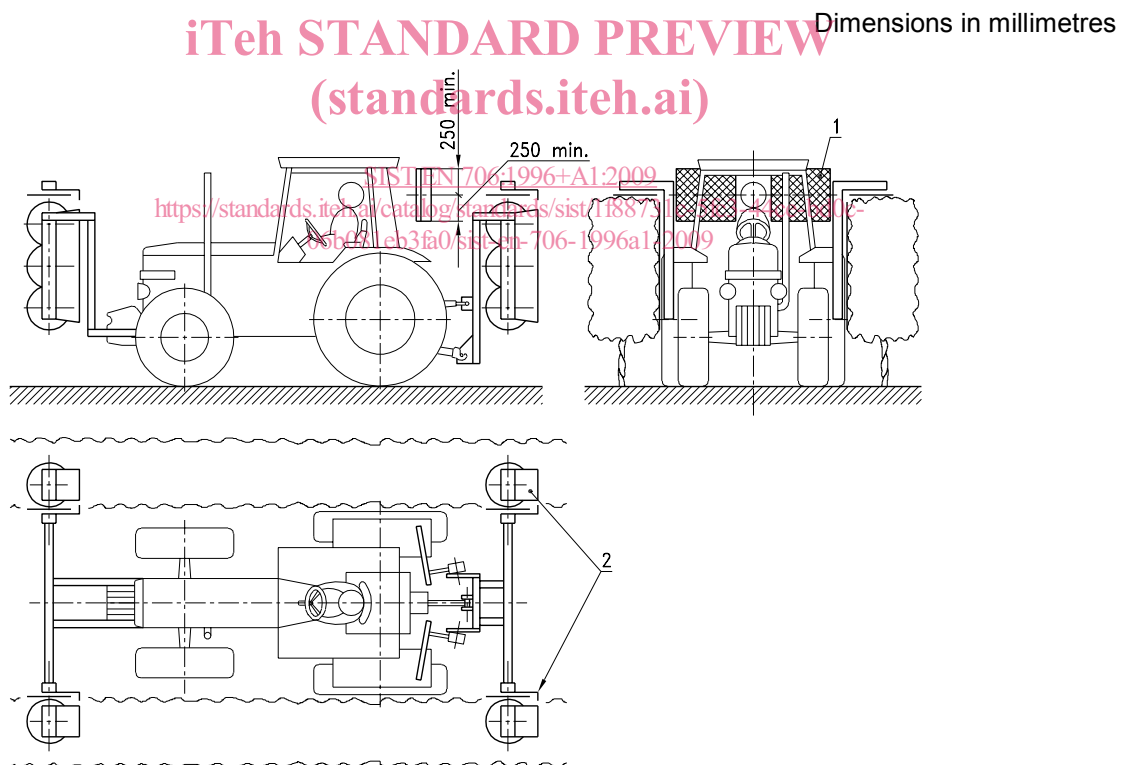
- Interlocking movable guards (according to 3.22.4 of EN 292-1:1991); or
- Movable guards fitted with a device which prevents their opening so long as the parts are moving.

### 3.4 Protection against unintentional contact with the cutting tools

Cutting tools shall be fitted with rigid deflectors in accordance with figures 1 and 2.

All parts of the cutting tools not protected against contact with the operator shall be located at more than 850 mm from the reach zone as shown in figure 3.

NOTE Requirements on the strength of the deflectors will be added by the revision of the standard.



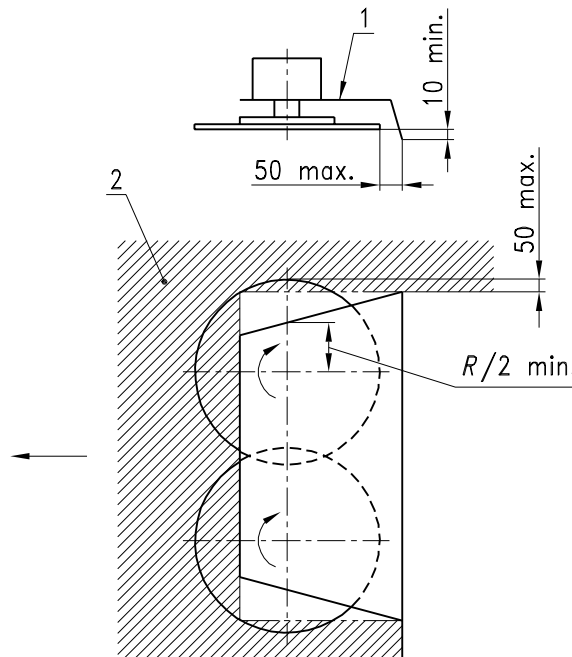
#### Key

- 1 protective grating
- 2 rigid deflector

Figure 1



Dimensions in millimetres



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**Key**

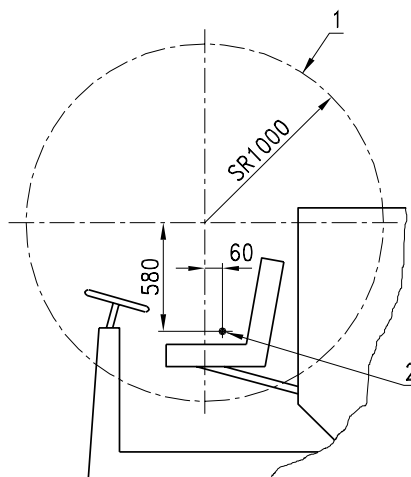
- 1 rigid deflector
- 2 residual projection plane

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**Figure 2**

Dimensions in millimetres



**Key**

- 1 reach zone
- 2 SIP (according to EN 25353)

**Figure 3**

**EN 706:1996+A1:2009 (E)****3.5 Protection against ejection of vegetable waste**

The protection against the ejection of vegetable waste is ensured by the rigid deflectors described in 3.4 when the residual projection plane as defined in figure 2 does not encroach into the driving station.

If this residual projection plane does not encroach into the driving station, the machine shall be fitted with a protective grating. This protective grating shall be an integral part of the machine and shall be perpendicular to the rotation plane of the cutting tools. The grating shall extend to a minimum height of 25 cm on both sides of the tool's rotation plane (50 cm minimum total height). Its width shall be at least equal to the cutting width of the concerned cutting tool (see figure 1). The mesh of the grating shall not permit the penetration of a cylinder of diameter greater than 10 mm and shall have a maximum length of 20 mm.

These requirements do not apply to machines with reciprocating cutting bars nor to machines with rotative blade and counter blade.

NOTE Requirements for the strength of the protective gratings will be added by the revision of the standard.

**3.6 Protection against breakage of the cutting tools**

Rotating parts involved in the cutting action shall be designed and built so that they cannot break or come free as a result of centrifugal force and the pull caused by the way they work, for example in the event of them striking obstacles such as stakes. This requirement shall be verified using the test method described in 4.2.

This requirement does not apply to machines with reciprocating cutting bars nor to machines with rotative blade and counter blade.

The maximum rotation speed of the cutting tools shall be fixed by design. In the case of hydraulically powered tools, this requirement is fulfilled when the driving circuit is fitted with a maximum flow control valve.

**3.7 Balancing of the cutting tools**

Cutting tools working by impact shall be dynamically balanced.

**3.8 Locking of lateral movement**

A machine capable of lateral movement shall be fitted with a mechanical locking device for the transport position.

**4 Verification of safety requirements and/or measures****4.1 General**

Unless otherwise specified, compliance with the safety requirements stated in this standard shall be verified by manual inspection using appropriate measuring instruments.

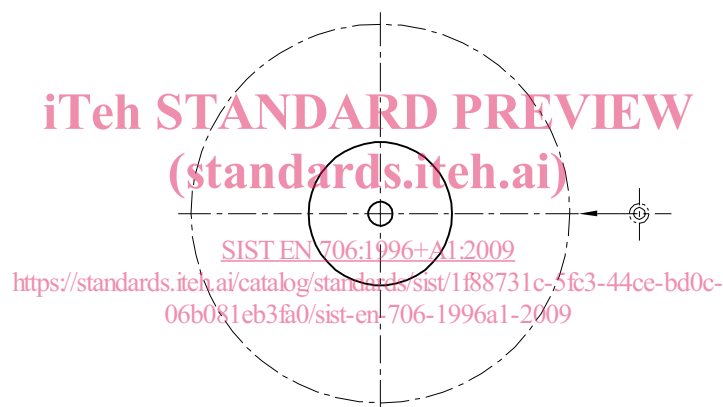
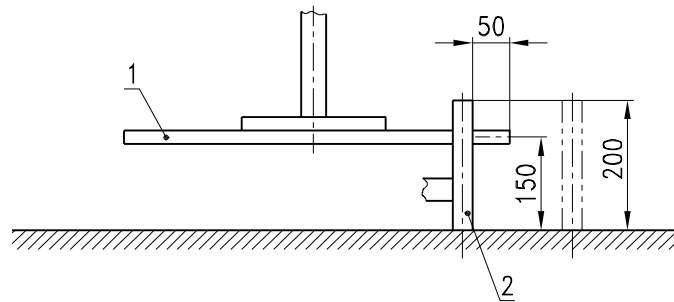
**4.2 Impact test****4.2.1 Test procedure**

Attach the cutting tool on a rigid frame by the same means as on the machine and drive it in rotation at the limit speed and at the torque recommended by the manufacturer for normal use.

Place an obstacle formed of a 30 mm x 3 mm metal tube of steel Fe 310-0 (in accordance with EN 10025) in front of the cutting tool perpendicular to the cutting plane and move the obstacle at a speed of less than 2 m/s with a force of 1 500 N towards the tool. The impact point is at 150 mm above the fixing surface for the obstacle which is 200 mm high (see figure 4).

Apply the force of 1 500 N for 10 s. Carry out this test 10 times.

Dimensions in millimetres



#### Key

- 1 cutting tool
- 2 tube 30X3

Figure 4

#### 4.2.2 Test acceptance

Neither the cutting tools nor their supports shall become detached.

Any visible fracture or break in a cutting tool or a supporting device shall be considered as a failure.

The break of a torque limiting device (e.g. shear-pin) if one is fitted, is not considered as a failure.

NOTE This test acceptance will be reviewed at the time of revision of the standard.