# SLOVENSKI STANDARD
# SIST EN 14017:2006

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**Kmetijski in gozdarski stroji – Trosilniki mineralnih gnojil – Varnost**

Agricultural and forestry machinery - Solid fertilizer distributors - Safety

Land- und Forstmaschinen - Mineraldüngerstreuer - Sicherheit



Matériel agricole et forestier - Distributeurs d'engrais solides - Sécurité

**Ta slovenski standard je istoveten z: EN 14017:2005**



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**ICS:**

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| 65.060.25 | Oprema za skladiščenje, pripravo in razdeljevanje gnojiv | Equipment for storage, preparation and distribution of fertilizers |

**SIST EN 14017:2006** **en**

EUROPEAN STANDARD

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**EN 14017**

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English Version

# Agricultural and forestry machinery - Solid fertilizer distributors - Safety

Matériel agricole et forestier - Distributeurs d'engrais solides - Sécurité

Land- und Forstmaschinen - Mineraldüngerstreuer - Sicherheit

This European Standard was approved by CEN on 29 August 2005.

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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 Central Secretariat 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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## Contents

## Foreword

This European Standard (EN 14017:2005) 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of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this European Standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## Introduction

This European Standard 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 European Standard. These hazards are specific to solid fertilizer distributors.

Significant hazards that are common to all agricultural 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, applied together with EN 1553:1999, specifies the safety requirements and their verification for the design and construction of mounted, semi-mounted, trailed or self-propelled fertilizer distributors for solid fertilizer application, i.e. full width solid fertilizer distributors, solid fertilizer broadcasters, distributors with oscillating tube and line-distributors as well as solid fertilizer distributors driven by an auxiliary engine to be used by one operator only, used in agriculture, horticulture and in forestry. In addition, this European Standard specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

When requirements of this European Standard are different from those which are stated in EN 1553:1999 the requirements of this European Standard take precedence over the requirements of EN 1553:1999 for machines that have been designed and built according to the provisions of this European Standard.

It does not apply to:

— combined seed and fertilizer drills;

— machines for distributing granulated pesticides;

— pedestrian controlled distributors;

— knapsack distributors.



This European Standard deals with all the significant hazards, hazardous situations and events relevant to solid fertilizer distributors, when they are used as intended and under the conditions foreseen by the manufacturer (see Clause 4), excepting the hazards arising from:



— inadequate lighting of moving/working area;

— inadequate visibility from drivers/operators position;

— inadequate seating;

— travelling functions (drive, braking etc.);

— rolling over;

— equipment for loading fertilizer into the machine;

— an auxiliary engine.

It is not applicable to electromagnetic compatibility (EMC) nor to environmental hazards (except noise). These aspects are covered by EN 13739-1:2003, EN 13739-2:2003, EN 13740-1:2003 and EN 13740-2:2003.

This European Standard is not applicable to solid fertilizer distributors which are manufactured before the date of its publication as EN.

## 2 Normative references

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.

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

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

EN 13739-1:2003, *Agricultural machinery – Solid fertilizer broadcasters and full width distributors – Environmental protection – Part 1: Requirements*

EN ISO 11688-1:1998, *Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning (ISO/TR 11688-1:1995)*

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)*



## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.



**3.1**
**solid fertilizer distributor**
machine which spreads fertilizer in a continuous way on the soil surface and in the crop

[EN 13739-1:2003]

**3.2**
**full width solid fertilizer distributor**
solid fertilizer distributor which spreads fertilizer over the whole surface and which has a working width which is roughly the same as the machine width

[EN 13739-1:2003]

**3.3**
**solid fertilizer broadcaster**
solid fertilizer distributor which spreads fertilizer over the whole surface and which has a working width which is essentially wider than the machine width

[EN 13739-1:2003]

**3.4**
**solid fertilizer line-distributor**
solid fertilizer distributor which spreads fertilizer in bands separated by bands without fertilizer and which has a working width which is roughly the same as the machine width

[EN 13739-1:2003]

## 4 List of significant hazards

For the purposes of this European Standard, Table 1 gives, for defined danger zones, all the significant hazards, the hazardous situations and the significant hazardous events, covered by this European Standard, that have been identified by risk assessment as being significant for this type of machine, and which require specific action to eliminate or to reduce the risk.

**Table 1 — List of significant hazards associated with solid fertilizer distributors**

| Nr | Hazard | Location or event | Clause/subclause of EN 1553:1999 | Clause/subclause of this European Standard |
|---|---|---|---|---|
| 1.1 | Crushing hazard | Fall of the distributor or the spreading devices, folding or unfolding of the swivelling and movable components, calibration, hitching and insufficient clearance zone. | 4.1.7.1, 4.2.2.2, 4.2.6.1, 4.3.2.3, 4.3.4.1 | 5.1, 5.2, 5.3.1.2, 5.8, 5.9, 5.10, 7.1 |
| 1.2 | Shearing hazard | Folding or unfolding of the swivelling and movable components, contact with distributing swivelling and movable components or with agitator | 4.1.7.3, 4.2.2.2 | 5.1, 5.3.1.2, 5.3.2.1, 7.1, 7.2 |
| 1.3 | Cutting or severing hazard | Folding or unfolding of the swivelling and movable components, contact with distributing components or with agitator | 4.1.1, 4.1.7.1, 4.2.6.1, 4.3.2.3, 4.3.4.1 | 5.1, 5.3.1.2, 5.3.2.1, 7.1, 7.2 |
| 1.4 | Entanglement hazard | Fall of the distributor on the operator, contact with distributing components or with agitator | 4.1.1, 4.1.7.1, 4.2.6.1, 4.3.2.3, 4.3.4.1 | 5.1, 5.3.2.1, 5.4, 5.9, 7.1, 7.2 |
| 1.5 | Drawing-in or trapping hazard | Fall of the distributor on the operator, contact with agitator | - | 5.1, 5.4, 5.9, 7.1 |
| 1.6 | Impact hazard | lack of stability, hitching and insufficient clearance zone | 4.1.1, 4.1.7.1, 4.1.7.3, 4.2.6.1, 4.3.2.3, 4.3.4.1 | 5.1, 5.2, 5.3.1.2, 5.3.2, 5.10, 6.1 |
| 1.9 | High pressure fluid injection or ejection hazard | Rupture of pressurised hoses | 4.1.8.2 | - |
| 2.2 | Contact of persons with parts which have become live under faulty conditions (indirect contact) | Contact of the swivelling and movable components with overhead power line | - | 5.3.1.1, 7.1, 7.2 |
| 2.3 | Approach to live parts under high voltage | Contact of the swivelling and movable components with overhead power line | - | 5.3.1.1, 7.1, 7.2 |
| 4.1 | Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness) | Hearing damage due to the working of the machine | 4.1.2, Annex D | 5.11, 7.1 |
| 7.1 | Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts | Leakage of fuel, contact with operating fluid, ejection of solid fertilizer | 4.2.5.2, 4.2.6.2, 4.3.4.2, 5.1 | 5.7, 7.1 |

**Table 1 — List of significant hazards associated with solid fertilizer distributors** (*concluded*)

| Nr | Hazard | Location or event | Clause/subclause of EN 1553:1999 | Clause/subclause of this European Standard |
|---|---|---|---|---|
| 8.1 | Unhealthy postures or excessive efforts | Non-ergonomic access to loading, hopper contents inadequately located; removal of spreading devices, insufficient hitching and clearance zone | 4.1.4, 4.1.5.1, 4.1.6, 4.2.6.1, 4.3.4.1 | 5.3.1.2, 5.5, 5.6, 5.8, 5.10, 7.1 |
| 8.2 | Inadequate consideration of hand-arm or foot-leg anatomy | Inappropriate dimensioning of accesses for loading and checking of the hopper contents, insufficient hitching and clearance zone | 4.1.5.1, 4.1.5.2, 4.1.6, 4.2.2.2, 4.2.2.1, 4.2.3 | 5.5, 5.6, 5.10 |
| 15 | Errors of fitting | | 4.3.3, 5.1 | 7.1 |
| 17 | Falling or ejected objects or fluids | Ejection of parts of distributing components, of spread fertilizer | 4.1.8.2 | 5.3.2.2, 5.7, 7.1, 7.2 |
| 18 | Loss of stability/overturning of machinery | Lack of stability due to the unfolded swivelling and movable components, when parked or for manual handling | 4.2.4.1, 4.3.2.1 | 5.2, 5.3.1.2, 7.1 |
| 19 | Slip, trip and fall of persons (relating to machinery) | Access for loading and checking of the hopper contents with inappropriate surface | 4.1.5.1, 4.1.5.2, 4.1.5.3, 4.1.6, 4.2.5.2, 4.2.6.2, 4.3.4.2 | 5.5, 5.6, 7.1, 7.2 |
| 21.1 | Fall of persons during access to (or at/from) the work position | Access for loading and checking of the hopper contents with inappropriate surface | 4.1.5.1, 4.1.6 | 5.5, 5.6 |
| 22.1 | Inadequate location of manual controls | Inappropriate adjusting location of the supporting devices, swivelling of the swivelling and movable components | 4.3.1 | 5.2.3, 5.3.1.2 |
| 22.2 | Inadequate design of manual controls and their mode of operation | Inappropriate adjusting location of the supporting devices, contact with the swivelling and movable components, contact of the swivelling and movable components with high voltage power line | 4.2.1, 4.3.1 | 5.2.3, 5.3.1.1, 5.3.1.2 |
| 24.2 | Hazards from transmission of power between machines | Contact with the drive | 4.1.7.1, 4.3.2.3 | - |
| 24.3 | Hazards from coupling | Hitching and insufficient clearance zone | 4.3.3, 5.1 | 5.10 |



## 5 Safety requirements and/or protective 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 ISO 12100 for relevant but not significant hazards, which are not dealt with by this European Standard.

### 5.2 Stability when parked and for manual handling

#### 5.2.1 General

The machine shall be designed to be stable as specified in 4.3.2.1.1 of EN 1553:1999. This shall be verified according to 6.1.1. See also 7.1 k) and 7.1 q).

#### 5.2.2 Mounted machines fitted with rollers for manual handling when dismounted

Machines equipped with transport rollers for manual handling shall be designed so that they cannot turn over. This shall be verified according to 6.1.2.

#### 5.2.3 Machines with adjustable supporting devices

When the machine is fitted with adjustable supporting devices, it shall be possible for the operator to adjust these supporting devices without going beneath the machine. This shall be verified by inspection.

### 5.3 Distributing components

#### 5.3.1 Swivelling and movable components

**5.3.1.1** To limit the risk associated with overhead power lines, the swivelling and movable components shall be capable of folding and unfolding without exceeding a height of 4 m.

See Clause 6 for verification.

**5.3.1.2** The requirement of 5.3.1.1 does not apply during release of the folded components from the transport position, and during positioning of the folded components into the transport position.

Swivelling and movable components that can be manually folded/unfolded shall be fitted with two handles located at a distance of at least 300 mm from the nearest articulation. These handles may be integral parts of the components, provided they are ergonomically designed and clearly identified.



In the case of powered operation, the control shall be of the hold-to-run type and the manual control shall be located outside the swivelling zone.



A device shall be provided to prevent the component from moving when it is in the transport position. If this locking device is a hydraulic valve not directly fitted to the cylinder, the bursting pressure of the circuit's components from the valve to the cylinder shall be 4 times its maximum working pressure.

The unlocking and the unfolding of the components shall be controlled by separate actions from the operator.

#### 5.3.2 Spreading plates and oscillating tubes

##### 5.3.2.1 Protection against unintentional contact with distributing components

Machines shall be designed or guarded in such a way that any unintentional contact with the distributing components at the front, at the rear and at the sides is avoided (e.g. a barrier or a part of the machine). This shall not apply to solid fertilizer distributors with ground-wheel-driven distributing components. This shall be verified by inspection. See also 7.1 e) and 7.1 m).

**5.3.2.1.1** For machines where the working heights *(h)* according to the instruction handbook are less than 1 500 mm from the ground, the guarding shall be achieved by:

— a horizontal overlap between the side of the hopper or structural framework of the machine, at a height of 1 500 mm, and the path of motion of the tip of the distributing components of (see Figure 1):

  — 200 mm minimum in the case of rotary distributors; or

  — 50 mm minimum in the case of oscillating distributors;

or

— a barrier located above the distributing components so that the dimensions given in Figure 2 and Table 2 are respected. In addition, the dimension $(h + y)$ shall not exceed 1 500 mm.