BRITISH STANDARD

BS EN 14017:2005 +A2:2009

Agricultural and forestry machinery — Solid fertilizer distributors — Safety

ICS 65.060.25

BSI British Standards

National foreword

This British Standard is the UK implementation of EN 14017:2005+A2:2009. It supersedes BS EN 14017:2005+A1:2008 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by ⟩A1⟨.

The UK participation in its preparation was entrusted to Technical Committee AGE/32, Agricultural implements and trailers.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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EUROPEAN STANDARD

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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 and includes Amendment 1 approved by CEN on 9 August 2008 and Amendment 2 approved by CEN on 23 May 2009.

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

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Contents

Foreword

This document (EN 14017:2005+A2:2009) 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of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.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 2008-08-09 and Amendment 2, approved by CEN on 2009-05-23.

This document supersedes [A2] EN 14017:2005+A1:2008 [/A2].

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] [/A1] and [A2] [/A2].

This document 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).

[A2] For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. [/A2]

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.

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.

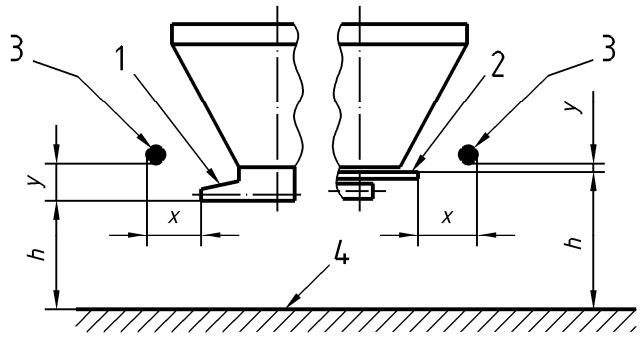
5.3.2 Spreading plates and oscillating tubes

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 A1 For machines where the maximum working height *(h)* is less than 1 500 mm from the ground, the guarding shall be achieved by:

a) a barrier located above the distributing components so that the dimensions given in Figure 1 and Table 2 are respected.



Key

1 distributing component (oscillating distributor)
2 distributing component (rotary distributor)
3 barrier
4 ground
h maximum working height
x horizontal distance between the tip of distributing components and the barrier
y vertical distance between the tip of distributing components and the barrier

NOTE *h*, as shown, is only given here as an example.

Figure 1 — Guarding by the use of a barrier for machines where the working height is less than 1 500 mm – without horizontal overlap

Table 2 — Distance between the tip of distributing components and the barrier – without horizontal overlap

Horizontal distance mm	**Vertical distance** mm
$100 \leq x < 200$	$y \leq 200$
$x \geq 200$	$y \leq 300$

or

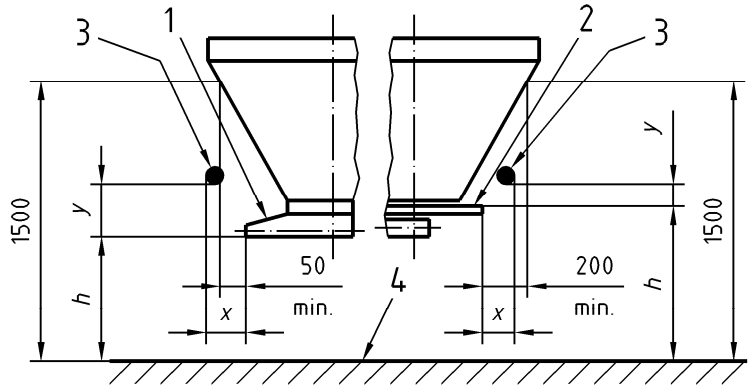
b) when a horizontal overlap between the side of the hopper or structural framework of the machine, at a height of 1 500 mm, and the path of motion of the tip of the distributing components of (see Figure 2):

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

— 50 mm minimum in the case of oscillating distributors;

then a barrier located above the distributing components so that the dimensions given in Figure 2 and Table 3 are respected. In the case where the barrier is located at least 100 mm inside the external contour of the hopper, then this barrier shall withstand a vertical and a horizontal load of 600 N.

Dimensions in millimetres



Key
1 distributing component (oscillating distributor)
2 distributing component (rotary distributor)
3 barrier
4 ground
h maximum working height
x horizontal distance between the tip of distributing components and the barrier
y vertical distance between the tip of distributing components and the barrier

NOTE *h*, as shown, is only given here as an example.

Figure 2 — Guarding by the use of a barrier for machines where the working height is less than 1 500 mm – with horizontal overlap

Table 3 — Distance between the tip of distributing components and the barrier – with horizontal overlap

Horizontal distance mm	**Vertical distance** mm
$50 \leq x < 100$ mm	$y \leq 100$ mm
$x \geq 100$ mm	$y \leq 150$ mm

In both cases a) and b), the dimension *(h + y)* shall not exceed 1 500 mm.

This shall be verified by measurement and inspection. A1

5.3.2.1.2 [A1] For machines where the minimum working heights *(h)* are more than 1 500 mm from the ground, the guarding shall be achieved by a barrier located below the distributing components so that the dimensions given in Figure 3 and Table 2 are respected. [A1]

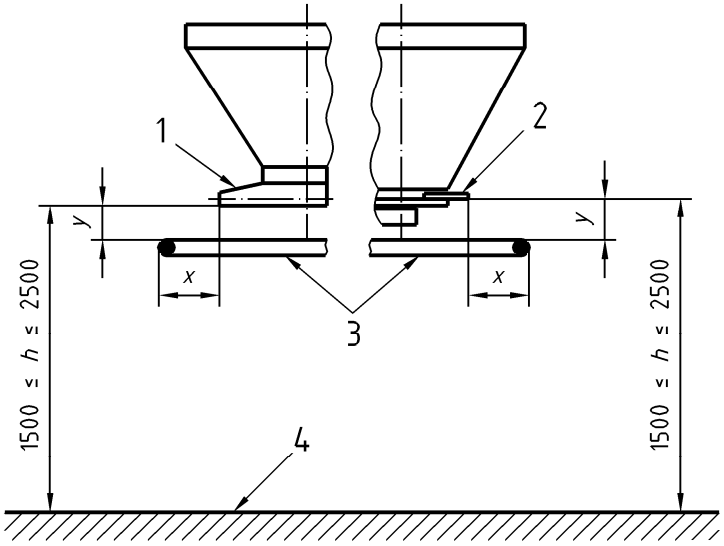
This shall be verified by measurement and inspection.

5.3.2.1.3 For machines where the working heights *(h)* according to the instruction handbook can be less than or more than 1 500 mm from the ground, the dimensions given in 5.3.2.1.1 and 5.3.2.1.2 apply.

This shall be verified by measurement and inspection.

[A1] *deleted text* [A1]

Dimensions in millimetres



Key
1 Distributing component (oscillating distributor)
2 Distributing component (rotary distributor)
3 Barrier
4 Ground
h [A1] Minimum working height [A1]

NOTE *h* is the value calculated from the ground to the distributing components taken on the lower level of the plate or the axis of the oscillating tube.

Figure 3 — Guarding for machines where the working height is more than 1 500 mm

[A1] *deleted text* [A1]

5.3.2.2 Protection against ejection of parts of machine

Parts of distributing components of solid fertilizer broadcasters, such as blades, shall be reliably fixed e.g. by a fixing bolt with a safety lock-nut.

This shall be verified by inspection.

NOTE A test method on the strength of this device will be developed.

5.4 Feeding components guarding

To ensure the protection of the operator against unintentional contact with the agitator and/or feed auger when there is a drawing-in or trapping hazard, the machine shall be designed in such a way that the feeding components cannot be reached from any part of the hopper.

For machines of which feeding components are not ground-wheel-driven, the hopper shall be fitted with a grid, either

— fixed (according to 3.25.1 of EN ISO 12100-1:2003); or

— which remains attached to the machine when opened (for example by means of hinges) and automatically locks in the closed position without the use of a tool and needing a tool to be opened; or

— combination of these two types of grids. The grid apertures and location shall comply with the safety distances given in Tables 1, 3, 4 and 6 of EN 294:1992 in closed position.

These requirements shall be verified by inspection and measurement. See also 7.1 r).

When in the closed position, this grid shall resist the strength requirement for the vertical load as specified in 4.1.7.2 of EN 1553:1999.

The distributing conveyors and flow control regulators, which are not ground-wheel-driven, shall be guarded against any contact, except for the feeding zone of distributing components.

The accessible parts of the ground-wheel-driven distributing conveyors and of the flow control regulators shall be guarded on the top and at the sides, except for the feeding zone of distributing components.

This shall be verified by inspection.

5.5 Loading

5.5.1 Safe access for loading

The height for a loading, either manually or with large bags, measured as the vertical distance between the upper edge of the hopper at the loading location and the surface of the ground or the operator platform, in the position defined in the instruction handbook, shall not exceed 1 250 mm (see Figure 4). In case the platform is narrower than the hopper, provisions to indicate the end of a platform to the operator shall be provided. These provisions shall not constitute an obstacle of access. See also 7.1 h) and 7.1 q).

If a loading platform is provided, this platform shall meet the following requirements:

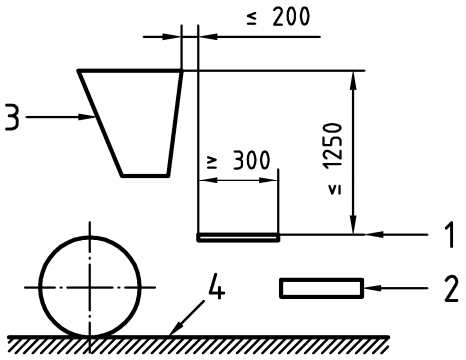
— the minimum width of the platform shall be 600 mm and the minimum depth from back to front shall be 300 mm;

— the distance between the edge of the hopper or the edge of the opened cover and the vertical plane through the edge of the platform shall be 200 mm maximum (see Figure 4);

— a handrail or handhold(s) shall be provided between the hopper and the platform. This (these) handrail/handhold(s) may be an integral part(s) of the hopper provided it (they) is (are) suitably designed.

This shall be verified by measurement and inspection.

Dimensions in millimetres



Key
1 Platform
2 Step
3 Hopper
4 Ground

Figure 4 — Loading location

5.5.2 Boarding means to loading location

The approach to the loading location shall be freely accessible so that the operator does not need to climb over or on to machine components in order to reach the boarding means.

Boarding means shall comply with 4.1.5 of EN 1553:1999 and with the requirements given below.

If a platform is provided, the vertical height of which above the ground exceeds 300 mm, a boarding means with an inclination from the horizontal of less than 70° shall be provided (see Figure 5).

The vertical distance between the lowest step and the ground shall not exceed 300 mm and shall be freely accessible. The steps shall have at least a depth of 200 mm and at least a width of 300 mm (see Figure 5).

The boarding means to a platform located more than 1 200 mm above the ground shall be fitted with at least one handrail or handholds suitably located.

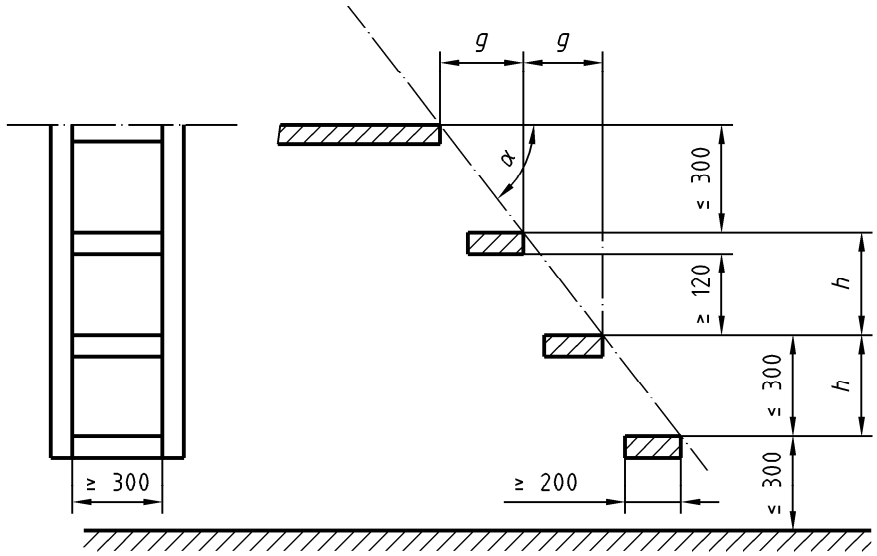
The lower end of the handrail/handhold shall be located at a maximum horizontal distance of 400 mm from the edge of the first step.

Other boarding means, if available, shall meet the requirements of 4.1.6 of EN 1553:1999.

This shall be verified by measurement and inspection.

Dimensions in millimetres

[A1]



[A1]

Key

h going (height between two successive steps)
g rise (depth between two successive steps)

Figure 5 — Dimensions of boarding means for loading location when a platform is provided

5.6 Checking of the hopper contents

In order to enable the operator to check the content of the hopper, e.g. the residual volume, if the distance of the upper edge of the hopper is in the low loading position and is more than 1 600 mm from the ground:

— boarding means complying with 4.1.6 of EN 1553:1999 shall be provided whereby the vertical distance between the upper edge of the hopper and the upper step shall be neither less than 1 200 mm nor more than 1 600 mm; or

— an inspection window shall be provided in the hopper wall; or

— other measures shall be provided enabling a risk-less check of the hopper content for the operator, e.g. by using a level indicator, a video camera, etc.

This shall be verified by measurement and inspection see 7.1 O).

5.7 Protection against ejection of fertilizer

Solid fertilizer distributors shall be designed so that there is no ejection of fertilizer towards the operator on a 2 m width in a vertical plane, perpendicular to the driving direction of the machine and going through the lower hitching points or towing point.

This shall be verified by measurement and inspection. See also 7.1 f).

NOTE A test method will be developed for inclusion upon revision of this European Standard.

5.8 Removal of the spreading device

Removable spreading devices with a mass equal to or greater than 40 kg shall be fitted with clearly identified hooking points, which enable the use of lifting equipment.

This shall be verified by inspection. See also 7.1 g).

5.9 Flow rate calibration system

When a solid fertilizer distributor is supplied with a flow rate calibration system, it shall be possible for the operator to use it without going beneath the machine during the calibration test, intended to check the application rate as defined in EN 13739-1:2003 and while the fertilizer is falling or the machine is working.

This shall be verified by inspection.

5.10 Hitching and clearance zone

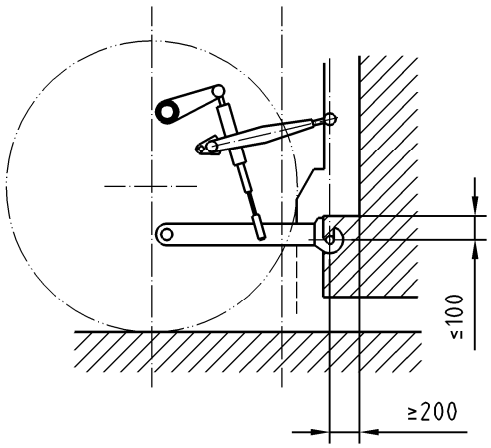
For mounted machines, a sufficient clearance between the fertilizer distributor and the tractor shall be ensured for the connection of the driving elements (e.g. transmission), if provided, and/or the steering elements (e.g. electric/hydraulic remote control). That shall be achieved by:

— an increase of the clearance zone given in Figure 6 at least on one side so that it is possible to connect the driving and/or steering elements after having coupled the fertilizer distributor; or

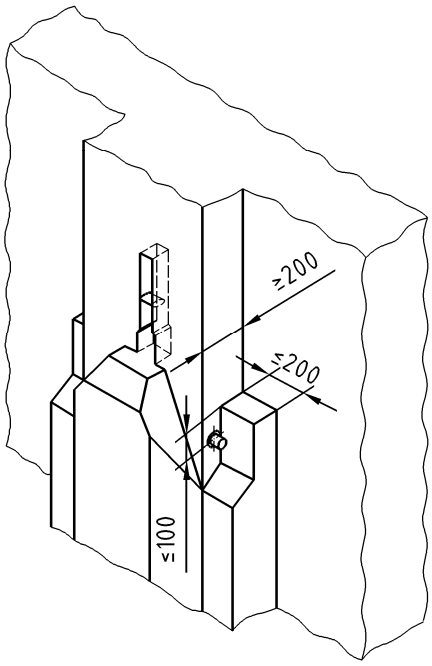
— design of the driving and/or steering elements so that their connection is possible before coupling the fertilizer distributor in a comparable clearance zone according to Figure 6.

This shall be verified by measurement and inspection. See also 7.1 j).

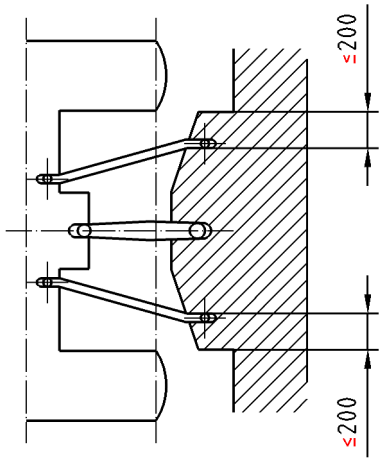
Dimensions in millimetres



a) Side view



b) Global view



c) Top view

Figure 6 — Clearance zone

5.11 Noise

5.11.1 Noise reduction as a safety requirement

5.11.1.1 Reduction at source by design and by protective measures

The machine shall be designed to generate a noise level as low as practicable. The main sources causing noise are:

— spreading devices;

— vibrating surfaces.

Machines shall be designed and constructed taking into account the available information and technical measures to control noise at source at the design stage, as described in EN ISO 11688-1.

NOTE EN ISO 11688-2 gives useful information on noise generation mechanisms in machinery.

5.11.1.2 Reduction by information

If after taking all possible technical measures for reducing noise at the design stage a manufacturer considers that further protection of the operator is necessary, then adequate information shall be given in the instruction handbook (see 7.1 s)).

5.11.2 Verification of requirements on noise based on noise emission values

For the determination of the sound power level and of the emission sound pressure level at the operator's position the noise test code given in EN 1553:1999, Annex D shall be used.

6 Verification of the safety requirements and/or protective measures

6.1 Stability when parked and for manual handling

6.1.1 General

The requirement of 5.2.1 shall be verified according to 4.3.2.1.1 of EN 1553:1999 with the basic hopper(s) half full to capacity of test material with a density of 1.

6.1.2 Mounted machines fitted with rollers for manual handling when dismounted

The requirement of 5.2.2 shall be checked as follows: Place the machine, which has been parked with the hopper(s) empty according to the manufacturer's instructions, on a horizontal and even plane. Then, push it at a speed of 1 $m \cdot s^{-1}$ against a fixed rectangular obstacle 50 mm high with a length at least equal to the distance between the external transport rollers and located on the ground at a right angle to the direction of movement of the machine.

This test shall be carried out forwards and backwards.

The machine shall remain upright.

6.2 Swivelling and movable components

The requirement of 5.3.1.1 shall be verified by measurement as follows: the height of 4 m shall be measured with the machine on horizontal level ground.

7 Information for use

7.1 Instruction handbook

Comprehensive instructions and information on all aspects of maintenance and the safe use of the machine, including suitable clothing and personal protective equipment (PPE) requirements and the need for training, if necessary, shall be provided by the manufacturer in the instruction handbook. Useful information for the drafting of the instruction handbook is given in 6.5 of EN ISO 12100-2:2003.

In particular, the following points shall be emphasised (residual risks):

a) that the engine is stopped during maintenance;

b) that all persons not concerned with the machine shall be kept away;

c) the fact that the load in mounted distributors can influence tractor manoeuvrability and that if the balance of the spreader is affected when partially unloaded, then care shall be taken (see Annex A which gives recommendations for calculations to be used to ensure stability of the tractor/distributor combination);

d) that persons shall not enter the machine when the spreading device is running;

e) that the operator shall avoid wearing loosely fitting clothes which could become entangled with moving parts;

f) that the operator shall wear personal protective equipment (PPE) when necessary or when required by the manufacturer of the fertilizer (e.g. when handling chemicals);

g) the hazards involved during removal and refitting of the spreading device, and the instructions to be followed for its handling;

h) the procedures to be followed for the calibration and loading;

i) the need to use a PTO drive shaft equipped with a guard in good condition;

j) instructions concerning the use of automatic and semi-automatic hitching, when provided;

k) that it is recommended that the distributor is parked on a horizontal, solid ground with the hopper(s) empty;

l) the risk of unintentional contact with overhead power lines where this is possible during application operations e.g. due to uneven ground or use of swivelling and movable components, requires a risk assessment to be completed before any working operation commences in the area to be operated by the machine;

m) the need to check that the unlocking procedure does not cause the swivelling and movable components to fall down in an uncontrolled way (especially important with new machines);

n) the different working heights for which the machine is intended;

o) in case of ATV (All Terrain Vehicle) operated machines, the need to refer to the ATV instruction handbook in particular for the stability and maximum loads;

p) the conditions of use to prevent blockages occurring (e.g. in the hopper) and the hazards related to clearing blockages;

q) the need to follow advice concerning manual handling of heavy loads and/or the need to follow correct procedures for sack handling and lifting;

r) precautions to take when mounting and dismounting extensions on the hopper;

A2

s) The instruction handbook and the technical documentation describing the machine prepared by the manufacturer for the information of potential users shall:

- give the declared noise emission values of the machinery as follows:
  - the A-weighted emission sound pressure level at workstations, where this exceeds 70 dB. Should the sound pressure level not exceed 70 dB, this fact shall be indicated;
  - the peak C-weighted emission sound pressure level at workstations, where this exceeds 63 Pa (130 dB in relation to 20 µPa);
  - the A-weighted sound power level emitted by the machinery as determined, where the A-weighted emission sound pressure level at workstations/the operator position exceeds 80 dB(A);
- give reference to the noise test code specified in Annex D of EN 1553:1999;
- specify the uncertainty of measurement ;
- recommend the use of low-noise operating modes, and/or limited time of operation, if necessary;
- recommend the use of ear protection, if necessary. ⟨A2⟩

7.2 Marking

All machines shall be marked legibly and indelibly with at least the following information:

- ⟨A2⟩ the business name and full address of the manufacturer and, where applicable, his authorised representative; ⟨A2⟩
- year of construction;
- ⟨A2⟩ the designation of the machinery; ⟨A2⟩
- designation of series or type, if any;
- serial number, if any;
- mass of the machine, when empty in its basis configuration;
- maximum pay load;
- mass of the spreading device, if removable;
- nominal rotation frequency and direction of rotation of the power input connection (marked by an arrow), when applicable;
- nominal power, in kW.

In addition, warnings shall be affixed on the machine drawing attention to:

- hazards caused by moving parts (distributing components);
- hazards caused by ejection of materials;
- hazard of falling off when climbing on protective structures that are not designed for boarding purposes;
- that it is dangerous to ascend onto the machine while it is moving; this warning is to be affixed near the means of access, if any.

Examples of pictograms are given in Annex B.

Annex A
(informative)

Stability of the tractor distributor combination

This annex is related to 7.1 c), in which there is the requirement to give information concerning the possible loss of stability of the tractor due to the connection with the fertilizer distributor.

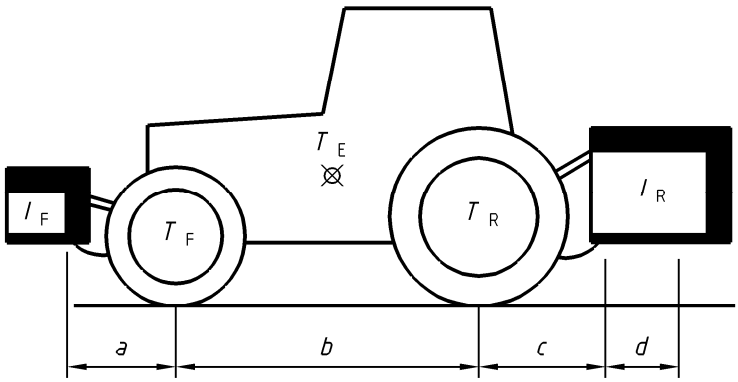
The following text is a suggestion to the manufacturer to enable him to provide adequate and complete information.

The example suggested refers to a solid fertilizer distributor mounted on a tractor.

Due to the mass of the machine itself and of the materials present in the hopper, the tractor distributor combination may become unstable. In order to verify the total stability, the following expression can be applied for the calculation of the minimum ballasting at the front $I_{F,min}$, which allows to have a weight on the front axle equal to 20 % of the unladen weight of the tractor:

$$I_{F,min} = \frac{(I_R \times (c + d)) - (T_F \times b) + (0{,}2 \times T_E \times b)}{a + b} \quad \text{(A.1)}$$

NOTE Rear mounted implement and front/rear combinations are considered for this calculation.



Key

T_E [kg]	Unladen weight of tractor	❶
T_F [kg]	Front axle load of unladen tractor	❶
T_R [kg]	Rear axle load of unladen tractor	❶
I_R [kg]	Combined weight of rear mounted implement/rear ballast	❷
I_F [kg]	Combined weight of front mounted implement/front ballast	❷
a [m]	Distance from centre of gravity for combined front mounted implement/front ballast to front axle centre	❷❸
b [m]	Tractor wheelbase	❶❸
c [m]	Distance from rear axle centre to centre of lower link balls	❶❸
d [m]	Distance from centre of lower link balls to centre of gravity for combined rear mounted implement/rear ballast	❷
❶	see instruction handbook of the tractor	
❷	see price list and/or instruction handbook of the implement	
❸	to be measured	

Figure A.1 — Stability of the tractor distributor combination

Annex B
(informative)

Examples of pictograms

Figure B.1 — Hazards caused by moving parts

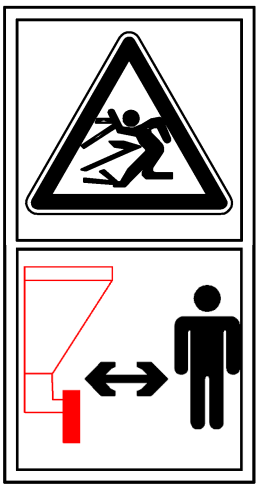


Figure B.2 — Hazards caused by ejection of materials

Figure B.3 — Ascending onto the machine while operating is dangerous

Annex ZA
(informative)

[A2] Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 98/37/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements, *except Essential Requirement(s) for all machines: 1.1.4, 1.5.11, 3.3.3, and additionally for self-propelled machines: 1.5.5, 1.5.9, 3.2.1, 3.2.2, 3.4.3, 3.6.3.a)* of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. [A2]

Annex ZB
(informative)

[A2] Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of *conformity* with the relevant Essential Requirements, *except Essential Requirement(s) for all machines: 1.1.4, 1.2.1, 1.4.2.1 (2nd paragraph), 3.3.3, and additionally for self-propelled machines: 1.1.8, 1.5.5, 1.5.9, 3.2.1, 3.2.2, 3.4.3, 3.6.3.1* of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. [A2]

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[1] EN 13739-2:2003, *Agricultural machinery – Solid fertilizer broadcasters and full width distributors – Environmental protection – Part 2: Test methods*

[2] EN 13740-1:2003, *Agricultural machinery – Solid fertilizer line-distributors – Environmental protection – Part 1: Requirements*

[3] EN 13740-2:2003, *Agricultural machinery – Solid fertilizer line-distributors – Environmental protection – Part 2: Test methods*

[4] EN ISO 11688-2:2000, *Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 2: Introduction to the physics of low-noise design (ISO/TR 11688-2:1998)*

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