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**Kmetijski in gozdarski stroji - Okoljevarstvene zahteve za prašilnike**

Agricultural and forestry machinery - Environmental requirements for dusters

Land- und forstwirtschaftliche Maschinen - Umweltanforderungen an Stäubegeräte

Matériel agricole et forestier - Exigences environnementales relatives aux poudreuses

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English Version

## Agricultural and forestry machinery - Environmental requirements for dusters

Matériel agricole et forestier - Exigences  
environnementales relatives aux poudreuses

Land- und forstwirtschaftliche Maschinen -  
Umweltanforderungen an Stäubegeräte

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 144.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1044 Brussels**

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## European foreword

This document (prEN 17744:2022) 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 document is currently submitted to the CEN Enquiry.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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

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## Introduction

The Amendment of the Machinery Directive considers also the environmental requirements of the equipment for the pesticide application (PAE).

To allow to fulfil these requirements, the harmonized standard series EN 16119 has been produced. However, these standards do not include the dusters that are widely distributed in Europe and abroad.

This document defines the environmental requirements of the dusters and the methods to measure them.

It will help duster manufacturers in fulfilling the environmental requirements mentioned in the Amendment of the Machinery Directive.

This document is a type-C standard as stated in EN ISO 12100. 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 organizations, 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.

## 1 Scope

This document specifies general requirements and their test methods for dusters for applying formulated products in the form of dust with regard to minimizing the potential risk of environmental contamination during use.

Hand operated portable dusters (knapsack) are not included in this document.

This document deals with all the significant environmental hazards related to the duster.

This document is not applicable to dusters manufactured before the date of its publication.

## 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 5681:2020, *Equipment for crop protection — Vocabulary*

ISO 9357:1990, *Equipment for crop protection — Agricultural sprayers — Tank nominal volume and filling hole diameter*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5681:2020 and the following apply.

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

— IEC Electropedia: available at <https://www.electropedia.org/>

— ISO Online browsing platform: available at <https://www.iso.org/obp>

### 3.1

#### **duster**

appliance for applying formulated products in the form of dust

### 3.2

#### **device for dust extraction**

mechanism which allows the transfer of the dust from the hopper to the outlets in a constant predetermined flow rate

### 3.3

#### **hopper nominal capacity**

volume indicated by the maximum filling level marked on the hopper when placed on a level horizontal surface

## 4 Requirements

### 4.1 General

Duster and their components shall be reliable and so designed that they can be used in accordance with their intended use as described in the operator manual, in order to minimize the potential risk of environmental contamination.

It shall be possible to connect the necessary measuring instruments to the duster to check its functioning.

**prEN 17744:2022 (E)**

Duster shall be designed so that a suitable distribution and deposition can be achieved. This shall be characterized by minimizing losses to non-target areas.

The duster shall be designed and constructed to minimize losses of plant protection products during application and after the application function has been switched off.

It shall be designed and constructed to facilitate the changing of worn parts without contaminating the environment.

Compliance shall be checked by (visual inspection, measurements, functional test, or testing) as appropriate according to Clause 5.

**4.2 Hopper(s)****4.2.1 Filling opening**

It shall be present a system able to minimize the risk that undesirable materials of more than 20 mm will cause blockages (for example presence of a grid, deflector) and influence the flow rate or transversal distribution in a negative way.

The filling hole diameter of the hopper shall at least comply with ISO 9357:1990.

It shall be present a system able to minimize the risk that undesirable materials of more than 20 mm will cause blockages (for example presence of a grid, deflector) and influence the flow rate or transversal distribution in a negative way.

The filling hole diameter of the hopper shall at least comply with ISO 9357:1990.

**4.2.2 Capacity**

The hopper's total capacity shall be at least 5 % more than its nominal capacity as determined in 5.2.

**4.2.3 Level indicator**

It shall be possible to determine the level of product that is in the hopper.

The scale shall cover at least 10 % to 100 % of the nominal volume and have a graduation for at least each 10 % of the nominal volume for hoppers with >600 l capacity.

Hoppers within 100 l to 600 l capacity shall have a graduation for each 20 % of the nominal volume.

Hoppers with <100 l capacity shall have a graduation for each 30 % of the nominal volume.

These requirements are not applied to hoppers with  $\leq 30$  l capacity as indicated in 5.3.

The accuracy of the graduation marks shall be within  $\pm 15\%$  of the actual value as indicated in 5.3.

**4.2.4 Lid**

The hopper shall be equipped with a suitable lid that can close tightly to prevent any accidental opening and prevent the dispersion of material and protect the content against entry of water or dust.

In duster with pneumatic extraction system the lid shall be tight (pressure hopper).

This shall be checked following 5.5.

**4.2.5 Accessibility**

Hopper(s) shall be designed and mounted on the duster to be accessible in a safe way as indicated below.

The filling hole of the hopper shall be so positioned that the height from the ground or platform is not more than 1 250 mm.

The horizontal reach between the rim of the hole and the outer edge of any part of the sprayer which could hinder the operator shall not be more than 300 mm at the operator filling position.



#### 4.2.6 Emptying system

Hopper(s) shall be provided with a system that allows the emptying without the use of special tools or removing parts from the machine. The total residue volume verified as described in 5.4 shall be indicated into the instruction handbook and it shall not exceed 1,0 % of the hopper nominal capacity.

#### 4.2.7 Continuous distribution system

Hopper(s) shall be provided with a means that ensures the continuous and correct flow of dust towards the distribution system.

### 4.3 Fan

#### 4.3.1 General

The rotation speed of the fan shall not differ by more than 10 % from the values indicated by the manufacturer as measured in 5.6.

#### 4.3.2 Air speed outlet (symmetry)

The maximum difference of the air velocity at the output openings between the average values measured at the left side and at the right side shall be  $\pm 20$  % measured according to the indications given in 5.7.

### 4.4 Electrostatic discharge device

All metallic parts of the duster that can conduct static electricity (framework, screw conveyor, blower, controls and regulation systems, cables) shall be connected to an electrostatic discharge device.

### 4.5 Measuring systems, controls and regulation systems

#### 4.5.1 General

The duster shall be equipped with a system to switch on or off the dust distribution.

The duster shall be equipped with a system which allows to carry out the distribution from one side only.

The adjustment device during operation, shall be reachable and visible from the operator's position.

#### 4.5.2 Device for adjusting the output rate

The adjustment device shall be lockable in a predefined position corresponding to an intended dose rate.

The adjustment device shall be provided with clear indications (marks) to select the intended rate.

### 4.6 Outlets

It shall be possible to adjust the outlets position.

## 5 Test methods

### 5.1 Test materials and equipment

#### 5.1.1 Materials

- Clean water without suspended solids,
- Kaolin dust (density: 2,6 g cm<sup>-3</sup>; granule dimension: 2  $\mu$ m to 4  $\mu$ m).

**prEN 17744:2022 (E)****5.1.2 Test equipment needed**

Anemometer:

- Accuracy: 0,1 m/s
- Full scale: 60 m/s

Tachometer:

- Accuracy: 1 rev/min
- Full scale: 5 000 rev/min

Tape measure; scale.

Equipment for volume measurement and balance for weighing with precision of 2 %.

**5.2 Estimation of the hopper maximum capacity**

With the empty machine placed horizontally, fill the hopper with clean water until the liquid level reaches the edge of the filling opening. At this point the maximum capacity of the hopper is identified.

The additional capacity of the hopper shall be calculated as follows:

(measured value – nominal value) / nominal value (as measured in 5.3)

**5.3 Estimation of hopper graduation scale**

The volume of the hopper shall be estimated with the machine placed horizontally.

With the empty machine placed horizontally, fill the hopper with clean water until the liquid level reaches the sign of the nominal volume.

The hopper shall be filled with water between 10 % to 100 % of the nominal hopper volume.

This shall be performed three times: one at the 10 % filling level, one at the 50 % filling level and one at the 80 % filling level, with the surface levelled according to the instruction handbook.

For hoppers with <100 l capacity the test shall be performed at 30 %, 60 % and 90 % filling level.

The deviation in percent between the amount of water put into the hopper and the indicated volume shall be noted.

**5.4 Residual volume of the hopper**

The duster shall be placed stationary on a horizontal plane.

Use the material indicated in the 5.1.1 (kaolin dust) filling the hopper at 10 % of its nominal capacity or at least 50 dm<sup>3</sup>.

Operate at the number of revolutions of the PTO recommended by the manufacturer, distributing the maximum capacity allowed by the device for adjusting the dust rate.

Keep the duster running until the cloud dust collapses.

After stopping the machine, manually empty the hopper and determine the amount of residual material weighing it.