
**Agricultural machinery — Equipment
for sowing — Minimization of the
environmental effects of fan exhaust
from pneumatic systems**

*Matériel agricole — Semoirs — Considérations pour réduire au
minimum les effets de l'échappement du ventilateur des systèmes
pneumatiques*



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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 3, *Safety and comfort*.

Introduction

This International Standard has been developed to consider potential methods of minimizing the effects of seed coating dust drift when mixed in the exhaust fan air flow. This dust has the potential to become fugitive during the sowing process on equipment with pneumatic systems.

Agricultural machinery — Equipment for sowing — Minimization of the environmental effects of fan exhaust from pneumatic systems

1 Scope

This International Standard specifies various means of minimizing the environmental effects of fan exhaust from pneumatic systems for vacuum-style sowing agricultural field equipment used for sowing coated seeds.

It is applicable to vacuum-style sowing systems where “dust off” (fugitive) material from seed coatings can mix with fan (blower) intake air and be exhausted into the atmosphere.

This International Standard is not applicable to

- conveyance systems between a central tank and remote meters where the air is exhausted at the remote meters, and
- conveyance systems where the meter is at a central tank and the air is exhausted at a ground engaging opening device.

The design principles in this International Standard are not applicable to pneumatic equipment for sowing which was manufactured before the date of its publication.

NOTE National or local requirements can apply which could be more stringent.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

direct drift

quantity of plant protection product that is carried out of and deposited within specified distance of the sowed area by the action of air currents during the sowing process

2.2

fan exhaust zone

cylindrical shape (static) that defines the boundaries of the fan exhaust of a pneumatic system

2.3

vacuum-style sowing system

pneumatic system where negative air pressure is used to meter seeds on equipment for sowing

2.4

zero position

distance from the sowing area that is half of the row width from the last row

Note 1 to entry: See [Figure 2](#).

3 Requirements

3.1 General

A means of minimizing the effects of fan exhaust from pneumatic systems shall be employed using either of the methods found in [3.2](#) and [3.3](#).

The application of design principles is an acceptable means to minimize the effects of fan exhaust. Alternatively, testing methods can be used to verify conformance.

3.2 Principles of design method

3.2.1 Fan exhaust outlet

3.2.1.1 The height of the fan exhaust outlet above the ground plane shall be $\leq 0,5$ m with the machine in the sowing mode.

3.2.1.2 The height of the fan exhaust outlet above the ground plane when changing direction in the turning (headland) mode shall be $\leq 1,5$ m.

3.2.2 Fan exhaust system verification

3.2.2.1 The equipment for sowing shall be set up per the manufacturer's recommendations for the shape, size, and sowing rate of 60 000 seeds/ha to 80 000 seeds/ha of the field (dent) maize seed being used.

3.2.2.2 The seed metering device shall be loaded with field (dent) maize seeds (2 500 seeds/kg – 4 000 seeds/kg) as test material.

3.2.2.3 The maximum air velocity of the exhaust stream shall not exceed 2 m/s external to a 2 m radius cylinder centring on the fan outlet and extending from a height of 0,25 m above the ground plane to a cylinder height as defined by [3.2.2.5](#) and [3.2.2.6](#). The air velocity at the cylinder sides from the ground plane to 0,25 m height shall not exceed 4 m/s. For verification, eight (8) equally spaced measurements in the cylinder height range shall be made (see [Figure 1](#)).

3.2.2.4 When 2 m radius cylinders from separate exhaust outlets intended to operate simultaneously overlap, those overlapping cylinders shall be connected into a single ovoid shape with 2 m radius ends. Air speed measurements shall be taken with both exhaust outlets in operation. Air speed external to the ovoid shall not exceed limits specified for a single exhaust outlet.

3.2.2.5 The equipment for sowing shall be stationary and the ground plane shall be smooth, level, and unobstructed. The maximum ambient wind speed shall be $\leq 0,5$ m/s.

3.2.2.6 The height of the air velocity measurement cylinder above the ground plane shall be $\leq 0,5$ m with the machine in the sowing mode.

3.2.2.7 The height of the air velocity measurement cylinder above the ground plane when changing direction in the turning (headland) mode shall be $\leq 1,5$ m.

3.2.2.8 The air velocity measurement device shall be an anemometer with a measurement head diameter of 45 mm to 90 mm, a minimum measurement range of 0,5 m/s to 20 m/s and an accuracy of $\pm 2\%$. The specific volume of the ambient air during testing shall be 0,819 m³/kg to 0,894 m³/kg.