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**Agricultural and forestry machinery —  
Knapsack combustion-engine-driven  
mistblowers — Safety requirements**

*Matériel agricole et forestier — Nébulisateurs portés à dos à moteur à  
combustion interne — Exigences de sécurité*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 28139 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 144, *Tractors and machinery for agriculture and forestry*, in collaboration with Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 6, *Equipment for crop protection*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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## Introduction

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

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 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.

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# Agricultural and forestry machinery — Knapsack combustion-engine-driven mistblowers — Safety requirements

**IMPORTANT** — The electronic file of this document contains colours which are considered to be useful for the correct understanding of the document. Users should therefore consider printing this document using a colour printer.

## 1 Scope

This International Standard specifies safety requirements and their verification for the design and construction of knapsack mistblowers incorporating a combustion engine where the air flow is generated by a fan.

It describes methods for the elimination or reduction of hazards arising from their use. In addition, it specifies the type of information on safe working practices to be provided by the manufacturer. It does not, however, give any technical requirement for reducing noise or vibration hazards. Indeed, the different means available to reduce these hazards are a matter for the technical aids to which the manufacturer may resort, through specialized books or specified bodies.

This International Standard deals with all significant hazards, hazardous situations and events, excepting those arising from

- electromagnetic compatibility,
- static electricity,
- explosion or fire from chemicals for spraying,
- insufficient structural integrity, and
- noise and vibration.

It is applicable to knapsack combustion-engine-driven mistblowers when they are used as intended and under the conditions foreseen by the manufacturer (see Clause 4).

It is not applicable to knapsack combustion-engine-driven mistblowers manufactured before the date of its publication.

## 2 Normative references

The following referenced documents are indispensable for the application 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 3767-5:1992, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 5: Symbols for manual portable forestry machinery*

ISO 3864-1:2002, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*

ISO 8893:1997, *Forestry machinery — Portable brush-cutters and grass-trimmers — Engine performance and fuel consumption*

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

ISO 11684:1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety signs and hazard pictorials — General principles*

ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles*

ISO 13732-1:2006, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 19932-1:2006, *Equipment for crop protection — Knapsack sprayers — Part 1: Requirements and test methods*

## 3 Terms and definitions

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

**3.1 knapsack mistblower**  
machine with a backpack power unit designed for applying chemicals to crops by means of a hand-held spraying device with the liquid being contacted, nebulized and transported by a high-speed air flow generated by a fan

NOTE An example of this machine is given in Annex C.

**3.2 backpack power unit**  
power source which is designed to be carried on the operator's shoulders by means of a supporting device and harness

**3.3 harness**  
adjustable strap(s) used to suspend the machine from the operator