SLOVENSKI STANDARD
SIST EN ISO 28139:2021

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Nadomešča:
SIST EN ISO 28139:2010

Oprema za zaščito poljščin - Nahrbtna škropilnica na zračni tlak s pogonskim motorjem - Varnostne in okoljske zahteve in preskusne metode (ISO 28139:2019)

Equipment for crop protection - Knapsack combustion engine-driven airblast sprayers - Safety and environmental requirements and test methods (ISO 28139:2019)

Pflanzenschutzgeräte - Rückentragbare, verbrennungsmotorbetriebene Sprühgeräte - Sicherheits- und Umweltanforderungen und Prüfverfahren (ISO 28139:2019)

Matériel de protection des cultures - Pulvérisateurs pneumatiques à dos à moteur à combustion - Exigences de sécurité et environnementales et méthodes d'essai (ISO 28139:2019)

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EUROPÄISCHE NORM

EN ISO 28139

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ICS 65.060.40

Supersedes EN ISO 28139:2009

English Version

Equipment for crop protection - Knapsack combustion engine-driven airblast sprayers - Safety and environmental requirements and test methods (ISO 28139:2019)

Matériel de protection des cultures - Atomiseurs portés à dos motorisés - Exigences de sécurité et environnementales et méthodes d'essai (ISO 28139:2019)

Pflanzenschutzgeräte - Rückentragbare, verbrennungsmotorbetriebene Sprühgeräte - Sicherheits- und Umweltanforderungen und Prüfverfahren (ISO 28139:2019)

This European Standard was approved by CEN on 29 April 2021.

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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-1040 Brussels

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European foreword

This document (EN ISO 28139:2021) has been prepared by Technical Committee ISO/TC 23 "Tractors and machinery for agriculture and forestry" in collaboration with 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of an identical text or by endorsement, at the latest by November 2021, and conflicting national standards shall be withdrawn at the latest by May 2024.

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

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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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 28139:2019 has been approved by CEN as EN ISO 28139:2021 without any modification.

INTERNATIONAL STANDARD

ISO 28139

Second edition
2019-12

Equipment for crop protection — Knapsack combustion engine-driven airblast sprayers — Safety and environmental requirements and test methods

Matériel de protection des cultures — Atomiseurs portés à dos motorisés — Exigences de sécurité et environnementales et méthodes d'essai

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 6, *Equipment for crop protection*.

This second edition of ISO 28139 cancels and replaces ISO 28139:2009 and ISO 10988:2011, which have been technically revised. The main changes compared to the previous edition are as follows:

— addition of environmental requirements;

— addition of environmental tests;

— exclusion of ergonomics;

— general update to the state of the art.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The structure of safety standards in the field of machinery is as follows:

a) type-A standards (basic standards) giving basic concepts, principles for design, and general aspects that can be applied to machinery;

b) type-B standards (generic safety standards) dealing with one safety aspect or one type of safeguards that can be used across a wide range of machinery:

   — type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise),

   — type-B2 standards on safeguards (e.g. two-hand control devices, interlocking devices, pressure sensitive devices, guards);

c) type-C standards (machinery safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

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

Equipment for crop protection — Knapsack combustion engine-driven airblast sprayers — Safety and environmental requirements and test methods

1 Scope

This document specifies safety requirements and their verification, environmental requirements and related test methods, and minimum performance limits, for the design and construction of knapsack combustion engine-driven airblast sprayers as defined in 3.9.

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 addresses general operating parameters as well as the potential deposition of spray droplets under specified controlled conditions.

This document deals with all significant hazards, hazardous situations and events, excepting those arising from vibration transmitted to the back of the operator.

It is applicable to knapsack combustion engine-driven airblast sprayers when they are used as intended and under the conditions foreseeable by the manufacturer (see Table A.1).

It is not applicable to:

— hydraulic pressure sprayers;

— thermal sprayers;

— cold foggers;

— sprayers adapted for the application of dry material.

It is not applicable to knapsack combustion engine-driven airblast sprayers manufactured before the date of its publication. The requirements of this document applies to products manufactured 18 months after 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 3767-5, *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 machines*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 5681, *Equipment for crop protection — Vocabulary*

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

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

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

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

ISO 14982:1998, *Agricultural and forestry machinery — Electromagnetic compatibility — Test methods and acceptance criteria*

ISO 19732, *Equipment for crop protection — Sprayer filters — Colour coding for identification*

ISO 19932-1, *Equipment for crop protection — Knapsack sprayers — Part 1: Safety and environmental requirements*

ISO 19932-2:—, *Equipment for crop protection — Knapsack sprayers — Part 2: Test methods*

ISO 22867, *Forestry and gardening machinery — Vibration test code for portable hand-held machines with internal combustion engine — Vibration at the handles*

ISO 22868:2011, *Forestry and gardening machinery — Noise test code for portable hand-held machines with internal combustion engine — Engineering method (Grade 2 accuracy)*

IEC 61032:1997, *Protection of persons and equipment by enclosures — Probes for verification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100, ISO 5681, ISO 19932-1 and the following apply.

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

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

— IEC Electropedia: available at http://www.electropedia.org/

3.1
harness
adjustable strap(s) used to suspend the machine from the operator

3.2
engine stopping device
control fitted to the machine which stops the engine

3.3
throttle trigger
throttle control
device, usually a lever, activated by the operator's hand or finger, for controlling the engine speed

3.4
throttle lock
device for temporarily setting the throttle in a partially open position

3.5
throttle trigger lockout
device that prevents unintentional activation of the *throttle trigger* (3.3)

3.6
air tube
tube for the air flow between the fan and the nozzle

3.7
normal operation
use of the machine that is reasonably foreseeable and which is consistent with such activities as distribution of chemicals, starting, stopping, fuelling, filling with chemicals and emptying

3.8
throttle limiting device
manually activated device allowing different maximum positions of the throttle provided to facilitate operation of the engine over a long working period

3.9
knapsack airblast sprayer
self-contained appliance carried on the operator's back by means of shoulder straps in which spray is produced by the action a high velocity air stream on the spray mixture

4 Safety requirements and/or protective measures

4.1 General

The 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 ISO 12100 for relevant but not significant hazards which are not dealt with by this document. (See Annex A for a list of significant hazards and hazardous situations and Annex D for a functional representation of the machine.)

Wearing parts (such as nozzles, filters, anti-drip valves, valves, diaphragms) specified in the instruction handbook shall be changeable without special tools, unless provided with the sprayer, by an operator wearing appropriate PPE (at least protective gloves) and without contamination of the operator and the environment.

Compliance shall be checked by inspection and function test.

4.2 Stability when in operation

The centre of gravity of the upright sprayer shall not be located at a horizontal distance greater than 150 mm from the back support of the harness with fuel and spray tanks filled to their nominal volume and with the equipment ready for use.

Compliance shall be checked by measurement as described in ISO 19932-2:—, 5.3.4.

4.3 Exhaust system

The engine exhaust outlet shall be located so as to direct exhaust emissions away from the operator in the normal operating position.

Compliance shall be checked by inspection and functional testing.

4.4 Air tube and chemical hoses

The air tube shall be fitted with a handle on which a throttle trigger complying with 4.5.3 and an engine stopping device complying with 4.5.4 are mounted.

To adjust the flow of chemicals to the nozzle, an on-off valve shall be fitted such that it can be easily reached by the operator in the working position.

The minimum length of the air tube from the middle of the hand grip to the extremity of the air tube shall be 500 mm as shown in Figure 1.