SLOVENSKI STANDARD
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Oprema za zaščito poljščin - Nahrbtni škropilniki - 1. del: Varnostnotehnične in okoljevarstvene zahteve (ISO/DIS 19932-1:2022)

Equipment for crop protection - Knapsack sprayers - Part 1: Safety and environmental requirements (ISO/DIS 19932-1:2022)

Pflanzenschutzgeräte - Tragbare Geräte - Teil 1: Sicherheitstechnische und umweltrelevante Anforderungen (ISO/DIS 19932-1:2022)

Matériel de protection des cultures - Pulvérisateurs à dos - Partie 1: Exigences environnementales et de sécurité (ISO/DIS 19932-1:2022)

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Equipment for crop protection — Knapsack sprayers —

Part 1:
Safety and environmental requirements

Matériel de protection des cultures — Pulvérisateurs à dos —

Partie 1: Exigences environnementales et 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.

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 of 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 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 third edition cancels and replaces the second edition (ISO 19932-1:2013), which has been technically revised. The main changes compared to the previous edition are as follows:

— the scope has been changed to include sprayers with a nominal volume of more than 6 l in order to address sprayers in professional use only;

— cancellation and modification of requirements.

A list of all parts in the ISO 19932 series can be found on the ISO website.

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 application of plant protection products with knapsack sprayers should take into consideration biological, economic, environmental and operator issues.

The aim of this document is to specify safety and environmental requirements for equipment.

Implementation of this document should achieve an appropriate level of operator safety and avoid unnecessary dispersal of plant protection products into the environment.

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 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.

Equipment for crop protection — Knapsack sprayers —

Part 1: Safety and environmental requirements

1 Scope

This document specifies the safety and environmental requirements and their means of verification for the design and construction of knapsack sprayers carried on the back or shoulder of the operator for use with plant protection products. In addition, it specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

It is applicable to lever-operated knapsack sprayers, knapsack compression sprayers and knapsack sprayers driven by an engine or electric motor using hydraulic pressure atomisation of the spray liquid intended to be used primarily in agriculture, forestry and horticulture with a nominal volume of more than 6,0 l.

This document is not applicable to knapsack sprayers which are manufactured before the date of publication of this document.

It does not apply to knapsack combustion engine-driven air-blast sprayers according to ISO 28139:2019.

This document deals with all significant hazards, hazardous situations and hazardous events relevant to knapsack sprayers when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Annex A), excepting the hazards arising from:

— static electricity;

— explosion or fire from chemicals for spraying; and

— insufficient structural integrity.

This document does not cover electromagnetic compatibility (EMC) requirements.

To give presumption of conformity with the Essential Requirements of EU Directive 2006/42/EC, this document shall only be applied in conjunction with ISO 19932-2:2020.

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.

ISO 3767-5:2016, *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 3864-1:2012, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

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

ISO 5682-2:2017, *Equipment for crop protection — Spraying equipment — Part 2: Test methods to assess the horizontal transverse distribution for hydraulic sprayers*

ISO 6385:2016, *Ergonomics principles in the design of work systems*

ISO 8169:1984, *Equipment for crop protection — Sprayers — Connecting dimensions for nozzles and manometers*

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

ISO 10626:1991, *Equipment for crop protection — Sprayers — Connecting dimensions for nozzles with bayonet fixing*

ISO 11684:1995, *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 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 19732:2007, *Equipment for crop protection — Sprayer filters — Colour coding for identification*

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

ISO 22867:2021, *Forestry and gardening machinery — Vibration test code for portable hand-held machines with internal combustion engine — Vibration at the handles*

ISO 22868:2021, *Forestry and gardening machinery — Noise test code for portable hand-held machines with internal combustion engine — Engineering method (Grade 2 accuracy)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5681:2020 and ISO 12100:2010 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 https://www.electropedia.org/

3.1
knapsack sprayer
self-contained sprayer carried on the operator's back or shoulder by means of straps or a strap

3.2
nominal volume
tank volume at the maximum filling level specified by the manufacturer

Note 1 to entry: The maximum filling level can be marked by the upper value of the contents gauge scale or at a lower level by a dedicated mark.

3.3
maximum working pressure
maximum pressure allowed at any part of the sprayer

4 General requirements

4.1 General

4.1.1 The sprayer shall comply with the safety and environmental requirements and/or protective measures of this clause, as well as the additional requirements for particular types of knapsack sprayer specified in Clauses 5, 6, and 7.

In addition, the sprayer shall be designed according to the principles of ISO 6385:2016 and ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

All spray functions including spraying, filling, emptying and cleaning (including cleaning nozzles and filters) shall be possible for an operator wearing appropriate protective gloves.

Compliance shall be checked by inspection and function test.

4.1.2 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 value and with the equipment ready for use.

Compliance shall be tested according to ISO 19932-2: XXXX, 5.6.

4.1.3 The sprayer shall have an adjustable spray liquid output which does not deviate by more than ±15 % of the values specified in the instruction handbook for each setting.

Compliance shall be tested according to ISO 19932-2: XXXX, 5.3.2.

4.1.4 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 protective gloves and without contamination of the operator and the environment.

Compliance shall be checked by inspection and function test.

4.1.5 The sprayer shall be equipped with a means for lifting and carrying the filled sprayer (e.g. a handle) in an upright position.

Compliance shall be checked by inspection and function test.

4.1.6 In order to guarantee the stability of the sprayer during filling operations, the sprayer shall remain stable on an incline of 8,5° (±0,2°) in any direction, irrespective of the amount of liquid in the spray tank.

Compliance shall be tested according to ISO 19932-2: XXXX, 5.3.4.

4.1.7 The sprayer shall be designed so that the loss of liquid during stoppage of spraying is minimized. The volume emitted within 5 s after spray shut-off shall not be more than 5 ml.

Compliance shall be checked by measurement.

4.1.8 For sprayers with a nominal volume of up to 17 l, the residual volume of liquid shall not exceed 250 ml. For those that exceed 17 l, this volume shall not exceed 1,5 % of the nominal spray-tank volume.

Compliance shall be tested according to ISO 19932-2: XXXX, 6.3 for lever-operated sprayers, according to ISO 19932-2: XXXX, 7.2 for engine- or motor-driven sprayers or according to ISO 19932-2: XXXX, 8.1.2 for compression sprayers.