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Equipment for crop protection - Knapsack sprayers - Part 1: Safety and environmental requirements (ISO 19932-1:2025)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/26

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EN ISO 19932-1

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Supersedes EN ISO 19932-1:2013

English Version

**Equipment for crop protection - Knapsack sprayers - Part
1: Safety and environmental requirements (ISO 19932-
1:2025)**

Matériel de protection des cultures - Pulvérisateurs à
dos - Partie 1: Exigences environnementales et de
sécurité (ISO 19932-1:2025)

Pflanzenschutzgeräte - Tragbare Geräte - Teil 1:
Sicherheitstechnische und umweltrelevante
Anforderungen (ISO 19932-1:2025)

This European Standard was approved by CEN on 29 June 2025.

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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

EN ISO 19932-1:2025 (E)

Contents	Page
European foreword.....	3
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC amended by Directive 2009/127/EC aimed to be covered	4

European foreword

This document (EN ISO 19932-1:2025) 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of an identical text or by endorsement, at the latest by February 2026, and conflicting national standards shall be withdrawn at the latest by February 2026.

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.

This document supersedes EN ISO 19932-1:2013.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 19932-1:2025 has been approved by CEN as EN ISO 19932-1:2025 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC amended by Directive 2009/127/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request "M/396 Mandate to CEN and CENELEC for Standardisation in the field of machinery" and "M/471 Mandate to CEN for standardisation in the field of machinery for pesticide application" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 2009/127/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in [Table ZA.1](#) confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

**Table ZA.1 — Correspondence between this European Standard and Annex I of Directive
2006/42/EC amended by Directive 2009/127/EC**

The relevant Essential Requirements of Directive 2006/42/EC amended by Directive 2009/127/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1. ESSENTIAL HEALTH AND SAFETY REQUIREMENTS		
1.1.2. (a)	4 , 5 , 6 , 7 , 8	
1.1.2. (c)	4 , 5 , 6 , 7 , 8	
1.1.2. (d)	4 , 8	
1.1.2. (e)	4 , 7 , 8	
1.1.3. Materials and products	8.1.1 .	
1.1.5. Design of machinery to facilitate its handling	4.1.5 .	
1.1.6. Ergonomics	4.1.1 , 4.1.2 , 4.1.4 , 4.1.12, 4.2.1 , 4.2.3 , 4.2.4 , 4.4.1 , 4.4.2 , 4.5.1 , 6.2.5 , 6.10 , 6.11 , 7.2 .	
1.2. CONTROL SYSTEMS		
1.2.1. Safety and reliability of control systems	4.5.1 , 4.5.3 , 4.5.4, 4.5.5, 4.5.6.	
1.2.2. Control devices	4.4 , 6.3 .	
1.2.3. Starting	4.4.2 .	

The relevant Essential Requirements of Directive 2006/42/EC amended by Directive 2009/127/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.2.4. Stopping	4.4.2 , 6.3	
1.2.4.1. Normal stop	4.4.2 , 6.3	
1.2.4.2. Operational stop	4.4.2 , 6.3	
1.2.4.3. Emergency stop		Not covered
1.2.4.4. Assembly of machinery	8.1.1 .	
1.2.5. Selection of control or operating modes		Not covered
1.2.6. Failure of the power supply		Not covered
1.3. PROTECTION AGAINST MECHANICAL HAZARDS		
1.3.1. Risk of loss of stability	4.1.6 .	
1.3.2. Risk of break-up during operation		Not covered
1.3.3. Risks due to falling or ejected objects	4.2.5 , 5.1.1 , 7.1.1 .	
1.3.4. Risks due to surfaces, edges or angles	4.1.11	
1.3.7. Risks related to moving parts	6.4 .	
1.4. REQUIRED CHARACTERISTICS OF GUARDS AND PROTECTIVE DEVICES		
1.4.1. General requirements	6.3 , 6.4 .	
1.4.2.1. Fixed guards	6.4 .	
1.4.2.2. Interlocking movable guards		Not covered
1.4.2.3. Adjustable guards restricting access		Not covered
1.4.3. Special requirements for protective devices		Not covered
1.5. RISKS DUE TO OTHER HAZARDS		
1.5.1. Electricity supply	6.8 , 6.11	
1.5.3. Energy supply other than electricity	6.5	
1.5.5. Extreme temperatures	6.6 .	

EN ISO 19932-1:2025 (E)

The relevant Essential Requirements of Directive 2006/42/EC amended by Directive 2009/127/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.5.6. Fire	6.5	
1.5.8. Noise	6.9	
1.5.9. Vibrations	6.10	
1.5.13. Emissions of hazardous materials and substances	4.1.6 , 4.1.7 , 4.1.9 , 4.1.10 , 4.7 , 5.1.2 , 6.1.1 , 6.3 , 6.5.3 , 7.1.2 , 7.3.3 .	
1.6. MAINTENANCE		
1.6.1. Machinery maintenance	8.1.1 .	
1.6.3. Isolation of energy sources	6.8.2.1 , 6.11	
1.6.4. Operator intervention	4.4.2 , 6.8.2.1	
1.6.5. Cleaning of internal parts	4.6.2 .	
1.7. INFORMATION		
1.7.1. Information and warnings on the machinery	8.1 , 8.2 , 8.3 .	
1.7.1.1. Information and information devices	8.1 , 8.2 , 8.3 .	
1.7.1.2. Warning devices	8.3 .	
1.7.2. Warning of residual risks	8.3	
1.7.3. Marking of machinery	8.2	
1.7.4. Instructions	8.1	
1.7.4.1. General principles for the drafting of instructions	8.1 .	
1.7.4.2. Contents of the instructions	8.1 .	
2.4. MACHINERY FOR PESTICIDE APPLICATION	4.1 , 4.2 , 4.3 , 4.4 , 4.5 , 4.6 , 4.7 , 5.1 , 5.2 , 6.1 , 6.2 , 6.3 , 6.4 , 6.5 , 6.6 , 6.7 , 6.8 , 6.9 , 6.10 , 6.11 , 7.1 , 7.2 , 7.3 .	
2.4.2. General	4.1 , 5.1 , 6.1 , 7.1 .	
2.4.3. Controls and monitoring	4.3.2 , 4.4 , 6.3 .	
2.4.4. Filling and emptying	4.1.9 , 4.3.1 , 4.3.2 , 4.3.4 , 4.3.5 , 4.3.6 , 5.2.2 , 5.2.3 , 5.2.4 , 5.2.5 , 6.2.2 , 6.2.3 , 6.2.4 , 6.2.5 , 6.2.6 , 7.3 .	
2.4.5. Applications of pesticides	4 , 5 , 6 , 8	
2.4.5.1. Application rate	4.1.3 , 4.4.4 , 5.2.1 , 6.2.1 , 8.1.1 .	
2.4.5.2. Distribution, deposition and drift of pesticide	4.7.1 , 4.7.3 , 4.7.4 , 5.2 , 8.1.1 .	

The relevant Essential Requirements of Directive 2006/42/EC amended by Directive 2009/127/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
2.4.5.3. Tests		Not covered
2.4.5.4. Losses during stoppage	4.1.7	
2.4.6. Maintenance	8.1.1	
2.4.6.1. Cleaning	8.1.1	
2.4.6.2. Servicing	8.1.1	
2.4.7. Inspections	8.1.1	
2.4.8. Marking of nozzles, strainers and filters	4.6.1 , 4.7.4 .	
2.4.10. Instructions	8.1 .	

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 Other Union legislation may be applicable to the product(s) falling within the scope of this standard.



International Standard

ISO 19932-1

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*

**Third edition
2025-06**

ISO 19932-1:2025(en)



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ISO 19932-1:2025(en)**Contents**

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 General requirements	3
4.1 General	3
4.2 Harness	4
4.3 Spray tank	5
4.4 Controls	5
4.5 Hoses	6
4.6 Filters	6
4.7 Spray lance and nozzles	6
5 Specific requirements for lever-operated knapsack sprayers	7
5.1 General	7
5.2 Spray tank	7
6 Specific requirements for engine- or motor-driven knapsack sprayers	8
6.1 General	8
6.2 Spray tank	8
6.3 Controls	9
6.3.1 Motor/engine shut-off control	9
6.3.2 Pressure control	9
6.4 Power-driven components	9
6.5 Fuel tank for engine-driven knapsack sprayers	9
6.6 Hot parts for engine-driven knapsack sprayers	9
6.7 Exhaust system for engine-driven knapsack sprayers	10
6.8 Electrical requirements for engine-driven knapsack sprayers	10
6.8.1 General	10
6.8.2 Ignition circuit	10
6.9 Noise	11
6.9.1 General	11
6.9.2 Test method for engine-driven knapsack sprayers	11
6.10 Vibration	11
6.10.1 Reduction by design at source and by protective measures	11
6.10.2 Vibration measurement	11
6.11 Battery safety	11
7 Specific requirements for compression sprayers	11
7.1 General	11
7.2 Harness	12
7.3 Spray tank	12
8 Information for use	12
8.1 Instruction handbook	12
8.1.1 General	12
8.1.2 Technical data	15
8.2 Marking	15
8.3 Warnings	16
Annex A (informative) List of significant hazards associated with knapsack sprayers	17
Bibliography	21

ISO 19932-1:2025(en)**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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

This third edition cancels and replaces the second edition (ISO 19932-1:2013), which has been technically revised.

The main changes 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.

ISO 19932-1:2025(en)**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 ISO 19932-1:2025 and ISO 19932-2:2025 will 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 12100:2010.

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. It also specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

This document 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+A1:2024.

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.

Noise is not considered to be a relevant hazard for:

- lever operated knapsack sprayers;
- electric motor driven knapsack sprayers.

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

This document is intended to be applied in conjunction with ISO 19932-2:2025.

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 3767-5:2016, *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 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 19932-1:2025(en)

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

ISO 11684:2023, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety labels — General principles*

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

ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

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

ISO 19932-2:2025, *Equipment for crop protection — Knapsack sprayers — Part 2: Test methods*

ISO 20599:2024, *Manually portable (hand-held) powered lawn and garden equipment and forest machinery — Engine performance and fuel consumption*

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)*

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

IEC 62133-1:2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications — Part 1: Nickel systems*

IEC 62133-2:2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications — Part 2: Lithium systems*

IEC/EN 62841-1:2014, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery — Safety — Part 1: General requirements*

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