

BS EN ISO 19932-2:2013



BSI Standards Publication

Equipment for crop protection — Knapsack sprayers

Part 2: Test methods (ISO 19932-2:2013)

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National foreword

This British Standard is the UK implementation of EN ISO 19932-2:2013. Together with BS EN ISO 19932-1:2013, it supersedes BS ISO 19932-1:2006 and BS ISO 19932-2:2006 which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee AGE/15, Equipment for crop protection and application of liquid fertilizer.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

Equipment for crop protection - Knapsack sprayers - Part 2: Test methods (ISO 19932-2:2013)

Matériel de protection des cultures - Pulvérisateurs à dos -
Partie 2: Méthodes d'essai (ISO 19932-2:2013)

Pflanzenschutzgeräte - Tragbare Geräte - Teil 2:
Prüfverfahren (ISO 19932-2:2013)

This European Standard was approved by CEN on 8 May 2013.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 19932-2:2013) 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of an identical text or by endorsement, at the latest by December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.

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

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive.

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

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 19932-2:2013 has been approved by CEN as EN ISO 19932-2:2013 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC on machinery and Directive 2009/127/EC amending Directive 2006/42/EC with regard to machinery for pesticide application

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery and Directive 2009/127/EC amending Directive 2006/42/EC with regard to machinery for pesticide application.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of Directives 2006/42/EC and 2009/127/EC and associated EFTA regulations.

NOTE The main function of ISO 19932-2 is to provide test procedures for the verification of the requirements of ISO 19932-1. Compliance with ISO 19932-1 and ISO 19932-2 is necessary to achieve presumption of conformity with the Essential Requirements of Directive 2006/42/EC and Directive 2009/127/EC and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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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. www.iso.org/directives

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

The committee responsible for this document is ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 6, *Equipment for crop protection*.

This second edition of ISO 19932-2, together with ISO 19932-1, cancels and replaces ISO 19932-1:2006 and ISO 19932-2:2006, which have been technically revised.

ISO 19932 consists of the following parts, under the general title *Equipment for crop protection — Knapsack sprayers*:

- *Part 1: Safety and environmental requirements*
- *Part 2: Test methods*

Introduction

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

The aim of this part of ISO 19932 is to specify test methods for the verification of requirements for equipment to ensure safe use and protect the environment.

Implementation of parts 1 and 2 of ISO 19932 should achieve an appropriate level of operator safety and avoid unnecessary dispersal of plant protection products into the environment.

Equipment for crop protection — Knapsack sprayers —

Part 2: Test methods

1 Scope

This part of ISO 19932 specifies test methods for the verification of requirements of ISO 19932-1 for knapsack sprayers carried on the back or shoulder of the operator for use with plant protection products.

It is applicable to lever-operated knapsack sprayers, knapsack compression sprayers and knapsack sprayers driven by an engine or electric motor using hydraulic pressure atomization of the spray liquid, with a nominal volume of more than 3 l for their intended use primarily in agriculture and horticulture.

It does not apply to knapsack mistblowers covered by ISO 28139.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5681:1992, *Equipment for crop protection — Vocabulary*

ISO 19932-1:2013, *Equipment for crop protection — Knapsack sprayers — Part 1: Safety and environmental requirements*

3 Terms and definitions

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

4 Test liquids and equipment

4.1 Water, clean and free from solids.

4.2 Preconditioning device, allowing holding of the sprayer and the operation of the lever-operated knapsack sprayer pump lever continuously. The stroke and frequency shall be adjustable. An example is given in [Annex A](#).

4.3 Shut-off device test equipment, consisting of a frame to fix the hand-held part of the shut-off device and a unit for moving the shut-off device control, e.g. valve lever, to open it periodically with an induced flow at the prescribed rate and pressure. The stroke shall be adjustable. An example is given in [Annex B](#).

4.4 Strap test device, capable of dropping the sprayer, vertically guided, onto each strap from a height of 200 mm using a horizontal restraining bar that is 75 mm in diameter. The device is to be capable of testing sprayers with one or two upper and/or lower fixing points. An example is given in [Annex C](#). Other devices with equivalent performance can be used.

WARNING — This test device presents an element of risk when the test is underway. All personnel shall either be kept out of the test area or otherwise protected from hazards such as parts displaced from the sprayer on test.

4.5 Drop test device, to drop the upright sprayer, vertically guided, from a height of (600 ± 20) mm onto a flat level surface, 800 mm x 800 mm x 50 mm in height, made of high density polythene (HDPE) or hard wood placed on a flat level floor. The device shall not affect the impact force of the dropped sprayer. An example is given in [Annex D](#). Other devices with equivalent performance can be used.

4.6 Filling device, by which the volume and flow of water or test liquid can be controlled and adjusted. An example is given in [Annex E](#). Other devices with equivalent performance can be used.

4.7 Weighing devices, with the ability to weigh up to:

- a) 25 kg with a maximum error of ± 1 g;
- b) 2 kg with a maximum error of $\pm 0,1$ g.

4.8 Measuring cylinder, for measuring volumes of up to 1 l with a maximum error of ± 10 ml.

4.9 Timer (stop watch), with a maximum error of $\pm 0,5$ s for measuring periods up to 5 min.

4.10 Pressure supply device, to place the sprayer under pressure using air or water. The pressure shall be adjustable up to 10 bar with a maximum error of ± 5 % of the measured value.

4.11 Pressure gauges, to measure between 0 bar and 25 bar with a maximum error of $\pm 0,15$ bar (equivalent to a class 0,6 pressure gauge according to EN 837-1).

4.12 Polythene bags, the size of which shall be at least 30 cm x 40 cm.

4.13 Polythene sheets, the size of which shall be at least 2 m x 1 m.

5 General

5.1 Test conditions

The tests shall be performed with one new specimen of the sprayer type at an air temperature of 10 °C to 30 °C and relative air humidity of at least 30 %, with no influence of wind or sunlight.

5.2 Sprayer

Assemble the knapsack sprayer in accordance with the instruction handbook. Inspect for tightness of the filling cap, gland nut and other operator controlled couplings. Weigh the complete empty sprayer using a weighing device [4.7 a)] and record the mass in kilograms.

5.3 Functional tests

5.3.1 Shut-off device reliability

Detach the shut-off device assembly with the spray lance from the sprayer and mount it on a frame ([4.3](#)). Connect the shut-off device to a pressurized water supply of $(3 \pm 0,2)$ bar. Fully activate the shut-off device using a frequency of (15 ± 5) cycles/min for a total duration of 25 000 cycles. Inspect functionality and record any leakage occurring within 1 min ± 5 s after completion of the last cycle.

5.3.2 Spray liquid output

The spray liquid output rate q_m of the sprayer for each combination of nozzle/pressure regulator supplied for use with the sprayer shall be measured with a maximum error of ± 1 % at the optimum spray pressure specified in the instruction handbook or at the setting specified in the instruction handbook.