



**International
Standard**

ISO 16122-3

**Agricultural and forestry
machinery — Inspection of sprayers
in use —**

**Part 3:
Sprayers for bush and tree crops**

Matériel agricole et forestier — Contrôle des pulvérisateurs en service —

Partie 3: Pulvérisateurs pour cultures arbustives et arboricoles

[ISO 16122-3:2024](https://standards.iteh.ai/standards/iso/51c114a9-9f3c-4bd5-9101-4161d0326045/iso-16122-3-2024)

<https://standards.iteh.ai/catalog/standards/iso/51c114a9-9f3c-4bd5-9101-4161d0326045/iso-16122-3-2024>

**Second edition
2024-12**

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ISO 16122-3:2024](https://standards.itih.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024)

<https://standards.itih.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Requirements and method of verification	1
4.1 General.....	1
4.2 Leaks and dripping.....	2
4.2.1 Static leaks.....	2
4.2.2 Dynamic leaks.....	2
4.2.3 Spraying and dripping on parts.....	2
4.3 Pump(s).....	2
4.3.1 Capacity.....	2
4.3.2 Pulsations.....	3
4.3.3 Air chamber.....	3
4.4 Spray mix agitation.....	3
4.4.1 Hydraulic.....	3
4.4.2 Mechanical.....	3
4.5 Spray tank(s).....	3
4.5.1 Lid.....	3
4.5.2 Tank filling strainer.....	4
4.5.3 Pressure compensation.....	4
4.5.4 Tank content indicator(s).....	4
4.5.5 Tank emptying.....	4
4.5.6 Tank filling.....	4
4.5.7 Induction hopper.....	4
4.5.8 Cleaning device for plant protection product containers.....	4
4.5.9 Cleaning equipment.....	5
4.6 Measuring systems, controls and regulation systems.....	5
4.6.1 General.....	5
4.6.2 Pressure indicator for spray liquid.....	5
4.6.3 Other measuring devices.....	6
4.6.4 Pressure adjusting devices.....	6
4.6.5 Pressure drop.....	6
4.6.6 Spray boom section pressure equalizer.....	6
4.7 Lines (pipes and hoses).....	6
4.7.1 Lines.....	6
4.8 Filters.....	6
4.8.1 Filter presence.....	6
4.8.2 Isolating device.....	7
4.8.3 Filter insert changeability.....	7
4.9 Nozzles.....	7
4.9.1 Nozzle arrangement.....	7
4.9.2 Dripping.....	7
4.9.3 Switching off.....	7
4.9.4 Adjustment.....	7
4.10 Distribution of pressure and spray liquid flow.....	7
4.10.1 Distribution of spray liquid.....	7
4.11 Blower.....	8
4.11.1 Condition.....	8
4.11.2 Adjustability.....	8
4.12 Spray guns and lances (if present).....	9
4.12.1 Trigger.....	9
4.12.2 Adjustment of flow rate and angle.....	9

5	Test methods	9
5.1	Test facilities and equipment.....	9
	5.1.1 General.....	9
	5.1.2 Test facilities.....	9
5.2	Pumps.....	9
	5.2.1 Pump capacity test.....	9
	5.2.2 Pump pulsations.....	10
5.3	Sprayer's pressure indicators.....	10
	5.3.1 Specification of pressure indicators used for verification.....	10
	5.3.2 Verification method of the sprayer pressure indicator.....	10
5.4	Flow meters for controlling the volume/area rate.....	10
	5.4.1 General.....	10
	5.4.2 Operating procedure No. 1: Verification by nozzle flow rate measurement.....	11
	5.4.3 Operating Procedure No. 2: Verification by installing a calibrated flow meter in the circuit of the sprayer.....	11
5.5	System for controlling forward speed.....	12
5.6	Flow rate of the spray nozzles.....	12
	5.6.1 General.....	12
	5.6.2 Measurement with nozzles fitted on the sprayer.....	13
	5.6.3 Measurement with nozzles removed from the sprayer.....	13
	5.6.4 Measurement on spray gun / lance.....	13
5.7	Pressure drop.....	13
5.8	Pressure variation when the spray is switched off.....	13
5.9	Pressure distribution.....	13
Bibliography		15

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 16122-3:2024](https://standards.iteh.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024)

<https://standards.iteh.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024>

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.

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*, 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 second edition cancels and replaces the first edition (ISO 16122-3:2015), which has been technically revised.

<https://standards.iteh.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024>

The main changes are as follows:

- removed errors and resolve contradictions to the ISO 16119 series which specifies environmental requirements for new sprayers;
- updated the normative references;
- modified the terms and definitions;
- modified the testing capacity of the spraying pump;
- modified the tank filling strainer/Filling hole;
- modified the tank emptying (modified);
- modified the controls;
- modified the diameter analogue pressure indicators;
- modified the maximum error flow-meters for controlling the volume/hectare rate;
- modified dripping;
- modified spray guns and lances;
- modified the pump capacity test.

ISO 16122-3:2024(en)

A list of all parts in the ISO 16122 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.

iTeh Standards (<https://standards.itih.ai>) Document Preview

[ISO 16122-3:2024](https://standards.itih.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024)

<https://standards.itih.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024>

Introduction

There are two main reasons for the inspection of sprayers:

- reducing the potential risk of environmental contamination by plant protection products;
- good control of the pest with the minimum possible input of plant protection product.

In order to use plant protection products in agricultural production safely, it is necessary to define the requirements and test methods for sprayers in use. This is a relevant step after having standardized minimum requirements for new sprayers, in respect of safety hazards (see ISO 4254-6) and potential risks of environmental contamination (see ISO 16119 series).

Standardising the requirements and methods for inspection of sprayers in use takes into consideration not only the original performance of the sprayer but also its use, care and maintenance. This is a logical link to ensure the continued benefit arising from the supply of new sprayers of good quality.

The inspection of sprayers in use can be a mandatory requirement or adopted on a voluntary basis. In both cases further requirements, outside the scope of this document, are necessary for the management of inspections. These include, for example, requirements for the competence of persons carrying out inspections and the frequency of inspections.

The terms and definitions for specific sprayers in the relevant specific parts.

NOTE National or local regulations concerning the qualifications and competence of inspectors can apply.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 16122-3:2024](https://standards.iteh.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024)

<https://standards.iteh.ai/catalog/standards/iso/51c114a9-9f3c-4bdc-adb1-4161d0326045/iso-16122-3-2024>

Agricultural and forestry machinery — Inspection of sprayers in use —

Part 3: Sprayers for bush and tree crops

1 Scope

This document, when used together with ISO 16122-1:2024, specifies the requirements and test methods for the inspection of sprayers for bush and tree crops, when in use.

The requirements relate mainly to the condition of the sprayer with respect to its potential risk for the environment and its performance to achieve good application.

NOTE Requirements for the protection of inspectors during an inspection are given in ISO 16122-1:2024.

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 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 12809:2020, *Crop protection equipment — Reciprocating positive displacement pumps and centrifugal pumps — Test method*

ISO 16122-1:2024, *Agricultural and forestry machinery — Inspection of sprayers in use — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5681:2020 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/>

4 Requirements and method of verification

4.1 General

Before starting the inspection, the pre-inspection requirements of ISO 16122-1:2024, Clause 5 shall be met.

4.2 Leaks and dripping

4.2.1 Static leaks

The sprayer shall be filled with water to its nominal tank volume.

With the pump not running and the sprayer parked on a level horizontal surface, a visual inspection for any leakage from the tank, pump and associated pipes shall be carried out and there shall be no visible leakage from any part of the sprayer.

For tanks with a volume > 2 000 l, water filling may be reduced to half the nominal volume or to 2 000 l, whichever is the greater. For these cases, an additional visual inspection of the tank shall be carried out in order to identify any cracks, holes or other damage that can cause leakage.

Compliance shall be checked by inspection.

4.2.2 Dynamic leaks

4.2.2.1 Leak test when not spraying

With the sprayer running at a pressure which is equal to the maximum working pressure specified in the sprayer instruction manual, or if this is not known, max. 20 bar (10 bar for sprayers with pneumatic nozzles), with the section valves closed, there shall be no visible leakage from any part of the sprayer.

Compliance shall be checked by inspection.

4.2.2.2 Leak test while spraying

While spraying at a pressure that is equal to the maximum working pressure recommended in the sprayer instruction manual, or in the nozzle recommendations for the nozzles mounted on the sprayer if lower, there shall be no visible leakage from any part of the sprayer or spray boom.

Compliance shall be checked by inspection.

4.2.3 Spraying and dripping on parts

Regardless of the distance between the spray nozzles to the target to be sprayed, in the range between the nozzles and the target surface, no liquid shall be sprayed directly on to the sprayer itself (for example parts of the sprayer, hoses). This does not apply if needed by function (for example sensors) and if dripping is minimised.

Compliance shall be checked by inspection and function test.

4.3 Pump(s)

4.3.1 Capacity

The pump capacity shall be suited to the needs of the sprayer.

- a) The pump capacity shall be at least 90 % of its original nominal flow as specified by the sprayer instruction manual, or another minimum pump capacity as specified in the sprayer instruction manual, measured at free outlet of the pump (with the lowest possible pressure) and with a pressure of the pump of 8 bar to 10 bar.

Compliance shall be checked by measurement according to [5.2.1.1.3](#).

- b) Or, alternatively, in case method a) is not possible on sprayers not fitted with a test adapter, when the pump capacity is not specified in the instruction manual for the pump mounted on the sprayer, or for pumps for which the maximum working pressure is not known, for example for sprayers built before