



**SLOVENSKI STANDARD**  
**SIST ISO 5682-2:2018**

**01-februar-2018**

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**Oprema za zaščito posevkov - Oprema za škropljenje - 2. del: Preskusne metode za ocenjevanje vodoravnega prečnega pršenja hidravličnih škropilnikov (ISO 5682-2:2017)**

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

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Matériel de protection des cultures -- Equipement de pulvérisation -- Partie 2: Méthodes de test pour évaluer la distribution transversale horizontale des pulvérisateurs à jet projeté (ISO 5682-2:2017)

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**Ta slovenski standard je istoveten z: ISO 5682-2:2017**

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**ICS:**

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INTERNATIONAL  
STANDARD

ISO  
5682-2

Third edition  
2017-05

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**Equipment for crop protection —  
Spraying equipment —**

Part 2:

**Test methods to assess the horizontal  
transverse distribution for hydraulic  
sprayers**

iTeh STANDARD PREVIEW

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*Matériel de protection des cultures — Équipement de pulvérisation —  
Partie 2: Méthodes d'essai pour évaluer la distribution transversale  
horizontale des pulvérisateurs à jet projeté*

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Reference number  
ISO 5682-2:2017(E)

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ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

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## ISO 5682-2:2017(E)

## 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](http://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](http://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](http://www.iso.org/iso/foreword.html). (standards.iteh.ai)

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 5682-2:1997), which has been technically revised as follows:

- addition of a spray flow transverse volume distribution test method;
- addition of a spray pressure transverse distribution test method;
- clarification for nozzle positioning;
- addition of an annex;
- agitation method removed;
- suppression of fill from the tank filling device;
- suppression of capacity of the tank;
- suppression of head losses in the delivery piping;
- suppression of discharge from the pump.

A list of all the parts in the ISO 5682 series can be found on the ISO website.

# Equipment for crop protection — Spraying equipment —

## Part 2:

# Test methods to assess the horizontal transverse distribution for hydraulic sprayers

## 1 Scope

This document is applicable for sprayers intended to apply liquid over a horizontal surface.

This document specifies test methods to assess sprayed liquid horizontal transverse distribution. Methods are based on sprayed liquid volume measurement, nozzle flow rate measurement or nozzle tip pressure measurement.

This document does not cover aerial sprayers.

Hydraulic sprayers use a range of design features to deliver and control spray. The test methods provided in this document are all useful but don't give the same information. They are complementary. Some test methods are not suitable for all sprayer types. Applicable test methods are described in an informative annex.

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## 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, *Equipment for crop protection — Vocabulary*

ISO 5682-1:2017, *Equipment for crop protection — Spraying equipment — Part 1: Test methods for sprayer nozzles*

## 3 Terms and definitions

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

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

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Measuring equipment

Measuring equipment shall conform to ISO 5682-1:2017, Clause 4.

The horizontal patternator shall be in accordance with ISO 5682-1:2017, 4.2.

In the case of a horizontal patternator comprised of grooves spaced at intervals of 50 mm or 25 mm, summing of two or four adjacent grooves, respectively, to derive an equivalence to 100 mm grooves is acceptable.

## ISO 5682-2:2017(E)

Low flow rate measurements may not be possible directly with available flow meters. In this case, a volume collected over measured time may be used.

### 5 Test conditions

#### 5.1 General

The sprayer is to be operated per sprayer manufacturer's instructions. All operational conditions and test parameters shall be indicated in the test report. Clean water used for testing shall be free from solids in suspension.

If an adjuvant, plant protection product or other chemical is added, its identity, properties and concentration shall be documented in the test report.

#### 5.2 Temperature and relative humidity

The temperature of the test liquid and the air temperature of the test premises shall be between 5 °C and 35 °C during the test.

The temperature and the relative humidity of the test premises shall be stated in the test report. Relative humidity is recorded for information only.

#### 5.3 Choice of nozzles for the tests

The spray boom shall be equipped with nozzles, including nozzle filters and anti-drip devices, according to the relevant specifications provided by the sprayer manufacturer's instruction manual. The nozzle type that is used shall be documented by nozzle manufacturer, model and size.

Nozzle size may be chosen for very high flow if the purpose of the evaluation is to determine maximum variation of the sprayer transverse distribution.

Nozzle size may be chosen to provide lower flow, more representative of a common application practice.

#### 5.4 Control pressure

The control pressure is to be chosen according to the operating characteristic of the nozzle. During the test period, the pressure shall not deviate by more than 5 % from the intended pressure.

The control pressure shall be stated in the test report.

### 6 Test methods

#### 6.1 General

Sprayed liquid volume horizontal transverse distribution (6.3), nozzle volume transverse distribution (6.5), and nozzle tip pressure transverse distribution (6.6) are three methods that evaluate differently horizontal transverse liquid distribution.

When nozzle volume or nozzle tip pressure methods are used to evaluate horizontal transverse liquid distribution, nozzle tip position, nozzle orientation (verticality of the nozzle and twist of the nozzle from perpendicular) and nozzle tip spray pattern of all nozzles shall also be verified. It shall also be verified that no objects occur in the sprayed liquid stream.

For nozzle tip position requirements, see 6.4.

[Annex B](#) identifies tests or test methods typically applicable to different sprayer types.



## 6.2 Standard conditions

Test conditions shall conform to ISO 5682-1:2017, Clause 5.

Tests shall be carried out on a complete spray boom. Measurements may occur on only one section or with a few nozzles at a time; however, the whole boom shall be spraying during all of the measurements.

Tests shall be performed at pressure(s) chosen that are consistent with the ranges recommended by the nozzle tip manufacturer and the sprayer manufacturer.

## 6.3 Transverse distribution evaluation by means of sprayed liquid volume measurement – sprayed liquid volume measurement method

### 6.3.1 Setup

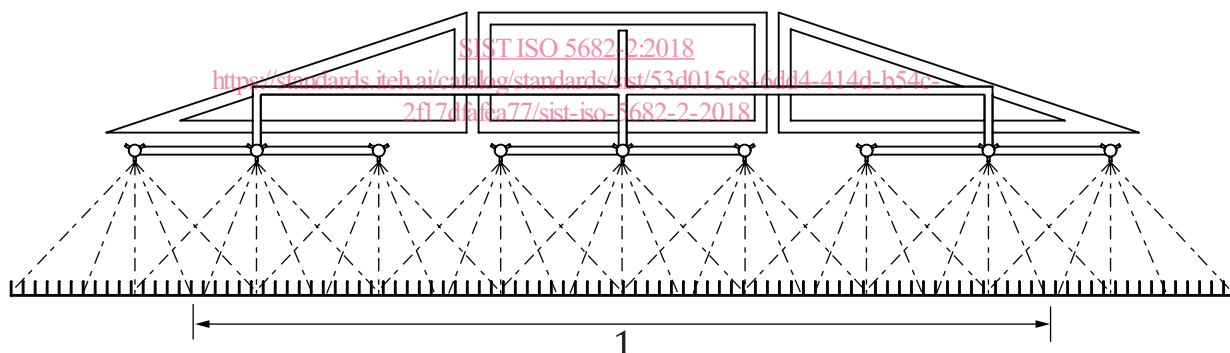
The method shall conform to ISO 5682-1:2017, 6.4.

The spray boom height shall be measured vertically between the top of the groove wall of the patternator and the orifice of the lowest nozzle.

Flat fan nozzle(s) shall be positioned for the test so that the widest dimension of the spray pattern is perpendicular to the grooves or in its normal working position as defined by the nozzle manufacturer.

A normal working position may for example have a spray angle offset of 5° to 15° from perpendicular to avoid spray pattern interference of adjacent nozzles.

**Figure 1** shows a spray boom with a horizontal patternator collecting the spray. This method measures volume or mass distribution, in a horizontal plane, transverse to the intended direction of travel.



#### Key

1 verification area

**Figure 1 — Horizontal patternator method**

### 6.3.2 Measurement

The liquid shall be measured by graduated volume, by weight or by other equivalent method. If weight is chosen, the collection container shall be weighed prior to collecting the samples and the difference used in calculating the net weights.

The liquid shall be collected from each nozzle on the boom for a chosen collection period while spraying with the complete boom.

The collection period shall be chosen to ensure 1,0 % maximum measurement error of the liquid. Factors such as collection device volume, graduations and operator capability should be taken into consideration. The collection period should be chosen to ensure overall accuracy based on these factors.