

# SVENSK STANDARD

## SS-EN ISO 16122-3:2015



Fastställt/Approved: 2015-03-22  
Publicerad/Published: 2015-03-31  
Utgåva/Edition: 1  
Språk/Language: engelska/English  
ICS: 14.210; 65.060.40; 65.060.25

---

### **Lantbruks- och skogsmaskiner – Kontroll av sprutor i drift – Del 3: Utrustning för besprutning av buskar och träd (ISO 16122-3:2015)**

### **Agricultural and forestry machinery – Inspection of sprayers in use – Part 3: Sprayers for bush and tree crops (ISO 16122-3:2015)**



# Standarder får världen att fungera

*SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.*

## Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

## Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

## Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

**Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på [www.sis.se](http://www.sis.se) eller ta kontakt med oss på tel 08-555 523 00.**



# Standards make the world go round

*SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.*

## Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

## Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

## Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

**If you want to know more about SIS, or how standards can streamline your organisation, please visit [www.sis.se](http://www.sis.se) or contact us on phone +46 (0)8-555 523 00**



Europastandarden EN ISO 16122-3:2015 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 16122-3:2015.

Denna standard ersätter SS-EN 13790-2, utgåva 1.

The European Standard EN ISO 16122-3:2015 has the status of a Swedish Standard. This document contains the official English version of EN ISO 16122-3:2015.

This standard supersedes the Swedish Standard SS-EN 13790-2, edition 1.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 16122-3:2015/  
Relations to other parts under the same general title - Extract from the Foreword of ISO 16122-3:2015**

ISO 16122 consists of the following parts, under the general title *Agricultural and forestry machinery — Inspection of sprayers in use*:

- Part 1: General
- Part 2: Horizontal boom sprayers
- Part 3: Sprayers for bush and tree crops
- Part 4: Fixed and semi-mobile sprayers

Other parts are planned (see Annex A).

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

*Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.*

*Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.*

Denna standard är framtagen av kommittén för Lantbrukssprutor, SIS/TK 224.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på [www.sis.se](http://www.sis.se) - där hittar du mer information.



EUROPEAN STANDARD

**EN ISO 16122-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2015

ICS 65.060.40

Supersedes EN 13790-2:2003

English Version

**Agricultural and forestry machinery - Inspection of sprayers in use - Part 3: Sprayers for bush and tree crops (ISO 16122-3:2015)**

Matériel agricole et forestier - Contrôle des pulvérisateurs en service - Partie 3: Pulvérisateurs pour cultures arbustives et arboricoles (ISO 16122-3:2015)

Land- und Forstmaschinen - Kontrolle von in Gebrauch befindlichen Pflanzenschutzgeräten - Teil 3: Geräte mit vertikalem Gestänge, Sprühgeräte und ähnliche Geräte (ISO 16122-3:2015)

This European Standard was approved by CEN on 13 September 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



# Contents

Page

<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Requirements and method of verification</b> .....	<b>2</b>
4.1 Leaks and dripping.....	2
4.1.1 Static leaks.....	2
4.1.2 Dynamic leaks.....	2
4.1.3 Spraying and dripping on parts.....	2
4.2 Pump(s).....	2
4.2.1 Capacity.....	2
4.2.2 Pulsations.....	3
4.2.3 Air chamber.....	3
4.3 Spray mix agitation.....	3
4.3.1 Hydraulic.....	3
4.3.2 Mechanical.....	3
4.4 Spray liquid tank(s).....	3
4.4.1 Lid.....	3
4.4.2 Filling hole(s).....	3
4.4.3 Induction hopper.....	4
4.4.4 Pressure compensation.....	4
4.4.5 Tank content indicator(s).....	4
4.4.6 Tank emptying.....	4
4.4.7 Tank filling.....	4
4.4.8 Cleaning device for plant protection product containers.....	4
4.4.9 Cleaning equipment.....	4
4.5 Measuring systems, controls and regulation systems.....	5
4.5.1 General.....	5
4.5.2 Pressure indicator.....	5
4.5.3 Other measuring devices.....	6
4.5.4 Pressure adjusting devices.....	6
4.6 Lines (pipes and hoses).....	6
4.7 Filters.....	6
4.7.1 Filter presence.....	6
4.7.2 Isolating device.....	6
4.7.3 Filter insert changeability.....	6
4.8 Nozzles.....	6
4.8.1 Symmetry.....	6
4.8.2 Dripping.....	7
4.8.3 Switching off.....	7
4.8.4 Adjustment.....	7
4.9 Pressure drop.....	7
4.9.1 General.....	7
4.9.2 Compensative returns.....	7
4.9.3 Distribution.....	7
4.10 Blower.....	8
4.10.1 Switching off.....	8
4.10.2 Adjustability.....	8
4.11 Spray guns and lances.....	9
4.11.1 Trigger.....	9
4.11.2 Adjustment of flow rate and angle.....	9

<b>5</b>	<b>Test methods</b>	<b>9</b>
5.1	Test facilities	9
5.2	Spray and agitation pump(s)	9
5.2.1	Pump capacity test	9
5.2.2	Pump pulsations	10
5.3	Sprayer's pressure indicators	10
5.3.1	Specifications of pressure indicators used for verification	10
5.3.2	Verification method of the sprayer pressure indicator	11
5.4	Flow meters for controlling the volume/hectare rate	11
5.4.1	General	11
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 on the circuit of the sprayer	12
5.5	System for controlling forward speed	12
5.6	Flow rate of the spray nozzles	13
5.6.1	General	13
5.6.2	Measurement with nozzles fitted on the sprayer	13
5.6.3	Measurement with nozzles removed from the sprayer	13
5.7	Pressure drop	14
5.8	Pressure variation when the spray is switched off	14
5.9	Pressure distribution	14
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2009/128/EC</b>		<b>9</b>
<b>Bibliography</b>		<b>1</b>



## Foreword

This document (EN ISO 16122-3:2015) 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 September 2015, and conflicting national standards shall be withdrawn at the latest by September 2015.

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 supersedes EN 13790-2:2003.

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(s).

For relationship with EU Directive(s), 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 16122-3:2015 has been approved by CEN as EN ISO 16122-3:2015 without any modification.

## Introduction

There are two main reasons for the inspection:

- less 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 standard, 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.

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

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

## Part 3: Sprayers for bush and tree crops

### 1 Scope

This part of ISO 16122, when used together with ISO 16122-1, specifies the requirements and test methods for the inspection of sprayers for bushes and trees, 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 a good application.

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

### 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 5682-2:1997, *Equipment for crop protection — Spraying equipment — Part 2: Test methods for hydraulic sprayers*

ISO 16122-1:2015, *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 16122-1 and the following apply.

#### 3.1

##### **sprayer for bush and tree crops**

machine for spraying plant protection products on bush and tree crops such as grapes, fruits or hops (including annual plants/crops), the application being mostly directed sideways and/or upwards to the target

Note 1 to entry: Characteristics of sprayers for bushes and tree crops are specified in ISO 16122-1:2015, Table A.1.

#### 3.2

##### **plant protection product container**

collective name for plant protection product packaging

EXAMPLE Can, bottle, bag, sack, box.

#### 3.3

##### **cleaning device**

device for cleaning the inside of empty plant protection product containers

Note 1 to entry: The device may be an integral part of the sprayer or an independent installation (e.g. stationary equipment).