



BSI Standards Publication

Crop protection equipment — Reciprocating positive displacement pumps and centrifugal pumps — Test method

National foreword

This British Standard is the UK implementation of ISO 12809:2020. It supersedes BS ISO 12809:2011, which is withdrawn.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.

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Date	Text affected
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**Crop protection equipment —
Reciprocating positive displacement
pumps and centrifugal pumps — Test
method**

*Matériel de protection des cultures — Pompes volumétriques
alternatives et pompes centrifuges — Méthodes d'essai*





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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 (see 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).

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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*.

This second edition cancels and replaces the first edition (ISO 12809:2011), which has been technically revised.

The main changes compared to the previous edition are as follows.

- The definitions for the following terms have been modified:
 - [3.1](#) reciprocating positive displacement pump;
 - [3.2](#) centrifugal pump;
 - [3.12](#) air vent line.
- In [Clause 4](#), text has been added to better specify the test on pump installed on the sprayer.
- In [Clause 5](#), more specification about the test liquid has been provided.
- In [7.2](#), [Figure 2](#) and related text have been added to better specify how to manage test with centrifugal pumps.
- The following subclauses have been improved:
 - [7.3](#)
 - [7.3.1](#)
 - [7.3.2](#)
 - [7.3.3](#)
 - [7.3.3.1](#)

- [7.3.3.2](#)
- [7.3.3.3](#)
- A new [Annex B](#) has been added.

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.

Crop protection equipment — Reciprocating positive displacement pumps and centrifugal pumps — Test method

1 Scope

This document specifies test methods and the environmental conditions for evaluating the performance of reciprocating positive displacement pumps and centrifugal pumps designed for crop protection equipment.

This document is applicable when defining the performance of stand-alone pumps or pumps that are installed on a sprayer.

Some of the tests indicated in this document are suited only for specific pump types.

It is not applicable to pesticide metering pumps for injection systems.

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5681 and the following 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 <http://www.electropedia.org/>

3.1

reciprocating positive displacement pump

machine in which liquid is trapped in confined volumes and transported from an inlet connection to an outlet connection by the reciprocating movement of pistons or plungers

3.2

centrifugal pump

non-volumetric pump in which the flow of the liquid is achieved by means of one or more impellers

3.3

suction pressure

pressure at the suction fitting of the pump

3.4

reference suction pressure

value of *suction pressure* (3.3) used for taking into account the pressure drop that is present when the pump is installed on the sprayer

3.5

delivery pressure

pressure at the *delivery fitting* (3.11) of the pump

3.6

rated pressure

maximum pressure at which the pump can be used continuously when installed on the sprayer, as declared by the pump manufacturer

3.7

rotating speed

number of revolutions of the pump shaft in the considered time interval

3.8

flow-rate

volume of liquid that flows through the pump per unit of time

3.9

power consumption

power given to the pump by the power source, measured at the inlet shaft of the pump

3.10

flow-rate adjustment valve

valve for adjusting the liquid flow

3.11

delivery fitting

body of pipelines collecting the liquid coming from the pump and routing it to the delivery pipeline

3.12

air vent line

small hose or tube connected to a *centrifugal pump* (3.2) to bleed off trapped air

Note 1 to entry: For air vent line connection is made from the highest point in the centrifugal pump casing and is routed continually upward to discharge above the highest liquid level in the tank.

4 Accuracy of measurements

Temperatures shall be measured with a maximum error of ± 1 °C.

Length shall be measured with a maximum error of ± 1 mm.

Suction pressure shall be measured with a maximum error of ± 2 kPa.

Delivery pressure shall be measured with a maximum error of ± 1 %.

Rotating speed shall be measured with a maximum error of ± 1 %.

Flow-rate for stand-alone pumps according to 7.2 shall be measured with a maximum error of $\pm 1,5$ %.

Flow-rate for pump installed on a sprayer as in 7.3 shall be measured with a maximum error of ± 2 % of the measured value when the flow-rate of the pump is >100 l/min, and ± 2 l/min when the flow-rate of the pump is ≤ 100 l/min.

Load torque shall be measured with a maximum error of ± 5 %, at least for values greater than the 25 % of the maximum torque.

The time measurements shall be made to an accuracy of ± 1 s, with the exception of measurement indicated in 7.2.7.2 and 7.2.8.2 for which the accuracy shall be of $\pm 0,05$ s.