

Agricultural irrigation equipment — Centre-pivot and moving lateral irrigation machines with sprayer or sprinkler nozzles — Determination of uniformity of water distribution (ISO 11545:2009)

ICS 65.060.35

National foreword

This British Standard is the UK implementation of EN ISO 11545:2009. It supersedes BS EN ISO 11545:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee AGE/30, Irrigation and drainage equipment.

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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Agricultural irrigation equipment - Centre-pivot and moving
lateral irrigation machines with sprayer or sprinkler nozzles -
Determination of uniformity of water distribution (ISO
11545:2009)

Matériel agricole d'irrigation - Pivots et rampes frontales
équipés de buses d'arrosage ou d'asperseurs -
Détermination de l'uniformité de la distribution d'eau (ISO
11545:2009)

Landwirtschaftliche Bewässerungsausrüstung - Kreis- und
Linearberegnungsmaschinen mit Düsen oder Regnern -
Bestimmung der Gleichförmigkeit der Wasserverteilung
(ISO 11545:2009)

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Foreword

This document (EN ISO 11545:2009) has been prepared by Technical Committee ISO/TC 23 "Tractors and machinery for agriculture and forestry" in collaboration with Technical Committee CEN/TC 334 "Irrigation techniques" the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

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 ISO 11545:2001.

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Endorsement notice

The text of ISO 11545:2009 has been approved by CEN as a EN ISO 11545:2009 without any modification.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 11545 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

This third edition cancels and replaces the second edition (ISO 11545:2001), which has been technically revised.

Agricultural irrigation equipment — Centre-pivot and moving lateral irrigation machines with sprayer or sprinkler nozzles — Determination of uniformity of water distribution

1 Scope

This International Standard specifies an in-field method for determining the uniformity of water distribution in the field from centre-pivot and moving lateral irrigation machines equipped with sprayer or sprinkler nozzles. The calculation of the coefficient of uniformity is also specified.

This International Standard is applicable to agricultural irrigation machines for which the water application device is more than 1,5 m above the soil surface and for which the water distribution from successive devices overlaps.

It is not applicable to the evaluation of centre-pivot irrigation machines equipped with various corner arm application devices.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

centre-pivot irrigation machine

automated irrigation machine consisting of a number of self-propelled towers supporting a pipeline rotating around a pivot point and through which water supplied at the pivot point flows radially outward for distribution by sprayers or sprinklers located along the pipeline

2.2

moving lateral irrigation machine

automated irrigation machine consisting of a number of self-propelled towers supporting a pipeline transverse to the direction of travel moving in such a way that the pipeline remains generally in a straight line, traversing the field in a straight path, and through which water supplied to the irrigation machine at any point along the pipeline is distributed over a basically rectangular area by sprayers or sprinklers located along the pipeline

2.3

sprinkler

water-distribution device of a variety of sizes and types

EXAMPLE Impact sprinkler, fixed nozzle sprinkler, irrigation gun.

2.4

irrigation sprayer

device that discharges water in the form of fine jets or in a fan shape without rotational movement of its parts

2.5

sprinkler package

collection of water-distribution devices fitted to the outlets of either centre-pivot or moving lateral irrigation machines, either with or without moving components, piping, pressure or flow-control devices and supporting plumbing designed for a specific irrigation machine and set of operating parameters

2.6

endgun

set of one or more sprayers or sprinklers installed on the distal end(s) of a centre-pivot or moving lateral irrigation machine to increase the irrigated area, and usually operating for only a portion of the time to conform to field boundaries

2.7

test pressure

pressure of a centre-pivot or moving lateral irrigation machine measured at the first available outlet downstream from the elbow or the tee at the top of the inlet to the pipeline

2.8

effective radius

radius of the circular-field area to be irrigated by a centre-pivot irrigation machine, measured as the distance from the pivot point to the terminal sprayer or sprinkler on the pipeline

2.9

effective length

dimension parallel to the pipeline of a moving lateral machine, measured as the distance between the two most distant end sprayers or sprinklers on the pipeline, except where a portion of the area under the pipeline is used for the water supply system and not for crop production, in which case that distance is excluded

2.10

wetted radius

r_w

distance measured from the centreline of a sprayer or sprinkler to the last collector with measurable water or estimated from the manufacturer's catalogue data as half of the diameter of coverage

2.11

applied depth

d_i

adjusted volume of water caught in each collector in an array of collectors plus the average amount of water that evaporates while the water is in the collector, divided by the area of the collector opening

2.12

collector

receptacle into which the water is deposited during a water distribution test

2.13

client

person(s) or organization for which a test is performed

2.14

tester

person(s) or organization that conduct(s) a test

3 Test conditions and equipment

3.1 Collectors

3.1.1 All collectors used for a test shall be identical and shaped such that water does not splash in or out. The lip of the collector shall be symmetric and without depressions. The height of each collector shall be at least twice the maximum depth of the water collected during the test, but not less than 150 mm. It shall have a circular opening with sharp edges free from deformities. The diameter shall be at least half the height, but shall not be less than 85 mm. To minimize measurement error, it is recommended that testers use collectors that are as large as practicable.