

Rotating sprinklers for irrigation equipment —

Part 1: Specification for design and operational requirements

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee AGE/30, Irrigation and drainage equipment, upon which the following bodies were represented:

- ADAS
- Agricultural Engineers' Association
- British Agricultural and Garden Machinery Association Ltd.
- British Turf and Landscape Irrigation Association
- Health and Safety Executive
- Silsoe College (Cranfield Institute of Technology)
- Silsoe Research Institute
- UK Irrigation Association
- Well Drillers' Association

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National foreword

This British Standard has been prepared by Technical Committee AGE/30. It is identical with ISO 7749-1:1995 *Agricultural irrigation equipment — Rotating sprinklers — Part 1: Design and operational requirements*, published by the International Organization for Standardization (ISO). It supersedes BS 7459-1:1991 which is withdrawn.

Part 1 specifies the design and operational requirements for rotating sprinklers and sprinkler nozzles for irrigation equipment and that method of test.

Part 2 specifies the conditions and methods used for testing the uniformity of distribution and test methods of rotating sprinklers.

Cross-references

Publication referred to	Corresponding British Standard
ISO 7-1:1994	BS 21:1985 ^a <i>Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions)</i> (Technically equivalent)
ISO 2859-1:1989	BS 6001 <i>Sampling procedures for inspection by attributes</i> Part 1:1991 <i>Specification for sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection</i> (Identical)
ISO 3951:1989	BS 6002 <i>Sampling procedures for inspection by variables</i> Part 1:1993 <i>Specification for single sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection</i> (Identical)
ISO 7749-2:1990	BS 7459 <i>Rotating sprinklers for irrigation equipment</i> Part 2:1991 <i>Methods of test for uniformity of distribution</i> (Identical)

^a Technically equivalent to ISO 7-1:1982.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This part of ISO 7749 specifies the design and operational requirements of rotating sprinklers and sprinkler nozzles for agricultural irrigation equipment and their test methods. It applies to sprinklers intended for assembly in pipeline networks for irrigation and operation at the pressures recommended by the manufacturer.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7749. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7749 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation.*

ISO 2859-1:1989, *Sampling procedures for inspection by attributes — Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection.*

ISO 3951:1989, *Sampling procedures and charts for inspection by variables for percent nonconforming.*

ISO 7749-2:1990, *Irrigation equipment — Rotating sprinklers — Part 2: Uniformity of distribution and test methods.*

3 Definitions

For the purposes of this part of ISO 7749, the following definitions apply.

3.1

rotating sprinkler

device which by its rotating motion around its vertical axis distributes water over a circular area or part of a circular area

3.2

nozzle

aperture or adjutage of the sprinkler through which the water is discharged

NOTE 1 A sprinkler may contain one or several cylindrical nozzles, or nozzles of other shapes. It may refer to either a single nozzle, or to a combination of nozzles in a multinozzled sprinkler.

3.3

equivalent nozzle diameter

theoretical nozzle outlet diameter, calculated on the basis of nozzle pressure and flowrate

NOTE 2 The calculation is described in Annex A.

3.4

minimum effective pressure, $p_{\min}$

lowest working pressure declared by the manufacturer, measured near the base of the sprinkler, at a point situated about 0,2 m below the main nozzle of the sprinkler, but with the pressure gauge situated in the same plane as the main nozzle (See Figure 1.)

3.5

maximum effective pressure $p_{\max}$

highest working pressure declared by the manufacturer, measured near the base of the sprinkler, at a point situated about 0,2 m below the main nozzle of the sprinkler, but with the pressure gauge situated in the same plane as the main nozzle (See Figure 1.)

3.6

range of effective pressure

pressure range between the minimum effective pressure, $p_{\min}$, and the maximum effective pressure, $p_{\max}$, declared by the manufacturer as the pressure range in which the sprinklers operate effectively (See Figure 2.)

3.7

test pressure

water pressure within the range of the effective pressure (3.6) used for testing the sprinkler

3.8

nominal flowrate

quantity of water per unit of time discharged by a sprinkler with a specific nozzle at ambient temperature at the test pressure declared by the manufacturer in the manufacturer's data sheets

3.9

radius of throw

farthest distance measured, while the sprinkler is rotating normally, from the sprinkler centreline to the point at which the sprinkler deposits water at the minimum rate of 0,25 mm/h for a sprinkler whose discharge exceeds 75 l/h, and 0,13 mm/h for a sprinkler whose discharge is equal to or less than 75 l/h, typically measured at any arc of coverage except at the arc extremes for part-circle sprinklers

NOTE 3 The respective values relate only to sprinklers in continuous operation.

3.10

effective diameter of coverage

twice the radius of throw (3.9)

3.11**trajectory height**

maximum height of the trajectory of the water stream above the sprinkler nozzle when operating at the test pressure

3.12**trajectory angle**

angle of the water stream above a horizontal plane, as discharged from the sprinkler nozzle operating at the test pressure

3.13**normal trajectory angle**

trajectory angle of 20° and greater

3.14**low trajectory angle**

trajectory angle smaller than 20°

3.15**sprinkler spacings**

distance between sprinklers along the irrigation laterals and distance between laterals

3.16**coefficient of distribution uniformity, CDU**

uniformity of water application rate, depth or amount, at a given pressure and at a particular spacing, expressed as a percentage

NOTE 4 The CDU is determined by the Christiansen method described in ISO 7749-2.

3.17**wind speed**

average wind speed at the test site during the test of distribution uniformity of the sprinkler

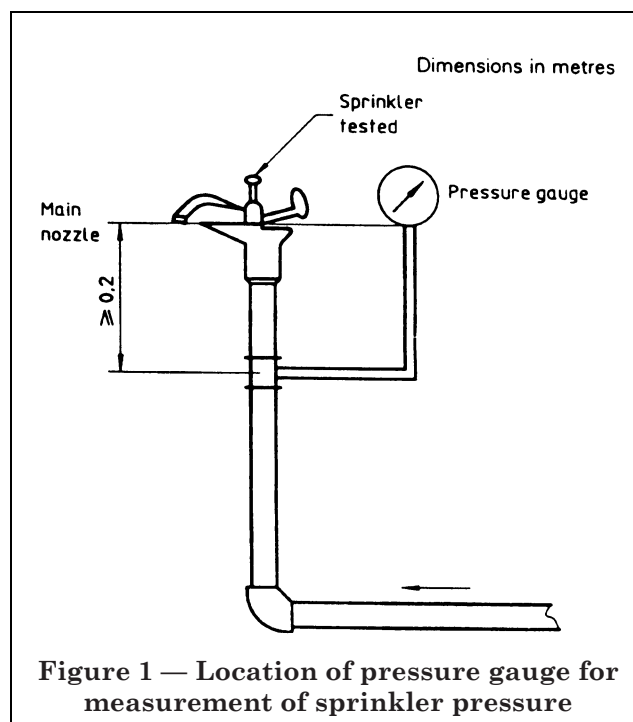
NOTE 5 The calculation is described in ISO 7749-2.

3.18**irrigation lateral**

branch supply line on which water distribution devices (sprinklers, emitters, drippers) are mounted directly or by means of fittings, risers or tubes

3.19**water distribution curve**

curve of application rates of the water accumulated in collectors laid out along a wetted radius, as a function of the distances of the collectors from the sprinkler

**3.20****part-circle sprinkler**

rotating sprinkler designed to irrigate a sector of a circular area, either with or without an attachment which enables it to be adjusted to irrigate the entire circular area

3.21**pop-up sprinkler**

irrigation sprinkler which is designed for installation so that the nozzle is below ground level when not operating

NOTE 6 When the sprinkler is pressurized, the part containing the nozzle is raised so that the nozzle is above ground level for irrigation. When the pressure is shut off, the part containing the nozzle returns to its original position.

3.22**collector**

receptacle into which the water discharged by the sprinkler is deposited during the test for radius of throw

