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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 27612.3-2023

Replacing GB/T 27612.3-2011

**Agricultural irrigation equipment - Sprinklers - Part 3:
Characterization of distribution and test methods**

农业灌溉设备 喷头 第3部分：水量分布特性和试验方法

(English Translation)

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Table of Contents

Foreword	
Introduction	
1 Scope	
2 Normative reference documents	
3 Terms and definitions	

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 3 of GB/T 27612 "Agricultural Irrigation Equipment Sprinkler Heads": GB/T 27612 has released the following parts:

- Part 1: Terminology and classification;
- Part 3: Water distribution characteristics and test methods;
- Part 4: Durability test methods:

This document replaces GB/T 27612.3-2011 "Agricultural Irrigation Equipment Sprinklers - Part 3: Water Volume Distribution Characteristics and Test Methods" "Law", compared with GB/T 27612.3-2011, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) The scope of application of the standard has been changed (see Chapter 1, Chapter 1 of the:2011 edition);

b) Changed the terms "ambient temperature", "sprinkling area", "density curve", "effective irrigation intensity", "rain gauge grid layout method" and "advanced":

In the definition of "nozzle specification", change "reversing nozzle" to "fan-shaped nozzle", change "nozzle range" to "spray radius", and change for its definition, change "injection height" to "maximum injection height" (see 3.1, 3:2, 3:7, 3:9, 3:12, 3:13, 3:16, 3:20, 3:27,:2011 version of 3:1, 3:2, 3:7, 3:10, 3:12, 3:13, 3:20, 3:24, 3:30);

c) The terms "contour diagram", "maximum working pressure", "minimum working pressure", "nozzle pressure", "nozzle size" and "spray diameter" are deleted and definitions (see 3.6, 3:15, 3:16, 3:18, 3:19, 3:32 of the:2011 edition);

d) Added the terms and definitions of "critical drying area", "effective spray radius" and "rotating nozzle" (see 3.6, 3:10, 3:22);

- e) The installation requirements for the tested nozzles have been changed (see Chapter 5, Chapter 5 of the:2011 edition);
- f) Changed the pressure measurement requirements (see 6.2, 6:2 of the:2011 edition);
- g) Added correction requirements for evaporation loss in the rain gauge (see 6.4);
- h) The arrangement, spacing and quantity requirements of rain gauges have been changed (see Chapter 7, Chapter 7 of the:2011 edition);
- i) Additional tests have been changed (see Chapter 8, Chapter 8 of the:2011 edition);
- j) The test operation has been changed (see Chapter 9, Chapter 9 of the:2011 edition);
- k) Changed the requirements for water distribution characteristics (see Chapter 11, Chapter 11 of the:2011 edition);
- l) Added spray radius and water volume distribution curve test methods (see Chapter 12):

This document is equivalent to ISO 15886-3:2021 "Agricultural Irrigation Equipment Sprinklers Part 3: Water Distribution Characteristics and Test Methods":

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

GB/T 27612 "Agricultural Irrigation Equipment Sprinklers" is intended to consist of 4 parts:

- Part 1: Terminology and classification: The purpose is to give the terminology and classification of sprinklers:
- Part 2: Design and operation technical requirements: The purpose is to give technical requirements for nozzle design and operation:
- Part 3: Water distribution characteristics and test methods: The purpose is to give the key performance indicators of the sprinkler head, the water volume distribution characteristics and its experiment method:
- Part 4: Durability test methods: The purpose is to provide a test method for the durability of nozzles:

This series of standards completely gives the terms and definitions of nozzles, design and operation technical requirements, water volume distribution characteristics and test methods, resistance to the durability test method provides a basis for the manufacturing and product upgrading of agricultural irrigation equipment sprinkler heads:

Agricultural irrigation equipment sprinkler heads Part 3: Water volume distribution characteristics and test methods

1 Scope

This document specifies the test conditions and test methods for the water volume distribution characteristics of agricultural irrigation sprinklers:

The nozzles specified in this document are generalized nozzles, covering all types of nozzle products: This document is applicable to all types of irrigation sprinkler heads:

Test performance such as cloth uniformity, spray radius and spray height: In order to verify the nozzle design performance given by the manufacturer, the above three properties need to be can take measurements:

This document mainly includes the radiation arrangement method of indoor and outdoor rain gauges and the grid layout method of rain gauges: The first is common to all tests conditions, then conditions unique to indoor-only testing, and finally conditions unique to outdoor-only testing:

For any given nozzle, due to the diversity of nozzle structures, operating conditions and adjustment methods, at least in theory, a large number of Related tests: On the premise that the test accuracy meets the requirements, testing institutions and manufacturers can use interpolation technology to reduce the number of actual tests:

frequency:

This document does not cover specific performance testing of sprinkler heads for frost protection:

This document also does not cover water droplet spectral measurements and characteristics as well as related issues such as soil compaction, droplet drift, evaporation losses, etc., which can as a consideration in the design of sprinkler irrigation systems:

This document is used to evaluate the irrigation coverage of sprinklers that are identical and arranged in a fixed, repeating geometric pattern: This document is not suitable for mobile Irrigation system:

This document is applicable to fan sprinklers if the testing organization can handle potential anomalies in the performance parameters:

Note: Appendix A describes the procedure for determining the uniformity of water volume distribution in sprinklers: Appendix B describes the fan nozzle test method:

2 Normative reference documents

This document has no normative references:

3 Terms and definitions

The following terms and definitions apply to this document:

ambient temperature the air temperature around the sprinkler head:

Spray areaareaofcoverage the wet area formed by spraying the sprinkler head when operating within the range of effective irrigation intensity (3:9) specified by the manufacturer:

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The arithmetic deviation method is used to characterize the uniformity coefficient of sprinkler water volume distribution obtained through field measurement or rain gauge grid layout simulation: