



**SLOVENSKI STANDARD**  
**SIST EN 12484-5:2004**  
**01-januar-2004**

---

**Namakalna tehnika – Avtomatski namakalniki za trate – 5. del: Preskusne metode**

Irrigation techniques - Automatic turf irrigation systems - Part 5: Testing methods of systems

Bewässerungsverfahren - Automatische Rasenbewässerungssysteme - Teil 5: Prüfung von Anlagen

**iTeh STANDARD PREVIEW**

(standards.iTeh.si)  
Techniques d'irrigation - Installations avec arrosage automatique intégré des espaces verts - Partie 5: Méthodes d'essai des installations

SIST EN 12484-5:2004

Ta slovenski standard je istoveten z: **EN 12484-5:2002**

<https://standards.iTeh.si/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-049a9b27626f/sist-en-12484-5-2004>

---

**ICS:**

65.060.35	Namakalna in drenažna oprema	Irrigation and drainage equipment
-----------	------------------------------	-----------------------------------

**SIST EN 12484-5:2004**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 12484-5:2004

<https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12484-5**

September 2002

ICS 65.060.35

English version

## Irrigation techniques - Automatic turf irrigation systems - Part 5: Testing methods of systems

Techniques d'irrigation - Installations avec arrosage  
automatique intégré des espaces verts - Partie 5:  
Méthodes d'essai des installations

Bewässerungsverfahren - Automatische  
Rasenbewässerungssysteme - Teil 5: Prüfverfahren

This European Standard was approved by CEN on 1 August 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN 12484-5:2004](https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004)

<https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Contents

	page
Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions.....	4
4 Inspection and testing for commissioning .....	4
5 Presentation of test results.....	9

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 12484-5:2004](https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004)

<https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004>

## Foreword

This document EN 12484-5:2002 has been prepared by Technical Committee CEN/TC 334 "Irrigation techniques", 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 March 2003, and conflicting national standards shall be withdrawn at the latest by March 2003.

Within its programme of work CEN/TC 334 "Irrigation techniques" charged CEN/TC 334/WG 4 "Automatic turf irrigation systems" to prepare the following standard:

- EN 12484-5, *Irrigation techniques - Automatic turf irrigation systems - Part 5: Testing methods of systems.*

The other parts of this standard are:

- EN 12484-1, *Irrigation techniques - Automatic turf irrigation systems - Part 1: Definition of the programme of equipment by the owner.*
- EN 12484-2, *Irrigation techniques - Automatic turf irrigation systems - Part 2: Design and definition of typical technical templates.*
- EN 12484-3, *Irrigation techniques - Automatic turf irrigation systems - Part 3: Automatic control and system management.*
- EN 12484-4, *Irrigation techniques - Automatic turf irrigation systems - Part 4: Installation and acceptance.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

**EN 12484-5:2002 (E)****1 Scope**

This European Standard specifies a method for evaluating the performance of an automatic turf irrigation system regarding the uniformity of water distribution in order to commission the system.

**2 Normative references**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 12484-1, *Irrigation techniques - Automatic turf irrigation systems - Part 1: Definition of the programme of equipment by the owner.*

EN 12484-2, *Irrigation techniques - Automatic turf irrigation systems - Part 2: Design and definition of typical technical templates.*

EN 12484-3, *Irrigation techniques - Automatic turf irrigation systems - Part 3: Automatic control and system management.*

EN 12484-4:2002, *Irrigation techniques - Automatic turf irrigation systems - Part 4: Installation and acceptance.*

ISO 7749-1:1995, *Agricultural irrigation equipment - Rotating sprinklers - Part 1: Design and operational requirements.*

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

SIST EN 12484-5:2004  
<https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004>

**3 Terms and definitions**

For the purpose of this European Standard, the terms and definitions of EN 12484-1 to 4 together with the relevant units apply.

**4 Inspection and testing for commissioning****4.1 Hydraulic Measurements**

The acceptable measurement device error shall be: pressure 2 %, flow 3 %.

After the conformity control according to clause 4 of EN 12484-4:2002, carry out the following measurements:

**4.1.1 Measurements at the system inlet**

- Pressure shall be in accordance with the design pressure of the project to within  $\pm 5$  %.
- Total flow shall be equal to the flow according to the design flow of the project to within  $\pm 5$  %.

**4.2 Water distribution uniformity measurements**

The purpose of the water distribution uniformity tests, performed according to ISO 7749-2, is to verify the performance of the system according to the design of the project.

#### 4.2.1 Pressure measurements at sprinklers

Tap connection upstream of the sprinkler shall comply with 4.1.5 of ISO 7749-2:1990. On a station, pressure measurements shall be made with the same pressure gauge at the most pressurized and less pressurized sprinkler pressure variation between these two sprinklers shall not be greater than 20 %. The pressure measured at the less pressurized sprinkler shall be equal to the design pressure of the project. The pressure measured at the most pressurized sprinkler shall be within the limit of working pressure specified by the manufacturer.

#### 4.2.2 Characteristics of the area where the measurements will be made

The area shall correspond to the spacing of the sprinklers defined in the design.

For a single station, at least two test areas, representative of the most and less pressurized sprinkler zones, shall be measured.

The surface area on which the collectors are placed shall be free of obstacles that could block the spray trajectory. The height of the vegetative cover shall not exceed 10 cm to 15 cm so as not to interfere with spray droplet access to collectors.

#### 4.2.3 Characteristics of collectors

The collectors shall be:

- cylindrical, over at least the top third of their height;
- of the identical size and shape;
- with sharp edges on the collecting surface;
- constructed so that none of the water collected splashes out.

**ITeH STANDARD PREVIEW**  
**(standards.iteh.ai)**  
SIST EN 12484-5:2004  
<https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004>

The height of the collectors shall be at least twice the average depth of the water collected during the test and not less than 15 cm.

The diameter of the collector opening shall be equal to one and a half times its height and not less than 8,5 cm.

Other collector designs may be used, provided that their measuring accuracy is not less than that described above.

The openings of all the collectors shall be horizontal, with a vertical angle tolerance of  $\pm 5^\circ$ .

#### 4.2.4 Characteristics of atmospheric conditions

The maximum permissible wind velocity during the test is defined in ISO 7749-1:1995 Table 3.

Velocity shall be recorded to the nearest 0,2 m/s and directions to the nearest  $10^\circ$ . The direction shall be noted with respect to the main axis of the collector grid layout.

Wind velocity sensing equipment shall be located at 2,0 m height. A second measurement can be made at a higher height for sprinklers with a trajectory height of more than 2,0 m. The sensor height shall be equal to the highest point in the trajectory of the sprinkler main nozzle  $\pm 10\%$ .

Wind velocity measurement shall be carried out at a distance not greater than 45 m away from the measurement area. The maximum permissible wind velocity is 0,9 m/s.

At the beginning of the distribution uniformity test and during the test, the wind velocity and direction shall be measured at intervals not exceeding 15 min.

The relative humidity and ambient temperature shall be measured at the beginning and at the end of the test.

**EN 12484-5:2002 (E)****4.2.5 Pressure measurement**

The pressure, at the station entry, shall be adjusted to the design pressure.

The pressure shall be measured at the sprinkler inlet and kept constant over the duration of the test with a deviation of  $\pm 4\%$ .

**4.2.6 Duration of tests**

Care shall be taken in starting and stopping tests to avoid direct deposition in collectors by under pressured jets or unstable rotational movement. Actual test duration shall be long enough to provide measurable amounts of water in the collectors compatible with the accuracy required for the test.

For sprinklers with programmed variations in operating characteristics, the duration of the test shall be long enough to subject all collectors to the same operational sequences.

**4.2.7 Location of collectors**

The collectors shall be arranged in a square grid over the entire test area (see Figure 1). Grid spacing between two adjacent collectors shall be:

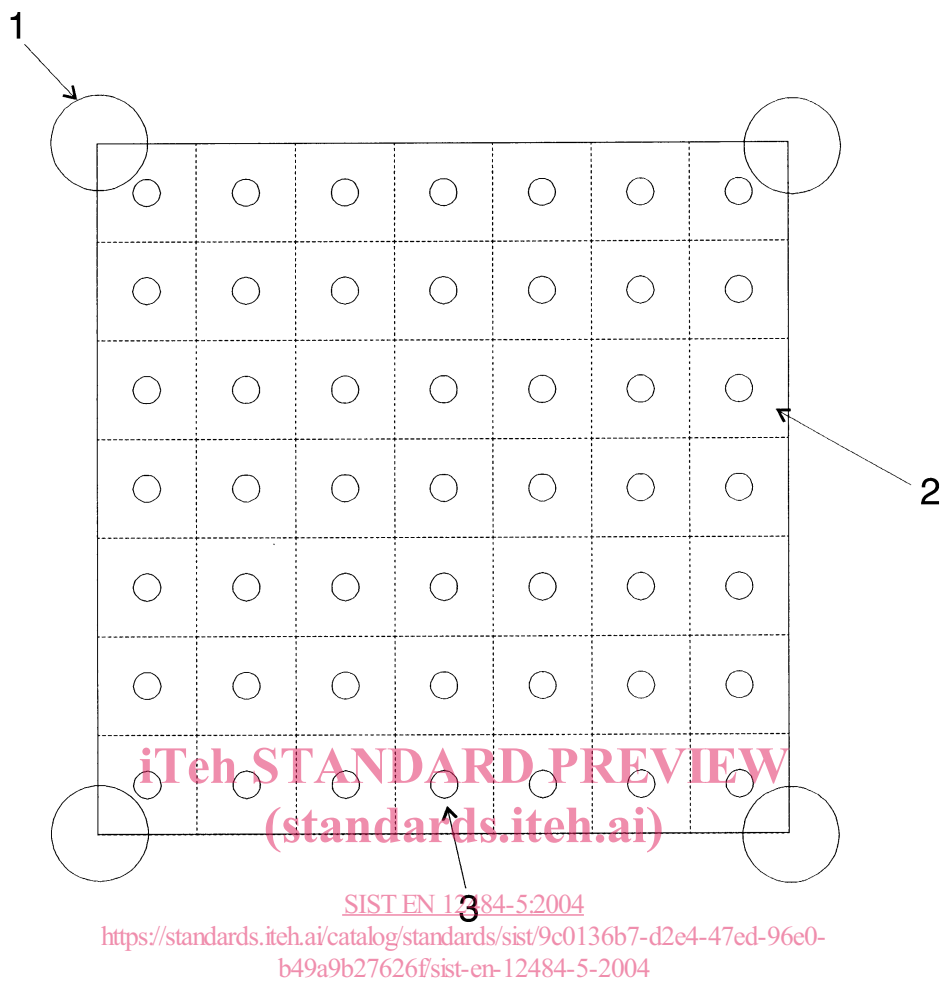
- 2 m maximum for sprinklers with radius larger than 10 m;
- 1 m maximum for sprinklers with radius between 5 m and 10 m;
- 0,5 m maximum for sprinklers with radius smaller than 5 m.

Collectors shall be equidistant according to both axes and equidistant with respect to the sprinklers.

SIST EN 12484-5:2004

<https://standards.iteh.ai/catalog/standards/sist/9c0136b7-d2e4-47ed-96e0-b49a9b27626f/sist-en-12484-5-2004>



**Key**

- 1 – Sprinkler
- 2 – Grid
- 3 – Collector

**Figure 1 - Layout of collectors (case of square sprinkler spacing)**

#### 4.2.8 Processing of data

The coefficient of distribution uniformity shall be computed from the results of the sprinkler distribution tests in the field. The quantity of water collected in each collector, serves as a basis for calculating the Christiansen uniformity coefficient. The following formula is used:

$$CC = 100 \times \left( 1 - \frac{\sum |h_m - h_i|}{n \times h_m} \right)$$

where

- $CC$  Christiansen uniformity coefficient in percentage;
- $n$  is the number of readings;
- $h_m$  is the arithmetical mean of the readings or measured average pluviometry;