



SLOVENSKI STANDARD
SIST EN 13948:2007

01-oktober-2007

Hidroizolacijski trakovi - Bitumenski, polimerni in elastomerni trakovi za tesnjenje streh - Določevanje odpornosti proti preboju korenin

Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of resistance to root penetration

Abdichtungsbahnen - Bitumen-, Kunststoff- und Elastomerbahnen für Dachabdichtungen - Bestimmung des Widerstandes gegen Durchwurzelung

Feuilles souples d'étanchéité - Feuilles d'étanchéité de toiture, bitumineuses, plastiques et élastomères - Détermination de la résistance à la pénétration des racines

<https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007>

Ta slovenski standard je istoveten z: EN 13948:2007

ICS:

91.060.20	Strehe	Roofs
91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials

SIST EN 13948:2007

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13948:2007

<https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007>

EUROPEAN STANDARD

EN 13948

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2007

ICS 91.100.50

English Version

Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of resistance to root penetration

Feuilles souples d'étanchéité - Feuilles d'étanchéité de toiture, bitumineuses, plastiques et élastomères - Détermination de la résistance à la pénétration des racines

Abdichtungsbahnen - Bitumen-, Kunststoff- und Elastomerbahnen für Dachabdichtungen - Bestimmung des Widerstandes gegen Durchwurzelung

This European Standard was approved by CEN on 23 May 2007.

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 CEN 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/a59ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007>



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
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle.....	5
5 Apparatus	6
5.1 Greenhouse	6
5.2 Test and control containers.....	6
5.3 Moisture layer.....	7
5.4 Pressure distribution layer	7
5.5 Growing substrate	7
5.6 Fertiliser.....	8
5.6.1 Basic fertilisers (to be mixed with the growing substrate).....	8
5.6.2 Slow working coated fertiliser (to be used during the testing period).....	8
5.7 Tensiometer.....	8
5.8 Test plants	8
5.9 Water quality for irrigation.....	8
6 Sampling of test specimens	9
7 Procedure	9
7.1 Preparation of growing substrate	9
7.2 Preparation and installation of the test containers.....	10
7.3 Preparation and installation of the control containers.....	12
7.4 Care of the plants.....	12
8 Expression of results	13
8.1 General.....	13
8.2 During the test.....	13
8.3 At the end of the test.....	13
9 Precision of test method.....	14
10 Test report	14

iTech STANDARD PREVIEW

(standards.iteh.ai)

[SIST EN 13948:2007](#)[https://standards.iteh.ai/catalog/standards/sist/a55ed16d-516e-41d1-9a7a-](https://standards.iteh.ai/catalog/standards/sist/a55ed16d-516e-41d1-9a7a-318a71c194d3/sist-en-13948-2007)[318a71c194d3/sist-en-13948-2007](#)

Foreword

This document (EN 13948:2007) has been prepared by Technical Committee CEN/TC 254 "Flexible sheets for waterproofing", the secretariat of which is held by BSI.

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 December 2007, and conflicting national standards shall be withdrawn at the latest by December 2007.

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13948:2007](https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007)

<https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007>

EN 13948:2007 (E)

Introduction

This European Standard has been prepared by the Technical Committee CEN/TC 254 to determine the resistance to root penetration of flexible sheets for roof waterproofing.

This European Standard is based on a method developed by the Association FLL (Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau (<http://www.f-l-l.de/english.html>), Bonn, Germany).

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13948:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007>

1 Scope

This European Standard specifies a method to determine the resistance of roof waterproofing sheets to root penetration.

This European Standard relates exclusively to sheets. It is not possible to test a system comprising several different sheets.

This European Standard does not contain any evaluation of the sheet to be tested in respect of its environmental requirements.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 13037, *Soil improvers and growing media — Determination of pH*

EN 13038, *Soil improvers and growing media — Determination of electrical conductivity*

EN 13651, *Soil improvers and growing media — Extraction of calcium chloride/DTPA (CAT) soluble nutrients*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3 Terms and definitions

[SIST EN 13948:2007](#)

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

<https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-31da71c19d55/sist-en-13948-2007>

3.1

root penetration

roots that have grown into and/or through the surface or joints of a sheet under test where the underground parts of the plants have actively created cavities and thus damaged the sheet

4 Principle

The protection against root penetration of a sheet is tested in containers where the sheet is under exposure to roots under specified conditions.

The test specimens of the sheet are installed in 6 test containers. The sheet shall have four wall corner joints, two base corner joints and one central T joint (see Figure 2). Additionally there shall be two control containers without sheets providing a comparison of the vitality of the plants in the test and control containers throughout the whole test period.

The containers receive a layer of growing substrate and a dense covering of vegetation. This produces a high growing pressure from the roots, emphasised by a limited amount of fertiliser and a moderate watering.

The test and control containers are exposed in a climate-controlled greenhouse, in which the parameters having an influence on the growing of the plants can be controlled.

The growing period is 2 years as this period is the minimum time necessary to obtain reliable results.

EN 13948:2007 (E)

After the testing period, the growing substrate is taken away and the behaviour of the test samples is assessed to observe if any root penetration has occurred.

5 Apparatus**5.1 Greenhouse**

The greenhouse shall be capable of regulating the temperature and ventilation. The minimum of the internal temperature shall be (18 ± 2) °C in the daytime and (16 ± 2) °C at night. The greenhouse shall be ventilated when the internal temperature reaches (22 ± 2) °C. A temperature exceeding 35 °C should be avoided.

NOTE The natural light conditions in Central Europe associated with the indicated temperatures give favourable conditions for the growth of the test plants throughout the year. No shading of the plants in summer or artificial light in winter is necessary. In the case where the tests are performed under significant different light conditions (i.e. North or South of Europe), the light and the shading may be adapted in order to allow the plants to grow properly.

Each 800 mm × 800 mm container requires an area of approximately 2 m², taking into account the requirements for clearance as specified in 7.2.

5.2 Test and control containers

6 test containers and 2 control containers are needed for testing one single sheet.

The inside dimensions of the test containers shall be at least 800 mm × 800 mm × 250 mm. It may be necessary, for installation purposes, to have larger containers. The containers shall be fitted with transparent bases to allow the observation of the roots, which may have passed through the sheet during the testing period, without taking away the growing substrate. The base shall be blacked out (with a foil for example) to avoid the growing of algae in the moisture layer. For the water supply to the moisture layer, the containers shall have a filler pipe, pointing obliquely upwards, with a diameter of 35 mm, ending near the base tray (see Figure 1).

<https://standards.iteh.ai/catalog/standards/sist/a35ed16d-316e-41d1-9a7a-3fda71c19d55/sist-en-13948-2007>

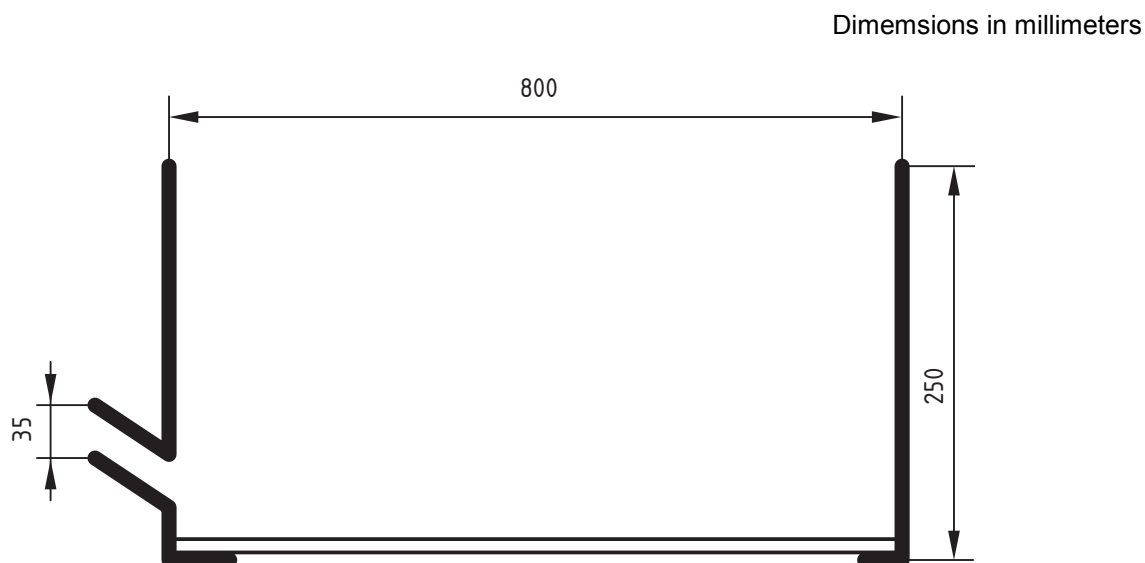


Figure 1 — Construction of container

5.3 Moisture layer

A layer of coarse mineral granulates shall be placed on the transparent bases of the containers. It shall be permanently kept moist to encourage the roots to draw down onto the transparent base, in order to observe any early penetration of the roots

This layer shall be composed of expanded slate/clay (grain fraction 8/16) of a quality suitable for use in hydroponics systems. When determined in accordance with EN 13038, the expanded slate/clay shall have an electrical conductivity of $< 15,0$ mS/m.

5.4 Pressure distribution layer

In order to achieve a uniform distribution of the pressure, a fleece or woven material, ≥ 170 g/m² and chemically compatible with the sheet to be tested, shall be placed directly under the sheet onto the moisture layer.

5.5 Growing substrate

A mixture of homogeneous materials of identified quality available permanently at all of the test sites. It shall be structurally stable and show a favourable water/air rate and weak base fertiliser content for optimal development of the roots of the test plants.

The growing substrate shall be a blend of:

- 70 % by volume of barely decomposed peat which shall have an electrical conductivity of $< 8,0$ mS/m when determined according to EN 13038 and a pH $4,0 \pm 1,0$ when determined according to EN 13037;
- 30 % by volume of expanded slate/clay (grain fraction 8/16) complying with the requirements as specified in 5.3.

The growing substrate shall be in direct contact with the test sample.