SLOVENSKI STANDARD
SIST EN 1297:2005

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Hidroizolacijski trakovi - Bitumenski, polimerni in elastomerni trakovi za tesnjenje streh - Metoda umetnega staranja z dolgotrajno izpostavitvijo ultravijoliļ nemu sevanju, poviġani temperaturi in vodi

Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Method of artificial ageing by long term exposure to the combination of UV radiation, elevated temperature and water

Abdichtungsbahnen - Bitumen-, Kunststoff- und Elastomerbahnen für Dachabdichtungen - Verfahren zur künstlichen Alterung bei kombinierter Dauerbeanspruchung durch UV-Strahlung, erhöhte Temperatur und Wasser

Feuilles souples d'étanchéité - Feuilles d'étanchéité de toiture bitumineuses, plastiques et élastomeres - Méthode de vieillissement artificiel par exposition combinée de longue durée aux rayonnements UV, a la température élevée et a l'eau

Ta slovenski standard je istoveten z: **EN 1297:2004**

ICS:

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

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English version

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This European Standard was approved by CEN on 22 July 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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

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Contents

Foreword

This document (EN 1297:2004) has been prepared by Technical Committee CEN /TC 254, "Flexible sheets for waterproofing", the secretariat of which is held by BSI.

This standard is one of a series of standards, which specify test methods for determining dimensions and characteristics of flexible sheets as factory made products.

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 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

No existing European Standard is superseded.

This document includes a Bibliography.

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

Introduction

This document has been prepared by CEN/TC 254 ”Flexible sheets for waterproofing” in order to test flexible bitumen, plastic and rubber sheets for roof waterproofing in relation to their ageing resistance to combined effects of long term exposure to UV radiation, elevated temperature and water.

This document defines one common procedure to be applied as a method for artificial ageing to all types of flexible sheets for roof waterproofing

This document has been drafted for applications in roofing but it may also be applied to other areas where it is relevant.

1 Scope

This document specifies the method for exposure of factory made bitumen or plastic or rubber sheets for roof waterproofing to combined effects of long term exposure by UV radiation, elevated temperature and water as means of artificial ageing.

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 13416, *Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Rules for sampling*

EN ISO 4892-1, *Plastics – Methods of exposure to laboratory light sources – Part 1: General guidance (ISO 4892-1:1999)*

EN ISO 4892-3, *Plastics – Methods of exposure to laboratory light sources – Part 3: Fluorescent UV lamps (ISO 4892-3:1994)*

3 Terms and definitions

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

	Symbol	Unit
3.1 **fluorescent UV lamp** lamp in which primary radiation from a low pressure mercury arc is transformed into higher wavelength UV by means of a fluorescent phosphor. The spectral emission of a fluorescent lamp is determined by the spectral emission of the fluorescent phosphor and the transmission characteristics of the glass tube. A fluorescent UV lamp is a lamp in which the radiant emission in the ultraviolet region of the spectrum < 400 nm makes up at least 80 % of the total radiation output		
3.2 **irradiance** incident radiant flux onto a surface per unit area	E	W / m²
3.3 **spectral irradiance** radiant flux per unit area per wavelength interval	E_λ	W/(m²·nm)
3.4 **Radiant exposure** time integral of irradiance	H	J/m²
3.5 **UV-radiation** radiation with a wavelength λ between: 100 nm < λ < 400 nm	λ	nm

3.6 **Exposed side** side of the test specimen designated by the manufacturer to be exposed to the sunlight		

4 Principle

Test specimens cut from the product sample are exposed in an apparatus with fluorescent UV lamps at specified irradiance, black standard temperature (BST), relative humidity and cyclic water spraying.

The resistance to this exposure is determined by follow-up tests described in the product standards on flexible bitumen or plastic or rubber sheets for roof waterproofing.

5 Apparatus

5.1 Laboratory light source

The UV source shall be an array of fluorescent UV lamps of type I (340 nm) or a fluorescent UV lamp combination in accordance with EN ISO 4892-3 with a mean UV irradiance in the plane of the specimen surfaces of (45 ± 5) W/m² in the wavelength range $\lambda \geq 300$ nm. For typical spectral irradiances see Figure A.1. The irradiance at the test specimen surface shall not vary more than ± 10 % in relation to any two points in the specimen holder plane.

In order to achieve homogeneous exposure conditions operate the apparatus according to the manufacturer's instructions (e. g. replacement of lamps and repositioning of specimens) and use dummy specimens at void positions.

5.2 Test Chamber

The design of the test chamber may vary but it shall be constructed from inert material and provide for uniform irradiance in accordance to 5.1 with means for controlling the black standard temperature (BST) and relative humidity in the dry period.

5.3 Specimen arrangement

The test specimen racks shall allow the specimens to

– lie flat in the plane ≥ 5° above the horizontal;

– be mounted so that the exposed face is in the plane of uniform irradiance.

The specimens shall be attached to stainless steel platens of at least the same size as the specimens by appropriate means. The attachment shall leave an area open to free irradiation so that subsequent tests can be performed on irradiated parts of the specimen.

For inclinations near to horizontal the specimens may be alternatively placed in stainless steel pans of at least the same size as the specimens. The specimens shall be weighted in this arrangement by means of a U shaped stainless frame. The external dimensions of the frame shall correspond to the specimen size. The cross section of the steel frame shall be (5 ± 0,5) mm by approximately 10 mm. The dimension of (5 ± 0,5) mm stands for the width of the cross section, i. e. the plane that is in contact with the specimen. If the specimens are placed in pans, the lower end of the pans shall have sufficient slits or holes to avoid any collection of water. The attachment arrangement shall not restrain the test specimens from changes in dimensions during exposure.

5.4 Water supply and spray mechanism

Demineralized water with a maximum conductivity of 500 µS/m shall be used for spraying. In general the temperature of the water to be used in the spraying procedure shall be (25 ± 5) °C at the beginning of the spray cycle. Spray nozzles shall provide a uniform and continuous wetting of the exposed specimens sides for defined periods of time.

The flow rate through the nozzles shall be (10 ± 3) litres per min and m² of the exposed specimen surface.

5.5 Cycle timer

A continuously operating cycle timer or controller shall allow programming of the spray cycles. An hour meter shall be provided to record total time of operation and UV exposure.

5.6 Thermometer

Thermometer capable of measuring the black standard temperature in accordance with EN ISO 4892-1, with means to record the temperature during each cycle.

5.7 Radiometer

A radiometer to determine the UV radiant exposure in J/m² in the wavelength region from 300 nm to 400 nm.

6 Sampling and preparation of test specimens

6.1 Sampling

For the purpose of this document, a complete undamaged roll of the sheet to be tested shall be selected in accordance with EN 13416.

6.2 Dimensions of test specimens

Test specimens of sufficient size according to the follow-up test to be performed shall be cut from the test piece in accordance with EN 13416. The machine direction should be indicated.

Durable marks for dimensional measurements before and after exposure shall be applied to the test specimens.

6.3 Preconditioning of specimens

Appropriate preconditioning of the specimens shall be carried out according to the tests to be performed as specified in the product standard on bitumen or plastic or rubber sheets.

7 Procedure

7.1 General

The test specimens and the black standard thermometer shall be mounted in the specimen holders with their exposed sides facing the lamps (5.1).

7.2 Exposure cycle

An exposure cycle has a duration of 360 min and consists of a 300 min dry period followed by a 60 min spray (wet) period in accordance with EN ISO 4892-3. Irradiation is not maintained during the wet period.

7.3 Black standard temperature

The black standard temperature (BST) shall be at (60 ± 3) °C during the dry period. The air temperature in the test chamber (5.2) shall be controlled to a constant value such that the black standard temperature (BST) equals the required value after 30 min in the dry period.

7.4 Chamber heating

During the spray period the chamber heating is turned off.