



# SLOVENSKI STANDARD

## SIST EN 12311-2:2013

01-september-2013

Nadomešča:  
SIST EN 12311-2:2010

---

### Hidroizolacijski trakovi - Ugotavljanje nateznih lastnosti - 2. del: Polimerni in elastomerni trakovi za tesnjenje streh

Flexible sheets for waterproofing - Determination of tensile properties - Part 2: Plastic and rubber sheets for roof waterproofing

Abdichtungsbahnen - Bestimmung des Zug-Dehnungsverhaltens - Teil 2: Kunststoff- und Elastomerbahnen für Dachabdichtungen

Feuilles souples d'étanchéité - Détermination des propriétés en traction - Partie 2 : Feuilles d'étanchéité de toiture plastiques et élastomères

Ta slovenski standard je istoveten z: **EN 12311-2:2013**

---

#### **ICS:**

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

**SIST EN 12311-2:2013** en,fr,de

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

SIST EN 12311-2:2013

<https://standards.iteh.ai/catalog/standards/sist/a02735a1-c5b4-40a2-bad6-b7e47a263b2f/sist-en-12311-2-2013>

EUROPEAN STANDARD

EN 12311-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2013

ICS 91.100.50

Supersedes EN 12311-2:2010

English Version

## Flexible sheets for waterproofing - Determination of tensile properties - Part 2: Plastic and rubber sheets for roof waterproofing

Feuilles souples d'étanchéité - Détermination des propriétés en traction - Partie 2 : Feuilles d'étanchéité de toiture plastiques et élastomères

Abdichtungsbahnen - Bestimmung des Zug-Dehnungsverhaltens - Teil 2: Kunststoff- und Elastomerbahnen für Dachabdichtungen

This European Standard was approved by CEN on 28 March 2013.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

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



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

## Contents

	Page
Foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 Principle.....	5
5 Apparatus .....	5
6 Sampling.....	6
7 Preparation of test specimens .....	6
8 Procedure .....	7
9 Expression of results .....	8
9.1 Evaluation.....	8
9.2 Precision of the test method .....	9
10 Test report .....	9
Bibliography .....	10

[SIST EN 12311-2:2013](https://standards.iteh.ai/catalog/standards/sist/a02735a1-c5b4-40a2-bad6-b7e47a263b2f/sist-en-12311-2-2013)  
<https://standards.iteh.ai/catalog/standards/sist/a02735a1-c5b4-40a2-bad6-b7e47a263b2f/sist-en-12311-2-2013>

## Foreword

This document (EN 12311-2:2013) has been prepared by Technical Committee CEN/TC 254 "Flexible sheets for waterproofing", the secretariat of which is held by NEN.

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 November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12311-2:2010.

This document has been technically and editorially revised in order to:

- adjust the separation speed to CEN TC 189 standards;
- add precision data of a Round Robin test.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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

## Introduction

This European Standard is intended for characterisation of plastic and rubber sheets as manufactured or supplied before use. This test method relates exclusively to products, or to their components where appropriate, and not to waterproofing membrane systems composed of such products and installed in the works.

This test is intended to be used in conjunction with European Standards on product characteristics for plastic and rubber sheets for waterproofing.

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

SIST EN 12311-2:2013

<https://standards.iteh.ai/catalog/standards/sist/a02735a1-c5b4-40a2-bad6-b7e47a263b2f/sist-en-12311-2-2013>

## 1 Scope

This European Standard specifies test methods for the determination of the tensile properties of plastic and rubber sheets for roof waterproofing.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1849-2, *Flexible sheets for waterproofing — Determination of thickness and mass per unit area — Part 2: Plastic and rubber sheets*

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

EN ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system (ISO 7500-1)*

## 3 Terms and definitions

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

### 3.1

#### **top surface**

upper side of the sheet, as used in situ

SIST EN 12311-2:2013

<https://standards.iteh.ai/catalog/standards/sist/a02735a1-c5b4-40a2-bad6-b7e47a263b2f/sist-en-12311-2-2013>

Note 1 to entry: This is usually the inside of the roll.

### 3.2

#### **maximum tensile force**

largest value of tensile force recorded during testing

### 3.3

#### **elongation at maximum tensile force**

elongation of the test specimen at the maximum tensile force

### 3.4

#### **elongation at break**

elongation of the test specimen at rupture

## 4 Principle

A test specimen is stretched at a constant speed until it ruptures. The force and elongation is continuously recorded throughout the test, and preferably with a permanent record of the maximum tensile force.

## 5 Apparatus

Tensile testing machine equipped with a continuous recording of force and corresponding elongation and capable of maintaining a uniform speed of grip separation as specified below.

**EN 12311-2:2013 (E)**

The tensile testing machine shall have a sufficient loading capacity of at least 2000 N and a grip separation speed of  $(5 \pm 1, 100 \pm 10 \text{ and } 500 \pm 50)$  mm/min. The width of grips shall not be less than the width of the test specimen.

The tensile testing machine shall be equipped with grips of a type which maintain or increase the clamping pressure as a function of the increase of the tensile force applied to the test specimen. The test specimen shall be held so that it does not slip in the grips more than 1 mm for products up to and including 3 mm thick, and 2 mm for thicker products. A mark or tape on the test specimen where it enters the grips will help reveal any slip.

The method of gripping shall not induce premature rupture close to the grips.

If the slippage from the grips exceeds the stated limits or for the method B (dumb-bell type), the actual elongation of the test specimen shall be measured with an extensometer.

The force measuring system shall meet at least Class 2 of EN ISO 7500-1 (i.e.  $\pm 2\%$ ).

**6 Sampling**

Samples shall be taken in accordance with EN 13416.

**7 Preparation of test specimens**

Unless otherwise specified, for a complete tensile test two sets of test specimens shall be prepared: a set of five for the longitudinal direction and a set of five for the transverse direction.

Test specimens shall be cut from a test piece not closer than  $(100 \pm 10)$  mm from the edge of the sheet, with the aid of a template, or die cutter as follows:

- method A: rectangular type  $(50 \pm 0,5)$  mm x 200 mm according to Figure 1 and Table 1;
- method B: dumb-bell type  $(6 \pm 0,4)$  mm x 115 mm according to Figure 2 and Table 1 or rectangular type  $(15 \pm 0,5)$  mm x 170 mm according to Figure 1 and Table 1.

Any non-permanent surface layer should be removed.

A set of test specimens (longitudinal or transverse direction) with a mesh or fabric internal layer, backing or laminated reinforcement shall have the same number of threads. Cutting of threads should be avoided.

Condition the test specimens, prior to testing, for at least 20 h in a standard atmosphere of  $(23 \pm 2)$  °C and  $(50 \pm 5)$  % relative humidity.

The tensile properties shall be determined in accordance with method A with the following exceptions:

- For sheet with a non-woven inner layer (e.g. fibre glass mat) of less than or equal to 80g/m<sup>2</sup>, method B the dumb-bell type (see Figure 2 and Table 1) shall be used.
- For determining tensile properties (young modulus/ secant modulus), e.g. for EN 1548 and for determining tensile properties in accordance with EN 1847, method B with a 15 mm rectangular specimen shall be used.

## 8 Procedure

In the case of method B, the thickness is measured as the effective thickness of the sheet according to EN 1849-2.

The test specimen shall be tightly clamped in the tensile test machine grips (Clause 5) taking care that the longitudinal axis of the test specimens and the axis of the testing machine and grips are correctly aligned. A preload of maximum 5 N before the start of the test is recommended to take out any slack in the test specimen.

The test is carried out on a test specimen at a temperature of  $(23 \pm 2)$  °C.

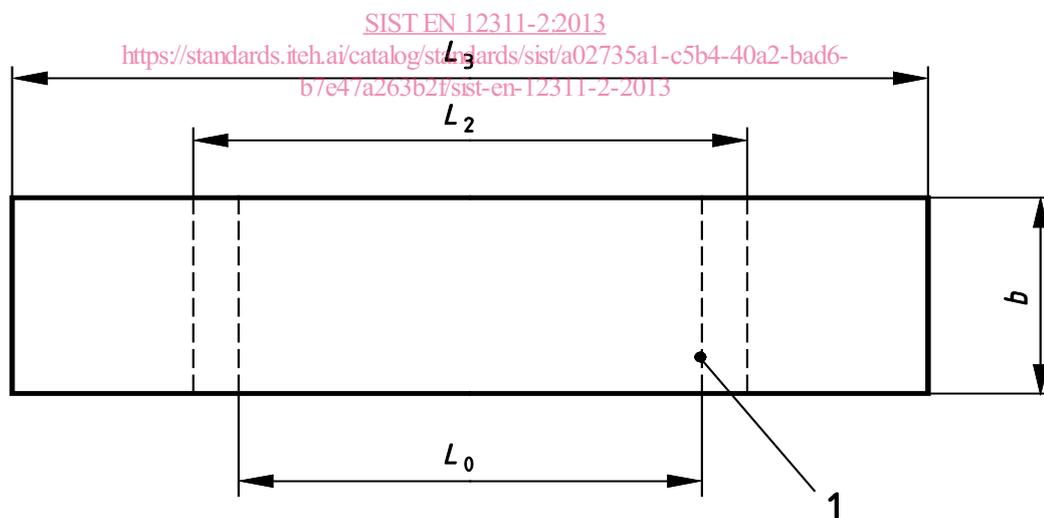
A constant separating speed for the grips of  $(100 \pm 10)$  mm/min with the following exceptions has to be used:

- For products with a declared value (e.g. MLV or MDV) for the elongation with more than 400 %, a constant separation speed of 500 mm/min has to be used.
- For the young modulus, which is defined as secant modulus between 1 % and 2 % strain, shall be deduced from the stress-strain curve when a separation speed of  $(5 \pm 1)$  mm/min has been used.

The applied tensile force and the distance between the grips or the distance between the gauge marker for the rectangular type or the distance between the gauge marks for the dumb-bell types shall be recorded until the test specimen breaks.

The mode of failure of the specimen shall be noted.

In the case of sheets with composite reinforcements, which give rise to two or more distinct peaks on the force/elongation curve, the force and elongation of the two greatest peaks and also the elongation at break shall be recorded.



### Key

- 1 gauge mark

Figure 1 — Rectangular test specimen for method A and method B