



SLOVENSKI STANDARD
SIST EN 1606:1997
01-december-1997

Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Določanje lezenja pod tlačno obremenitvijo

Thermal insulating products for building applications - Determination of compressive creep

Wärmestoffe für das Bauwesen - Bestimmung des Langzeit-Kriechverhaltens bei Druckbeanspruchung

Produits isolants thermiques destinés aux applications du bâtiment - Détermination du fluage en compression

iTeh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/4bacc7e1-27f1-468c-b7e1-e24f2181e9f6/sist-en-1606-1997>

Ta slovenski standard je istoveten z: EN 1606:1996

ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
-----------	---	--

SIST EN 1606:1997

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1606:1997

<https://standards.iteh.ai/catalog/standards/sist/4bacc7e1-27f1-468c-b7e1-e24f2181e9f6/sist-en-1606-1997>

EUROPEAN STANDARD

EN 1606

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 1996

ICS 91.120.10

Descriptors: buildings, thermal insulation, thermal insulating materials, compression tests, creep tests, testing conditions

English version

**Thermal insulating products for building
applications - Determination of compressive creep**

Produits isolants thermiques destinés aux
applications du bâtiment - Détermination du
fluage en compression

Wärmedämmstoffe für das Bauwesen - Bestimmung
des Langzeit-Kriechverhaltens bei
Druckbeanspruchung

(standards.iteh.ai)

[SIST EN 1606:1997](https://standards.iteh.ai/catalog/standards/sist/4bacc7e1-27f1-468c-b7e1-e24f2181e9f6/sist-en-1606-1997)

<https://standards.iteh.ai/catalog/standards/sist/4bacc7e1-27f1-468c-b7e1-e24f2181e9f6/sist-en-1606-1997>

This European Standard was approved by CEN on 1996-10-05. 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.

The European Standards exist 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.

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

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword	3
1 Scope	5
2 Normative references	5
3 Definitions	5
4 Principle	6
5 Apparatus	6
6 Test specimens	7
7 Procedure	9
8 Calculation and expression of results	12
9 Precision of the method	12
10 Test report	12
Annex A (normative) Calculation method	14
Annex B (informative) Example of a linear regression analysis	17

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1606:1997

<https://standards.iteh.ai/catalog/standards/sist/4bacc7e1-27f1-468c-b7e1-e24f2181e9f6/sist-en-1606-1997>

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 88 "Thermal insulating materials and products", the secretariat of which is held by DIN.

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 May 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

This European Standard is one of a series of standards which specify test methods for determining dimensions and properties of thermal insulating materials and products. It supports a series of product standards for thermal insulating materials and products which derive from the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (Directive 89/106/EEC) through the consideration of the essential requirements.

This European Standard contains two annexes:

- Annex A (normative) - Calculation method,
- Annex B (informative) - Example of a linear regression analysis.

This European Standard has been drafted for applications in buildings but it may also be used in other areas where it is relevant.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1606:1997

In pursuance of Resolution BT 20/1993 Revised, CEN/TC 88 have proposed defining the standards listed below as a European "package" of standards, setting December 31, 1997 as the date of withdrawal (dow) of national standards which conflict with the European Standards of this package.

The "package" of standards comprises the following group of inter-related standards on test methods for determining dimensions and properties of thermal insulation materials and products, all of which come within the scope of CEN/TC 88:

EN 822	Thermal insulating products for building applications - Determination of length and width
EN 823	Thermal insulating products for building applications - Determination of thickness
EN 824	Thermal insulating products for building applications - Determination of squareness
EN 825	Thermal insulating products for building applications - Determination of flatness
EN 826	Thermal insulating products for building applications - Determination of compression behaviour
EN 1602	Thermal insulating products for building applications - Determination of the apparent density

EN 1603	Thermal insulating products for building applications - Determination of dimensional stability under constant normal laboratory conditions (23 °C/50 % relative humidity)
EN 1604	Thermal insulating products for building applications - Determination of dimensional stability under specified temperature and humidity conditions
EN 1605	Thermal insulating products for building applications - Determination of deformation under specified compressive load and temperature conditions
EN 1606	Thermal insulating products for building applications - Determination of compressive creep
EN 1607	Thermal insulating products for building applications - Determination of tensile strength perpendicular to faces
EN 1608	Thermal insulating products for building applications - Determination of tensile strength parallel to faces
EN 1609	Thermal insulating products for building applications - Determination of short term water absorption by partial immersion
prEN 12085	Thermal insulating products for building applications - Determination of linear dimensions of test specimens
prEN 12086	Thermal insulating products for building applications - Determination of water vapour transmission properties
prEN 12087	Thermal insulating products for building applications - Determination of long term water absorption by immersion
prEN 12088	Thermal insulating products for building applications - Determination of long term water absorption by diffusion
prEN 12089	Thermal insulating products for building applications - Determination of bending behaviour
prEN 12090	Thermal insulating products for building applications - Determination of shear behaviour
prEN 12091	Thermal insulating products for building applications - Determination of freeze-thaw resistance

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

1 Scope

This European Standard specifies the equipment and procedures for determining the compressive creep of test specimens under various conditions of stress. It is applicable to thermal insulating products.

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.

- EN 826 Thermal insulating products for building applications - Determination of compression behaviour
- prEN 12085 Thermal insulating products for building applications - Determination of linear dimensions of test specimens

3 Definitions

iTeh STANDARD PREVIEW
(standards.iteh.ai)

For the purposes of this standard, the following definitions apply:

3.1 thickness: Linear dimension measured perpendicular to the length and width plane. <https://standards.iteh.ai/catalog/standards/sist/4bacc7e1-27f1-468c-b7e1-e24f2181e9f6/sist-en-1606-1997>

3.1.1 thickness, d : Original product thickness.

3.1.2 thickness, d_s : Thickness of the test specimen.

3.1.3 thickness, d_l : Thickness of the test specimen under the basic compressive stress of the loading device ("dead weight").

3.1.4 thickness, d_0 : Thickness of the test specimen 60 s after the beginning of the loading.

3.1.5 thickness, d_t : Thickness of the test specimen at a given time t .

3.2 compressive stress, σ_c : Ratio of the compressive force to the initial surface area of the cross section of the test specimen.

3.3 deformation, X : Reduction in thickness of the test specimen.

3.4 relative deformation, ϵ : Ratio of the deformation X of the test specimen and its thickness d_s , measured in the direction of the load.

3.5 compressive creep, X_{ct} : Increase of the deformation of the test specimen under a constant stress with time under specified conditions of temperature and humidity.

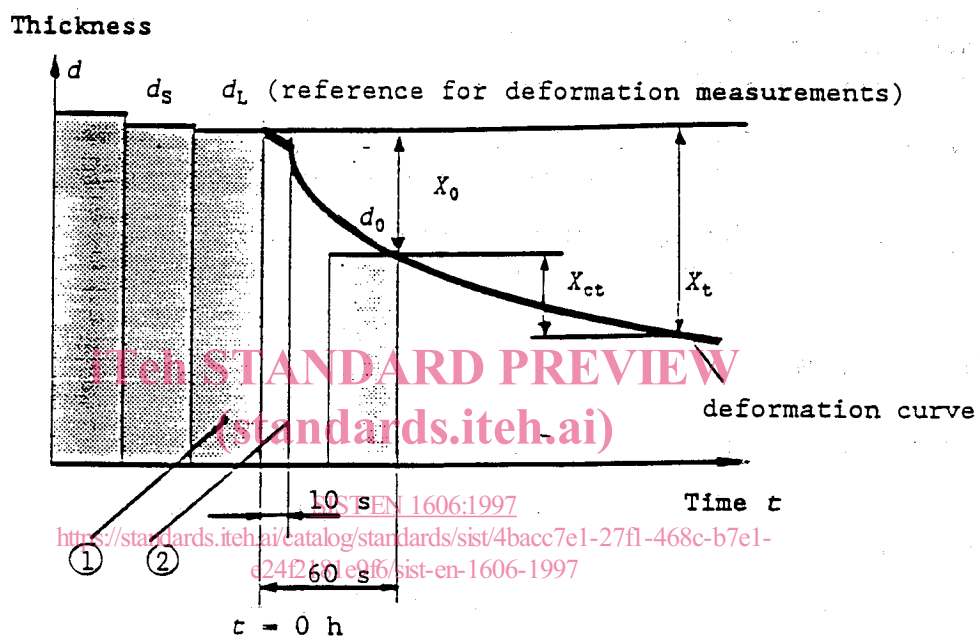
$$X_{ct} = X_t - X_0$$

where:

X_t is the deformation at time t ;

X_0 is the initial deformation (after 60 s from the beginning of loading).

An illustration of the different thicknesses and deformations is given in figure 1.



- 1 "Dead weight" of the loading device (<10 % of the smallest chosen stress for the creep test)
- 2 Load applied for the compressive creep test

In the illustration d_l is used as a reference value for the measurements of deformation. If d_s is used as the reference value the illustration can be used with the omission of the column for d_l (see 7.3).

Figure 1: Illustration of the different thicknesses and deformations

4 Principle

The compressive creep is determined by measuring the increase of deformation of a test specimen under a constant compressive stress and specified conditions of temperature, humidity and time.

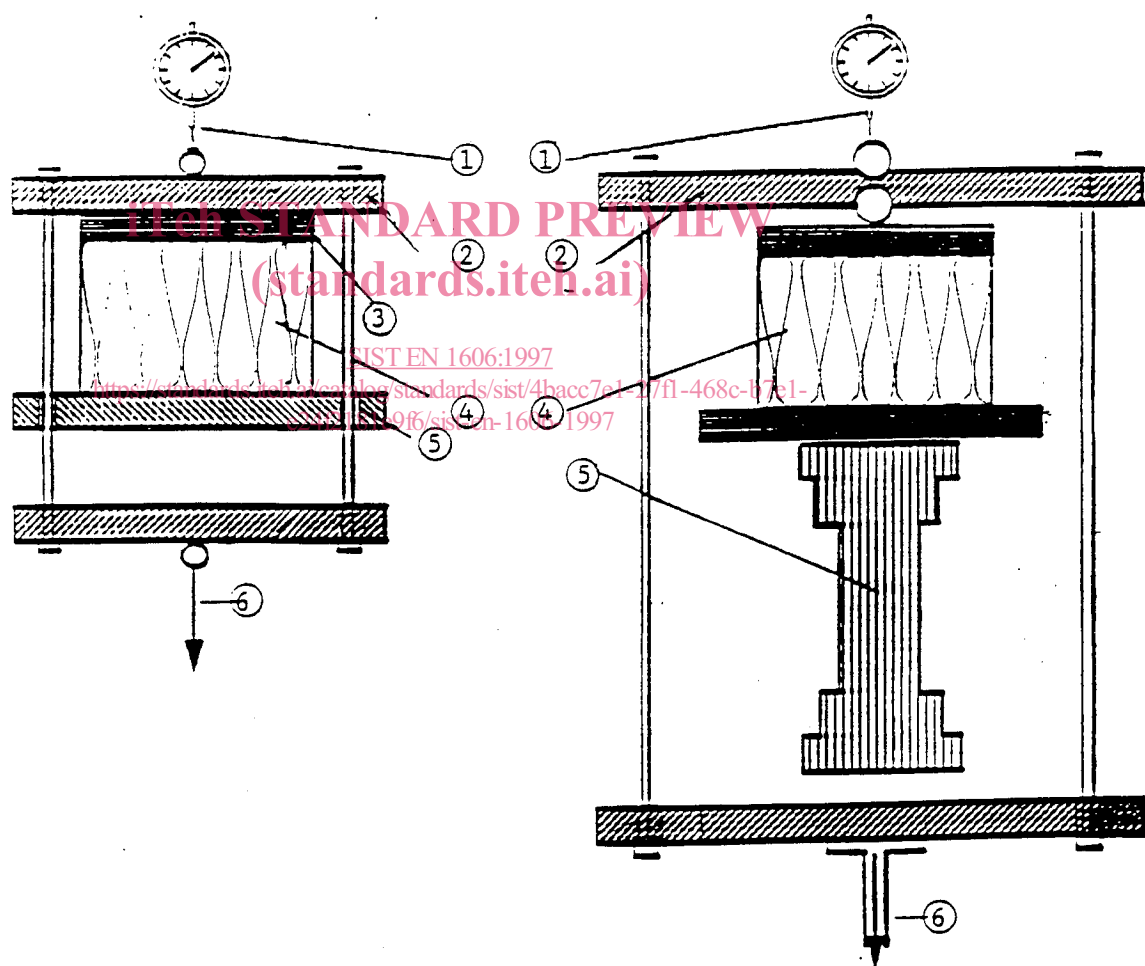
5 Apparatus

5.1 Loading device, consisting of two flat plates, one of which shall be movable, so arranged that they compress the test specimen in a vertical direction. The movable plate shall be guided in such a manner as to be self aligning. The plates shall be capable of being loaded smoothly and without distortion so that, during the test, the static stress does not change by more than $\pm 5\%$.

5.2 Measuring device (e.g. dial gauge), capable of determining the distance between the two plates, i.e. the deformation of the test specimen to an accuracy of 0,01 mm.

5.3 Suitable damping measures to minimize the effects of external vibration e.g. substantial foundation of the apparatus support.

Examples of the testing apparatus are given in figure 2.



a)

b)

- 1 Displacement transducer or dial gauge
- 2 Loading bridge
- 3 Load distribution plate (movable, self aligning)
- 4 Test specimen
- 5 Support beam
- 6 Load by weights

Figure 2: Examples of test apparatus

6 Test specimens

6.1 Selection of test specimens

The test specimens for determining the compressive creep shall be taken from the same sample, with the same preparation as the test specimens used for the compression test, made in accordance with EN 826

The method of selection of the test specimens shall be as specified in the relevant product standard.

NOTE: In the absence of a product standard or any other European technical specification the method of selection of the test specimens may be agreed between parties.

6.2 Dimensions of test specimens

The thickness of test specimens shall be the original product thickness. The width of the test specimens shall not be less than its thickness. Products with facings or integrally moulded skins which are retained in use shall be tested with these faces or skins intact.

Test specimens shall not be layered to produce a greater thickness for testing.

The test specimens shall be squarely cut and square having sides with the following recommended dimensions:

50 mm x 50 mm or
100 mm x 100 mm or
150 mm x 150 mm or
200 mm x 200 mm or
300 mm x 300 mm.

The dimensions of the test specimens shall be the same as used in the compression test made in accordance with EN 826. These are specified in the relevant product standard or agreed between parties.

The linear dimensions shall be determined in accordance with prEN 12085, with an accuracy of 0,5 %.

The tolerance on parallelism and flatness between the upper and lower face of the test specimen shall not be greater than 0,5 % of the test specimen side with a maximum of 0,5 mm.

If the test specimen is not flat, it shall be ground flat or an adequate coating shall be applied to prepare the surface for the test. If it is coated, no significant creep should occur in the coating or it shall be taken into account by deducting the creep of the coating.

6.3 Number of test specimens

The number of test specimens shall be as specified in the relevant product standard. If the number is not specified, then at least three test specimens shall be used for each compressive stress selected from 7.2.

NOTE: In the absence of a product standard or any other European technical specification the number of test specimens may be agreed between parties.

6.4 Preparation of test specimens

The test specimens shall be cut so that the direction of test forces applied to the product will correspond to the direction in which the compressive forces are applied to the product during its use.

The test specimens shall be cut by methods that do not change the original structure of the product.

For products with non-parallel faces, the parallelism of the upper and lower face of the test specimen shall be in accordance with 6.2.

NOTE: Special methods of preparation, when needed, may be given in the relevant product standard.

6.5 Conditioning of test specimens

The test specimens shall be conditioned for at least 24 h under the test conditions. In case of dispute the time for conditioning (equilibrium of moisture content) shall be as specified in the relevant product standard.

iTeh STANDARD PREVIEW

7 Procedure

(standards.iteh.ai)

7.1 Test conditions

SIST EN 1606:1997

The test shall be carried out at $(23 \pm 2)^\circ\text{C}$ and $(50 \pm 5)\%$ relative humidity.

NOTE: Other conditions may be given in the relevant product standard or may be agreed between parties.

7.2 Stress selection

The test shall be carried out at three or more different stresses.

The alternative stresses, σ_c , for the creep investigation shall be based on either the compressive strength, σ_m , or the compressive stress, σ_{10} , at 10 % deformation measured in accordance with prEN 826, and shall be calculated as follows:

$$\begin{array}{ll} \sigma_c = 0,15 \times \sigma_m & \text{or} & \sigma_c = 0,15 \times \sigma_{10} \\ \sigma_c = 0,20 \times \sigma_m & \text{or} & \sigma_c = 0,20 \times \sigma_{10} \\ \sigma_c = 0,25 \times \sigma_m & \text{or} & \sigma_c = 0,25 \times \sigma_{10} \\ \sigma_c = 0,30 \times \sigma_m & \text{or} & \sigma_c = 0,30 \times \sigma_{10} \\ \sigma_c = 0,35 \times \sigma_m & \text{or} & \sigma_c = 0,35 \times \sigma_{10} \end{array}$$

NOTE: If appropriate other values of σ_c may be chosen.