



**SLOVENSKI STANDARD**  
**SIST ENV 13420:2001**

**01-september-2001**

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Windows - Behaviour between different climates - Test method

Fenster - Differenzklima - Prüfverfahren

**iTeh STANDARD PREVIEW**

Fenêtres - Comportement entre différents climats - Méthode d'essai

**Ta slovenski standard je istoveten z: EN 13420:2000**

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**ICS:**

91.060.50      Vrata in okna

Doors and windows

**SIST ENV 13420:2001**

**en**

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EUROPEAN PRESTANDARD  
PRÉNORME EUROPÉENNE  
EUROPÄISCHE VORNORM

**ENV 13420**

April 2000

ICS 91.060.50

English version

## Windows - Behaviour between different climates - Test method

Fenêtres - Comportement entre différents climats -  
Méthode d'essai

Fenster - Differenzklima - Prüfverfahren

This European Prestandard (ENV) was approved by CEN on 7 June 1999 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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

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

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## Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 33 "Doors, windows, shutters, building hardware and curtain walling", the secretariat of which is held by AFNOR.

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

The status as an European Prestandard was proposed because some experience in testing the different climates still has to be collected. The ENV phase should enable the countries to do this.

This Prestandard is one of a series of European standards for windows.

## Introduction

Through climatic loading of the windows it is possible in the case of unfavourable designs that the frames of windows manufactured of different materials may

- decay through accumulation of moisture and may thus be damaged; this moisture may come from water vapour diffusion and condensation;
- be unable to fulfill their basic functions (serviceability, air permeability) because of unacceptable deformations.

This Prestandard defines the test procedures which are to be used in dependence of the potential risk of the design.

## 1 Scope

This European Prestandard specifies the test methods for evaluating

- the risks of decay of windows manufactured of different materials through increased moisture accumulation as a result of condensation or water vapour diffusion;
- the influence of deformation on basic performances of windows manufactured of different materials exposed to different climates between their external and internal faces.

Three test methods are to be differentiated. They take into account different cases of loadings.

**Test method 1:** For designs with low resistance to water vapour diffusion (normally designs with water vapour equalization holes); the test procedure is to be used for cross-sections where the danger is given by the moisture accumulation as a result of the condensation of moisture between the planking and the timber (see informative Annex A, Figure A.1). <https://standards.iteh.ai/catalog/standards/sist/24c64c5e-ba52-478f-86b9-9412d6492b9c/sist-env-13420-2001>

**Test method 2:** For designs with high resistance to water vapour diffusion (normally designs without water vapour equalization holes); the test procedure is to be used for cross-sections where the danger is given by the moisture accumulation as a result of water vapour diffusion of the moisture at the internal and external face (see informative Annex A, Figure A.2 + A.3).

**Test method 3:** For designs being sensitive to deformation; the test procedure is to be used for cross-sections where they are sensitive to the function through deformation as a result of climatic loading.

This Prestandard is relevant to initial type testing, i. e. to developments or changes in designs. It is not relevant to routine quality control or to proven designs.

NOTE: Designs are included in Annex A, Annex B is the survey of general design criteria where tests are not

necessary.

## 2 Normative references

This European Prestandard 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 Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 1026

Windows and doors – Air permeability – Test method

prEN 1121

Doors - Behaviour between two different climates – Test method

prEN 12046-1

Operating forces – Test method – Part 1: windows

prEN 12519

Doors and windows – Terminology

## 3 Definitions

For the purposes of this Prestandard the definitions given in prEN 12519 Doors and windows - Terminology shall apply, together with those given hereafter:

### 3.1 Designs with low resistance to water vapour diffusion

A design is regarded as being a design with low water vapour diffusion when moisture conditioned by water vapour diffusion can be drained in the cross-section in a controlled way under specified service conditions, e. g. through sufficient ventilation.

### 3.2 Designs with high resistance to water vapour diffusion

A design is regarded as being a design with high resistance to water vapour diffusion when as a result of profile coverings a sufficient draining of the moisture conditioned by water vapour diffusion is impaired in the cross-section.

### 3.3 Designs being sensitive to deformation

A design is regarded as being sensitive to deformation when under specified service conditions relative expansion (thermal or hygrometrical) of the material within the cross-section of the profile may impair the basic functions of the window (e. g. operating forces, air permeability).

### 3.4 Windows manufactured of different materials

The window manufactured of different materials is a window whose frame members, operating hardware being excluded, is made of a minimum of two materials.

NOTE: Typical examples

- basic timber windows clad with aluminium or PVC profiles;
- basic aluminium windows clad with timber (solid profiles or veneers);
- basic plastic windows clad with aluminium profiles.



### 3.5 Orientation

**Side 1:** Inward looking face

**Side 2:** Outward looking face

### 3.6 Wet spot

After climatic exposure, a visible moisture accumulation at the interface between timber (or any other hygroscopic materials) and another material.

## 4 Principle of test

In order to create a gradient of water vapour diffusion and condensation hazards as well as a temperature gradient and deformation hazards, the test specimen is exposed on both sides, for a specified time, to a set of different climates capable of creating a temperature below dew point in composite profiles. In the case of test procedures 1 and 2 the moisture content is to be determined periodically with an electric hygrometer or oven-dry samples on hygroscopic frame materials. Wet spots are to be recorded at the end of the exposure, by dismantling the test samples, if possible.

In the case of test method 3 the operating forces and the air permeability are to be determined at a maximum deformation and at the end of the loading.

## 5 Test facility

The test facility is defined in prEN 1121; in addition the following test facilities are required:

- a measuring device for determining the moisture content; an electric hygrometer properly calibrated for determining the moisture content of the timber. The hygrometer has to have an accuracy of  $\pm 1$  %.
- a measuring device for determining the deformation with an accuracy of 0,1 mm.

## 6 Dimensions of the test specimens

For test methods 1 and 2 the test results are independent of the dimensions; for that reason, the dimension can be agreed upon between the test laboratory and the applicant.

In the case of designs sensitive to deformation (test method 3) the largest overall dimension foreseen by the manufacturer is to be tested to ensure the validity of the test.

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## 7 Preparation for test

The test specimen shall be mounted taking into account the installation instructions as defined and published by the manufacturer.

The test specimen shall be fixed in the test rig plumb without any twists or bends which may influence the test results. The specimen shall be fully operable and shall be opened and closed five times before the test.

During the test the windows shall be secured in a closed and locked position.

## 8 Test conditions

The test conditions according to prEN 1121 are to be maintained.

The test conditions subsequently listed shall be used in connection with the test methods in clause 9.

**Table 1: Test methods for designs with low and high resistance to water vapour diffusion**

Test method	Test climate	Side 1		Side 2		Cycle/ durability
		Air temp. <sup>1</sup> <sub>1</sub> °C	Rel. humidity (U) <sup>θ</sup> %	Air temp. <sup>1</sup> <sub>2</sub> °C	Rel. humidity (U) <sup>θ</sup> %	
1	A	23	50	-10	-	see Figure 1 (12 h)
	B	23	50	60	-	
2.1	C	23	70	3	80 %	≥ 30 days ≤ 60 days *
2.2	A	23	50	-10	-	≥ 30 days ≤ 60 days *

\* until the constant moisture content of the hygroscopic materials or visible condensation is reached in the profile.

**Table 2: Test methods for designs sensitive to deformation**

Test method	Test climate	Side 1		Side 2		Cyclus / durability
		Air temp. <sup>1</sup> <sub>1</sub> °C	Rel. humidity (U) <sup>θ</sup> %	Air temp. <sup>1</sup> <sub>2</sub> °C	Rel. humidity (U) <sup>θ</sup> %	
3	A	23	50	-10	-	24 h
	D	23	50	75 <sup>1)</sup>	-	24 h

<sup>1)</sup> The reference temperature for heating up the surface by radiation.

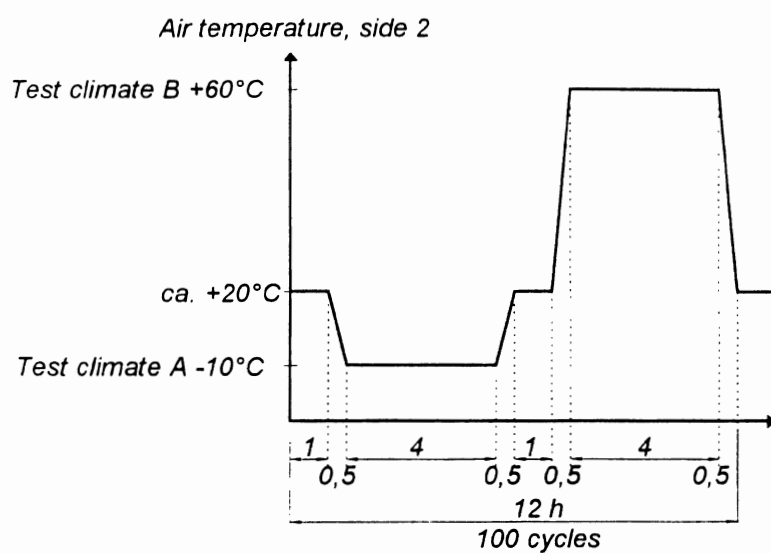
## 9 Test methods

### Test method 1

For the test the specimen shall be exposed within a changing test climate A and B (see table 1) according to Figure 1 with 100 cycles or until a constant weight or moisture of the hygroscopic materials of a climatic exposure has been reached. The moisture of the wood shall be continuously examined and recorded.

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NOTE: The moisture content of the specimen shall be measured before and after the test procedure 2.2.

Figure 1: Loading by changing temperatures ("side 2" in accordance with definition 3.1)

### Test methods 2.1 and 2.2

For the test the specimen shall be exposed to a constant climatic loading according to the test climate C or A (Table 1) for a period of 30 days (min.) and 60 days (max.)<sup>1)</sup>. The moisture of the wood shall be examined and recorded continually or at least once a week.

### Test method 3

For the test the specimen shall be loaded with test climate A and D (Table 2) with a temperature loading on one side for a period of 24 h per climate.

## 10 Test sequence

For test method 3 the following test sequence is to be carried out:

- Air permeability according to prEN 1026;
- Operating forces according to prEN 12046-1;
- Deformation;
- Cold test - climate A (Table 2);
- Deformation;
- Operating forces according to prEN 12046-1;
- Heat test - climate D (Table 2);
- Deformation;
- Operating forces according to prEN 12046-1;
- Air permeability according to prEN 1026.

NOTE : For analysing the test results it is reasonable to measure the deformation of the sash and the frame members before and after the climatic loading.

<sup>1)</sup> Until the constant moisture content of the hygroscopic materials or visible condensation is reached in the profile.