



**SLOVENSKI STANDARD**  
**SIST EN 1026:2001**

**01-september-2001**

**BUXca Yý U**  
**SIST EN 42:1996**

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**Okna in vrata - Prepustnost zraka - Preskusna metoda**

Windows and doors - Air permeability - Test method

Fenster und Türen - Luftdurchlässigkeit - Prüfverfahren

Fenêtres et portes - Perméabilité a l'air - Méthode d'essai

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**Ta slovenski standard je istoveten z: ~~SIST EN 1026:2001~~ EN 1026:2000**

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**ICS:**

91.060.50      Vrata in okna                      Doors and windows

**SIST EN 1026:2001**                                      **en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 1026

June 2000

ICS 91.060.50

Supersedes EN 42:1975

English version

## Windows and doors - Air permeability - Test method

Fenêtres et portes - Perméabilité à l'air - Méthode d'essai

Fenster und Türen - Luftdurchlässigkeit - Prüfverfahren

This European Standard was approved by CEN on 20 September 1999.

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.

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

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

## Foreword

This European Standard 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.

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 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.

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

This standard is one of a series of standards for windows and doors.

This European Standard supersedes EN 42: 1975 "Methods of testing windows – Air permeability test".

## 1 Scope

This standard defines the conventional method to be used to determine the air permeability of completely assembled windows and doors of any material, when submitted to positive or negative test pressures. This test method is designed to take account of conditions in use, when the window or door is installed in accordance with the manufacturer's specification and the requirements of relevant European Standards and codes of practice.

This standard does not apply to the joints between the window or door frame and the building construction.

## 2 Normative references

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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.

prEN 12519, Doors and windows - Terminology.

## 3 Definitions

For the purpose of this European Standard the definitions given in prEN 12519 and the following definitions apply.

### 3.1

#### test pressure

difference between the static air pressures on the external face and the internal face of the test specimen.

Test pressure is positive if the static air pressure on the external face is higher than that on the internal face.

Test pressure is negative if the static air pressure on the external face is lower than that on the internal face.

### 3.2

#### air permeability

amount of air passing through a closed and fastened test specimen caused by the test pressure. Air permeability shall be expressed in cubic metres per hour ( $\text{m}^3/\text{h}$ ).

### 3.3

#### opening joint

line of discontinuity between :

- either a frame and its matched component which can be opened by means of its hardware, see figure 1 ;
- or two components which can be opened by means of their hardware, see figure 2.

Conventionally, this discontinuity is as seen from the inside face of the test specimen.

### 3.4

#### length of opening joint

Length of the line of frame, sash, casement, leaf or infilling, as seen from the inside face, separating the two contiguous components, determined as shown in figure 1 and figure 2.

Actual length of gaskets or seals fitted into the underlying profiles of the components or joints of components built into opening parts are not relevant. The length of joint shall be expressed in metres (m).

### 3.5

#### overall area

Area of the test specimen measured parallel to the glazing or the leaf, see figure 1 and figure 2

The overall area shall be expressed in square metres ( $\text{m}^2$ )

## 4 Principle of test

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Application of a defined series of test pressures (positive and negative) and at each test pressure measurement of the air permeability with a suitable test device.

## 5 Test apparatus

5.1 A chamber with an open side to which the test specimen can be fitted. It shall be constructed so as to be able to withstand the test pressures without deflecting to an extent likely to influence the test results.

5.2 Means for applying controlled test pressure to test specimen.

5.3 Means of producing rapid changes in test pressure, controlled within defined limits.

5.4 Instrument suitable for measuring the quantity of air flow into or out of the chamber within an accuracy of  $\pm 5\%$  (calibrated at  $+20\text{ }^\circ\text{C}$ , 101 kPa).

5.5 Means of measuring the test pressure applied across the specimen, within an accuracy of  $\pm 5\%$ .

5.6 Means of sealing all joints of the specimen, when required.

## 6 Preparation of test specimen

The test specimen shall be fixed as intended for use in the works without any twists or bends which may influence the test results. The specimen shall be fully operable. The test specimen shall be cleaned and surfaces dry. Ventilation devices, if any, shall be taped over, except when it is required to determine the amount of air flow through such devices.

## 7 Test procedure

### 7.1 Preliminaries

The ambient temperature and humidity close to the specimen shall be within the range 10 °C to 30 °C and 25 % to 75 % RH and the specimen shall be conditioned thus for at least 4 h immediately before testing.

Temperature shall be measured to within  $\pm 3$  °C and relative humidity to within  $\pm 5$  %. Atmospheric pressure shall be measured to within  $\pm 1$  kPa.

The test pressure shall be applied in steps of 50 Pa up to 300 Pa and from 300 Pa in steps of 150 Pa. The air permeability result shall be given to an accuracy of 10 %.

### 7.2 Air permeability of test chamber

Determine the procedure to follow in accordance with what is known about the air permeability of the test chamber.

#### 7.2.1 Test chamber with known air permeability

Assume the air permeability of the test chamber is zero if it is less than 5 % of the maximum air permeability permitted throughout the range of the classification that is attributed to the test specimen.

When this is not so, measure the air permeability of the test chamber as described in 7.2.2 unless it is known and shown to be approximately constant within the limit of accuracy of the measurement recorded by the test laboratory.

In no case shall the air permeability of the test chamber exceed 30 % of the overall air permeability of the test specimen and the test chamber.

#### 7.2.2 Test chamber with unknown air permeability

Seal all joints in the test specimen with adhesive tape or an airtight sheet covering the whole test specimen. Measure the air permeability of the test chamber with positive test pressures as described in 7.3.1. When it is intended to carry out an air permeability test with negative test pressures, measure the air permeability of the test chamber with negative test pressures as described in 7.3.1.

Remove the adhesive tape or airtight sheet covering the test specimen.

### 7.3 Overall air permeability of test specimen and the test chamber – Positive pressures

Open and close all opening parts of the test specimen at least once before securing them in the closed position.

Measure the air permeability of the test specimen with positive test pressures as described in 7.3.1 see Annex A.

#### 7.3.1 Measurement of air permeability

Apply three pressure pulses each 10 % greater than the maximum test pressure to be used in the test or 500 Pa, whichever is greater. The time to reach the maximum test pressure shall be not less than 1 s and the pressure shall be sustained for at least 3 s. Apply positive test pressure steps as specified in 7.1. Measure and record the air permeability at each step. The duration of each step shall be sufficient to allow the test pressure to stabilise before the air permeability is measured.

## 7.4 Overall air permeability of test specimen and the test chamber – Negative pressures

Perform this test only when specifically required. Open and close all opening parts of the test specimen at least once before securing them in the closed position. Measure the air permeability of the test specimen and test chamber with negative test pressures as described in 7.3.1, see Annex A.

## 8 Test result

8.1 Adjust the result of the air flow measurements ( $V_x$ ) at each step, to calculate the air flow ( $V_o$ ) at normal conditions ( $T_o = 293$  K,  $P_o = 101,3$  kPa), considering the actual temperature  $T_x$  expressing in °C and atmospheric pressure  $P_x$  expressed in kPa, during the test.

$$V_o = V_x \cdot \frac{293}{273 + T_x} \cdot \frac{P_x}{101,3}$$

8.2 For a specimen the air permeability at each step is equal to the overall air permeability adjusted in accordance with 8.1 less the air permeability of the chamber, when not zero, adjusted in accordance with 8.1.

8.3 Using the length of the opening joint as defined in 3.4 and the overall area as defined in 3.5

calculate the air permeability in terms of  $\frac{\text{m}^3}{\text{h}\cdot\text{m}}$  et  $\frac{\text{m}^3}{\text{h}\cdot\text{m}^2}$  expressing the results to two significant figures.

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8.4 Record on a graph the air permeability ( $V_o$ ) related to the length of joint ( $V_L$ ) and the overall area ( $V_A$ ), for each pressure step.

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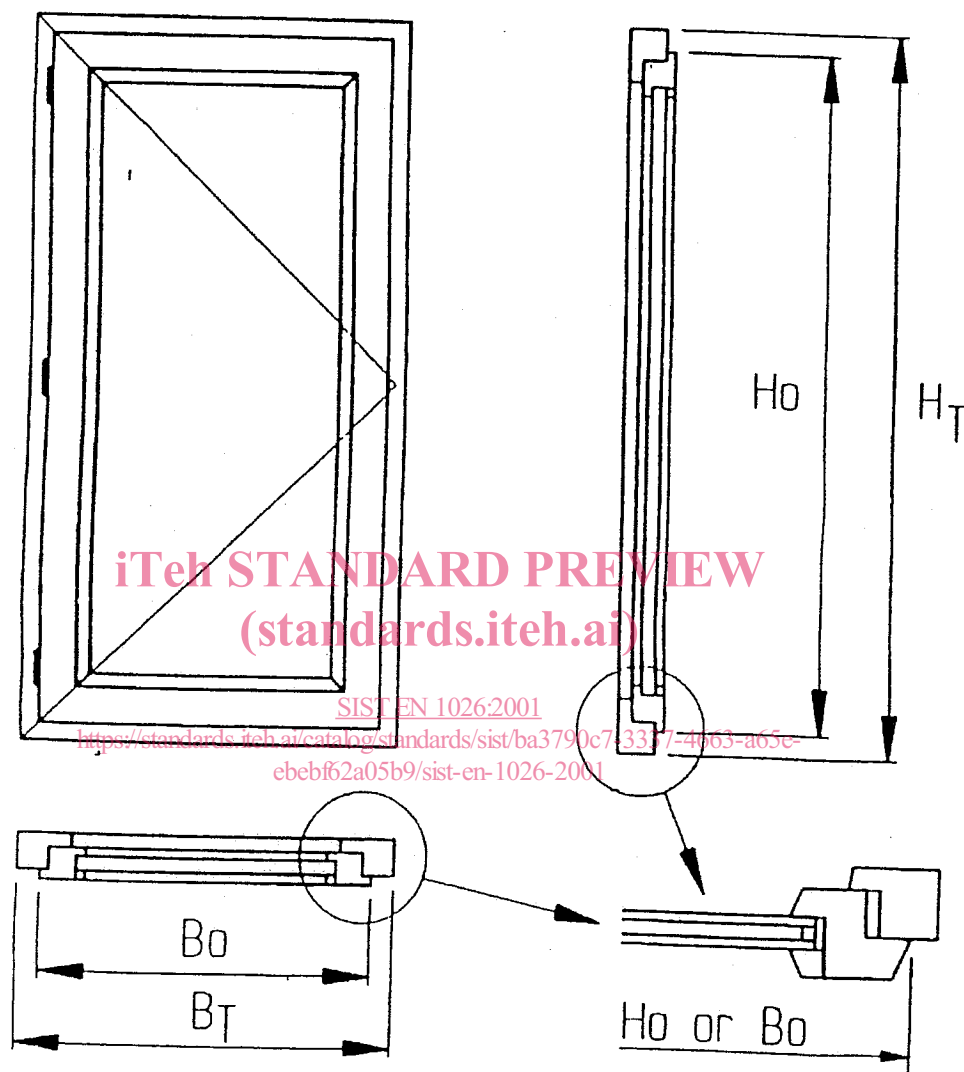
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## 9 Test report

This shall state the airflow measurement devices used for the test and record on a drawing or a photograph of the test specimen, the location of any significant points or air leakage observed. Where appropriate the report shall contain as a minimum the following information :

- reference to this standard ;
- the name of the test institution ;
- date of the test ;
- all necessary references to identify the specimen and the method of selection of the test ;
- all relevant details concerning the dimensions of the specimen, its materials, design, construction and manufacture and its surface finish and fittings ;
- Drawings of details of the specimen including cross section to a scale of 1:2 or larger ;
- presence of ventilation, type and condition (i.e. closed, taped over, etc.) ;
- test method ;
- test procedures, including storage and conditioning prior to test, and mounting the test specimen ready for test;
- test climates used.

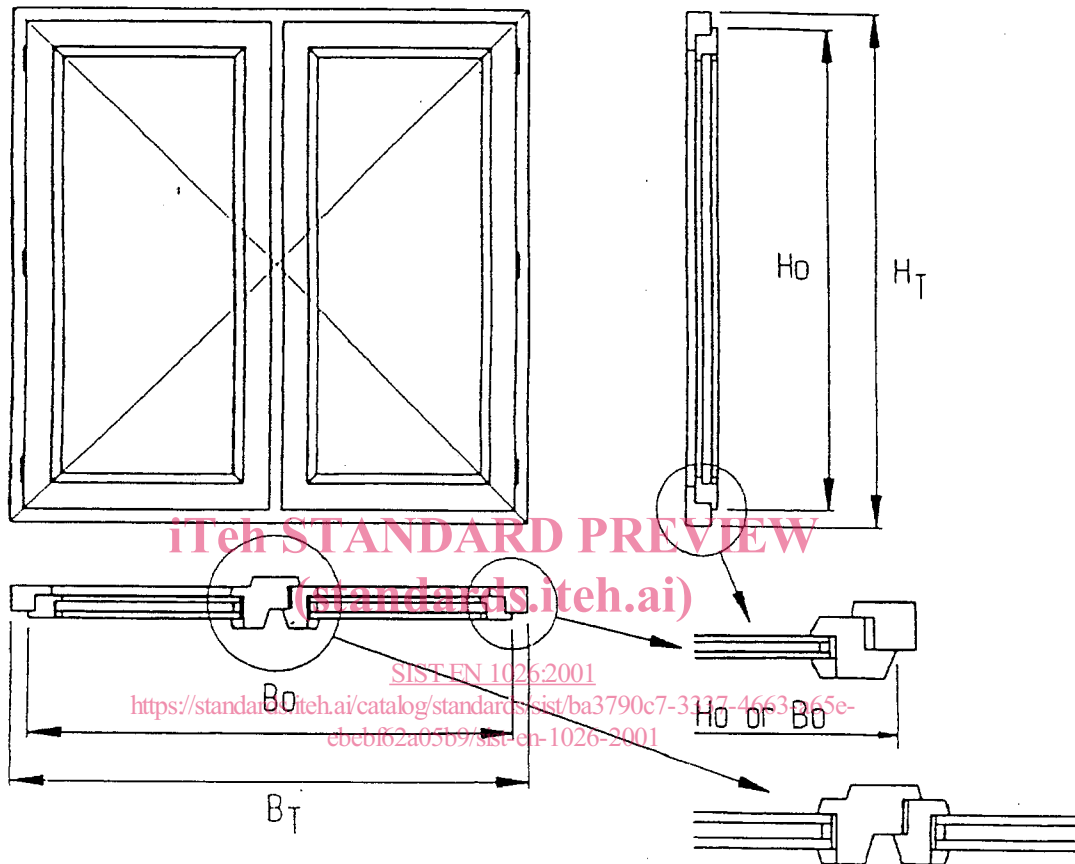
## Definition of reference parameters



Length of opening joints :  $2 H_o + 2 B_o$   
 Overall area :  $H_T \times B_T$

Figure 1 : Single leaf specimen





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Length of opening joints :  $3 H_0 + 2 B_0$   
Overall area :  $H_T \times B_T$

Figure 2 - Double leaf specimen