DRAFT INTERNATIONAL STANDARD ISO/DIS 6445
Attributed to ISO/TC **162** by the Central Secretariat (see page ii)

Voting begins on
2002-09-26

Voting terminates on
2003-02-26

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

FAST-TRACK PROCEDURE

Doors — Behaviour between two different climates — Test method

[Revision of first edition (6445:1989)]

Portes — Comportement entre deux climats différents — Méthode d'essai

ICS 91.060.50

NOTE FROM THE ISO CENTRAL SECRETARIAT

This draft International Standard is submitted for voting to ISO member bodies under the fast-track procedure.

ISO/TC 162 *Doors and windows*, at its meeting held in September 2001, proposed that the EN standard 1121, *Doors -- Behaviour between two different climates -- Test method*, be submitted for vote under the "Fast-track procedure", in accordance with the provisions of clause F.2, Annex F, of the ISO/IEC Directives, Part 1 (fourth edition, 2001) :

F.2 “Fast-track procedure”

F.2.1 Proposals to apply the fast-track procedure may be made as follows.

F.2.1.1 Any P-member or category A liaison organization of a concerned technical committee may propose that an **existing standard from any source** be submitted for vote as an enquiry draft. The proposer shall obtain the agreement of the originating organization before making a proposal. The criteria for proposing an existing standard for the fast-track procedure are a matter for each proposer to decide.

F.2.1.2 An international standardizing body recognized by the ISO or IEC council board may propose that a **standard developed by that body** be submitted for vote as a final draft International Standard.

F.2.1.3 An organization having entered into a formal technical agreement with ISO or IEC may propose, in agreement with the appropriate technical committee or subcommittee, that a **draft standard developed by that organization** be submitted for vote as an enquiry draft within that technical committee or subcommittee.

F.2.2 The proposal shall be received by the Chief Executive Officer, who shall take the following actions:

a) settle the copyright and/or trademark situation with the organization having originated the proposed document, so that it can be freely copied and distributed to national bodies without restriction;

b) for cases F.2.1.1 and F.2.1.3, assess in consultation with the relevant secretariats which technical committee/subcommittee is competent for the subject covered by the proposed document; where no technical committee exists competent to deal with the subject of the document in question, the Chief Executive Officer shall refer the proposal to the technical management board, which may request the Chief Executive Officer to submit the document to the enquiry stage and to establish an ad hoc group to deal with matters subsequently arising;

c) ascertain that there is no evident contradiction with other International Standards;

d) distribute the proposed document as an enquiry draft (F.2.1.1 and F.2.1.3) in accordance with 2.6.1, or as a final draft International Standard (case F.2.1.2) in accordance with 2.7.1, indicating (in cases F.2.1.1 and F.2.1.3) the technical committee/subcommittee to the domain of which the proposed document belongs.

F.2.3 The period for voting and the conditions for approval shall be as specified in 2.6 for an enquiry draft and 2.7 for a final draft International Standard. In the case where no technical committee is involved, the condition for approval of a final draft International Standard is that not more than one-quarter of the total number of votes cast are negative.

F.2.4 If, for an enquiry draft, the conditions of approval are met, the draft standard shall progress to the approval stage (2.7). If not, the proposal has failed and any further action shall be decided upon by the technical committee/subcommittee to which the document was attributed in accordance with F.2.2 b).

If, for a final draft International Standard, the conditions of approval are met, the document shall progress to the publication stage (2.8). If not, the proposal has failed and any further action shall be decided upon by the technical committee/subcommittee to which the FDIS was attributed in accordance with F.2.2 b), or by discussion between the originating organization and the office of the CEO if no technical committee was involved.

If the standard is published, its maintenance shall be handled by the technical committee/subcommittee to which the document was attributed in accordance with F.2.2 b), or. if no technical committee was involved, the approval procedure set out above shall be repeated if the originating organization decides that changes to the standard are required.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1121

June 2000

ICS 91.060.50

Supersedes EN 79:1985

English version

Doors - Behaviour between two different climates - Test method

Portes - Comportement entre deux climats différents - Méthode d'essai

Türen - Verhalten zwischen zwei unterschiedlichen Klimaten - Prüfverfahren

This European Standard was approved by CEN on 14 February 2000.

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.

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

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

Ref. No. EN 1121:2000 E

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 European Standard supersedes EN 79:1985.

This draft is one of a series of standards for doors.

This standard includes six informative annexes describing the test procedures.

1 Scope

This European Standard defines the test method to be used for determining the behaviour of door leaves and doorsets between two different climates.

2 Normative refererences

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.

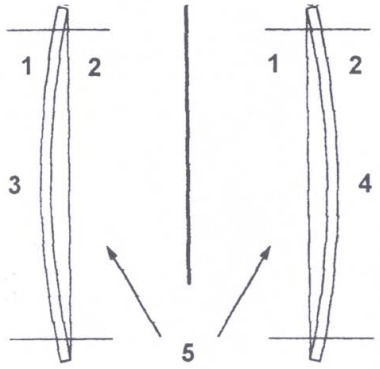
EN 952	Door leaves - General and local flatness - Measurement method
EN 12046-2	Operating forces – Test method – Part 2: Doors
EN 1026	Windows and doors – Air permeability – Test method
prEN 12519:1996	Doors and windows - Terminology

3 Definitions

For the purposes of this standard the definitions given in prEN 12519:1996 apply, together with the following:

3.1
Face 1, face 2
the orientation of face 1 and face 2 of the door with regard to the climates is defined in 6.1

3.2
Bow
Maximum deviation of the long edge of a door leaf measured in accordance with EN 952. According to its orientation, it can be positive or negative, see figure 1



1 Face 1
2 Face 2
3 Negative bow
4 Positive bow
5 Datum line as defined in EN 952

Figure 1 - Definition of positive and negative bow

4 Principle

The test is carried out by subjecting the doors to two different climates on either side for a period of time, and measuring the resulting bow of the longitudinal lock side edge at stages of the test. If required, the operating forces and the air permeability of the doors in their deformed state are also determined.

5 Apparatus

5.1 Basic equipment

The test facility shall consist as minimum of :

- a climate chamber or enclosure in which the required climatic conditions on the cold side can be maintained and adjusted within the stipulated tolerances ;

- an opposite climate chamber or enclosure in which the required climatic conditions on the warm side can be maintained and adjusted within the stipulated tolerances ;

- a frame for supporting the doors, which is sufficiently rigid that it will not be significantly deformed by any force that may be transmitted from the door leaf to the door frame ;

- a device for measuring bow ;

- a device for determining the operating forces in accordance with EN 12046-2 during exposure to the climatic stress.

5.2 Supplementary equipment

- a bank of filament infrared lamps (see informative Annex A) for heating face 2 of the door. The power of the apparatus shall be such that the surface temperature θ_3 shall be reached within 2 hours and maintained afterwards within a range of $\pm$ 5 °C.

The filament infrared lamps shall be positioned in such a way that the emitted radiation energy is distributed as evenly as possible over the door leaf. (See Annex A).

- Reference surfaces, having an absorption coefficient a_s in the visible field (0,4 µm to 0,7 µm) of at least 0,90 and a thermal resistance of between 0,1 Km²/W and 0,2 Km²/W, each consisting of an aluminium sheet with matt black finish, mounted on polystyrene thermally insulating material (extruded; lambda 0,03 W/mK) having a thermal resistance between 0,6 Km²/W and 0,7 Km²/W, and incorporating a temperature sensor;

NOTE 5 mm thickness of polystyrene is usually adequate.

- a device for measuring the surface temperatures of the door leaf;

- a device, installed in the climatic chamber, for determining the air permeability of the door between the test chambers in accordance with EN 1026;

or

- a device for deforming the door leaf mechanically, when determination of the air permeability of the doorset is carried out outside the climatic test chambers.

NOTE Annex B gives an example of such a device.

6 Preparation

6.1 Orientation of the doors

The orientation of the faces of the door shall be defined by the manufacturer prior to its installation in the test chamber. (See also tables 1 and 2).

Closing side = face 1, if the door normally opens outwards, or

Closing side = face 2, if the door normally opens inwards.

If this information is missing, the door shall be tested in the orientation least favourable for the classification.

NOTE Which orientation is least favourable for the classification depends on the test required. One orientation may be worse for operating forces and the other for air permeability. It may therefore be necessary to test the door in both orientations.

6.2 Mounting

If possible, the door and its frame shall be mounted in the test facility in accordance with the manufacturer's normal fixing instructions. However, the door frame shall be fixed in such a way that its bow does not exceed 1,0 mm under test.

6.3 The door's closing condition

6.3.1 During exposure to the climates

The door shall be latched and unlocked, unless this is inconsistent with the hardware of the door set.

6.3.2 When determining bow

The bow shall be determined with the door unlatched.

NOTE This means that the door is slightly open and that the door leaf is under the minimum stress.

If the bow of the door leaf is measured in a different state, this shall be recorded and the reasons given.

6.3.3 When determining air permeability

If the air permeability of the door is to be measured, this shall be done with the door closed and locked.

7 Measurement methods and accuracy

7.1 Bow

The bow of the door leaf shall be measured in accordance with the procedure specified in 4.2 of EN 952. The deviation shall be measured and recorded to an accuracy of 0,1 mm.

7.2 Operating forces

The operating forces shall be determined in accordance with EN 12046-2 when specified in the test procedure. Each determination of operating forces shall be completed before the loss of bow has exceeded 10 % of the bow measured previously.

7.3 Air permeability

If required, air permeability shall be measured in accordance with EN 1026 when specified in the test procedure. Alternatively, the air permeability may be determined away from the climatic test facility provided that the door is maintained in its deformed condition within 10 % (e.g. as shown in Annex B). For this the door leaf is deformed mechanically in such manner as to reproduce the bow caused by the climatic stress.

NOTE 1 It is recommended that all air permeability checks are carried out in the climate chambers without moving the frame of the test specimen.

If during the determination of the air permeability the bow of the door leaf has changed by more than 10 %, the bow shall be reset by changing the pressure applied to the jack, and the

measurement of air permeability repeated. This shall be carried out either in the climate chambers or outside. If the measurement of air permeability is carried out outside the climate chambers, the loss of bow of the leaf shall not exceed 10 % of the bow measured previously. If necessary, the closing edge of the leaf shall be deformed mechanically with an appropiate device so as to reproduce the bow measured previously.

NOTE 2 Annexe B shows an example of such a device.

8 Test conditions

Table 1 - Test climate a to d

Test climates	Required climates			
	Side 1		Side 2	
	Air temperature (θ_1) °C	Relative humidity (φ_1) %	Air temperature (θ_2) °C	Relative humidity (φ_2) %
a	23 ± 2	30 ± 5	18 ± 2	50 ± 5
b	23 ± 2	30 ± 5	13 ± 2	65 ± 5
c	23 ± 2	30 ± 5	3 ± 2	85 ± 5
d	23 ± 2	30 ± 5	-15 ± 2	No requirements

θ_1 air temperature on side 1

θ_2 air temperature on side 2

φ_1 relative humidity on side 1

φ_2 relative humidity on side 2.

The mean values of temperature and relative humidity shall be kept as close as practicable to the nominal values. The stated tolerances are maximum allowable deviations.

Table 2 - Test climate e

Test climates	Required climates			
	Side 1		Side 2	
e	Air temperature (θ_1) °C	Relative humidity (φ_1) %	Air temperature (θ_2) °C	Relative humidity (φ_2) %
	20 min. 30 max.	No requirements	Reference temperature $\theta_3 = \theta_1 + (55 \pm 5)$	No requirements

θ_1 air temperature on side 1

θ_3 reference temperature for heating up the door surface by radiation
The reference temperature is the average temperature of at least three reference surfaces as described in 5.2, placed on the surface of the door leaf or on the test frame

φ_1 relative humidity on side 1.

φ_2 relative humidity on side 2.

The mean values of temperature and relative humidity shall be kept as close as practicable to the nominal values. The stated tolerances are maximum allowable deviations.

8.1 Verification of the test temperatures

Air temperatures shall be measured to an accuracy of ± 0,5 °C, within planes parallel to each face of the door leaf, at a distance of (100 ± 50) mm. They shall be measured at 3 points, at least, located in the centre of the door leaf and symmetrically to the vertical axis of the door leaf, within 100 mm of the top and the bottom of the leaf. If more points are measured, they shall be arranged symmetrically to the vertical and horizontal axes of the door leaf. The average of the results from all the measuring points on each face shall be taken as the temperature of the climate applied on that face.

NOTE This procedure does not apply to the measurement of the surface temperature when heating is achieved by radiation (face 2 in climate “e”). In this case, the procedure for measuring the surface temperature is specified in table 2.

8.2 Air velocity

Air velocities shall be sufficient to ensure that the maximum difference in air temperature registered within the plane of measurement in front of each side of the door leaf does not exceed 2 °C.

NOTE Air velocities ≥ 0,3 m/s are usually adequate.

8.3 Surface temperature and radiation properties of the test chamber walls

The difference between the air temperature and the temperature of those surfaces of the test chamber visible from the test specimen shall not exceed 3 °C when testing to climates a, b, c or d. Those surfaces shall have an emission coefficient ε in range $\lambda \geq 0{,}7$ μm of at least 0,85.

NOTE This can normally be achieved by painting with a paint that contains no metallic pigments.

9 Procedure

The measurement methods shall comply with clause 7.

9.1 Test sequence with set of climates a, b, or c

9.1.1 testing doors with no special requirements

- measurement of initial bow ;

- determination of operating forces ;

- exposure of the doorset to the set of climates specified in table 1;

- measurement of final bow ;

- determination of operating forces ;

- calculation of the difference between final and initial bow.

The exposure to the specified set of climates shall not be less than 7 days and not more than 28 days. In between those two durations, the exposure shall be terminated if during 3 successive days, the increase in deformation is less than 0,1 mm per day.

NOTE See sequence of test procedures illustrated in Annex C.

9.1.2 Testing doors with requirements for air permeability

- measurement of initial bow ;

- determination of operating forces ;