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Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics

Fenster und Türen - Produktnorm, Leistungseigenschaften - Teil 1: Fenster und Außentüren ohne Eigenschaften bezüglich Feuerschutz und/oder Rauchdichtheit

Fenêtres et portes - Norme produit, caractéristiques de performance - Partie 1: Fenêtres et blocs portes extérieurs pour piétons sans caractéristiques de résistance au feu et/ou dégagement de fumée

**Ta slovenski standard je istoveten z: EN 14351-1:2006**

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English Version

Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics

Fenêtres et blocs portes pour piétons - Norme produit, caractéristiques de performance - Partie 1 : Fenêtres et blocs portes extérieurs pour piétons sans caractéristiques de résistance au feu, de dégagement de fumée et de feu extérieur, incluant les performances concernant les feux extérieurs des fenêtres de toit

Fenster und Türen - Produktnorm, Leistungseigenschaften - Teil 1: Fenster und Außentüren ohne Eigenschaften bezüglich Feuerschutz und Rauchdichtheit, aber mit Schutz gegen Brand von außen für Dachflächenfenster

This European Standard was approved by CEN on 3 February 2006.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This European Standard (EN 14351-1:2006) 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 September 2006, and conflicting national standards shall be withdrawn at the latest by December 2008.

This European Standard is one of a series of standards for windows and pedestrian doorsets (see Figure 1).

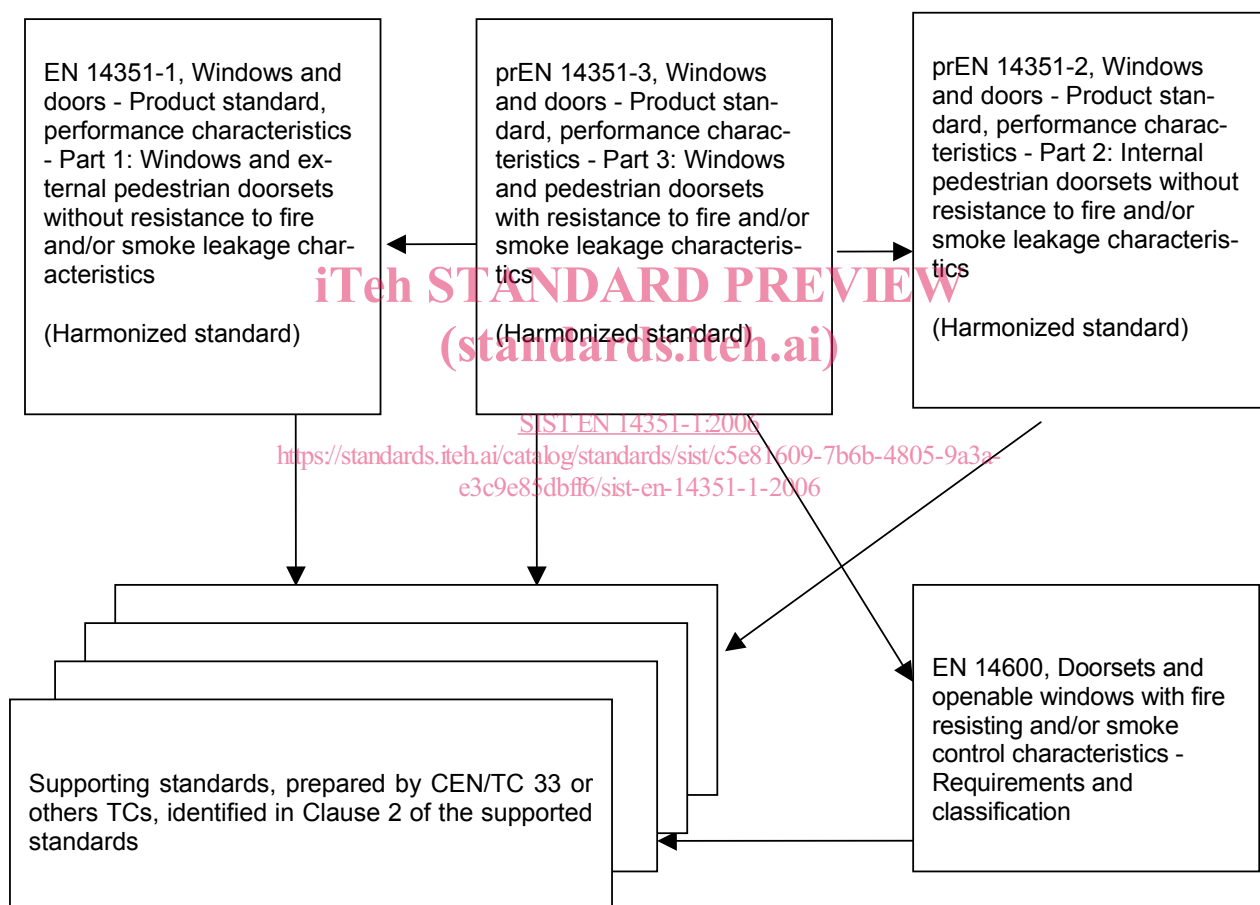


Figure 1 — Relationship between various standards

Parts of this European Standard have been prepared under the mandates M/101 (M/126) and M/122 given to CEN by the European Commission and the Free Trade Association and support the essential requirements of European Directives.

For relationship with European Directives, see informative Annexes ZA, ZB and ZC, which are integral parts of this European Standard.

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

## 1 Scope

This European Standard identifies material independent performance characteristics that are applicable to windows (including roof windows, roof windows with external fire resistance and French windows), external pedestrian doorsets (including unframed glass doorsets, escape route doorsets) and screens.

This European Standard applies to:

- Manually or power operated windows, French windows and screens for installation in vertical wall apertures and roof windows for installation in inclined roofs, complete with:
  - related hardware, if any;
  - weather stripping, if any;
  - glazed apertures when intended to have glazed apertures;
  - with or without incorporated shutters and/or shutterboxes and/or blinds;

and manually or power operated windows, roof windows, French windows and screens that are

- fully or partially glazed including any non-transparent infill;
  - fixed or partly fixed or openable with one or more casements/sashes (e.g. hinged, projecting, pivoted, sliding).
- Manually or power operated external pedestrian doorsets with flush or panelled leaves, complete with:
- integral fanlights, if any;
  - adjacent parts that are contained within a single frame for inclusion in a single aperture, if any.

The products covered by this European Standard are not assessed for structural applications.

This European Standard does not apply to:

- windows and pedestrian doorsets subject to regulations on smoke leakage and resistance to fire according to prEN 14351-3 but individual characteristics and performance requirements given in clause 4 can be relevant for these doors and windows (see prEN 14351-3);
- rooflights according to EN 1873 and prEN 14963;
- curtain walling according to EN 13830;
- industrial, commercial and garage doors and gates according to EN 13241-1;
- internal pedestrian doorsets according to prEN 14351-2 but individual characteristics and performance requirements given in clause 4 can be relevant for internal doors (see prEN 14351-2);
- revolving doorsets;
- windows for escape routes.

## 2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

### 2.1 Classification standards

EN 1192, *Doors — Classification of strength requirements*

EN 1522, *Windows, doors, shutters and blinds — Bullet resistance — Requirements and classification*

ENV 1627, *Windows, doors, shutters — Burglar resistance — Requirements and classification*

EN 12207:1999, *Windows and doors — Air permeability — Classification*

EN 12208, *Windows and doors — Watertightness — Classification*

EN 12210, *Windows and doors — Resistance to wind load — Classification*

EN 12217, *Doors — Operating forces — Requirements and classification*

EN 12219, *Doors — Climatic influences — Requirements and classification*

EN 12400, *Windows and pedestrian doors — Mechanical durability — Requirements and classification*

EN 13049, *Windows — Soft and heavy body impact — Test method, safety requirements and classification*

EN 13115, *Windows — Classification of mechanical properties — Racking, torsion and operating forces*

EN 13123-1, *Windows, doors and shutters — Explosion resistance — Requirements and classification — Part 1: Shock tube*

EN 13123-2, *Windows, doors, and shutters — Explosion resistance — Requirements and classification — Part 2: Range test*

### 2.2 Test and calculation standards

EN 179, *Building hardware — Emergency exit devices operated by a lever handle or push pad — Requirements and test methods*

EN 410, *Glass in building — Determination of luminous and solar characteristics of glazing*

EN 947, *Hinged or pivoted doors — Determination of the resistance to vertical load*

EN 948, *Hinged or pivoted doors — Determination of the resistance to static torsion*

EN 949, *Windows and curtain walling, doors, blinds and shutters — Determination of the resistance to soft and heavy body impact for doors*

EN 950, *Door leaves — Determination of the resistance to hard body impact*

EN 1026, *Windows and doors — Air permeability — Test method*

EN 1027, *Windows and doors — Watertightness — Test method*

EN 1121, *Doors — Behaviour between two different climates — Test method*



- EN 1125, *Building hardware — Panic exit devices operated by a horizontal bar — Requirements and test methods*
- ENV 1187, *Test methods for external fire exposure to roofs*
- EN 1191, *Windows and doors — Resistance to repeated opening and closing — Test method*
- EN 1523, *Windows, doors, shutters and blinds — Bullet resistance — Test method*
- ENV 1628, *Windows, doors, shutters — Burglar resistance — Test method for the determination of resistance under static loading*
- ENV 1629, *Windows, doors, shutters — Burglar resistance — Test method for the determination of resistance under dynamic loading*
- ENV 1630, *Windows, doors, shutters — Burglar resistance — Test method for the determination of resistance to manual burglary attempts*
- EN 12046-1, *Operating forces — Test method — Part 1: Windows*
- EN 12046-2, *Operating forces — Test method — Part 2: Doors*
- EN 12211, *Windows and doors — Resistance to wind load — Test method*
- EN 12354-3, *Building acoustics — Estimation of acoustic performance of buildings from the performance of elements — Part 3: Airborne sound insulation against outdoor sound*
- EN 12758:2002, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*
- EN 13124-1, *Windows, doors and shutters — Explosion resistance — Test method — Part 1: Shock tube*
- EN 13124-2, *Windows, doors and shutters — Explosion resistance — Test method — Part 2: Range test*
- EN 13141-1:2004, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 1: Externally and internally mounted air transfer devices*
- EN 13363-1, *Solar protection devices combined with glazing — Calculation of solar and light transmittance — Part 1: Simplified method*
- EN 13363-2, *Solar protection devices combined with glazing — Calculation of total solar energy transmittance and light transmittance - Part 2: Detailed calculation method*
- ENV 13420, *Windows — Behaviour between different climates — Test method*
- EN 14608, *Windows — Determination of the resistance to racking*
- EN 14609, *Windows — Determination of the resistance to static torsion*
- EN ISO 140-3, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 3: Laboratory measurements of airborne sound insulation of building elements (ISO 140-3:1995)*
- EN ISO 717-1, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation (ISO 717-1:1996)*
- EN ISO 10077-1:2000, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 1: Simplified method (ISO 10077-1:2000)*
- EN ISO 10077-2, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 2: Numerical method for frames (ISO 10077-2:2003)*

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EN ISO 12567-1, *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Part 1: Complete windows and doors (ISO 12567-1:2000)*

EN ISO 12567-2, *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Part 2: Roof windows and other projecting windows (ISO 12567-2:2005)*

### 2.3 Other standards

EN 1863-2, *Glass in building — Heat strengthened soda lime silicate glass — Part 2: Evaluation of conformity/Product standard*

EN 12150-2, *Glass in building — Thermally toughened soda lime silicate safety glass — Part 2: Evaluation of conformity/Product standard*

EN 12453:2000, *Industrial, commercial and garage doors and gates — Safety in use of power operated doors — Requirements*

EN 12519:2004, *Windows and pedestrian doors — Terminology*

prEN 12650-1, *Automatic door systems - Part 1: Product requirements and test methods*

prEN 12650-2, *Automatic door systems - Part 2: Safety at automatic pedestrian doors*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 13501-5, *Fire classification of construction products and building elements — Part 5: Classification using test data from external fire exposure to roof tests*

prEN 13633, *Building hardware — Electrically controlled panic exit systems for use on escape routes — Requirements and test methods*

prEN 13637, *Building hardware — Electrically controlled emergency exit systems for use on escape routes — Requirements and test methods*

EN 14179-2, *Glass in building — Heat soaked thermally toughened soda lime silicate safety glass — Part 2: Evaluation of conformity/Product standard*

EN 14321-2, *Glass in building — Thermally toughened alkaline earth silicate safety glass — Part 2: Evaluation of conformity/Product standard*

EN 60335-2-103, *Household and similar electrical appliances — Safety — Part 2-103: Particular requirements for drives for gates, doors and windows (IEC 60335-2-103:2002)*

EN 61000-6-1, *Electromagnetic compatibility (EMC) — Part 6-1: Generic standards; Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1:1997, modified)*

EN 61000-6-3, *Electromagnetic compatibility (EMC) — Part 6-3: Generic standards; Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:1996, modified)*

EN ISO 9001, *Quality management systems – Requirements (ISO 9001:2000)*

EN ISO 12543-2, *Glass in building – Laminated glass and laminated safety glass – Part 2: Laminated safety glass (ISO 12543-2:1998)*

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units*

### 3 Terms and definitions

For the purposes of this European Standard, units and symbols given in ISO 1000:1992, terms and definitions given in EN 12519:2004 and the following apply.

#### 3.1

##### **external pedestrian doorset**

doorset which separates the internal climate from the external climate of a construction for which the main intended use is the passage of pedestrians. External pedestrian door assemblies fulfilling the provisions of this European Standard under the responsibility of one identified manufacturer are considered to be external pedestrian doorsets

#### 3.2

##### **overall area**

frame width x frame height  
(see EN 12519:2004, 3.4)

#### 3.3

##### **screen**

assembly of two or more windows and/or external pedestrian doorsets in one plane with or without separate frames

#### 3.4

##### **similar design**

modification by the replacement of components (e.g. glazing, hardware, weather stripping), and/or a change of material specification and/or dimensional change of profile section and/or methods and means of assembly which will not change the classification and/or declared value of a performance characteristic

NOTE Certain modifications might cause more favourable values for one or more characteristics, but also more unfavourable values for other characteristics (see Annex A).

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#### 3.5

##### **unframed glass doorset**

doorset where the leaf (leaves) and any adjacent part(s) are made of glass (e.g. single or insulating glass unit) and without any load bearing or load transferring framework

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#### 3.6

##### **adjacent part**

any part of a doorset, other than the door leaf (leaves), including outer frame, side panels, and overpanels

### 4 Performance characteristics and special requirements

#### 4.1 General

The performance characteristics for windows and external pedestrian doorsets shall be determined and expressed in accordance with 4.2 to 4.23.

NOTE 1 Not all these characteristics are applicable to every product or every intended end use situation. Where characteristics are required this European Standard identifies the means of determination and the ways to express the results as well as the evaluation of conformity.

NOTE 2 The order in which the performance characteristics are identified does not imply an order of priority or a test sequence.

NOTE 3 Special requirements for certain products, see 4.24.

## 4.2 Resistance to wind load

Tests on windows and external pedestrian doorsets shall be carried out in accordance with EN 12211. The deflection of frame elements (e.g. transoms and mullions) shall be determined by calculation or by test (reference method).

The results shall be expressed in accordance with EN 12210. The air permeability tests and classification referred to in EN 12210 shall be in accordance with 4.14.

The manufacturer shall provide sufficient information on the infill to enable the determination of the load-bearing capacity of the infill, e.g. information on the thickness and type of glass.

NOTE When appropriate European Standards are in place, the determination of the load-bearing capacity should be carried out as prescribed in those European Standards.

## 4.3 Resistance to snow and permanent load

The manufacturer shall provide sufficient information on the infill to enable the determination of the load-bearing capacity of the infill, e.g. information on the thickness and type of glass.

NOTE When appropriate European Standards are in place, the determination of the load-bearing capacity should be carried out as prescribed in those European Standards.

## 4.4 Fire characteristics

### 4.4.1 Reaction to fire

The (materials used in) roof windows shall be tested and classified in accordance with EN 13501-1.

### 4.4.2 External fire performance

Roof windows shall be tested and classified in accordance with EN 13501-5.

## 4.5 Watertightness

A watertightness test shall be carried out in accordance with EN 1027.

The results shall be expressed in accordance with EN 12208.

The test for watertightness of screens shall be carried out on the screen or on its individual parts. In the latter case the designation of the screen shall be determined by the part(s) with the most unfavourable performance.

## 4.6 Dangerous substances

In so far as the state of the art permits, the manufacturer shall establish those materials in the product which are liable to emission or migration during normal intended use and for which emission or migration into the environment is potentially dangerous to hygiene, health or the environment. The manufacturer shall establish and make the appropriate declaration of content according to the legal requirements in the intended country of destination.

NOTE An informative database of European and national provisions on dangerous substances is identified in Annex ZA.

## 4.7 Impact resistance

Windows and external pedestrian doorsets fitted with glass or other fragmental material shall be tested and the results shall be expressed in accordance with EN 13049. Where relevant, the test shall be carried out from both sides.

#### 4.8 Load-bearing capacity of safety devices

Safety devices (e.g. retaining and reversing catches, restrictors, and fixing devices for cleaning procedures), if provided and engaged in accordance with the manufacturer's published instructions, shall be able to hold the leaf, casement or sash in place for 60 s when 350 N are applied to the leaf, casement or sash in the most unfavourable way (i.e. position, direction). This threshold strength shall be demonstrated by means of tests carried out as described in EN 14609 or EN 948 (reference methods), or by calculation.

#### 4.9 Height and width of doorsets and French windows

The clear opening height and width of external pedestrian doorsets and French windows (see EN 12519:2004, 3.1) shall be expressed in mm.

Where the threshold and the head/transom are not parallel, the maximum and minimum height shall be stated.

NOTE The height and width can be diminished due to projecting hardware and angle of opening.

#### 4.10 Ability to release

Emergency exit devices and panic devices installed on external pedestrian doorsets in escape routes shall comply with EN 179, EN 1125, prEN 13633 or prEN 13637.

Doorsets intended for escape routes shall be identified as such with the appropriate class according to Table 2.

#### 4.11 Acoustic performance

The sound insulation shall be determined in accordance with EN ISO 140-3 (reference method) or for specific window types in accordance with Annex B.

The test results shall be evaluated in accordance with EN ISO 717-1.

#### 4.12 Thermal transmittance

The thermal transmittance for windows and external pedestrian doorsets shall be determined by using:

— EN ISO 10077-1:2000, Table F.1

or by calculation using:

— EN ISO 10077-1 or

— EN ISO 10077-1 and EN ISO 10077-2

or by hot box method using:

— EN ISO 12567-1 or

— EN ISO 12567-2

as appropriate.

EN ISO 12567-1 shall be used as reference method for windows and doorsets, EN ISO 12567-2 as reference method for roof windows.

The collective symbols for thermal transmittance are  $U_w$  for windows and  $U_D$  for doorsets, i.e. the symbol  $U_{st}$  used in EN ISO 12567-1 is equivalent to  $U_w$  or  $U_D$  and the symbol  $U_m$  used in EN ISO 12567-2 is equivalent to  $U_w$ .

#### 4.13 Radiation properties

The determination of the total solar energy transmittance (solar factor, g-value) and light transmittance of translucent glazings shall be carried out in accordance with EN 410, or if relevant, with EN 13363-1 or EN 13363-2 (reference method).

#### 4.14 Air permeability

Two air permeability tests shall be carried out in accordance with EN 1026, one with positive test pressures and one with negative test pressures.

The tests for air permeability of screens shall be carried out on the screen or on its individual parts including joints between the individual parts. In the latter case the air permeability of the screen shall be calculated as the sum of the air permeability of the individual parts and the joints.

The test result, defined as the numerical average of the two air permeability values ( $\text{m}^3/\text{h}$ ) at each pressure step shall be expressed in accordance with EN 12207:1999, 4.6.

#### 4.15 Durability

##### 4.15.1 General

The manufacturer shall provide information about maintenance and the replaceable parts.

The manufacturer shall declare the material(s) from which the product is manufactured including any applied coating and/or protection. This shall apply to all components that have an effect on the durability of the product in intended use except those components that comply with individual product standards (hardware, weather stripping). Where possible this shall be done by reference to European Standards.

By means of adequate choice of materials (including coatings, preservations, composition and thickness), components and assembly methods, the manufacturer shall ensure the durability of his product(s) for an economically reasonable working life taking into account his published maintenance recommendations.

NOTE The durability of windows and external pedestrian doorsets depends on the long-term performance of the individual components and materials as well as the assembly of the product and its maintenance. Specifications and classifications for individual materials and components are to be found in their respective material and component standards.

##### 4.15.2 Durability of certain characteristics

The durability of certain characteristics shall be ensured as follows:

- watertightness and air permeability: The durability of these characteristics depends mainly on the weather strippings which shall be replaceable.
- thermal transmittance: The durability of this characteristic is mainly linked to the long-term performance of the glazing (especially the Insulated Glass Units (IGU)). Glass meeting the requirements of the standards identified in Annex C shall be deemed to meet the durability requirements.
- ability to release (only for locked doorsets in escape routes): The durability of this characteristic shall be ensured by compliance with 4.10.
- operating forces: (only for automatic devices) The durability of this characteristic is covered by 4.24.2.2.

#### 4.16 Operating forces

Manually operated windows shall be tested in accordance with EN 12046-1. The results shall be expressed in accordance with EN 13115.

Manually operated external pedestrian doorsets shall be tested in accordance with EN 12046-2. The results shall be expressed in accordance with EN 12217.

#### 4.17 Mechanical strength

Windows shall be tested in accordance with EN 14608 and EN 14609. Prior to and after those tests manually operated windows shall be tested in accordance with EN 12046-1. The results shall be expressed in accordance with EN 13115.

External pedestrian doorsets shall be tested in accordance with EN 947, EN 948, EN 949 and EN 950. The results shall be expressed in accordance with EN 1192.

#### 4.18 Ventilation

Air transfer devices integrated in a window or an external pedestrian doorset shall be tested and evaluated in accordance with EN 13141-1:2004, 4.1. Joints and openings not subject to testing shall be taped over.

The results shall include:

- air flow characteristics ( $K$ ) and flow exponent ( $n$ );
- air flow rate at (4, 8, 10 and 20) Pa pressure difference.

NOTE 1 Additional pressure differences may be stated.

The volume air flow rate  $q_v$  shall be determined as follows:

$$q_v = K (\Delta p)^n$$

where

$K$  is the air flow characteristic of the device;

$n$  is the flow exponent;

$\Delta p$  is the pressure difference.

NOTE 2 Individual devices, designated to be installed in a window or external pedestrian doorset at a later date, are not covered by this European Standard.

#### 4.19 Bullet resistance

After testing in accordance with EN 1523 the bullet resistant characteristics of windows and external pedestrian doorsets shall be expressed in accordance with EN 1522.

#### 4.20 Explosion resistance

##### 4.20.1 Shock tube

After testing in accordance with EN 13124-1 the explosion resistance characteristics of windows and external pedestrian doorsets shall be expressed in accordance with EN 13123-1.

##### 4.20.2 Range test

After testing in accordance with EN 13124-2 the explosion resistance characteristics of windows and external pedestrian doorsets shall be expressed in accordance with EN 13123-2.