



SLOVENSKI STANDARD
oSIST prEN 16005:2009
01-december-2009

Avtomatska električna vhodna vrata - Varnost pri uporabi avtomatskih vhodnih vrat - Zahteve in preskusne metode

Powered pedestrian doors - Safety in use of power pedestrian doors - Requirements and test methods

Kraftbetätigte Türen - Nutzungssicherheit an kraftbetätigten Türen - Anforderungen und Prüfverfahren

Portes motorisées pour piétons - Utilisation sûre des portes motorisées pour piétons - Exigences et méthodes d'essai

Ta slovenski standard je istoveten z: prEN 16005

SIST EN 16005:2013

<https://standards.iteh.ai/catalog/standards/sist/8f637747-f243-484e-aea6-b37f504d4c9f/sist-en-16005-2013>

ICS:

91.060.50	Vrata in okna	Doors and windows
-----------	---------------	-------------------

oSIST prEN 16005:2009

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 16005

October 2009

ICS 91.190

English Version

**Powered pedestrian doors - Safety in use of power pedestrian
doors - Requirements and test methods**

Portes motorisées pour piétons - Utilisation sûre des portes
motorisées pour piétons - Exigences et méthodes d'essai

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 33.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

SIST EN 16005:2013

<https://standards.iteh.ai/catalog/standards/sist/8f637747-f243-484e-acaf-b37f504d4c9f/sist-en-16005-2013>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
Foreword	3
Introduction	4
1 Scope	5
1.1 General	5
1.2 Exclusions	5
2 Normative references	6
3 Terms and definitions	7
4 Requirements	9
4.1 General	9
4.2 Product information for installation, operation and maintenance	9
4.3 Drive	10
4.4 Door	11
4.5 Activation	11
4.6 Avoidance of danger points and protection at danger points	13
4.7 Additional requirements	22
5 Tests	26
5.1 General	26
5.2 Test conditions	27
5.3 Product information for installation, operation and maintenance	28
5.4 Drive	28
5.5 Door	28
5.6 Manual operation	28
5.7 Activation	28
5.8 Durability test	28
5.9 Special tests for hazards of revolving doors	29
5.10 Test results	30
Annex A (informative) Illustration of some essential terms for various types of door	31
Annex B (normative) Measuring points	32
Annex C (normative) Tests for protective devices	36
Annex D (informative) Infirm person sign	41
Annex E (informative) Emergency break-out sign	42
Annex F (normative) Low energy doors	43
F.1 Speed settings for low energy powered hinged and swing doors	43
F.2 Safeguarding of powered hinged and swing doors	43
F.3 Speed settings for low energy sliding doors	47
F.4 Time settings for low energy sliding doors	48
Annex G (informative) Danger points at revolving doors	51
Annex H (normative) Log book	54
Annex ZA (informative) Relationship between this European Document and the Essential Requirements of EU Directive 2006/42/EC	55

Foreword

This document (prEN 16005:2009) was prepared by CEN/TC 33, "Doors, windows, shutters, building hardware and curtain walling," the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s) see informative Annex ZA which is integral part of this document.

This document is a supporting standard of the relevant product standard(s) for power operated pedestrian doors with or without fire resistance or smoke control characteristics.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN 16005:2013](https://standards.iteh.ai/catalog/standards/sist/8f637747-f243-484e-acaf-b37f504d4c9f/sist-en-16005-2013)

<https://standards.iteh.ai/catalog/standards/sist/8f637747-f243-484e-acaf-b37f504d4c9f/sist-en-16005-2013>

Introduction

With the aim of clarifying the intentions of this European Standard and avoiding doubts when reading it, the following assumptions were made when producing it:

a) doors and components without specific requirements are:

- designed in accordance with the usual engineering practice and calculation codes for intended use, including all failure modes;
- of sound mechanical and electrical construction;
- made of materials with adequate strength and of suitable quality;

b) doors and components are kept in good repair and working order, so that the required characteristics remain during the economical working life despite wear;

c) For doors built according to good practice and the requirements of this European Standard to be fully effective it is assumed that:

- consultation shall occur between the manufacturer and the purchaser concerning particular conditions for the
 - use and places of use for the door related to health and safety;
 - place of use/installation to be adequately lit;
 - place of use/installation to allow safe use of the door.

These assumptions do not restrict the need for adequate information for use in this European Standard

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

SIST EN 16005:2013

<https://standards.iteh.ai/catalog/standards/sist/8f637747-f243-484e-acaf-b37f504d4c9f/sist-en-16005-2013>

1 Scope

1.1 General

This Standard specifies requirements regarding design and test methods for external and internal power operated pedestrian doors. Such door constructions may be operated electro-mechanically, electro-hydraulically or pneumatically.

This Standard covers safety in use of power operated pedestrian doors used for normal access as well as in escape routes and as fire and smoke control doors

The type of doors covered include power operated pedestrian sliding, swing, hinged and revolving doors, including sliding / swing (balanced) doors and folding doors with a horizontally moving leaf.

This European Standard does not cover operation in environments where the electromagnetic disturbances are outside the range of those specified in EN 61000-6-3.

1.2 Exclusions

It does not apply to:

- vertically moving doors;
- doors on lifts;
- doors on vehicles;
- powered doors or gates mainly intended for vehicular traffic or access for goods;
- doors used in industrial processes;
- partition walls;
- doors outside the reach of people (such as crane gantry fences);
- barriers;
- turnstiles.
- platform doors

This standard does not cover special functions of doors, like security in banks, airports, etc. or fire compartment, where conformity of the specific function with requirements of the application shall have the precedence.

This European Standard does not cover the radio part of doors. If a radio operating device is used, the relevant ETSI standards should be applied in addition.

This European Standard does not contain any specific requirement regarding noise emitted by a door in relation with the Machinery Directive as it is not considered to be a significant hazard.

This European Standard is not applicable to power operated pedestrian doors manufactured before the date of publication of this document by CEN.

This European Standard does not cover operation in environments where there is a risk of explosion.

2 Normative references

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

EN 349 *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body*

EN 982 *Safety of machinery - Safety requirements for fluid power systems and their components - Hydraulics*

EN 983 *Safety of machinery - Safety requirements for fluid power systems and their components - Pneumatics*

EN 1154 *Building hardware - Controlled door closing devices - Requirements and test methods*

EN 1760-1 *Safety of machinery - Pressure sensitive protective devices - Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors*

EN 1760-2 *Safety of machinery - Pressure sensitive protective devices - Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars*

EN 12100-1 *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology*

EN 12433-1 *Industrial, commercial and garage doors and gates - Terminology - Part 1: Types of doors*

EN 12433-2 *Industrial, commercial and garage doors and gates - Terminology - Part 2: Parts of doors*

EN 12519 *Windows and pedestrian doors - Terminology*

EN 12978 *Industrial, commercial and garage doors and gates - Safety devices for power operated doors and gates - Requirements and test methods*

EN 13849-1 *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design*

EN 13850 *Safety of machinery - Emergency stop - Principles for design*

EN 13857 *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs*

EN 14600 *Doorsets and openable windows with fire resisting and/or smoke control characteristics - Requirements and classification*

EN 17025 *General requirements for the competence of testing and calibration laboratories*

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

EN 60529 *Degrees of protection provided by enclosures (IP Code)*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12433-1 (definitions from 2.1 to 3.11), EN 12433-2, EN 12519 and the following apply:

3.1

powered pedestrian door

door for pedestrian passage only with one or more leaves that is moved, at least in one direction, by an external energy supply (e.g. electrically) or by means of stored energy. It includes drive unit, leaves, safety devices and any components needed for its safe operation

3.2

revolving door

powered pedestrian door with one or more leaves connected to a common vertical axis of rotation within an enclosure

NOTE 1 There are a wide range of design variations in this product group. See Figure 1 for examples.

NOTE 2 Figure 1 refers to any rotation. The shown anticlockwise rotation is only the more common one.

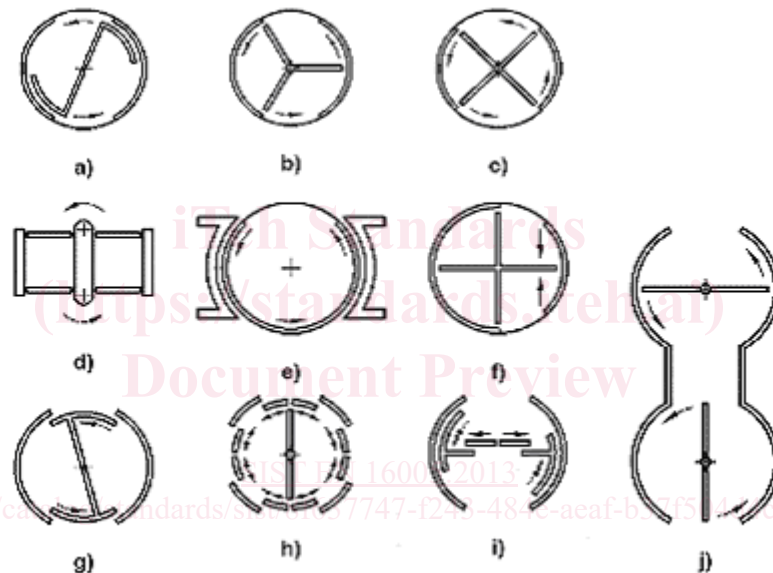


Figure 1 – Revolving doors

3.3

Hinged door

powered pedestrian door with a leaf which is hinged or pivoted at one side which only opens one way.

3.4

Swing door

powered pedestrian door with a leaf which is hinged or pivoted at one side which opens both ways.

3.5

Low energy powered door

powered pedestrian door with a limited kinetic energy when the open gap is bigger than 3° or 5 cm to cover also low energy sliding doors

3.6

break-out

system whereby door leaves and/or side screens can be pushed open manually in the direction of escape

prEN 16005:2009 (E)**3.7****monitoring system**

System that checks and verifies the correct functioning of another system and in the event of any malfunctioning of that system switches the powered door to a selected safe mode of operation

3.8**activator**

means by which the power operation of the door is started

3.9**automatic activation**

activation achieved automatically without the user needing to perform any function except approaching the door

NOTE Activation can, for example, be by radar, infra-red sensors or mat activators.

3.10**cycle**

movement consisting of an opening and closing movement

NOTE For sliding, swing and hinged doors a cycle consists of a complete opening and closing movement.
For revolving doors a cycle means 180° of rotation.
When duration of activation of a revolving door is set by a timer, the time set is considered to be a cycle.

3.11**lintel**

horizontal structural member spanning an opening at its head to carry a load above the opening

3.12**side screen**

fixed construction that can be part of a powered pedestrian door assembly

3.13**track**

component or assembly designed to guide or support a door leaf when it moves

3.14**leading mullion**

door mullion at the first point at which a leaf of a powered revolving door passes the curved screens

NOTE See Annex A.

3.15**trailing mullion**

door mullion at the last point at which a leaf of a revolving door passes the curved screens

NOTE See Annex A.

3.16**person in need of special protection**

person requiring special protection as a result of a physical disability or handicap or lack of awareness of hazardous situations

3.17**fire door**

generic term used in this standard for fire resistance doors and/or smoke control doors

NOTE For complete definition of Fire Resisting Doorset and Smoke Control Doorset see EN 14600

4 Requirements

4.1 General

Powered pedestrian doors as specified in this standard shall be designed, constructed, installed, operated and properly maintained to meet the requirements of this standard.

The expected characteristics of the users and the exact operational requirements shall be specified in collaboration with the client/operator in order to take into account the volume and type of pedestrian traffic that is likely to pass through the installation. Pedestrian traffic may include persons in need of special protection in the case of applications in which powered pedestrian doors may be used by persons other than those trained in their use.

A risk assessment shall be carried out to ensure that, as regards door type, operating mode, activation and safety devices, powered pedestrian doors are not only designed and equipped but can also be installed and used in such a way that they neither present non-acceptable hazards or risks to the users of the door and persons in its vicinity. Warning signs shall be used to draw the users' attention to any residual risks.

Powered pedestrian doors shall be designed and installed in such a way that they do not have any sharp edges that could result in injuries due to cuts or grazes.

Powered pedestrian doors shall be designed such that they can be installed, used, inspected and maintained safely.

Provisions shall be taken to prevent unintentional disengagement of components or parts of components during use.

4.2 Product information for installation, operation and maintenance

The manufacturer shall provide an operating manual and information on operation, maintenance and inspection. Documents with instructions on how to correctly install the powered door system shall be provided where appropriate.

Particular importance is attached to the description of danger points, the appropriate safety devices and residual risks.

All documentation relevant to the door, the installation, the maintenance requirements and any incorporated diagrams, shall be legible and written in a language acceptable in the country in which the product is to be installed.

Installation instructions to be used solely by the professional installer and which are not intended to be handed over to the owner, may be written in any official language used in Europe and agreed upon between manufacturer and purchaser.

The documentation shall include all the necessary warning, advisory or cautionary notices.

All symbols and diagrams incorporated into the documentation shall be in accordance with relevant European Standards.

The installation instructions shall detail all operations to be carried out to safely install or upgrade the door and shall clearly state when the specified procedure can be adequately completed by non-professionals.

The installation instructions shall state that all requirements of this standard shall be met and, if necessary, be verified.

Proper operating instructions including routine maintenance instructions shall be provided to the final user after installation/upgrading of the door.

User instructions shall at least include the following, as far as applicable:

- correct methods for operating the door;
- operating conditions: e.g. operating hours per day, automatic/manual operation; indication of the operating mode(s);
- explanation of the warning signs of the door;
- information about the safe use of manual emergency and/or manual release;
- range of intended environmental conditions (e.g. temperature, relative humidity, electromagnetic fields, and
- when applicable, warning against use in windy conditions);

prEN 16005:2009 (E)

– restrictions of use.

Details of safety functions, list and location of safety devices shall also be provided.

The documentation shall also contain information on prohibited use such as dashing through a closing door.

Routine maintenance instructions shall detail frequency of maintenance to be carried out and give simple general instructions for those that can be undertaken by the owner without any specific competence, highlighting all other maintenance is to be carried out by professionals.

The maintenance instructions shall inform the owner about the importance of recording any maintenance operation.

4.3 Drive**4.3.1 General**

The drive shall be constructed in such a way that it will move and stop the leaf (leaves) in a safe manner under intended conditions of use. It shall provide connection facilities for all relevant start, stop and safety devices.

Electrical drives and their components shall fulfil the requirements of EN 60335-2-103 for electrical safety.

4.3.2 Switching off the drive

When mains power of the drive is deactivated, either by the user or by a leaf travel-limiting device or by the interruption of the power supply, the leaf movement shall stop or reach a pre-determined safe position after one or more cycles and stop without endangering persons. A low-energy power operation mode complying with 4.6.4 and 4.6.5 is considered safe for persons. The pre-determined safety position can be reached using any kind of stored energy, including batteries. The leaf shall remain stationary until the cause of deactivation has been eliminated or the power supply is restored.

In case of failure or interruption of the power supply during movement of the door, restart shall not lead to a hazardous situation.

NOTE This might not apply to fire doors and doors in emergency and escape routes as national regulations for these door types might differ.

4.3.3 Electrical equipment

Doors with electrical drives shall be equipped with a main switch or plug-in system with which all mains phases can be switched off. The means of disconnection shall be positioned such that it can be safely used. A main switch is not necessary if the electrical drive unit is connected via a plug-in system. The means of disconnection shall be designed so that it can be safeguarded against unintentional and unauthorized activation. If this is not possible, the door shall be in view of the operator.

Where there is more than one source of power supply, it shall be possible to isolate each individual power source to allow work to be carried out safely.

4.3.4 Hydraulic drives

Hydraulic drives shall meet the requirements of EN 982.

4.3.5 Pneumatic drives

Pneumatic drives shall meet the requirements of EN 983.

4.4 Door

4.4.1 General

Safety relevant components of a door system shall comply to EN 13849-1 Performance Level “c” CAT.2. Safety relevant components used on doors in escape route shall comply with EN13849-1 Performance Level “d” CAT.3.

4.4.2 Materials

All parts of a door and door installations, whether fixed or movable, including the fixings shall be made of suitable materials and have adequate strength for the intended purpose. All materials used in the construction, operation and maintenance of powered door installations shall be non-hazardous.

There shall be no sharp edges and glazing shall not form sharp splinters if broken.

Toughened and laminated glasses are examples of suitable glazing materials. Float glass (silica-based glass) is not suitable for this application due to the risk of serious injury upon breaking.

Transparent leaves or leaf surfaces shall be clearly recognizable, e.g. by permanent marking, suitable labels or by using coloured materials.

Measures shall be taken to prevent unintentional disengagement of components or parts during use. The deflection of door leaves or other parts due to forces or pressure occurring either during normal use or during foreseeable misuse shall not cause permanent deformations or create any risk of derailment.

4.4.3 Shape of leaves

Sharp edges that may cause injuries due to cutting or grazing shall be avoided. Parts projecting from or devices such as letter box incorporated into the leaf shall not create potential hazards .

If powered glass door leaves are not totally framed, (e.g. glazing is only supported at the top and bottom) there shall be no glass-to-glass contact during the operation of the door.

4.4.4 Leaf travel limiting device

The door leaf shall be stopped automatically and safely at its terminal travel position by means of limiting devices or other means e.g. mechanical, electronic or electrical devices.

4.4.5 Manual operation

If the door can be operated manually the elements for manual operation, e.g. handles, grips, and grip plates, shall not constitute pinch, shear and drawing-in hazards in conjunction with fixed or movable elements in the immediate vicinity. It shall be possible to open or close the door leaf or leaves by means of a force not exceeding 220 N. The influence of wind or other environmental factors shall not be taken into account.

4.5 Activation

4.5.1 Automatic activation

4.5.1.1 General

The function of automatic activators is to ensure that activation is achieved by a person approaching a door at normal walking pace. In some situation, i.e. door opening on a public path, to avoid the door staying permanently open due to continuous passage of people, the person will have to get close to the door to activate the sensor and will have to wait the door to open. The distance from the door to the position where activation is initiated to ensure the door is open in time will be influenced by the door width and its opening speed.

prEN 16005:2009 (E)

The selection and location of activation devices shall also take into account the expected line of approach to the door by the user. If the line of approach could be from several directions, additional activation devices - possibly a combination of devices - may be required to ensure satisfactory operation.

4.5.1.2 Mat activation

The minimum width of the exposed area of a mat activator shall be the doorway opening width, less a maximum of 75 mm on each side.

The minimum depth of the exposed area of a mat activator may vary, depending on the width of the door.

NOTE To ensure that the door opens in time, the minimum depth should be between 1 000 mm and 1 500 mm from the plane of the door, or, in case of a door opening against the direction of travel, from the leading edge of the door (or doors) in the open position.

The minimum depth shall be not less than 1 500 mm for powered sliding doors on escape routes.

Where two or more mat activators are fitted side by side the inactive distance between the adjacent edges shall not exceed 60 mm.

Where two mat activators are fitted next to each other at a threshold the inactive distance between them shall not exceed 75 mm.

Mat activators shall be securely fastened to the floor without tripping hazards.

4.5.1.3 Sensor activation

Motion sensing devices or presence sensing devices may be used as automatic activation devices to initiate door movement since they are capable of detecting motion or presence within a given detection zone. Attention shall be paid to the provision and positioning of sufficient automatic activation devices for different types of door.

NOTE 1 The edge of the detection zone where activation is initiated should be between 1 000 mm and 1 500 mm in front of the plane of the door.

In the case of powered sliding doors on escape routes, the detection zone shall be not less than 1 500 mm in front of the door. The detection zone shall cover at least the entire opening width of the door.

NOTE 2 Where side approach is possible, the detection zone shall cover a minimum of 700 mm to each side of the doorway opening.

NOTE 3 When a hinged or swing door opens towards the user, the edge of the detection zone where activation is initiated should be between 1 000 mm and 1 500 mm from the leading edge of the door leaf in its fully open position.

4.5.2 Manual activation

Manual activation enables the user to open a power operated door by deliberately operating a manual activation device. The manual command may, however, also be given by lightly pushing the door. Manually activated doors are also usually designed to close automatically after a predetermined delay.

The possibility of manual activation may be provided on powered doors used by the public, for instance to help elderly and infirm persons open the door. Additional signs will be necessary.

NOTE See example of pictogram in Annex D.

The type of manual activation device and its positioning shall meet the needs of the user. In particular, the device shall be positioned where the user has a clear view of the door to ensure that he/she will not be impeded or struck by the door during its opening cycle. Manual activation devices shall be designed and installed so as to minimize the risk of inadvertent activation. They shall be positioned within reach of the user and shall be clearly identified and visible.