SLOVENSKI STANDARD
oSIST prEN 12445:2005

01-maj-2005

Vrata v industrijske in javne prostore ter garažna vrata - Varnost pri uporabi pogonskega mehanizma - Preskusne metode

Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Test methods

Tore - Nutzungssicherheit kraftbetätigter Tore - Prüfverfahren

Portes et portails industriels, commerciaux et les garages - Sécurité a l'utilisation des portes motorisées - Méthodes d'essai

Ta slovenski standard je istoveten z: **prEN 12445**

ICS:

91.060.50	Vrata in okna	Doors and windows
91.090	Konstrukcije zunaj stavb	External structures

oSIST prEN 12445:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 12445

March 2005

ICS

Will supersede EN 12445:2000

English version

Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Test methods

Portes et portails industriels, commerciaux et les garages - Sécurité à l'utilisation des portes motorisées - Méthodes d'essai

Tore - Nutzungssicherheit kraftbetätigter Tore - Prüfverfahren

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 Management Centre 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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword

This document (prEN 12445:2005) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 12445:2000.

This document is part of a series of European Documents for industrial, commercial and garage doors and gates that are identified in EN 13241-1.

This document is intended for use in conjunction with prEN 12453:2005. It contains the test methods needed to evaluate conformity of doors and gates to the requirements of prEN 12453:2005.

Introduction

This document is a type C document as stated in EN 1070.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in clause 1.

When provisions of this type C document are different from those which are stated in type A or B documents, the provisions of this type C document take precedence over the provisions of the other documents, for machines that have been designed and built according to the provisions of this type C document.

This product related document has been prepared to meet the needs of manufacturers, users and safety enforcement authorities, with the primary purpose of providing design and performance for mechanical aspects of industrial, commercial and garage doors and gates used by vehicles accompanied or driven by persons.

With the aim of clarifying the intention of this document and avoiding doubts when reading it, it was assumed when producing it that negotiation occurred between the manufacturer and the professional installer concerning:

— components to be kept in good repair or working order;

— negotiation occurred between the manufacturer and the user concerning the specificity of the use and place of use of the safety device;

— all parts of door installations, whether fixed or moving, including the fixing and assembling means, to be in all respects of good construction, suitable material, adequate strength and free from obvious defects for their intended working life;

— the design to be in accordance with European technical rules taking into account the most unfavourable static and dynamic forces occurring during the operation and all failure modes.

1 Scope

This document specifies the test methods to be applied to a power operated door, gate or barrier to demonstrate compliance with the requirements specified in prEN 12453:2005. In particular it specifies the method of measuring the forces developed by a power operated door, gate or barrier.

It applies to any power operated door, gate or barrier covered by prEN 12453:2005.

This document does not apply to power operated doors, gates and barriers which are manufactured before the date of publication of this document by CEN.

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

EN 1070, *Safety of machinery — Terminology.*

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.*

prEN 12453:2005, *Industrial, commercial and garage doors and gates — Safety in use of power operated doors — Requirements.*

EN 12605:2003, *Industrial, commercial and garage doors and gates — Mechanical aspects — Test methods.*

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

EN 60335-1:2001, H*ousehold and similar electrical appliances — Safety — Part 1: General requirements (IEC 335-1:2001, modified).*

EN 60335-2-95, *Safety of household and similar electrical appliances — Part 2-95: Particular requirements for drives for vertically moving garage doors for residential use (IEC 60335-2-95:1998, modified).*

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);*

IEC 60812, *Analysis techniques for system reliability — Procedure for failure mode and effects analysis (FMEA).*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070, EN 12433-1, EN 12433-2 and prEN 12453:2005 and the following apply.

NOTE Whenever the term “door” is used in this document, it shall be deemed to cover the full scope of types and variances of doors, gates and barriers defined in EN 12433-1.

3.1
measuring point
specified point where measurements of force are made

3.2
direction of measurement
specified direction in which measurements of force are made

3.3
opening gap
clear distance between the main closing edge and the opposing closing edge or between the leaf and neighbouring hard parts of the surroundings

4 Test method

The level of safeguarding of a power operated door, in respect of the requirements specified in prEN 12453:2005, shall be determined by the following tests and/or inspections.

Non automatic one single household vertically moving domestic garage doors, excluding those which open onto public areas, may be excluded if these doors are driven by drives which fulfil the requirements of EN 60335-2-95.

4.1 General

4.1.1 Avoiding or safeguarding against crushing, shearing and drawing-in points

Any crushing, shearing or drawing-in location shall be identified from a test specimen. For any identified hazardous location, a check shall be made to establish whether the hazard has been avoided or safeguarded. This check shall be done as follows:

4.1.1.1 Safety distance

When a crushing, shearing or drawing-in point is avoided by the provision of a safety distance, this distance shall be checked by inspection and measuring, taking into consideration the endangered parts of the human body.

4.1.1.2 Force limitation

When a crushing, shearing or drawing-in hazard is avoided by the provision of a force limitation system, this shall be checked

— by measuring the forces as specified in clause 5. The measured values shall be lower or equal to those mentioned in Annex A of prEN 12453:2005.

and

— by the following tests and inspections.

4.1.1.2.1 Crushing point

For any crushing point where the limitation of forces is achieved through force limiting devices or by devices for limitation of torque, electrical power, or pneumatic/hydraulic pressure, it shall be checked that these devices are properly designed by

— testing them according to EN 12978

and

— testing them against the single fault failure criteria as specified in clause 6.

4.1.1.2.2 Shearing point

For any shearing point which occurs at secondary closing edges, it shall be checked that

— forces exerted by the door leaf are limited to less than 150 N static and to less than 400 N dynamic, when measured according to clause 5

and

— either a distance of at least 25 mm has been provided between passing edges or the passing edges have been provided with round edges with a radius of at least 2 mm for each edge and a combined value (sum of the 2 radii) of at least 6 mm has not been exceeded.

4.1.1.3 Shaping of leaf surfaces

It shall be checked by inspection that the door leaf has no sharp edges, and that any part which protrudes shall cause no injury.

4.1.1.4 Hold-to-run-control

When a door is operated via "Hold-to-run" control, it shall be checked

— by measurement that the door leaf stops when the manual control device is released, within the specified overrun distance and maximum static force as specified in prEN 12453:2005, 5.1.1.4;

— by inspection that it is specified in the installation and user instructions that no manual controls other than hold to run control are to be installed and/or used;

— by inspection that when installed and operated in accordance with the installation and user instructions, the person controlling the door shall be in full view of the door and in the vicinity of the door during the leaf movement and shall not be in a hazardous position;

— by measurement that the speed of the primary edge is <0,5 m/s. This speed shall be measured at the same points as those specified for force measurement for the type of door concerned (see clause 5).

4.1.1.5 Guard

When guards such as enclosures, covers, enclosing guards or fixed protective leaves (screens) etc. are installed, it shall be checked by inspection that

— the danger points are safeguarded up to a height of 2,5 m above the floor to ensure that unprotected zones of the danger points do not remain,

— they are firm and resilient in respect of their safety-related function,

— they can be loosened only by use of a tool,

— they do not cause additional hazards,

— they cannot easily be defeated, bypassed or made ineffective.

4.1.1.6 Protective equipment

For any pressure sensitive (PSPE), electro sensitive (ESPE) or inherent protective equipment, it shall be checked by testing

— that when part of a person is in the detection zone of the ESPE or a person applies the activating force at any point within the active area of the PSPE sensing element or when the signal from the sensing unit is within a specified signal range, an appropriate output signal(s) is given in accordance with EN 12978. It shall be also checked that the control command for stopping the hazardous leaf movement (off state of the output signal switching device) is maintained as long as the protective device is actuated, or until a signal for reversing the direction of movement of the door leaf is given,

— that the safeguarding function of the protective equipment is effective up to a height of 2,5 m above the floor in a way that unprotected zones of the danger points are eliminated,

— or by failure mode analysis that, in case a single fault occurs, the protective equipment behaves as specified in prEN 12453:2005, 5.1.1.6.

It shall be also checked by measurement or test, that, in any case

— forces exerted by the door leaf are kept at acceptable values when measured according to clause 5

or

— the moving door is, in no circumstances, able to touch a person, as described in 6.2.

4.1.2 Safeguarding against hazard of being lifted

When a door is designed in a way that it opens upwards and is not operated in the “hold-to-run” mode of operation, it shall be checked that it cannot give an adult or a child a lift, in a dangerous way, by

— checking that the door leaf is without apertures or protruding parts which could give the possibility to travel with or to be lifted.

If there are possibilities to be lifted, it shall be checked

— that the door is not able to lift a mass of 20 kg (or 40 kg for doors installed in areas out of public access), from the closed position. The mass shall be attached onto the door leaf, in its most unfavourable position. The maximum dimension of the mass shall be 300 mm in any direction,

or

— that, when the door is able to lift a mass of 20 kg (alternatively 40 kg), the door shall stop before the lifted body reaches the lintel or other fixed parts of the building (see 7.4) or before the lifted body reaches a level of 2,5 m above ground, whichever is the lowest.

4.1.3 Safeguarding against impact hazards

Forces shall be measured on the main closing edges and at secondary edges, where persons can be pushed, as specified in clause 5. The measured values shall be less than the maximum values specified in prEN 12453:2005, Annex A.

4.2 Drive unit and power supply

4.2.1 Electrical drive unit

Electric drive units for non automatic one single household vertically moving domestic garage doors, excluding those which open onto public areas, shall be tested in accordance with EN 60335-2-95.

Electric drive units for all other kinds of doors shall be tested in accordance with EN 60335-2-103.

4.2.2 Additional requirements for hydraulic drive systems

It shall be checked that hydraulic drive systems are

— in accordance with EN 982,

— equipped with a means to protect them against over pressure and a means which makes it possible to connect a measuring gauge,

— able to resist three times the working pressure,

— constructed in a way that, when a total loss of pressure occurs in the system, the door leaf immediately stops in accordance with prEN 12453:2005, 5.2.7, or continues to operate at normal speed until it reaches a final end position where the fault is detected and further movement is prevented,

— designed in a way that entrapment of air is discouraged,

— not creating any hazardous situation, in particular an unexpected movement, when interruption of the power supply occurs.

4.2.3 Additional requirements for pneumatic drive systems

It shall be checked that pneumatic drive systems are

— constructed in accordance with EN 983;

— not allowed to work with a working pressure higher than 1,2 MPa;

— equipped with means to adjust the working pressure, to protect them against over pressure, and a means which makes it possible to connect a measuring gauge;

— able to withstand three times the working pressure;

— constructed so that uncontrolled hazardous movements are not created by variations of air compressibility.

4.2.4 Controls

The parts of door controls which are also part of safety devices, such as

— control units and output signal switching devices of safety devices,

— control devices for limitation of forces,

— control devices for limiting the leaf travel

shall be tested according to the relevant clauses 5, 6 and 7.

4.2.5 Switching on of the drive

If the drive may be switched on by manual activation devices which are designed for impulse and/or automatic and/or remote-controlled and/or programmed control operation, it shall be checked by inspection and/or test that the danger points of the door are avoided or safeguarded.

When danger points have to be avoided by safety distances and/or fixed guards and/or proper shaping of leaf surfaces, during the installation process, it shall be checked that all are properly addressed in the installation instructions.

It shall be accepted that, in automatic mode of operation, the door leaf may move to the fully open position and stop, or the door leaf may automatically move to the closed position after a period of time at the fully open position.

4.2.6 Switching off of the drive

4.2.6.1 Switching off of the drive by stop-command

It shall be checked by test, that the leaf movement stops and the drive is switched off, as soon as a stop-command, as specified in prEN 12453:2005, 5.2.7.1 is given.

4.2.6.2 Switching-off of the drive in case of power supply interruption

It shall be checked by test or inspection that, in case of interruption of the power supply during movement of the door leaf, the subsequent restart when the supply is restored does not lead to a dangerous situation.

4.2.7 Manual actuators

It shall be checked that any manual actuators are provided in such a manner that

— when permanently installed, the person operating the controls is not in a hazardous position. Check to be carried out either on site or by checking that this item is correctly specified in the installation instructions,

— unintended operation of the manual controls is prevented (by inspection).

4.2.8 Supply disconnecting device

It shall be checked that each door supplied with an electrical drive unit is equipped either with a supply disconnecting device which disconnects all incoming sources of supply, or with a plug-in system which can be used for isolation purposes.

It shall also be checked that this supply disconnecting device or plug-in system is designed so that it can be safeguarded against unintentional and unauthorised switching on.

For domestic applications, this safeguarding can be disregarded only if the disconnecting device is installed in vicinity of or in direct view from the drive unit. This shall be checked either on site or within the instructions for installation.

4.3 Manual operation

When a manual operation is provided on a power operated door, compliance with prEN 12453:2005, 5.3, shall be checked by inspection.

It shall be checked that instructions for use are correctly documented in respect of this point.