



SLOVENSKI STANDARD
oSIST prEN 12604:2005
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**Vrata v industrijske in javne prostore ter garažna vrata - Mehanske lastnosti -
Zahteve**

Industrial, commercial and garage doors and gates - Mechanical aspects - Requirements

Tore - Mechanische Aspekte - Anforderungen

Portes et portails industriels, commerciaux et de garage - Aspects mécaniques -
Exigences

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English version

Industrial, commercial and garage doors and gates - Mechanical aspects - Requirements

Portes industrielles, commercial et de garage - Aspects mécaniques - Exigences

Tore - Mechanische Aspekte - Anforderungen

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

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Foreword

This document (prEN 12604:2005) 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 12604:2000.

This document is one of a series of documents for industrial, commercial and garage doors and gates, which are identified in EN 13241-1, and for which the methods of verification are specified in prEN 12605:2005

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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 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 equipment;
- the wind the door has to withstand out of service;
- the wind conditions under which the door is expected to be operable;
- 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 usual European technical rules taking into account the most unfavourable static and dynamic forces occurring during the operation and all failure modes.

For the purpose of this document it is assumed that manually operated balanced doors with an out of balance of not more than 150 N in normal use (see 4.3.3) are fully manual doors (and out of the scope of the Machinery Directive).

1 Scope

1.1 General

This document specifies the safety, structural and mechanical requirements for doors, gates and barriers or their components, intended for installation in areas in the reach of people and for which the main intended uses are giving safe access for goods and vehicles accompanied or driven by persons in industrial, commercial and residential premises.

This document also covers commercial doors such as rolling shutters and rolling grilles used in retail premises which are mainly provided for the access of persons rather than vehicles or goods.

This document deals with all significant hazards listed in Annex A and specifies requirements to eliminate or minimise them.

These products may be manually or power operated. Calculation and sizing of the drive unit is not covered in this document.

1.2 Exclusions

It does not apply to

- lock gates and dock gates;
- doors on lifts;
- doors on vehicles;
- armoured doors;
- doors mainly for the retention of animals;
- theatre textile curtains;
- horizontally moving doors less than 2,5 m wide and 6,25 m² area, designed principally for pedestrian use
- doors outside the reach of people (such as crane gantry fences);
- revolving doors of any size;
- railway barriers;
- barriers used solely for vehicles.

This document is not applicable to doors, gates and barriers which are manufactured before the date of publication of this document by CEN.

1.3 Specific applications

This document applies only to doors which are not part of the load carrying structure of the building.

prEN 12604:2005 (E)**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 294, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs.*
- EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and moveable guards.*
- EN 1070, *Safety of machinery — Terminology.*
- EN 12424, *Industrial, commercial and garage doors and gates — Resistance to wind load — Classification.*
- 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 12385-4, *Steel wire ropes — Safety — Part 4: Stranded ropes for general lifting applications.*
- prEN 12453:2005, *Industrial, commercial and garage doors and gates — Safety in use of power operated doors — Requirements and classification.*
- EN 12600:2002, *Glass in buildings — Pendulum test — Impact test method for flat glass and performance requirements.*
- prEN 12605:2003, *Industrial, commercial and garage doors and gates — Mechanical aspects — Test methods.*
- EN 13241-1, *Industrial, commercial and garage doors and gates — Product standard — Part 1: Products without fire resistance and smoke control characteristics.*
- EN 13411-2, *Terminations for steel wire ropes — Safety — Part 2: Splicing of eyes for wire ropes slings.*
- prEN 13411-3:1999, *Terminations for steel wire ropes — Safety — Part 3: Ferule secured eyes.*
- prEN 13411-6:1998, *Terminations for steel wire ropes — Safety — Part 6: Asymmetric wedge socket clevis.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070, EN 12433-1 and EN 12433-2 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**normal use**

use intended and described by the manufacturer

3.2**vertically moving door**

door where the main closing edge moves, for at least a part of its travel, with a vertical component

3.3**ultimate failure load**

maximum differential pressure under which a door remains in its installed position even if permanently deformed

4 List of significant hazards

This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this document, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

A door should not cause injuries or damages due to:

- unintentional or uncontrolled movements of a door leaf due to external influences, such as wind, snow, water, etc.;
- unintentional or uncontrolled movements of a door leaf due to disintegration of the door system in any way, such as falling down, derailment, overrunning of terminal positions, broken components of the leaf suspension, etc.;
- intentional movements of a door leaf (opening or closing) thereby trapping or crushing persons or objects in any position;
- lack of recognition due to material (i. e. glass), colour etc. causing a person to run or walk into a door leaf or not being aware of the movement of the panel;
- lack of predictability of behaviour (doors opening on to a driveway etc.);
- lack of proper operating instructions or instructions which are difficult to understand or to follow;
- parts of a door leaf breaking off.

The exhaustive list of hazards as addressed in this document is stated in the Annex A.

5 Safety Requirements and/or protective measures

Doors shall comply with the safety requirements and/or protective measures of this clause.

In addition, the doors shall be designed according to the principles of EN 292 for hazards relevant but not significant, which are not dealt with by this document (e.g. sharp edges). This requirement may not apply to fully manual doors (see introduction) when these are not intended for power operation.

5.1 Mechanical specifications of door characteristics

The manufacturer shall provide all technical information to enable the door to be correctly selected for the structural opening prepared for it.

For the interpretation of the mechanical performance of doors the following specifications shall be given:

- structural opening sizes and dimension details;
- frequency of operation;
- operation mode;

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- degree of automation;
- position in building (inside, outside);
- provision of pass door;
- transparent surfaces;
- building materials to be used;
- position and types of fixing.

NOTE 1 If such data are not presented by the purchaser at the time of request or order, the producer/supplier may ask for such data or specify his document ones.

NOTE 2 Additional data with respect to mechanical aspects may be requested for specific conditions on site.

5.2 Design and construction**5.2.1 General**

The number of full operational cycles which the product is designed/constructed for, shall take into account the intended life time, the planned maintenance and replacement of parts subject to wear and fatigue.

5.2.2 Strength

The door and its components, including its fixing and assembling means for attachment to the building, shall be designed, so that, when operated as intended by the manufacturer, no part of the door, including the fixing and assembly means, shall be permanently deformed.

Anti-drop devices and related components may show permanent deformation after engagement.

The deflection of door leaves or other elements resulting from a specified differential pressure (e.g. wind load) shall not cause permanent deformations which will affect the functioning of the door or create any risk for derailment or the like.

The strength verification shall be either by calculation or by testing.

When calculating for permanent deformation for structural design purposes, the load to be considered for calculation shall be the classification load as stated in EN 12424 multiplied by the safety coefficients specified in Table 1 unless an EN Standard exists for a particular component which allows the use of a lower safety factor.

Table 1 — Safety factors for calculation purposes

Loading conditions	Safety coefficients for material with yield	Safety coefficients for material without yield
Load due to differential pressure	1,5 minimum yield stress	2,0 min. breaking stress
Stress due to other loads e.g. dead weight	2,0 minimum yield stress	3,5 min. breaking stress

When proof testing for permanent deformation, it shall be visually checked that no permanent deformation has occurred under a test load of 1,10 times the maximum load anticipated during normal operation or specified wind load differential pressure.

It shall be additionally checked that the door stays in place under an ultimate failure load equal to 1,25 the above test load. Under this ultimate failure load, permanent deformation shall be accepted.

5.2.3 Operability

Doors shall be designed so that elastic deformations under operational forces or torques which occur during normal use do not affect the function and the safety of the door.

Due to safety requirements, the power of the drive may be restricted thus preventing the door from being moved under windy conditions.

When operation under specified wind conditions is required, and when the safety is based on force limitation, additional safety devices shall be used.

NOTE It is recommended that user instructions should contain a warning, stating that operation in windy conditions can be dangerous.

5.2.4 Transparent surfaces

Transparent elements in leaves shall be so designed that they remain fully secured under normal operating conditions.

In order to avoid occurrence of sharp splinters, cutting edges or other dangerous parts, the transparent material shall comply with the requirements of class 3 of EN 12600:2002.

Compliance with class 3 of EN 12600:2002 can alternatively be demonstrated by using a test sample built into a representative door leaf segment incorporating the transparent element(s) as defined in 5.3.1 of prEN 12605:2005.

Door leaves, made primarily from transparent material without visible separations or with visible separations at 1,5 m or more, shall be coloured or have conspicuous markings on them to enable them to be seen by persons who might otherwise collide with them. (see introduction)

These markings may be any shape which shall at least cover a circle of 0,1m repeated at maximum 1,0 m intervals, and be positioned in a height of 0,8m to 1,5m above floor level.

5.3 Protection against unintentional and uncontrolled movements

5.3.1 Guides and end stops

The guides (and where appropriate the door leaf as well as any other moving part of a door system) shall be designed and constructed in such a way that unintentional disengagement or derailment are prevented during normal operation or in case of contact with stationary obstacle as described in EN 12605:2003, or in case of failure of a suspension element.

The movement of the door leaf shall be limited by end stops, with buffering where necessary for energy absorption. Elements of the construction such as the floor, a wall, a mullion, etc can be used as end stops.

5.3.2 Unintentional movements due to wind

Doors of a type where the leaf could move under the influence of a wind, related to the declared class of the door or to class 2 in accordance with EN 12424 whichever is the minimum, shall incorporate means to prevent such movement. These shall automatically be effective at the relevant terminal position(s).

Also, when a door is held in the closed position by a drive, it shall be checked that the door will not move if subjected to the ultimate failure load.