SLOVENSKI STANDARD
SIST EN 12604:2017+A1:2021

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Nadomešča:
SIST EN 12604:2017

Vrata v industrijske in javne prostore ter garažna vrata - Mehanske lastnosti - Zahteve in preskusne metode

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

Tore - Mechanische Aspekte - Anforderungen und Prüfverfahren

Portes et portails industriels, commerciaux et résidentiels - Aspects mécaniques - Exigences et méthodes d'essai

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ICS:

91.060.50	Vrata in okna	Doors and windows
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EUROPEAN STANDARD

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English Version

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

Portes et portails industriels, commerciaux et résidentiels - Aspects mécaniques - Exigences et méthodes d'essai

Tore - Mechanische Aspekte - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 14 August 2017 and includes Amendment 1 approved by CEN on 9 November 2020.

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

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European foreword

This document (EN 12604:2017+A1:2020) 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of an identical text or by endorsement, at the latest by June 2021 and conflicting national standards shall be withdrawn at the latest by June 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 9 November 2020.

This document supersedes A1 EN 12604:2017 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

Compared with EN 12604:2000 and EN 12605:2000, the following changes have been made:

a) EN 12604 has been merged with EN 12605; as EN 12605:2000 will be withdrawn;

b) limitation of the scope to manually operated doors;

c) cancellation of relationships to Regulation (EU) N°305/2011 and Machinery Directive 2006/42/EC (Annex ZA and ZB deleted);

d) revision of document structure (Clause 4 and Clause 5);

e) sorting and summary of requirements (Clause 4);

f) revision of informative Annexes in accordance to Clause 4 of this standard;

g) editorial revision.

This document is one of a series of supporting standards for industrial, commercial and garage doors and gates, which are identified in EN 13241.

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

Introduction

This document has been prepared to meet the needs of manufacturers and users, 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 that clarification occurred between all involved parties (manufacturer, professional installer, user, etc.) concerning:

— components to be maintained and kept in good working order;

— the intended use, the type of users and the place of use of the door;

— 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 forces occurring during the operation and all failure modes.

1 Scope

This European Standard specifies mechanical requirements and test methods for manually operated doors, gates and barriers, intended for installation in areas in the reach of persons, and for which the main intended use is giving safe access for goods and vehicles accompanied or driven by persons in industrial, commercial or residential premises.

This European Standard also covers manually operated vertically moving commercial doors such as rolling shutters and rolling grilles, used in retail premises which are mainly provided for goods protection.

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

It does not apply to:

— lock gates and dock gates;

— doors on vehicles;

— doors mainly for the retention of animals unless they are at the site perimeter;

— doors intended for pedestrian use;

— railway barriers.

Whenever the term “door” is used in this document, it is deemed to cover the full scope of types and variances of doors, gates and barriers defined by the scope of this European Standard.

2 Normative references

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

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*

EN 12600:2002, *Glass in building — Pendulum test — Impact test method and classification for flat glass*

EN 13241, *Industrial, commercial, garage doors and gates — Product standard, performance characteristics*

EN 13411-2, *Terminations for steel wire ropes — Safety — Part 2: Splicing of eyes for wire ropes slings*

EN 13411-3, *Terminations for steel wire ropes — Safety — Part 3: Ferule secured eyes*

EN 13411-6, *Terminations for steel wire ropes — Safety — Part 6: Asymmetric wedge socket clevis*

EN 61032:1998, *Protection of persons and equipment by enclosures — Probes for verification (IEC 61032:1997)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12433-1, EN 12433-2 and EN 13241 apply.

4 Safety requirements and/or protective measures

4.1 General

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

4.2 Design and construction

4.2.1 Operability

The door and its components, including its fixing and assembling means as specified by the manufacturer for attachment to a building or structure, shall be designed so that elastic or permanent deformations under operational forces or torques which occur during normal use do not affect the operation and the safety of the door.

The minimum safety factors for calculation purposes to be used for stress due to all loads for the design of the door are given in Table 1.

Table 1 — Safety factors for materials for calculation purposes

Safety factor for yield stress	Safety factor for breaking stress
2,0 minimum	3,5 minimum

〚A1〛 For components where testing is carried out instead of calculation the minimum safety factor before yield shall be 1,1. 〚A1〛

4.2.2 Glazing

Glazing elements in the door 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 glazing material shall comply at least with the requirements of class 3 of EN 12600:2002 and the glazing material shall not break.

Door leaves made primarily from glazing material shall be clearly recognizable, e.g. by visible separations, permanent marking, suitable labels or by using coloured materials.

4.3 Protection against unintentional and uncontrolled movements

4.3.1 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 a stationary obstacle, or in case of failure of a suspension element.

The movement of the door leaf shall be limited by end stops. Mechanical end stoppers in the terminal positions of the door movement shall withstand the energy developed by the possible impact of the door leaf.

4.3.2 Unintentional movements due to wind

When relevant, the door shall incorporate means suitable to prevent movement of the door due to the influence of wind. These means shall be effective at the relevant terminal position(s).

4.3.3 Uncontrolled movements of vertically operating doors

A vertically operating door leaf shall come to a stop and stay in position when released in any position during the opening or closing movement in normal operation.

4.3.4 Safeguarding against dropping of vertically operating door leaves

Vertically operating door leaves shall be safeguarded against dropping when in normal use or when a failure of a single element of the suspension or balancing system occurs. The failure of the connection between drum and curtain of a rolling door shall also be taken into consideration if the door when in the fully closed position does not cover at least half of the circumference of the roller.

The door shall not be able to close uncontrolled if a component fails. The design of the door shall also ensure that in case of a single failure the resulting short-term transient loads will not cause secondary mechanical failures of other elements of the door. Elements of the suspension or balancing system which could fail during operation of a door are balancing springs, counterweights, steel wire ropes, pulley, drums, chains, straps, belts and their attaching parts.

Rigid parts such as shafts or levers, provided that they are dimensioned and designed for the maximum load and foreseeable overload, need not be considered as a potential cause of the suspension or balancing system failure.

Safeguarding against dropping can be achieved by either using an anti-drop safety device or by other design features incorporated into the door. Safeguarding against dropping shall fulfil the following requirements:

a) in the event of a failure in the door suspension or balancing system, the main edge of the door leaf shall not move downwards more than 300 mm even in case of bouncing;

b) after the door leaf has been stopped by the anti-drop safeguarding, it shall be held safely in the same position, as long as no further action in accordance with the user instructions is carried out. User instructions shall clearly specify when a competent person is needed to further operate the stopped door;

c) the anti-drop safeguarding shall be automatically activated in the event of a suspension or balancing system failure;

d) an anti-drop safeguarding shall be designed to take the full dynamic load of the door leaf;

e) further, any component affected by the action of the anti-drop safeguarding shall be designed to bear the resulting dynamic forces;

f) parts of the anti-drop safeguarding or other door components may need to be replaced after activation of the anti-drop safeguarding. Unless activation of the anti-drop safeguarding does not cause any deformation and/or damage which impairs further operation of the door and of the anti-drop safeguarding, instructions for use shall specify parts to be replaced and whether the replacement can be carried out by the user.

The requirements of this paragraph can be disregarded if the following two requirements are simultaneously fulfilled:

— the maximum out-of-balance of the door leaf static force occurring at the primary closing edge of the door does not exceed 200 N when there is a suspension or balancing component failure;

and

— the failed component is clearly visible or detectable during normal operation of the door.

4.3.5 Safeguarding against dropping of hinged doors

Hinged door leaves shall be safeguarded against dropping when in normal use or when a failure of a single element of the fixing system occurs. The door leaf shall not be able to move uncontrolled if a component fails.

In case a hinge or other supporting means breaks or is damaged, the anti-drop safety device shall be able to keep the leaf in position with a maximum displacement of 300 mm from the rotation axis.

The door shall also be fitted with a device which avoids that the door leaf, during the opening or closing movement, can be lifted more than 50 % of the length of the pin of the hinges or any other supporting means (“anti-lifting” device).

4.4 Forces for manual operation

A door shall be able to open or close with a force not exceeding 150 N for doors for residential use and 260 N per person for industrial/commercial use, wind or other environmental factors not being considered. These forces can be exceeded to start the movement.

4.5 Devices for manual operation

Doors shall be fitted with suitable devices, such as handles or pull cords, on the inner and outer sides of the door to enable them to be moved, unless the basic design affords sufficient safe hand-hold. If a door is only operated from one side, it is acceptable that only that side is equipped with such devices.

4.6 Finger protection

Gaps, other than between the main closing edge and the secondary edge, in which the distance between door leaf components is reduced during the leaf movement and where the test probe B of EN 61032:1998 can be inserted shall be eliminated or safeguarded up to a height of 2,5 m above floor level or other permanent access level.

Sharp edges shall be eliminated or safeguarded to avoid the risk of cutting when operating the door.

Edges with radius of at least 2 mm and, for combined radius (sum of the 2 radii), of at least 6 mm (e.g. at least 2 mm + 4 mm or 3 mm + 3 mm) are considered to be safe.

If during normal use of the door the gap created within single coils of springs is greater than 8 mm, the path of those springs shall be safeguarded up to 2,5 m above floor level or any other permanent access level.

4.7 Specific requirements for parts used in suspension and balancing systems

4.7.1 General

Commonly used parts in suspension and balancing systems are balancing springs, counterweights, steel wire ropes, pulley, drums, chains, straps and belts.