



SLOVENSKI STANDARD

SIST EN 81-58:2022

01-september-2022

Nadomešča:
SIST EN 81-58:2018

Varnostna pravila za konstruiranje in vgradnjo dvigal (liftov) - Pregled in preskusi - 58. del: Preskus odpornosti vrat proti požaru

Safety rules for the construction and installation of lifts - Examination and tests - Part 58: Landing doors fire resistance test

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Überprüfung und Prüfverfahren - Teil 58: Prüfung der Feuerwiderstandsfähigkeit von Fahrschachttüren

Règles de sécurité pour la construction et l'installation des ascenseurs - Examens et essais - Partie 58 : Essai de résistance au feu des portes palières

Ta slovenski standard je istoveten z: EN 81-58:2022

ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
91.140.90	Dvigala. Tekoče stopnice	Lifts. Escalators

SIST EN 81-58:2022 en,fr,de

EUROPEAN STANDARD

EN 81-58

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2022

ICS 13.220.20; 91.140.90

Supersedes EN 81-58:2018

English Version

Safety rules for the construction and installation of lifts - Examination and tests - Part 58: Landing doors fire resistance test

Règles de sécurité pour la construction et l'installation
des ascenseurs - Examens et essais - Partie 58 : Essai de
résistance au feu des portes palières

Sicherheitsregeln für die Konstruktion und den Einbau
von Aufzügen - Überprüfung und Prüfverfahren - Teil
58: Prüfung der Feuerwiderstandsfähigkeit von
Fahrschachttüren

This European Standard was approved by CEN on 20 April 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Safety requirements and/or protective/risk reduction measures.....	7
4.1 Criteria of performance	7
4.2 Integrity (E).....	8
4.3 Thermal insulation (I).....	8
4.4 Radiation (W).....	8
5 Fire resistance classification.....	8
5.1 Fire resistance classification periods	8
5.2 Designatory letters.....	8
5.3 Combinations of criteria.....	9
5.4 Fire resistance classes.....	9
6 Verification of safety requirements and/or protective measures	9
6.1 Test principle.....	9
6.2 Test equipment.....	9
6.3 Test conditions.....	10
6.4 Test specimen.....	10
6.4.1 Construction.....	10
6.4.2 Number of test specimens.....	10
6.4.3 Size of specimen.....	10
6.4.4 Installation of specimen	10
6.5 Supporting construction.....	10
6.6 Conditioning.....	11
6.7 Pre-test examination	11
6.7.1 General.....	11
6.7.2 Constructional details	11
6.7.3 Clearance gap measurements and depth of penetration.....	11
6.7.4 Functionality test	16
6.8 Test instrumentation.....	16
6.8.1 Furnace thermocouples.....	16
6.8.2 Furnace CO ₂ concentration.....	16
6.8.3 Gas flow measuring system instrumentation	16
6.8.4 Furnace pressure	16
6.8.5 Unexposed face temperature.....	16
6.8.6 Radiation measurement	18
6.8.7 Deformation measurement	18
6.8.8 Flow measurement verification.....	18
6.9 Test method	19
6.10 Test termination.....	19
6.11 Assessment of performance	19
6.12 Direct field of application.....	20

6.13	Test report	20
7	Information for use	20
Annex A (normative)	Description of the canopy and measuring system	21
Annex B (normative)	Standard supporting construction	24
Annex C (normative)	Verification method for leakage rate measurement	25
Annex D (normative)	Calculation of leakage rate	26
D.1	Calculation of leakage rate when measuring according to EN ISO 5167-1:2003 with an orifice plate	26
D.2	Correction based on flow measurement verification	27
D.3	Correction based on pressure variation (pressure correction)	27
D.4	Interpreting the leakage rate curve	27
Annex E (informative)	Extrapolation rule for the leakage rate for higher doors	28
Annex F (informative)	Product fire performance report (assessment)	30
F.1	General	30
F.2	Content and format of fire classification report	30
F.3	Criteria of performance	30
F.4	Application of the test results to product variants	30
Annex G (informative)	Data label	32
Annex ZA (informative)	Relationship between this European Standard and the essential requirements of Directive 2014/33/EU aimed to be covered	33
Bibliography	34

EN 81-58:2022 (E)**European foreword**

This document (EN 81-58:2022) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, 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 November 2022, and conflicting national standards shall be withdrawn at the latest by May 2024.

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 supersedes EN 81-58:2018.

In comparison with the previous edition, the following significant changes have been made:

- the structure of the standard has been reorganized;
- the wordings of 6.12 a) and 6.12 b) and the associated Annexes D and E have been clarified;
- hazards due to emission of gasses have been excluded from the scope;
- normative references have been updated;
- Annex ZA has been modified.

No technical changes have been made in Clauses 4 and 5 during this revision.

This document is intended to be used in conjunction with EN 81-20:2020, which gives the basic requirements for passenger and goods passenger lifts.

This document is part of the EN 81 series of standards. The structure of the EN 81 series is described in CEN/TR 81-10:2008.

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

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

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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 is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard. <https://standards.iteh.ai/catalog/standards/sist/ad916d23-ae8f-4556-87c9-0e8c8e005934/sist-en-81-58-2022>

EN 81 series has identified the need for lift doors to act as fire barriers against the transfer of a fire via the lift well. This document specifies requirements for this purpose. It follows the general principle of EN 1363-1:2020 and where appropriate the procedure of EN 1634-1:2014+A1:2018. Additionally, a tracer gas technique for establishing the integrity of a lift landing door is used.

NOTE Lift landing doors are not included in the scope of EN 1634-1:2014+A1:2018.

EN 81-58:2022 (E)**1 Scope**

This document specifies the fire resistance requirements for lift landing doors which are intended to provide a barrier to the spread of fire from the landing side and via the lift well in buildings during a defined period of time. The fire resistance requirements are expressed in terms of integrity (E), insulation (EI) and radiation (EW).

It is applicable to lift landing doors installed in the lift well openings at landings and used as means of access to lift car.

It also specifies the method of testing and classification of fire resistance of lift landing doors. The test method is only valid for furnaces where the door is mounted in a vertical position. The test method specifies the measurement of integrity and if required the measurement of radiation and thermal insulation.

This document does not cover other technical requirements in addition to fire resistance requirements.

This document refers to CO₂ as means of tracing the propagation of fire. The document does not cover hazards due to emission of gases.

This document is not applicable to lifts which are installed before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 81-20:2020, *Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 20: Passenger and goods passenger lifts*

EN 1363-1:2020, *Fire resistance tests — Part 1: General requirements*

EN 1363-2:1999, *Fire resistance tests — Part 2: Alternative and additional procedures*

EN 1634-1:2014+A1:2018, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware — Part 1: Fire resistance test for door and shutter assemblies and openable windows*

EN ISO 5167-1:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements (ISO 5167-1:2003)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

ISO 9705-1:2016, *Reaction to fire tests — Room corner test for wall and ceiling lining products — Part 1: Test method for a small room configuration*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN 81-20:2020, EN 1363-1:2020 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

lift landing door

door designed to be installed in the lift well opening at a landing to provide access to the lift

3.2

thermally uninsulated lift landing door

lift landing door which is not intended to satisfy the selected insulation criteria

3.3

thermally insulated lift landing door

lift landing door which is intended to satisfy the selected insulation criteria

3.4

door opening

width of the clear opening allowing free passage through the open lift landing door

3.5

door assembly

complete assembly, including any frame or guide, door panel or panels, which is provided for access to and from the lift and the landing

Note 1 to entry: It includes all panels, hardware, sealing materials and any operating components.

3.6

supporting construction

construction provided in the opening of the test frame or the furnace front in order to accommodate the test specimen

3.7

leakage rate

total flow rate of hot gases passing through gaps of the door assembly, due to overpressure on the landing side

4 Safety requirements and/or protective/risk reduction measures

4.1 Criteria of performance

Lift landing doors shall comply with the safety requirements of this clause. In addition, the lift landing doors shall be designed according to the principles of EN ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

EN 81-58:2022 (E)

The main criteria of integrity performance of lift landing doors is the ability to remain in place as a fire barrier, ability to control the leakage of hot gases from the landing side to the lift well (E) and to satisfy any additional criteria for insulation (I) and radiation (W) which can be specified.

Lift landing door shall withstand fire exposure from the landing side and prevent the entry of a fire into the lift well during a defined period of time.

The fire resistance performance of the lift landing door shall be expressed in minutes, according to 4.2, 4.3 and 4.4, with one or more of the following criteria:

- integrity (E) : xx minutes;
- insulation (I) : yy minutes;
- radiation (W) : zz minutes.

4.2 Integrity (E)

The main requirement for lift door fire resistance is the integrity. The criteria is following:

- no sustained flaming in well side for more than 10 s at any time;
- the leakage rate per meter width of the door opening does not exceed $3,0 \text{ m}^3/(\text{min}\cdot\text{m})$ after 14 minutes fire.

4.3 Thermal insulation (I)

The average surface temperature rise of the lift door shall not exceed 140 K during a defined period of time.

For door panel, over panel and side panel with a width $\geq 300 \text{ mm}$, the maximum temperature rise on shall not exceed 180 K during a defined period of time.

For side panel width and/or over panel height of greater than 100 mm, but less than 300 mm, then the maximum temperature rise of these members shall not exceed 360 K during a defined period of time.

4.4 Radiation (W)

The radiation shall not exceed the value of $15,0 \text{ kW/m}^2$ during a defined period of time, measured as specified in EN 1363-2:1999.

5 Fire resistance classification**5.1 Fire resistance classification periods**

The fire resistance class is expressed as a combination of criteria's given in 4.1 and 5.3 and period of time in minutes. Period of time shall be rounded down to the nearest fire classification period hereafter: 15 min, 20 min, 30 min, 45 min, 60 min, 90 min or 120 min. See Table 1.

5.2 Designatory letters

The following designatory letters shall be used for the fire classification of lift landing doors:

- E for integrity;
- I for insulation;
- W for radiation.

5.3 Combinations of criteria

The fire resistance classes shall be expressed as follows:

- E *tt* : *tt* being the fire classification period during which the criterion integrity is satisfied;
- EI *tt* : *tt* being the fire classification period during which the criteria integrity and insulation are satisfied;
- EW *tt* : *tt* being the fire classification period during which the criteria integrity and radiation are satisfied.

When criteria are combined, the time declared shall be that of the criterion having the shortest time.

EXAMPLE A lift landing door with E: 47 min, W: 25 min and I: 18 min is classified E 45 and/or EW 20 and/or EI 15.

5.4 Fire resistance classes

Only the fire resistance classes given in Table 1 shall be used.

Table 1 — Fire resistance classes

E	15	20	30	45	60	90	120
EI	15	20	30	45	60	90	120
EW		20	30		60		

The fire resistance class of the lift landing door should be indicated in a data label according to Annex G.

6 Verification of safety requirements and/or protective measures

6.1 Test principle

The test consists in exposing the landing side of a lift landing door to the heating conditions specified in EN 1363-1:2020 for the period for which the door shall be assessed for its fire resistance. During the test, positive pressure exists over the whole height of the door on the exposed side, inducing the leakage of furnace gases to the unheated side. A canopy is provided on the unexposed side which collects the leaked gases and a suction fan draws these through a duct provided with a system for measuring the volume flow (see Annex A). The concentration of CO₂, used as a tracer gas, is measured in the furnace and at the airflow measuring point, and by monitoring the gas flow rate and its temperature it is possible to calculate the leakage rate of hot gases through the test door. The method gives a record of the hot gas leakage as a function of time which is corrected for normal conditions. This provides a basis for assessing the ability of the door to act as an effective fire barrier.

NOTE ISO 3008-2:2017 has the same test principle as EN 81-58 based on CO₂ measurement.

6.2 Test equipment

6.2.1 The test furnace shall be as described in EN 1363-1:2020.

6.2.2 The canopy shall be as specified in Annex A.

6.2.3 The measuring system for leakage rate shall be as specified in Annex A.

EN 81-58:2022 (E)**6.3 Test conditions**

6.3.1 The furnace shall be controlled to follow the temperature/time curve as specified in EN 1363-1:2020.

6.3.2 The furnace shall maintain positive pressure on the exposed side over the whole height of the specimen such that the pressure at the sill level is in the range of $(2 + 8,5 \times H_{\text{sill}}) \pm 2$ Pa where H_{sill} is the vertical distance (in metres) between the sill level and the intended floor level.

NOTE In some applications such as service lifts or dumbwaiters, the sill level is different than the intended floor level.

6.4 Test specimen**6.4.1 Construction**

The test specimen shall be fully representative of the door assembly on which information is required.

6.4.2 Number of test specimens

As information is required when the door is exposed to heating from the landing side only, one specimen is tested.

6.4.3 Size of specimen

The specimen shall be full size or the maximum size that can be accommodated in the furnace. The reference size of the front opening of the furnace is 3 m × 3 m. In order to expose a required minimum width of 200 mm of supporting construction for a 3 m × 3 m furnace, the opening in the supporting construction is restricted to 2,6 m × 2,8 m (width × height).

6.4.4 Installation of specimen

The specimen shall be mounted in a supporting construction having at least the fire resistance of the target classification. The supporting construction shall be built first within the test frame leaving an aperture of the specified size. The width of the supporting construction on the two vertical sides and the top shall be not less than 200 mm.

The design of the connection between the door and the supporting construction, including any materials used to make the junction, shall be as stated in instructions for use on the type of the supporting construction. The position of the door assembly in relation to the supporting construction shall be as stated in instructions for use.

The clearances at the beginning of test shall correspond to the maximum that is permissible by EN 81-20:2020, 5.3.1.4, when the lift landing doors are put into service, unless designed for another smaller maximum gap size, which shall then apply.

6.5 Supporting construction

In view of the field of direct application of test results, the lift landing doors shall be erected in the standard supporting construction as described in Annex B.

NOTE In special cases, the supporting construction can be of a type with which the door is intended to be used in practice. In such cases, the field of application of the test results is restricted to that construction.